



PROCEEDINGS
of the
National Safety Council

*EIGHTH ANNUAL
SAFETY CONGRESS*

Held at the
HOTEL STATLER
Cleveland, Ohio
October 1-4, 1919

INTRODUCTION

"The 1919 Congress was the greatest Congress ever held in the history of the National Safety Council." This was the unanimous verdict of the 3,000 representatives who attended the Congress in Cleveland, September 29 to October 4. Previous congresses have been characterized by great enthusiasm, splendid programs of speakers and round-table discussions, but there was a new spirit manifested at this Congress resulting doubtless from the war experience, a spirit of the faith in the cause of Safety, a vision of the future, a conviction of certainty of the future development of the Council and the Safety movement, and a spirit of determination to grip the accident problem and to solve it just as we gripped and solved the difficult problems during the war.

This volume of 1460 pages will bring to the members who were at the Congress something of the spirit which animated that great gathering and will place in their hands the valuable experience which was contributed by the various speakers and in the round-table discussions. The proceedings represent the best piece of literature on Safety which will be published this year—the most valuable compendium of experience for any individual or concern to use in developing Safety work in industry.

This volume constitutes one of the important items of service which the Council, as the clearing house of information, is able to furnish to its members.

INDEX

The Proceedings of the 1918 Congress included a cumulative index covering the Proceedings of all the Congresses held up to that time—1912 to 1918 inclusive. As a measure of economy, this cumulative index is not included in the present volume. By referring to the index at the end of this volume, covering the 1919 Congress only, and referring also to the cumulative index at the end of the 1918 Proceedings, covering the other Congresses, you will readily find a great variety of information on almost every phase of accident prevention and allied subjects.

CONTENTS

	PAGE
Annual Meeting of Members.....	7
General Session: Employees' Representation.....	39
General Session: Americanization.....	97
General Round-table Meeting.....	127
Safety Education Section.....	141
Banquet	183
Local Council Officers.....	199
Local Council Reports.....	267
Safety Bulletin Luncheon.....	285
A. B. C. Session.....	287
Automotive Section.....	315
Cement Section	363
Chemical Section.....	435
Construction Section.....	485
Electric Railway Section.....	533
Employees' Benefit Association Session.....	575
Employees' Publications.....	601
Health Service Section.....	613
Metals Section.....	717
Mining Section	803
Meat Packers' Section.....	953
Paper and Pulp Section.....	957
Public Safety Section.....	1003
Public Utilities Section.....	1089
Rubber Section	1167
Steam Railroad Section.....	1171
Textile Section	1341
Women in Industry Section.....	1371
Woodworking Section.....	1417
Index	1443

National Safety Council

Annual Meeting of Members

Cleveland, Ohio

October, 1, 1919

PRESIDENT DAVID VAN SCHAACK, Presiding Officer

WEDNESDAY MORNING SESSION

THE meeting convened at 10:15 A. M., Mr. David Van Schaack, President of the National Safety Council, presiding.

PRESIDENT VAN SCHAACK: The Eighth Annual Meeting of the National Safety Council will please come to order.

Our deliberations will be opened by prayer by the Rev. Dr. Blanchard.

INVOCATION

REV. DR. BLANCHARD (President, Federated Churches of Cleveland): Almighty God, Our Father, Thou the source of all life and power and love, by Thy wisdom do we come to acknowledge that by Thy life do we see light. We thank Thee that Thou hast led the children of men through all the years into a wider understanding of the value of life, and we thank Thee that Thou dost guide us in this day and generation by Thy spirit of compassion to care for others, and we pray that Thy blessing may rest upon this great convention as it seeks to make life richer and fuller and more safe and that Thou wilt guide all the deliberations and all the plans that are formed that there may come throughout this nation, through industry and through education and through all the ways of life in which men move, a deeper sense of personal responsibility and a wider and greater understanding of Thy value upon life. And so by the spirit that hast led and art ever leading men to understand Thy will, may that spirit keep all these, Thy servants, and may it be granted unto us all to hear without fear and without shame the words that shall be

spoken, "Inasmuch as Ye have done it unto one of the least of these my brethren, Ye have done it unto me." We ask it in the name of Jesus, Amen.

PRESIDENT VAN SCHIAACK: It gives me pleasure to introduce Director Waite of the Department of Parks and Buildings of the city of Cleveland who, in the unavoidable absence of Mayor Davis, will welcome us to the city of Cleveland. Mr. Waite.

ADDRESS OF WELCOME

MR. FLOYD WAITE: Mr. Chairman and Delegates to this great convention: It is not only a pleasure from the standpoint of hospitality, but it is also a great privilege to welcome you to this city. Cleveland has endeavored throughout the years to place herself as one of the leading municipalities of these United States. We have endeavored always to look forward, to strive to attain the best in municipal government and in the things of life. We feel that you are going to bring to us rich blessings for being here. We know that you are going to inspire the people of this city to better things in the way of human life.

I wish that I could express to you the feelings of the people of this great city. I wish that I might be able to let you know the hospitality that is within their hearts, but I do feel that as you go about this city and as you meet our people, you will really understand that we are not only glad to greet you, but that we want to do everything in our power to make your stay here a happy one and a profitable prosperous one.

I have the great honor to be associated with you in this great movement for safety. The Mayor has seen fit to appoint me as Chairman of the Public Safety Committee, and I feel that in doing this he has extended to me one of the greatest honors that has ever come to me in my life, and I want to say that we are going to carry this great work forward—the work that you are going to leave here with us.

The Committee that is being appointed is a committee of men who have the reputation of doing things, and when you come here again for one of your meetings you will find that Cleveland is not only one of the cities in the forefront in this great work, but I am going to prophesy to you that it is going to be the first city in this great work of safety.

We have learned a great many things during the last few years. We have learned a lesson that we thought we knew, that of coöperation. We believe here in this country that we understood what it meant to stand together, and yet we never realized for one moment the great possibilities of this great Republic until we were called together to face the enemy, and then we began to see what it all meant. We never dreamed of the great preparation that could be made by American business until the hour came that we were compelled to prepare through bloodshed and war, and then we learned the lesson of what we actually could do, and it seems to me that as we go forward in these days of peace we should understand our powers and our resources. If we work together, and if a great body like this, united throughout this country,

will only continue with enthusiasm to do the work they have started and to get others interested in it, the time will come when people will look back on the days when men and women and children were maimed and killed as days of barbarism comparable only to the days of witchcraft of old New England.

Everything moves toward the rising sun. It is the organization and the man with a vision, who look forward and see the things that lie beyond, who succeed. It is that spirit that has made this young Republic the greatest power in all the world. It is that spirit that has carried us forward through every contest victorious, and it is going to be the same spirit that makes these United States the leading nation in the accomplishment of all good things for humanity and for civilization.

We ought to be proud and happy that we are permitted to undertake a great work of this kind. We ought to be happy that we have such an organization as this in our country; but we should never be satisfied until we have interested in this great movement every man, woman, and child in these United States. That work can be done; it is being done. It is marvelous the work that is being done right here in Cleveland today. Every school child you talk with has but one subject of conversation, and that is safety. Every policeman you meet talks about the same thing, and it has gone into every home until today the great subject in Cleveland is SAFETY. We don't want to allow this thing to become a great message just for one week, or for one day, but we want the message to endure; we want to keep on and on in this great work until it becomes a part of a man's religion, a part of his life to be careful, and to be careful of the lives and the rights of others.

We are learning through this great Safety Council a lesson here in Cleveland. It is going to teach us how we can work together for the common good. It is going to teach the various municipalities how they can work together for the public safety, and it is going to leave behind it a great record of achievement.

I welcome you on behalf of the Mayor of Cleveland. I welcome you on behalf of the people of this great municipality; I welcome you for the lives of the men, women, and children that you will save in this city through your deliberations. I say to you that you are bringing a rich benediction to our community and I wish you every success in your great endeavors. I thank you.

RESPONSE BY PRESIDENT

PRESIDENT VAN SCHAAK: I cannot tell you, Mr. Waite, how much we appreciate the hearty welcome you have given us, just the kind of welcome which, I may say, we felt sure we would receive. Cleveland has long and deservedly been noted for unfailing and warm hospitality to her guests, upon whatever errand they may come.

Any organization may well be glad to hold its meeting here, but especially such a one as the National Safety Council, for both Cleveland and the Council stand for the initiation and furtherance of progressive ideas. The inventive genius and organizing ability of Cleveland men

have done much to revolutionize business and industry in many lines and thus to advance our country to the commanding position which it now occupies, and in civics and in sound philanthropy your city is second to none. So, too, is the National Safety Council a pioneer and leader. With a mission which is both humanitarian and economic, it seeks, through practical methods only, to conserve life and limb and health, to diminish suffering, to reduce privation, to promote efficiency, to further a better industrial understanding between those whose interests are essentially common, to make a real and a large contribution to the well-being of both industry and society.

There is another striking point of similarity between Cleveland and the Council. Both are firm believers in the principle of coöperation as the best means of advancing a purpose. Your churches were the first of any city to federate. Your activities for promoting the public health are coördinated. Your welfare work is carried on through a Federation of Charity and Philanthropy. The achievements of your Chamber of Commerce are a notable example of what can be accomplished when the leading men of a community pull together. Every branch of the National Safety Council's varied work, whether industrial, public, or educational, is based likewise upon coöperative effort, and whatever measure of success that work has attained has been due primarily to the whole-hearted concert of thought and action of the Council's membership.

I feel, Mr. Waite, that acknowledgment of your kind welcome would be incomplete if I did not take this opportunity of expressing our deep gratification at that other welcome which Cleveland is giving us, in conducting an active "Safety Week" campaign while our Congress is here, a campaign which I am sure will be followed by continuous organized effort along the same lines.

Permit me to offer to you, Mr. Waite, and to the City and people whom you represent, our sincere and appreciative thanks.

The next item of business is the roll call of members. The Secretary and the Registration Committee, having advised the Chairman that a quorum of members entitled to vote are present in person or by proxy, The Chair will be glad to entertain a motion to dispense with the calling of the roll. Do I hear such a motion?

(A motion was made that the calling of the roll be dispensed with. The motion was duly seconded and carried.)

The Chair would suggest that the members present who have filed proxies may withdraw them if they so desire to avoid duplication in voting. All proxies not withdrawn before the first vote is taken will be considered as in effect.

The Executive Committee having appointed three Inspectors of Election at its meeting yesterday, The Chair will appoint those men also Tellers of Election, which will take place today. The gentlemen are Mr. Davidson, Chairman, Mr. Stanion, and Mr. Case.

The next order of business is the annual address of the President. I am sorry I am not a ready public speaker, but I must ask you to bear with me with a manuscript.

PRESIDENT'S ADDRESS

DAVID VAN SCHAAK, PRESIDENT NATIONAL SAFETY COUNCIL, DIRECTOR.
BUREAU OF INSPECTION AND ACCIDENT PREVENTION, AETNA LIFE
INSURANCE AND AETNA CASUALTY COMPANY, HARTFORD, CONN.

Ladies and Gentlemen: It gives me profound pleasure to have again the privilege of welcoming you to an Annual Meeting and Congress of the National Safety Council and of reporting to you, on behalf of your Directors, Executive Committeemen, and Officers, upon the manner in which they have cared for your affairs, and upon the progress of your organization, during the past year.

As I note the large number present, I am once more deeply impressed with a keen sense of the constantly increasing interest taken in the cause which you are all endeavoring to serve, and of your clear understanding that, only through general personal participation in the conduct of your Council, and through cordial coöperation of all its members, can that cause be advanced as it should be and can the Council take its proper and important part in that advancement. Without such participation and such coöperation, the best efforts of those to whom you have entrusted the active management of your affairs could not have achieved anything like the measure of success with which the Council has met, and the safety cause would not be what it is today, a national movement of already wide range and with practically unlimited possibilities.

Time does not permit my reviewing the really marvelous progress of the Council since its formation only a few years ago, or my describing in detail the work of the past year, but those twelve months have been so marked by both accomplishment and unfolding of opportunity that I must call your attention at least to the broad lines of development.

THE HEADQUARTERS

As you know, the growth of the Council and the expansion of its activities have necessitated the removal of its Headquarters to larger offices which, I am happy to say, involve no greater rental than that paid for the offices which had become insufficient. You know, too, of the changes in our official staff made necessary by the resignation of the General Managership by Mr. Cameron, that far-seeing enthusiast whose works justified his faith and to whom both the Council and the safety cause are greatly indebted. We were fortunate in having available as his successor Mr. Price, another man of vision and faith, whose administration of his new office has proved, even in a few months, that we made no mistake in advancing him to a field of wider opportunity. We were fortunate, too, in being able to associate with Mr. Price in the administration of the Council's affairs a Secretary and Chief Engineer of the fine technical training and sound judgment of Mr. Williams, and a Treasurer and Business Manager of the capacity of Mr. Pardee, who, to our great regret, has recently found it necessary to resign his office.

Our headquarters' staff has been further reorganized and expanded by appointments of a new assistant secretary, an additional safety engineer,

a new librarian, with more assistance, a director of publicity, two regional field secretaries, and a public safety field secretary, the last three being W. R. Rasmussen, Frank E. Morris and Carl L. Smith, men favorably known to you all through good work they had already done for the Council.

These additions to our headquarters' staff, together with a further increase in membership and an improvement of the sound financial condition which was developed during the previous year, have done much to enable the Council to carry out its plans for improving its service and extending its activities and influence. We have not been able to do all that we would have liked to do, but I believe that we have done about everything possible within the scope of the funds available. It is both unfortunate and encouraging that the Council never has enough money to avail itself of all its opportunities—unfortunate because good work must be left undone, encouraging because the field in which the Council is operating always presents new possibilities of good work to be done.

A YEAR OF PROGRESS

Though we may wish that more could have been accomplished, we can look back upon a year of real progress, and in many respects. Our direct service has been notably improved. General bulletins have been of better quality and wider range, large-size ones have been issued more frequently, sectional bulletins show improvement in both nature and appearance, and a useful catalogue of bulletins has been prepared. A Safe Practices pamphlet has been issued every month, as against eight in all the previous year, and two sectional pamphlets have been published. The supply of films, slides, and phonographic records has been enlarged and a catalogue of slides has been issued. Our information bureau and library have increased largely in quantity and value of material, especially on industrial relations, and extensive progress has been made in proper cataloging.

In making use of its industrial relations material, the Council has followed, and very properly, a conservative policy. It has not attempted to give expert advice, but it has endeavored to bring together all that is really known upon this subject and to place it at the disposal of its members. This latter object has been accomplished in two ways; hundreds of inquiries have been answered by sending the inquirer printed matter relating to his question, as, for instance, on various employees' representation plans now in effect, and the Council has issued sixteen executive series bulletins, designed principally to stimulate the interest of its members in industrial relations subjects.

All of this improvement in direct service has been made possible largely by the continuance of that cordial coöperative effort on the part of the entire membership which has always been a distinguishing characteristic of the Council, and the value of which I wish to emphasize once more, and more strongly than ever. I think it no exaggeration to say that there has never been a finer illustration of close and hearty coöperation than that given by the membership of the National Safety Council from

its organization to the present day. As I said to you a year ago, you yourselves have made the Council what it is, and only you yourselves will make it whatever it is to be. You have always given to the Council freely, or more so, than you have taken from it. You have viewed the opportunity to give as an obligation to a worthy cause.

Your concert of effort is reflected in every phase of the Council's activities, in each feature of its service, whether headquarters or field, as well as in the formulation of its policies and the furtherance of its propaganda, and I cannot adequately express the deep gratitude which your Executive Committeemen and Officers feel for the warm support and invaluable aid which so many of you have given, as committeemen, in Local Council and sectional work, and as Directors, and which literally all of you have given in counsel and contribution, both voluntarily and upon request.

EXTENSION OF LOCAL COUNCIL ORGANIZATION

In three essential directions other than the service already mentioned the Council's work has developed rapidly and most satisfactorily during the year—in the extension of permanent Local Council organization, in the promotion of public safety, and in the advancement of safety education. Just as the Chicago headquarters are the heart of organized safety effort, so the Local Councils are the arteries and veins which carry life-giving blood throughout the entire body of the national safety movement. They bring the Council into direct and intimate touch with its membership, permeate communities with a real safety atmosphere, and spread far and wide the gospel of care for humanity. A year ago we noted with appreciative interest the earnest of success for the Local Council permanent secretary plan given by the progress of the experiments being conducted at Pittsburgh and St. Louis. Today we can feel, with more than reasonable assurance, that the promise afforded by these experiments has been fulfilled, that the permanent secretary idea is thoroughly practical and of far-reaching value. The Local Councils at Pittsburgh, St. Louis, and Rochester are now well established on this basis and doing excellent work. The plan has been put into effect also at Cleveland, covering Northeastern Ohio, at Cincinnati, at Kansas City, and at Portland, Oregon. Movements are actively in progress, and some of them nearing completion, for permanent secretaries in Chicago, San Francisco, Detroit, and Springfield, Mass. The Council has also assisted in organizing the Border Cities Local Council in the Canadian towns opposite Detroit and in coaching its new permanent secretary.

Not only are these developments highly encouraging in a general way, and demonstrative of the Council's wisdom in initiating the permanent secretary plan, but there is a feature quite common to them which is particularly significant. This is the manner in which it is undertaken to supply the funds necessary to support a permanent organization during the first year. The achievements of the first Local Councils to adopt the plan have made such an impression upon the more progressive men in industry in other communities that they are not waiting until

their Locals become of such size as naturally to demand permanent secretaries, but, under the leadership of one or more of them, are grouping themselves in small syndicates to underwrite the first year's expense and thus enable the permanent organization not only to start earlier, but to be fully equipped from the very beginning both to render service and to increase membership. With this financial backing the officers of the Local Council are able to make such a demonstration of the value of the work as will win the confidence of the business men generally and thus assure continuous support. There could be no better proof that the permanent secretary plan is sound and fills a real need, and no more convincing indication of a rapid increase in the Council's membership and, therefore, a correspondingly larger opportunity to render the service to industry and to humanity which I believe it has shown that it is qualified to give.

Local Council activities have by no means been confined, however, to this development of the permanent secretary plan. The many Locals which necessarily are without such secretaries have shown a lively interest both in their immediate work and in extending their influence, and several new ones have been established.

SCHOOLS FOR SAFETY SUPERVISORS

One of the most striking features of Local Council work has been the schools for safety supervisors, four of which have been conducted during the year, at St. Louis, Pittsburgh, Rochester, and Cleveland. In these schools a course of fifteen lessons has been given and 464 men have been graduated. Not only have these schools been of much direct benefit to those attending them, but they have had a notable influence upon other branches of the Council's work. A most gratifying development, for instance, has been the coöperation of the students in stimulating attendance at foremen's meetings. Taking St. Louis as an illustration, the average attendance for such a meeting in 1918 was about 150. After the opening of the safety supervisors' school, the attendance at foremen's meetings ranged from 1,200 to 2,000. It is believed that the graduates of these schools will also be of much assistance in securing large attendance at the similar schools for foremen which are one of the Council's new plans for the coming year.

PUBLIC SAFETY WORK

Closely connected with the development of the permanent secretary plan for Local Councils, in fact dependent upon it so far, has been the expansion of the Council's public safety work, which promises to become a real factor in many communities. The experiment conducted in Rochester early in 1918, now a permanent enterprise, pointed the way to work along generally similar lines in St. Louis which, ever since its memorable Safety Week at the time of the 1918 Congress, has conducted an active public safety campaign, and has led to the recent inauguration of such a campaign in Pittsburgh. The impulse given by the present Safety

Week here will doubtless result in Cleveland likewise undertaking to establish systematic public safety work.

The Council's public safety plan is based upon right principles. While the Local Council undertakes to stimulate public safety interest in a community, and while its permanent secretary takes an active part in the resultant campaign, the fundamental basis of the plan is to bring together in a comprehensive safety organization representatives of those departments of the municipal government which would properly be concerned, and representatives of the leading organizations naturally interested in the welfare of their city and its people, and to give this organization the benefit of definite knowledge of what has been done elsewhere and how it has worked out. Your Council is thus attempting, and I believe successfully, to fill a need which has hitherto remained unsatisfied, and I say this with all due deference to previous public safety efforts. It encourages a genuine and wide appreciation of, and demand for, public safety, aids in the creation of an organization which will be fully representative of the community, and then lays before this organization a carefully thought-out plan of action based upon all the experience available.

This method is exactly in line with that so successfully followed in industrial safety work and is in full keeping with the Council's general policy. There is no attempt by an outside agency to impose its individual theory or to arrogate to itself the practical application of such a theory. Coöperation by all interested, and by all who should be interested marks the Council's public safety work just as distinctively as it does its industrial safety efforts. In each field representative committees decide upon the plan and carry out its details, and there is the same endeavor in both to arouse that deep and general interest which can come only from every one feeling that he has his own particular bit of work to do, and that the success of the plan as a whole depends upon his doing it.

The efficacy of this method is evident from the results, of which, in order to avoid burdening you with details, I shall give only a couple of illustrations. In St. Louis the Coroner's report for the first eight months of 1919 showed 90 less inquests than in the corresponding months of 1918. Deaths from automobile accidents were $11\frac{1}{2}$ per cent less, notwithstanding a 25 per cent increase in the number of automobiles in use. In Rochester the accidental deaths during the first six months of 1919 showed a reduction of $13\frac{1}{2}$ per cent from the figures for the same months of the previous year.

SAFETY EDUCATION

In many respects perhaps the greatest advance made by the Council during the year has been in the matter of safety education, though not so much in the way of what has actually been done as in that of building a solid foundation for future accomplishment. No branch of the Council's progress is, in my opinion, more deserving of our keen interest. Promoting safety education in the schools and colleges is reaching to the

fundamentals of the safety problem and is in the natural line of development of the Council's work. What has been our chief task during our six years of active existence? Has it not been education? Admitting the great value of the Council as a bureau of exchange, as a collator and distributor of the best experience in safeguarding and in safety organization, has not the Council's chief mission been to carry the message to Garcia, to educate both employer and employee?

We have been trying, and with ever-increasing success, to educate the employer to a sense of appreciation of the need for accident prevention on both humanitarian and economic grounds, and of the value of the safeguards and organized methods which experience has shown to be the most effective. We have been endeavoring, and I believe with equal success, to educate the workman to an understanding of what accidents mean to him and to his, and of the fact that if they are to be reduced to the minimum, he must personally cooperate in the work of prevention. We have had to do this because unfortunately safety has so far been largely an afterthought, because it has been in no sense a factor in the ordinary education of either employer or workman, and because, in the absence of an instinctive tendency to think for safety, we could only try to get them to think against danger.

We soon came to appreciate that, necessary as this education was and for a long time will be, it was at best but a stop-gap, and that the safety movement must go deeper. Our experience was the same in this respect as it had been in the matter of safeguarding. While our first effort naturally was to see that existing buildings, machinery, and other physical equipment lacking elements of safety were safeguarded as well as possible, it quickly became apparent that the ultimate solution of this problem would be to make them right from the start, designed, constructed, and installed with due regard for every safety consideration. It is the same with safety education, and I am happy to report that the Council has made real progress during the year in approaching a solution of this problem.

A handbook on "The Principles and Practice of Safety," prepared by the Council for use in technical schools and universities, will be applied in many such institutions during the coming year. Mr. Keefer, of our Safety Engineering staff, has made a successful trip to eighteen Eastern and mid-Western colleges, and special lectures have been given by members and employees of the Council at several engineering schools.

The most distinguishing feature of our safety educational effort, however, has been the working out in St. Louis, by Dr. E. George Payne and his associates, of a definite plan for safety education in the common schools of the country, and the publication, at the request and with the endorsement of the Council, of a book describing and illustrating this plan, which has been brought to the attention of the National Education Association and which it is to be hoped will soon have wide circulation. In this plan the problem has been approached with full appreciation that it is psychological, that the object is to get people to think in terms of safety, and that if this object is to be attained, if regard for safety is to

have a controlling influence upon the lives of men and women, it must be developed in their minds while they are children, throughout the formative period of their school education, so that it will permanently affect their way of thinking.

As it has been so ably put by Mr. Whitney in his illuminating address before the National Education Association, from which I am taking the liberty of freely borrowing both thoughts and even the manner of their expression, education is the building up in the child, through the acquisition of certain processes, principles, and point of view having a direct application to life, of a mechanism for grasping the world. This cannot be done through abstractions. Materials in the child's life must be used. Principles must be developed from experience. The school should be approximately a working model of life, and both the principles and the facts of life should be got at the same time.

It is upon this theory that Dr. Payne's plan of safety education is based. Safety is not introduced into the curriculum as a new subject, but is made a part of all subjects. The child's knowledge and intuition of safety and danger figure as a part of that body of experience out of which the mechanism for right thinking is to be constructed. Safety thus becomes one of a considerable number of interests having equal importance and occupying an organic place in the body of experience which is used as a medium for teaching.

Safety has been handicapped by being misunderstood. It has been too commonly looked upon as merely a system of inhibitions, and, as we all know, a negative appeal stirs only with difficulty and incompletely either the heart or the imagination. This misunderstanding is due to the fact that safety is a bilateral idea. It has its positive as well as its negative side, but, like most people with two faces, it presents only one to the public. We are thoroughly familiar with the face "Safety from," but we have not seen clearly enough the face "Safety for." We have been too apt to ignore the fact that safety puts something in as well as takes something away, that it is not a process of deprivation but a process of substitution. I can think of no better, no larger, illustration of this than that furnished by the Great War. In the first flush of the French soldier's hot resentment against the invader, he threw himself into the fray with the utmost recklessness. His fine patriotism gloried in the sacrifice of his life. As the months and the years passed, he increasingly made use of every means of protecting that life. He had come to see that the safety of his country demanded all possible safety for himself and that he might the longer and the more effectively stand between her and the barbarians who were trying to destroy her. He sought safety, not from the enemy, but for France.

Safety gets its true meaning from the fact that life has a value. The positive side of safety lies in the thought that nothing must be allowed to interfere with full realization of this value. The St. Louis plan for safety education is based upon recognition of the need for furthering this positive side of safety. It seeks to avoid letting safety appear as a deprivation, as robbing life of the characteristic of adventure; on the

contrary, viewing life itself as the great adventure, its object is to substitute a worthy adventure for a mean one. This is a new thought in the conception of the safety movement, and I hope and believe it will go far. It lifts the safety movement from the material sphere to a spiritual one. It makes the fight for safety a fight for a real, a worth-while adventure, a fight which shall make life the measure of a purpose, and not the marred result of purposeless chance.

NATIONAL IN THE SCOPE OF ITS ACTIVITIES

It is unmistakably evident, I think, from this general review of what the Council is doing, that it is national in the scope of its activities. It is just as clear, from many events of the past year, that it is steadily becoming more and more national in reputation. Its coöperation has been more generally sought and, of course, it has always been freely given. To cite only a few instances: The State of Washington asked and obtained the Council's aid in training the staff which will put into effect the provisions of that State's new safety law. The Federal Board for Vocational Education has continued to call your organization into counsel upon certain features of its work. So, too, has the Working Conditions Service Bureau of the Department of Labor. The American Red Cross has increased its endeavor to work with the Council in every practicable way. Such organizations as the National Association of Employment Managers have felt that the Council should have a place on the programs of their conventions to explain how safety is connected with other national movements. I have just come from Pittsburgh, where, as president of an organization recognized to be national in both purpose and scope, I was invited to serve on the honorary committee in charge of the exercises incident to the dedication of the Bureau of Mines' magnificent new buildings. The Bureau of Standards has asked the Council to work with it in the formulation of certain standards. The American Engineering Standards Committee has invited the Council's representatives to advise with it regarding the whole standards situation.

These last two instances of appreciation of the Council's national character lead me to emphasize the fact, as I see it, that we must face important new problems during the coming year. We are called upon to take a responsible part in the standardization work which has been a crying need for a long time. It is natural that we should be, for we represent in larger numbers than any other organization the industrial interests upon whose application of standards their practical success must depend, and because those interests are in the best position to know the extent to which theory can be converted into practice and the degrees by which this should be done. In the fulfillment of our plain duty to our members, to industry generally, and to the cause of safety at large, we must meet this call, and fittingly. There has arisen, also, an urgent demand for engineering research in connection with safety as applied to certain industries and groups of industries, and I believe that, in some at least of our sections there must be early development along more

technical lines. Such work is in precise accord with that logical evolution of the Council's activities which has led us to the endeavor to place safety education upon a more scientific basis. It would be unbecoming for me, when about to retire from your presidency, to undertake to prescribe the manner in which these calls should be met, but I cannot refrain from expressing the feeling that meeting them is an imperative necessity and that the best means of meeting them should receive early and most careful consideration.

Speaking of my retirement from office, which will be within a day or two, I hope you will pardon my taking a moment of your time to express my appreciation of the honor you have done me in twice electing me your president, and my gratitude to my fellow members of the Executive Committee, and to you all, for the pleasant relationship, as well as the unselfish and wholehearted coöperation, which it has been my privilege to enjoy.

It is indeed an honor to be chosen to head such an organization as your Council, an organization national in the scope of its activity, national in reputation, and, from the nature of its self-evident mission and the manner in which it endeavors to forward it, destined without question to be a vital national force.

Little did any one foresee when the Council was started a few years ago by a small group of men who sought help from each other in the details of what is now but a part of our work, that from such simple and restricted beginnings there would develop a society, the several but homogeneous activities of which would influence our national life in so many ways and would have an enduring effect upon the true welfare of mankind. This development has been normally gradual, as well as astonishingly rapid, for it has come from the attempt to fill one need opening up the existence of another. Serving those already interested in safety, has pointed out the way to interesting others. As industry is but a part of community and national life and its interests are inseparably interwoven with both, the forwarding of industrial safety has been followed closely by efforts along public safety and safety educational lines.

We have unavoidably been led into fields other than our own immediate one, but we have entered them only in a coöperative way, or, as in the case of preventive and curative medicine, to enable a closer, and wider, application to industry than would otherwise be possible, to intensify in one specific direction the work of others.

Inasmuch as it is you members of the National Safety Council who really have done all that has been done, and who have built up an organization of such possibilities, there can be no tinge of self-gratulation to my inquiry as to whether you do not derive a keen satisfaction from what you have already accomplished, and do not feel an increasing enthusiasm to grasp the opportunities which lie before you.

In what more useful, what nobler effort, could you engage? In what way, or ways, could any one, or all, of you take part in a movement of more lasting benefit to humanity? Through your Council you are promoting better conditions under which men and women in industry may

work and better working conditions inevitably lead to better living conditions. By bringing employer and employee together, man to man you are furthering a better feeling between those who too often, unfortunately, have considered themselves as belonging to different classes, and are doing much to forward that new industrial day, the first rays of whose morning sun we hope we see creeping above the horizon. By saving thousands of men and women each year from accidental death and maiming, you are conserving the greatest resource of any nation, you are promoting our national efficiency, you are reducing the suffering, grief, and privation of which at best the world must have too much, and you are preserving to many of the rising generation the educational opportunity which will give them their chance in life.

I cannot imagine a better, a more soul-satisfying, work, and again I say, let us rededicate ourselves to our cause, let us strain every nerve to render the personal service, and raise the funds, necessary to take advantage of every opportunity that logically presents itself to us. Let us go further and seek for opportunity. Let us with renewed and constantly renewing vigor wage the battle until not only every individual, not only every community, but the American people as a nation shall think in terms of safety. Let us carry on with ever greater enthusiasm to the time when it can and will be universally said of the men and women who are the National Safety Council. "Well done thou good and faithful servants."

PRESIDENT VAN SCHAAK: The next item on our program is the approval with, or without, corrections of the minutes of the last Annual Meeting. As those minutes have already been printed a motion is in order to dispense with their reading and to approve them as printed. Do I hear such a motion?

(A motion was made that the reading of the minutes of the last Annual Meeting be dispensed with. The motion was duly seconded and carried.)

PRESIDENT VAN SCHAAK: We have next to hear the reports of our officers and committees. I will call first upon Mr. Price to report as General Manager.

GENERAL MANAGER PRICE: I think that in view of the fact that my report was published in our weekly letter which was circulated some ten days ago and which probably every man in this room has read, that I may well follow the custom of my honored predecessor, Mr. Cameron, and I therefore suggest that we omit the reading of the General Manager's Report.

(On motion the General Manager's Report was accepted as printed and placed on file.)

REPORT OF THE GENERAL MANAGER

In looking back over the year which has passed, the outstanding event which comes first to our minds is the resignation of our much esteemed General Manager, W. H. Cameron. We who are left to carry on the work which he organized appreciate more than anyone else what an invaluable

contribution he made to the Council and to the Safety Cause. He did more than any one man to make the Council possible and to develop its work.

But Mr. Cameron is not lost to the Council nor to the Safety Movement because he is now an active member of the Executive Committee of the Council and in his new field is doing most valuable work in Safety.

LOCAL COUNCILS

At the time of the last Congress three cities, Pittsburgh, St. Louis, and Rochester, had organized local councils with paid secretaries. During the past year Cleveland, Cincinnati, Kansas City, and Portland have been added to the list.

The paid secretary plan has solved the problem of local councils in large industrial centers. The thoroughgoing and effective work which has been done by these local councils has attracted wide attention and is encouraging the officers of local councils in other large cities to employ paid secretaries.

Local councils without paid secretaries have been organized in Delaware, with headquarters at Wilmington, and in Bellingham, Washington. Aggressive work is being done in these new councils as well as in many of the older councils in other cities.

FIELD SECRETARIES

Three new field secretaries have been added to the Council's staff during the past year, Mr. W. R. Rasmussen, Mr. Frank E. Morris, and Mr. Carl L. Smith. Mr. Smith is specializing in public safety.

The efforts of the field men have been largely centered on the large cities where they have helped to organize the work and train the new secretaries.

SCHOOLS FOR SAFETY SUPERVISORS

In Pittsburgh, St. Louis, Cleveland, and Rochester, Schools for Safety Supervisors have been conducted during the past year. Four hundred and sixty-four students have been graduated and given diplomas after finishing the course of fifteen lessons covering the fundamentals of safety. In view of the fact that the students are all picked men—men who occupy responsible positions in their respective plants—these schools have undoubtedly rendered a more direct and tangible service to the members of the Council than any other activity of the local councils.

PUBLIC SAFETY

The demonstration of public safety which was made in Rochester last year has borne good fruit. The Safety Week in St. Louis last September, which was made possible by the Rochester experience, has resulted in a most successful campaign in public safety during the past year. Strong public safety organizations are now being developed in all of the cities mentioned above where paid secretaries are employed and steps have been taken to encourage the smaller local councils to emphasize

public safety. The thought is rapidly gaining ground among all people interested in safety that Safety must be incorporated into the life of the community. When safety is systematically taught in the schools and in the homes, and when the public officials, the police force, the churches, the commercial clubs, and other organizations coöperate in promoting safety, then not only will the appalling increase in public accidents be checked, but the industries will be directly reached because of the widespread awakened thought on safety.

SCHOOL SAFETY

The most significant feature of the public safety work in St. Louis has been the development in the public schools of a plan for the systematic teaching of safety. This plan was developed by Dr. E. George Payne, Principal of the Harris Teachers College. The demonstrations of this plan which have been witnessed by the officers of the National Safety Council have been so convincing that the Executive Committee has decided to do everything in its power to secure the adoption of this plan in all the public schools in the United States. Some four hundred copies of the syllabus, which Dr. Payne has published, will be distributed to a selected list of members. A bulletin outlining the plan will be sent to all of the members of the Council and, through the efforts of our publicity department and other methods, it is hoped that within the next twelve months the schools of every city of any considerable size will be induced to add safety instruction to their curriculum. The response of all of the cities which have been approached thus far has been most cordial.

INDUSTRIAL RELATIONS

The enlargement of the service of the Council along the lines of Industrial Relations has been a most significant and encouraging development. The widespread interest in employees' representation and kindred subjects has brought to the Council hundreds of requests for information and help. The Council has not sought to give expert advice, but rather to stimulate interest and furnish information.

THE LIBRARY

The Library and Bureau of information at our headquarters has grown steadily with the growth of the Council. During the past year valuable additions have been made covering industrial relations subjects. Our efficient Librarian, Miss Mary B. Day, has visited the best libraries in the East and has gathered much valuable data along new lines.

Through the weekly news-letters and other means the Council's members are being constantly encouraged to avail themselves of the services of the Library.

PUBLICITY

From the inception of the Council the officers have looked with longing eyes on the great field of publicity and have keenly appreciated the pos-

sibilities of promoting safety through publicity but, owing to lack of funds, only limited efforts in this field were possible.

On August 1, a publicity director, Mr. Louis Resnick, was added to the staff of the Council. Through weekly letters to hundreds of newspapers and periodicals, and other methods, a nation-wide publicity campaign is now being launched. Thus far the response of the press has been most encouraging, which promises much for the development of this work in the future.

SERVICE TO MEMBERS

The bulletins for workmen have been improved in quality and the sectional bulletins are now being printed in two colors. Large size bulletins have been issued every two weeks.

A catalogue of bulletins has been prepared, including some 1100 miniature cuts of bulletins which have been issued. This catalogue will be valuable to members in ordering back numbers of bulletins covering hazards which may arise in their plants from time to time.

The weekly letter has been enlarged to a four-page publication and includes not only the current news items covering the Council's work and the development of the safety movement, but also the news-letters of the sections which heretofore have been sent out in separate forms to members only of the respective sections. The enlargement of our engineering staff and increased efficiency have made possible the issuing of twelve "Safe Practices" pamphlets as compared with eight during the previous year. Two sectional "Safe Practices" pamphlets have been issued. The Executive Series bulletins have included industrial relations subjects. The bulletin on employees' representation recently published brought many letters of appreciation from our members.

SAFETY INSTRUCTION IN TECHNICAL SCHOOLS AND UNIVERSITIES

A handbook has been published entitled "The Principles and Practice of Safety," for use in technical schools and universities. This handbook includes suggestions covering equipment and safe practices in college shops and outlines of lectures which are to be delivered by the members of the faculty in their regular courses on machine design and labor relations.

In June, Mr. W. D. Keefer of our engineering staff visited all of the larger colleges between Chicago and the Atlantic Coast and had conferences with the faculties of the engineering departments. He met with most cordial response. Forty-four colleges have indicated their intentions to include at least a part of the safety instruction outlined in the handbook.

SAFETY CALENDAR

One hundred and sixty thousand copies of the 1919 calendar were printed and distributed. The 1920 calendar is now in preparation.

THE STAFF

In addition to the appointment of the three field secretaries and the

director of publicity previously named in my report, the following changes have been made in the Council's staff:

Mr. Sidney J. Williams, Chief Engineer, has been given the added title of Secretary and his duties have been increased to include the supervision of the Library and the Publicity Department.

On January 11, Mr. F. W. Pardee was appointed business manager and later was elected treasurer. I regret to report that during the past two weeks he has severed his connection with the Council to take the position of secretary of a newly formed national trade organization, including steel foundries. Mr. Pardee's ability and experience as a business man has enabled him to render a valuable service to the Council in organizing and systematizing the work at our headquarters and in guiding the financial policies of the Council. His work in conducting membership campaigns and in organizing the Congress Safety Exhibit, and his helpful coöperation with the local councils' officers are examples of his service to the Council which deserve special mention.

Mr. R. T. Solensten has been appointed assistant secretary to succeed Mr. Lamont. Mr. Solensten has made a special study of industrial relations and kindred subjects and will devote a large part of his time to the development of the service along these lines.

Mr. W. D. Keefer has been added to the engineering staff. His experience in practical safety work along industrial lines has equipped him to share in the work of drafting "Safe Practices" pamphlets and bulletins.

Miss Mary B. Day has succeeded Miss White as librarian. Miss Day was formerly the librarian of the Portland Cement Association and has had unusual experience in industrial library work.

Mr. J. W. Bready has recently been appointed director of printing to succeed Mr. Seaman. Mr. Bready has had a number of years experience in handling printing and advertising in several of the large concerns of Chicago.

NEW OFFICES

On May first the Council's Headquarters were moved to 163 North Michigan Avenue, Chicago. The new offices occupy practically double the space of the old—but at a saving in rent and insurance of over \$300 per year. This increased space was absolutely necessary to carry on the increased work of the Council.

MEMBERSHIPS

The present membership is 3,761, including 16,700 representatives and 6,275,000 employees; gain in membership for the fiscal year ending July 31, 1919, one hundred sixty-one.

Income \$153,000; surplus \$45,000; no debts.

C. W. PRICE, General Manager.

STATEMENT OF RECEIPTS AND DISBURSEMENTS

JULY 31, 1919

RECEIPTS

Membership Dues—		
Active	\$134,898.56	
Associate	1,390.47	
	<u>\$136,289.03</u>	
Less: Refund of dues.....	154.55	
		<u>\$136,134.48</u>
Sales of Pamphlets, Bulletins, Calendars and Miscellaneous Receipts		14,796.62
Revenue, account 1919 Annual Congress Exhibit to date		2,045.00
Sale of Louisville Gas and Electric Company Bonds—		
Cost	\$ 4,923.33	
Gain	89.17	
		<u>5,012.50</u>
Refund of Advances to Field Secretary.....		308.60
Cash Balance, August 1, 1918—		
On Hand	\$ 200.00	
In Bank	6,755.13	
		<u>6,955.13</u>
		<u>\$165,252.33</u>

DISBURSEMENTS

Salaries of General Manager, Assistants and Office Staff	\$ 50,532.38
Office Printing and Supplies	2,893.99
Additions to Office Furniture and Equipment....	5,152.34
Postage	2,369.75
Rent of General Offices	6,202.50
Traveling Expenses	3,725.33
Telephone and Telegraph	1,001.07
General Office Expense	2,605.35
Library Expense	436.25
Membership Solicitation Expense	1,165.30
National Committee Expense	647.63
Shipping Room Expense	192.66
Service Account, Reprints of Bulletins, Slides, Films, etc.	2,705.55
Expenses of various Local Councils	10,640.11
"Safe Practices" Pamphlets ..	1,592.18
Annual Congress Expense	11,229.42

Eighth Safety Congress

Expense to date of 1919 Annual Congress	
Exhibit	841.09
Expense to date of 1920 Calendar	.94
Weekly Bulletin Service	20,875.52
Sectional Activity Expense (Including Printing	
Bulletins)	3,895.44
Public Safety Account	855.30
Moving Expense	1,367.51
Rochester Public Safety Campaign	134.60

INVESTMENTS

U. S. Certificates of Indebtedness	\$ 10,000.00
U. S. Victory Bonds	10,000.00
	20,000.00
Loans to Local Safety Councils.....	2,857.90
Advances to Local Councils for Petty Expenses,	
Net	866.74
Advances to Field Secretaries	1,401.48
Cash Balance, July 31, 1919—	
Cash on Hand	\$ 500.00
Cash in Bank	8,564.00
	9,064.00
	\$165,252.33

We have examined the above Statement of Receipts and Disbursements of the National Safety Council, have compared it with the books and vouchers and have found it correct.

ARTHUR YOUNG & Co.,
Certified Public Accountants.

Chicago, September 5, 1919.

PRESIDENT VAN SCHAAK: Will Mr. C. P. Tolman report as the Chairman of the Committee on Business and Administration?

MR. C. P. TOLMAN: The General Manager sets a very fine example. The address of the President, together with the General Manager's Report and the report of the Treasurer thoroughly cover the field of business and administration. Possibly one thing that I would like to add is that I have had occasion to visit the Chicago Office of the Council a great many times in the course of the last few months and I know you would all be immensely gratified at the enthusiasm and efficiency displayed in the execution of your work in that office. I know of no business office maintaining as high a standard as you will find there.

PRESIDENT VAN SCHAAK: What is the pleasure of the Congress in connection with this lengthy report which we have just heard?

(On motion the report was adopted.)

PRESIDENT VAN SCHAAK: I will call upon Mr. H. H. Robertson to report as Chairman of the Committee on Internal Development.

REPORT OF THE COMMITTEE ON INTERNAL DEVELOPMENT

MR. H. H. ROBERTSON: Your committee on Internal Development begs to report as follows:

The details of the work of this committee as outlined upon the Committee's appointment last year, contemplated a close and intensive study of the council's service and its plans for further activities in the following departments:

The increasing of *membership*.

The establishment, financing, and control of additional *Local Councils*.

The activities and future needs of the various *Sections*.

The development of the council's efforts in the field of *Industrial Relations* and kindred problems.

The inauguration of a more active *Health Service* program.

It was not contemplated that this Committee would be called upon to do any of the actual work of carrying out its recommendations resulting from the study of these various branches of the Council's work, but rather that the Committee should act as a planning board which would by intensive study of each individual problem place itself in a position of being able to offer constructive suggestions to the Executive Committee, and through the Executive, the headquarter's staff of the Council, in order that greater service might be rendered to the membership at large.

Meetings of the Committee have been held from time to time, and specific recommendations have been made upon the various activities referred to. Those of value and practical application have resulted in departmental activities already covered in the reports of the President and of the General Manager. Frequent conferences with the various members of the headquarters staff have been held from time to time.

While your Committee feels that its accomplishments during the year are less than had been hoped for, it realizes the fruitful possibilities of the sub-committee method of planned and "thought out" suggestion. It recommends that greater activities of this character be arranged for during the coming year.

B. F. TILSON

MARCUS A. DOW

W. E. WORTH

C. R. HOOK

C. A. LAUFFER, M. D.

H. H. ROBERTSON, Chairman

(On motion the report was adopted.)

PRESIDENT VAN SCHIAACK: The next item is a report from the Committee on Public Coöperation. Inasmuch as Dr. Frederick L. Hoffman, the Chairman of this committee is in Europe, I will ask Mr. C. M. Talbert, ranking member of that committee to report for the committee.

MR. C. M. TALBERT: I think, Mr. Chairman, I can well follow the precedent that has been set and make it very, very short. I would like

to say for the benefit of the membership at large that the President's very able address has covered almost completely the activities of the Public Coöperation Committee. It has been the policy of the Council in every manner possible to coöperate and coördinate with public authorities and with those particular municipalities in furthering the work of the Council, and as to the different items that have been taken up, as to the manner of carrying out that policy, as I said before, the President's Address has much more fully covered it than I could in any short statement. We have endeavored to formulate that in municipalities, in the schools, in conjunction with engineering societies, with the Bureau of Standards, with the Bureau of Mines, and with two or three others along that same line. As to whether or not those general policies have been successful the address of Mr. Waite as to the conditions in Cleveland can best be its own answer. We believe that we have secured that coöperation and that we are going still further to secure it. We will, in the various sections, take up the manner of doing that much more in detail and hope to be able to present at the end of this Congress the outline mentioned by the President that will cover this system of coöperation in municipalities and those other educational features. Those will develop as the Congress proceeds and will be brought out in the next annual report and will be laid before you then much more in detail and in a manner that we hope will prove beneficial to those who are interested in it.

I merely want to say that the report of the Committee itself will be embodied in those various proceedings as they are brought out during the sessions of the Congress and to say that Dr. Hoffman has done a great deal of work on that during the past year, and I am very sorry that he cannot be here to tell what has been done along that line. We hope the proceedings will answer that question when they are published.

(On motion the report was adopted.)

PRESIDENT VAN SCHLACK: The next item is a report from the Committee on Service to Members. I will ask the Chairman of that Committee, Mr. Sinn, to report on that.

REPORT OF THE COMMITTEE ON SERVICE TO MEMBERS

MR. F. P. SINN: Your Committee on Service to Members has the privilege of presenting to you the following report which has been made possible through the active coöperation and the continued effort and initiative of the headquarters staff.

Safe Practices Pamphlets: Twelve of these have been issued in the general series—one each month. A similar schedule will be maintained during the coming year. It is believed that the pamphlets have been considerably improved in their scope and thoroughness. Their value is largely due to the continued good work of the Safe Practices Conference Committee, under the able Chairmanship of Mr. R. J. Young, of the Illinois Steel Company. Too much credit cannot be given Mr. Young and his co-workers for the time and detailed effort put into this work. In addition to these, a Sectional Safe Practices pamphlet was

published last winter on "Cleaning and Finishing Rooms in Foundries." Two other Sectional pamphlets are now in preparation, one for the Mining Section on "Underground Cars and Haulage" and one for the Metals Section on "Blast Furnaces." In each case the Sectional pamphlets are reviewed before publication by the officers and committees of the Section. During the coming year, we hope to issue at least an equal number of Sectional pamphlets, turning now to those Sections which have not previously had any of this service.

Bulletins: During the year we have distributed 177 bulletins in the general series and 312 Sectional Bulletins. In accordance with the wishes of a considerable majority of the membership, as shown in a referendum vote, we have continued to distribute our large-sized bulletin (17 inches by 22 inches) every alternate week. We have continued to include occasional bulletins on health topics. A start has been made in issuing Executive Bulletins on Industrial Relations subjects other than safety. These and the Executive Bulletins dealing specifically with accident prevention have been distributed on alternate weeks. Great care has been taken to keep these Industrial Relations bulletins on a conservative basis. Sectional bulletins have been produced and distributed varying in frequency, according to the size of the section and the amount of material contributed by members. If any section is not getting a sufficient number of Sectional bulletins, it can get more by furnishing the headquarters with a greater quantity of material.

Bulletin Catalogue: There has been prepared a Bulletin Catalogue which contains miniature reproductions of about two thirds of all the bulletins ever issued, including all those which are of practical value as at present. These have been arranged according to the subject, with a classified index, which will enable any member to select from the catalogue, the bulletins on almost any subject desired. It is believed that this will be of the greatest value to our members in securing bulletins applicable to particular situations, especially new members who are not familiar with bulletins previously issued and which are available upon request.

Weekly Letter: This letter made its first appearance in printed form last winter, and has now increased to four pages, placing the Executive Series Bulletin on the last page and using the inside pages for Sectional and Local Council news, for the monthly Safety Engineer's round table letter, and for miscellaneous announcements and information. This change has been widely commended.

Films and Lantern Slide Service: This service has been continued, the collection of lantern slides largely increased, and a catalogue thereof issued. Slides are furnished to members without charge except for transportation. Members are urged to take advantage of this opportunity to secure a fine set of lantern slides on almost any phase of accident prevention. The phonograph records of safety talks which were demonstrated at the St. Louis Congress have also been furnished to members desiring them.

Library and Information Bureau: The work and service of this divi-

sion has been considerably developed during the year, especially during recent months, under the supervision of Miss Mary B. Day, our new Librarian. In particular, this division has accumulated a very valuable collection of data on industrial relations subjects, including employees' representation, and has answered many inquiries relating thereto, in addition to continuing to supply information on specific accident prevention problems, to the extent of some 3,000 inquiries. Members who have made use of this part of our service are, in many cases, most enthusiastic about the results obtained and those members who have not tried it are urged to write to the Council headquarters the next time they are confronted with some particular problem.

In closing, I wish, on behalf of this Committee, to commend to you in the highest terms the work of Mr. Sidney J. Williams, the Secretary and Chief Engineer of the Council, that of Messrs. F. M. Rosseland, R. H. Guerrant, and W. D. Keefer, Safety Engineers of the Council, and that of Mr. R. T. Solensten, the Assistant Secretary, all of whom have given their best thought and effort to this branch of the Council's activities.

Further, I wish to emphasize strongly, the self-evident fact that all of the work being carried on under the supervision of this Committee, is for the benefit of the Council's members and it is only through the continued coöperation and help of the individual members, that the Committee and headquarters staff can furnish the kind of service desired by the membership at large.

PRESIDENT VAN SCHAAK: Will Mr. A. W. Whitney report as Chairman of the Committee on Education?

REPORT OF COMMITTEE ON EDUCATION

MR. A. W. WHITNEY: The Educational Committee can report material progress during the year and the promise of still greater results during the coming year. Our two main attacks have been upon the engineering schools and the public schools. You will remember that last year we got out a pamphlet for the use of universities which gave a preliminary view of the field to be cultivated. This formed the basis for a pamphlet of some 200 pages which was gotten out this year, entitled, "The Principles and Practice of Safety." The additional matter included first a brief outline of the work of making university shops safe. Second a syllabi of five lecture courses as follows: First, a few lectures and an inspirational course for freshmen on the general field and problems of engineering, which is being given by many technical schools. Second, several lectures in a junior or senior course in industrial management. Third, fourth, and fifth, matter to be included in courses on machine design, building design, and construction and electrical design. Later pamphlets will include similar material for such courses as chemistry, mining, transportation, home economics, etc.

The National Safety Council is also prepared to give as part of its university service, first, assistance in securing experts to aid in the work of getting university shops in good condition, and second, outside speakers who can address the students in the various schools on particu-

lar aspects of the safety problem. During the year visits have been made by members of the staff to more than twenty of the leading universities and technical schools and correspondence has been had with 224 persons on the faculties of 82 educational institutions, as well as a considerable correspondence with people interested in education but not directly connected with institutions. Thirty-four universities and technical schools have signified their intention of using the pamphlet on "Principles and Practice of Safety" in their university work, thereby definitely incorporating safety instruction into their curricula. In some universities this work is being developed very extensively. For instance the University of Cincinnati has appointed an experienced safety man to take care of the work, who is also acting as Secretary of the Local Council in immediate connection with this work. This university is establishing a department of industrial medicine.

I will not report on the most remarkable educational work for shop foreman and safety supervisors which has been carried on this year by several of the local Councils, as this has not been under the direct charge of the Committee on Education.

This opportunity should be taken to note the most admirable work that the Federal Board for Vocational Education is preparing to do along the lines of safety and hygiene in the vocational schools. The work will be made compulsory in all such schools. The Board has recently issued its bulletin No. 31 which is practically a textbook on safety in the building trades. Other similar bulletins for other trades will follow. The Federal Board is represented on our Educational Committee and is coöperating with the National Safety Council in every possible way.

The greatest advance during the year in the educational field has been made in the work in the public schools. I will do no more than briefly to summarize this as it is to have a whole afternoon for itself—Saturday afternoon. While we were talking in the National Safety Council about how to teach children safety, St. Louis "up and did it" and did it so successfully that our efforts have been directed toward getting this most excellent plan before the country. For this purpose we have appeared before the National Educational Association at its general meeting in Milwaukee and have formed a section on Safety Education in connection with the Mid-winter Meeting of the National Education Association—that is the National Association of School Superintendents, the next meeting of which, by the way, will occur here in this city.

There is also to be formed at a luncheon on Friday of this week, to which all interested parties are invited, an educational section of the National Safety Council. The most important step has, however, been the publishing by Dr. Payne of the Harris Teachers' College, St. Louis, and under the auspices of the National Safety Council, of a book on, "The Theory and Technique of the St. Louis Plan." Copies of this book are to be had at this convention. The plan is now therefore available for introduction into any school in the country.

The next problem is to get this book into the hands of the teachers in every school and to push the movement hard. Neither the Committee nor the officers of the National Safety Council can accomplish this result

alone. The help is needed of every member. Every member should see that this book and this work is introduced in their own home schools.

(On motion the report was adopted.)

PRESIDENT VAN SCHAAK: I would like to ask Mr. C. P. Tolman, as Chairman of the Resolutions Committee to report any resolutions which in the judgment of that committee should be entertained by this Conference.

MR. C. P. TOLMAN: Mr. President, to do proper justice to part of the field covered by the Resolutions Committee I have asked a far more eloquent speaker to cover that portion of it, Mr. Arthur Morey, after which I will cover certain other phases of the work.

REPORT OF COMMITTEE ON RESOLUTIONS

MR. ARTHUR MOREY: Mr. Chairman, we know that where there is a great accomplishment there must have been great thought and great effort. The appearance on all sides here in Cleveland, the experiences that we have already had, and from the program's indications the experiences yet to come, should cause us to offer some form of appreciative resolution. Therefore, Mr. Chairman, the Resolutions Committee would like to offer the following, and having made inquiry as to some of the chief conspirators for our comfort, convenience, and safety and who have thus expedited the important work of our Congress:

RESOLVED that we express the extreme gratification of the National Safety Council in Annual Congress assembled to the city of Cleveland and to its citizens, particularly to the Mayor, the Hon. Harry L. Davis, and to all City Departments that have generously coöperated for the success of Safety Week. In like manner also to Hon. W. M. Pattison, Mayor of East Cleveland and to the late B. M. Cook, Mayor of Lakewood. We understand that Mayor Cook could not be gainsaid doing all he could, and that he raised up on his deathbed to sign the safety proclamation, and we offer to the citizens of Lakewood and to his bereaved family our loving sympathy and condolences. We thank the Chamber of Commerce, the Convention Bureau, the industries of Cleveland and its environs, the Cleveland Advertising Club with its especially cordial cooperation, Col. E. E. Fuller of the U. S. Army, the splendid and complete efforts of the Public School Authorities and the Parochial Schools, the Federated Women's Clubs, the Boy Scouts, the splendid help the Police and Fire Departments have given, the Church Federation, the Automobile Club, the very fine support of all the Cleveland Newspapers and the officers and employees of the Statler Hotel. And last, but not least, to S. W. Tener, President, and Adam H. Lintz, Secretary of the Northeastern Ohio Division. Oscar McNab, Chairman of the Arrangements Committee, B. W. Nutt, Chairman of the Reception Committee and their associates, and the members of the splendid Northeastern Ohio Division of the National Safety Council and the many other organizations and citizens too numerous to mention specifically, and it is expressed as our trust and our hope that Cleveland and its citizens thus aroused to welcome

the Safety idea, as represented by this Congress, may be permanently blessed by the spirit of the Safety Movement which, as it enters the hearts of men and brings them into coöperative agreement, touches and inspires them with that fundamental truth that is the precursor of Peace on Earth, Good Will Toward Men, and be it further

RESOLVED that the grateful appreciation of this Congress be offered to its President, Mr. David Van Schaack, for the constructive guidance and inspired leadership and able executive direction he has brought to bear upon the activities of the National Safety Council which, during the past year, has registered such spiritual and material growth, and made such substantial progress toward the goal for which it was organized, and be it further

RESOLVED that the hearty thanks of this Congress be unanimously extended to our former General Manager, W. H. Cameron, our General Manager, C. W. Price, and to all of the Headquarters Staff of the National Safety Council for the faithful devotion and painstaking efforts with which they have fulfilled the various offices and duties committed to them during the past year.

(On motion, the resolution was adopted.)

MR. TOLMAN: I will continue the report of the committee. Section 5 of Article VIII was amended sometime ago to make the fiscal year of the Council end on July 31. Other sections relating to the treasurer's report and to the reports of local councils should be changed to conform to the section first mentioned and for that purpose the following motions should be offered:

"(1) That the last paragraph of Section 7 of Article VII of the By-Laws be amended by striking out 'thirtieth day of June' and inserting 'thirty-first day of July'; and that the same section be amended by striking out the word 'sixty' and inserting the word 'thirty' (the latter refers to the number of days prior to Annual Meeting, when Treasurer's Report is to be mailed to members).

"(2) That Section 16 of Article III be amended by striking out the word 'sixty' and inserting the word 'thirty' for the same reason as above.

"(3) That Section 5 of Article XI be amended by striking out the word 'July' and inserting the word 'August'; and by striking out the words 'Thirtieth day of June' and inserting the words 'thirty-first day of July'. (This refers to the reports of local councils.)

Section 10 of Article V was amended sometime ago to add the General Manager to the list of officers to be elected by the Executive Committee each year. For the sake of uniformity, the third sentence should be amended in like manner, by the following motion:

"(4) That the third sentence of Section 10 of Article V be amended by inserting the words 'General Manager' before the word 'Secretary.'"

The next change is in order to permit the General Manager to sign checks:

"(5) That Section 2 of Article VIII be amended by inserting the words 'General Manager or' before the words 'Assistant Treasurer' in line 3, and likewise in line 5."

(On motion the resolution was adopted.)

PRESIDENT VAN SCHLAACK: The next item is the report of the Nominating Committee. Will Mr. Geo. E. Morgan report as Chairman of the Nominating Committee?

REPORT OF THE NOMINATING COMMITTEE

MR. GEORGE E. MORGAN: The undersigned Nominating Committee of the National Safety Council, appointed by the President and approved by the Executive Committee as provided by the By-Laws, reports the following nominations for election, at the annual meeting, as Directors of the National Safety Council, to succeed the Directors whose terms of office expire at the said annual meeting, and to hold office for three years:

David S. Beyer, Vice-President, Liberty Mutual Insurance Company, Boston, Mass.

L. H. Burnett, Assistant to the President, Carnegie Steel Company, Pittsburgh, Pa.

W. H. Cameron, Manager, Industrial Relations, Eastman Kodak Company, Rochester, N. Y.

C. L. Close, Manager, Bureau of Safety, Sanitation, and Welfare, United States Steel Corporation, New York City.

Robert F. Coleman, Director of Personnel, Pierce Arrow Motor Car Company, Buffalo, N. Y.

J. B. Douglas, Manager, Claim Department, United Gas Improvement Company, Philadelphia, Pa.

A. F. Duffy, Chief of Safety Section, United States Railroad Administration, Washington, D. C.

Dr. Otto P. Geier, Manager, Employees' Service Department, Cincinnati Milling Machine Company, Cincinnati, Ohio.

Isaiah Hale, Safety Superintendent, Atchison, Topeka & Santa Fe Railroad, Topeka, Kans.

Julien H. Harvey, The Bracken Company, Kansas City, Mo.

Dr. F. L. Hoffman, Statistician, Prudential Insurance Company of America, Newark, N. J.

Arthur T. Morey, General Manager, Commonwealth Steel Company, Granite City, Ill.

B. W. Nutt, Strong, Kennard, and Nutt Company, Cleveland, Ohio.

Lew R. Palmer, Director, Safety and Personnel, The Equitable Life Assurance Company New York City.

R. C. Richards, Chairman, Central Safety Committee, Chicago & North Western Railroad, Chicago, Ill.

H. H. Robertson, President, H. H. Robertson Company, Pittsburgh, Pa.

Francis P. Sinn, Assistant to Vice-President, The New Jersey Zinc Company, New York City.

Philip Stremmel, National Enameling and Stamping Company, Granite City, Ill.

Stephen W. Tener, Manager, Accident and Pension Department, American Steel and Wire Company, Cleveland, Ohio.

E. G. Trimble, Manager, Employers' Indemnity Exchange, Kansas City, Mo.

James E. West, Chief Scout Executive, Boy Scouts of America, New York City.

Arthur Williams, President, Safety Institute of America, New York City.

H. M. Wilson, The Associated Companies, Pittsburgh, Pa.

Mrs. Joseph R. Wilson, Albuquerque, N. M.

J. M. Woltz, Safety Director, Youngstown Sheet and Tube Company, Youngstown, Ohio.

George E. Morgan, Otis Elevator Company, Buffalo

H. G. Ellerd, Armour and Company, Chicago

R. S. Sperry, Scoville Manufacturing Company, Waterbury

John R. Brownell, Equitable Life Assurance Society, San Francisco

R. W. Campbell, Illinois Steel Company, Chicago (Chairman)

(On motion the report of the Nominating Committee was adopted.)

PRESIDENT VAN SCHAAK: No members' ticket having been nominated, under the provision of our Constitution and By-Laws a motion to close the nominations is now in order.

(A motion was made that the nominations be closed. The motion was seconded and carried.)

PRESIDENT VAN SCHAAK: As there have been legally nominated just enough men to take the place of those directors whose terms expire and to fill other vacancies, The Chair suggests, in order to facilitate the transaction of our business, that the Secretary be directed to cast one ballot for the candidates named for the terms for which they have been nominated.

(The suggestion of the President was put in the form of a motion and adopted.)

PRESIDENT VAN SCHAAK: The Secretary has cast the ballot. The inspectors of election who are serving as tellers will report the result of the vote.

SECRETARY WILLIAMS: Mr. Davidson has handed me the report of the Inspectors of Election and Tellers showing that there are 1,973 votes cast in favor of the nominees as read, and no votes against.

PRESIDENT VAN SCHAAK: The report of the tellers shows that 1,973 votes have been cast for the nominees and none against. It therefore gives me pleasure to announce that these gentlemen have been unanimously elected directors of the National Safety Council for the terms for which they have been nominated.

I would like to take this opportunity of asking all the directors to attend a meeting of the Board of Directors to be held at five o'clock this afternoon in Private Dining Room No. 3 on the mezzanine floor.

Is there any unfinished business to come before this meeting?

MR. LITTLE: There is the report of Special Committee on the Formation of an Engineering Section in the National Safety Council.

REPORT OF THE SPECIAL COMMITTEE ON THE FORMATION OF
AN ENGINEERING SECTION IN THE NATIONAL
SAFETY COUNCIL

In accordance with a resolution adopted by the Executive Committee, President Van Schaack appointed Messrs. Little (Chairman), Tolman, DeBlois, Talbert, and Sinn as a special committee to report on the advisability of forming an Engineering Section in the National Safety Council. This committee, together with Mr. C. C. Rausch, Assistant Director of the Safety Institute of America, and Mr. Sidney J. Williams, Secretary and Chief Engineer, National Safety Council, met and discussed the subject at considerable length.

The Safety Movement has, in our opinion, now reached a point where definite technical information must be developed and accumulated just as rapidly as possible in order to secure maximum results from the splendid educational propaganda which the Council has carried on with such notable success.

Furthermore, the work on Safety Standards, to which the Council is now definitely committed, can be carried on much more satisfactorily if there is established within the Council a Section which will be recognized without question as equal in professional attainments and dignity to the great national engineering societies.

An Engineering Section will give an opportunity for men of recognized standing in the profession to meet frequently for the exchange of ideas and information upon strictly engineering problems related to Safety, for a larger recognition of their professional status, and the service which they can render the Safety Movement.

For these reasons your committee recommends the formation of an Engineering Section, on substantially the following general basis:

Membership

The membership of the Engineering Section shall be composed entirely of individuals who are members of the Council or who are employed by or affiliated with members of the Council, and who in addition have the following qualifications: Either (1) they must be members of the American Society of Civil Engineers, The American Society of Mechanical Engineers, The American Institute of Electrical Engineers, The American Institute of Mining and Metallurgical Engineers, or the American Society of Chemical Engineers; or (2) they shall have had at least ten years' experience in engineering work and shall have been for at least five years in responsible charge of such work—a degree from a recognized college of engineering being accepted as equivalent to two years' experience. Persons who are members of the Council, or employed by or affiliated with members of the Council, may become associate members of the Engineering Section if they are either (1) associate members of the American Society of Civil Engineers or the other engineering societies above mentioned or (2) if they have had five years of practical experience in engineering work—a college degree being given the same credit as above. Such associate members shall have all the rights and privileges of members except the right to vote or hold office in the Section.

Organization

The Section shall have a Chairman, a Vice-Chairman, and a Secretary, the Secretary being a member of the engineering staff of the National Safety Council; and an Executive Committee of not more than twenty-five, including the officers; and including at least one member representing each of the industrial sections of the Council. Among the sub-committees of the Executive Committee there shall be a committee on Membership, with five members, which shall pass upon all applications for membership in the Section. Your Committee recommends that Messrs. D. S. Beyer, J. R. Brownell, A. P. Costigane, L. A. DeBlois, G. T. Fonda, H. W. Forster, E. B. Morgan, L. R. Palmer, C. E. Pettibone, C. C. Rausch, H. A. Schultz, F. P. Sinn, Thos. Stanion, C. M. Talbert, R. F. Tillson, C. P. Tolman, E. B. Tolsted, and S. J. Williams be constituted a temporary Executive Committee to perfect the organization of the Section.

Functions

The functions of the Engineering Section shall be:

(1) To help to meet the technical demands of the various industrial sections and furnish them technical information as desired:

(2) To perform technical service for the Council, on request of the Executive Committee of the Council, such as the development of Standards or participation therein; the solution, by inquiry or through research, of special engineering problems arising in safety work; and helpful coöperation with the casualty department of Underwriters' Laboratories, with the National Engineering societies, etc.

(3) To conduct one or more meetings as a part of the Annual Congress, at which engineering problems shall be discussed, being grouped with respect to the engineering operations involved rather than with respect to the industry—as, for example, a discussion on the collection of injurious dust, the guarding of transmission, etc.

(4) To conduct, if considered desirable, one or more additional sectional meetings throughout the year, or in different localities.

(5) To carry on such other activities as will, in the opinion of the Executive Committee of the National Safety Council, promote the Safety Movement and the best interests of the Council

Upon motion the report of the Committee was approved in principle and the engineers named in the report appointed to perfect the plan for the Engineering Section and report to the Executive Committee of the National Safety Council for final ratification.

PRESIDENT VAN SCHAAK: Is there any other new business to come before this meeting?

If there is no other new business, it is the privilege of The Chair to call your attention to a fact with which you may not all be familiar. You of course all know that the National Safety Council is constantly seeking members. Perhaps you do not all know of one way in which we have endeavored to secure a larger membership. Some few months ago it occurred to your Headquarters Office that the personal efforts of the men directly engaged in safety work in connection with the membership of this Council might be productive of a considerable increase in our membership, and they therefore offered prizes to such safety men

as would by their direct efforts secure new members for the National Safety Council. I may say that the result has been so encouraging that we look forward to much greater results next year.

**LIST OF MEN RECEIVING MEDALS FOR SECURING MEMBERS
DURING MEMBERSHIP CAMPAIGN**

Mr. H. P. Heyne, United Alloy Steel Corporation, Canton, Ohio.

Mr. G. E. Clarkson, Secretary, Western Pennsylvania Safety Council, Pittsburgh, Pa.

Mr. A. H. Lintz, Secretary, Northeastern Ohio Council, Cleveland, Ohio.

Mr. M. L. Fellmer, Secretary, Central Mississippi Division, N. S. C., St. Louis, Mo.

Mr. L. A. DeBlois, E. I. du Pont de Nemours and Company, Wilmington, Del.

Mr. R. T. Read, E. I. du Pont de Nemours and Company, Wilmington, Del.

Mr. Clarence Parker, Safety Engineer, Everett, Wash.

Mr. R. C. Paul, State Workmen's Insurance Fund, Harrisburg, Pa.

Mr. T. H. Boyd, Safety Engineer, Seattle, Wash.

Mr. Julien H. Harvey, The Bracken Company, Kansas City, Mo.

Mr. H. W. Donald, American Mutual Liability Insurance Company, Boston, Mass.

Mr. W. L. Myers, Tebo Yacht Basin Company, Brooklyn, N. Y.

Mr. R. A. Shaw, Ford Motor Company, Detroit, Mich.

Mr. A. B. Sherlock, American Mutual Liability Insurance Company, Portland, Maine.

If any of these gentlemen are here and will kindly come forward it will give me pleasure to present the medals. Those who are not here can procure their medals from Mr. Williams who will have them in his possession.

We are beginning to attract the interest of other cities which would like to have the Congress meet with them. I wish to advise this meeting that I hold in my hand a very cordial invitation from the Governor of the state of Indiana, from the Mayor of the city of Indianapolis and the Chamber of Commerce, inviting the National Safety Council to hold its Congress in 1920 in the city of Indianapolis.

It is in order at this Annual Meeting that reports should be presented from the several Local Councils. Those reports have all been received and inasmuch as they will be included in the Proceedings of this Congress in connection with the Meeting of Officers of Local Councils, The Chair takes the liberty to facilitate the proceedings by not calling upon the representatives of those Councils to read their reports at this meeting.

The business of this meeting having now been transacted it is in order to adjourn, but before entertaining a motion to adjourn. The Chair would like to ask all those present to remain and join in singing America.

The audience arose and sang two verses of America, after which the meeting adjourned.

General Session: Employees' Representation

October 1, 1919

ARTHUR H. YOUNG, Chairman

Manager, Industrial Relations, International Harvester Company, Chicago

CHAIRMAN YOUNG: The interest in this meeting and the subject to be discussed this afternoon is manifest by the assemblage here. It is eminently fitting that employee representation—that particular phase of industrial relations—should be discussed in the Annual Congress of the National Safety Council, for after all the Safety Movement and the Safety Committees are the parentage of the employee representation plan. It was through the non-controversial medium of safety that employers and employees found they could group themselves to mutual advantage around a Council Table, and in the discussion of safety which, in every aspect, is non-controversial, they came to know that they were of the same common clay and that their ideals, aims, and purposes were after all the same.

The splendid success obtained through employee representation in safety made it an easy and natural step to go further and include other possible controversial points such as wages and hours and working conditions generally for discussion and for determination in conference—in family conference. The movement of employee representation may be termed a movement of such recent origin that those who have been indulging in experience with it for only a few months are almost termed pioneers. Probably the great war had a very substantial effect in hastening the rapidity with which employee representation has been taken up so generally both directly and indirectly, indirectly because it was only natural and logical that after four years of concentration of thought by all of the civilized people of the world for the destruction of autocracy and for the establishment of democracy, that the culmination of that effort and the return to industry of the millions upon millions of men who had fought and suffered and worked together for a common cause should bring about a new change in industry. It is probable that there had been such autocracy in industry prior to the war as existed in Prussia, and therefore the democratization of industry was necessary to follow upon the return of these men to industry.

There was also a further direct effect. Abroad the formation of the Whitley Council and its reports lead definitely to the information of Inter-works Councils and Industrial Councils. Here in this country the

National War Labor Board's pronouncement and their adoption of the policy of employee representation had a very specific effect. It is true, however, that the voluntary assumption of employee representation in industry has been much greater than that forced through the War Labor Board.

The program this afternoon will give us a discussion of the subject from several different angles. The first two numbers on the program are by men who are interested in production, the production managers in large industrial establishments, and then we have a slant at the problem from an engineer, from a representative of organized labor, and then from the standpoint of the labor manager. It would be unfair for the Chairman to take up further time in a general discussion of the subject when it will be so ably presented by the speakers.

In introducing the first speaker, if I were to indulge in personalities, which are hardly within the province of The Chair, I feel that I could preach a real sermon because of my close relationship with Mr. McCormick in the Harvester organization. To those of you who know the Harvester organization and to those of you who do not, I can sum it all up in the simple phrase that Mr. McCormick is "a Harvester man," and I take pleasure in introducing to you Mr. Cyrus McCormick, Junior, Works Manager of the International Harvester Company.

COOPERATION AND INDUSTRIAL PROGRESS

CYRUS MCCORMICK, JR., WORKS MANAGER, INTERNATIONAL HARVESTER
COMPANY, CHICAGO

What I shall say here today is not propaganda; it is explanation, and for those of you who care to listen, the facts, purely from the standpoint of a man engaged in production and not in the social economics of industry, are as I am going to give them to you.

Some people blame the present industrial unrest as due to the war; some the cost of living; some this and some that; and some say it is merely a revolt due to conditions which they frequently hesitate to describe, a revolt against the older order of things.

Through every opinion there is, in one form or another, clear evidence of a realization that the war has brought home to us all the final chapter of the long lesson that individual workmen must be regarded as human beings. This new element has claimed for itself a permanent place in industrial thought and practice. We are now realizing what we saw before but perhaps not so clearly, that this human question is paramount. Industry is becoming humanized and the workmen are conscious of that fact. The man, as opposed to the machine, has the power to think and is endowed with a soul. He is at last seeking recognition of that fact.

This trend toward humanization in industry is expressing itself in the expressed desire of labor to share in the management of a business. The desire has taken various forms in various parts of the world. In Russia we have Bolshevism, Bolshevism being a practical application of the

theories put forward several years ago in this country by the I. W. W. and translated into a very fiery, but essentially—as they see it—practical form. Bolshevism seeks to establish the superiority of the workman upon a class basis, upon a basis from which everything else except actual manual labor is excluded. They tell us now that they are employing entrepreneurs to help them out of the difficulties under which they first labored, but at any rate the theory remains the same. I am told by people who ought to know that 65 per cent of the strikes which have swept over central Europe—and I am going farther west now, I am no longer referring to Russia—over France, over Germany, over Italy, have been of Syndicalist origin. That is to say, not merely with the demands for wages or hours or this or that, but with a political purpose in view.

In England the unrest first showed a definite reaction in the Whitley Report. That report was an answer to a very definite unrest, and since it was published last April, we have had many manifestations, (and now see one in progress) in which the plea for nationalization is put forward as the only solution of the unrest. Behind it all, as I have said, is this desire for self-expression, and one more thing, a demand for a realization of the fact which we must now admit, that the relations of employer and employee can no longer be based solely on a cash foundation. That is to say, the transaction is not complete when wages have been paid. Again, there is a man, endowed with a soul, who is asking for recognition.

COLLECTIVE BARGAINING

In answer to this, management in this country is beginning seriously and has in many large companies and many small ones, begun to take the men into its confidence. This, of course, applied through the terms of employee representation, involves a recognition of the principle of collective bargaining. Properly speaking, collective bargaining involves bargaining with groups rather than individuals; but the form the group may take is not restricted. Collective bargaining is a spirit rather than a form. Every company which has employee representation in any one of its forms is an advocate of collective bargaining. Now that theory of collective bargaining is condemned by many of the older economists. They fear it is going to get us into trouble. I feel that it is going to let us out of trouble. We are not defying economic laws when we set up a system of collective bargaining, but we are permitting other laws to operate which, through the weakness of the individual, to adopt a well-known phrase, cannot operate unless that individual is enabled to re-enforce himself collectively. Collective bargaining is with us now, and we might as well recognize it. It is the one great change that an old-style employer has to face when he adopts employee representation.

REASONS FOR EMPLOYEE REPRESENTATION

There are various reasons why employers are turning to employee representation. In the first place, there may be a fear of syndicalism, a fear

that if legitimate interests of employees are not recognized in this or some other way, or that because of repression they are unable to get things which they believe are legitimately theirs, they will have resort to revolution in order to secure a new state of things in which they shall be on top.

Secondly, I might compare the growth of employee representation to the growth of democracy, and call to your mind the history of the eighteenth century when Frederick the Great ruled over Germany. Frederick was a despot because he held the only reins of power. He was responsible to nobody. He did what he pleased, how he pleased; but he was a benevolent despot because he chose to be a despot in a good way. He built fine schools, colleges, roads, public works, and had a pretty decent system of taxation as it was understood in those times. Of course it was all for his own ends. It was despotism veiled sufficiently by fair deeds to be called benevolent. Now up to a very few years ago our industrial system was also benevolent despotism. It was benevolent because large corporations tried to do the best they could to start safety campaigns, to start scientific employment, to start welfare work, give recreation, and the like; but because all this came from the top and had no reference to the opinion of the governed, in other words amelioration without consent of the governed, that benevolence was still tinged with despotism.

There is another point, another reason why this is being considered, with which some practical men may quarrel, and that is what might be called the ethical side of the question. Are you willing to do something on a new and different basis simply because you no longer desire to operate in the materialism that is part and parcel of the lives of so many of us? Are you trying to accomplish something simply because it is right? You will find many men take that view of industrial democracy. They believe they see in employee representation an answer to the materialistic domination of industry, whether that domination is by the management or by the men. They wish to substitute principle for that domination which has for its end the mere accumulation of dollars.

A fourth and final reason is that employee representation is good business for the company and for the man. Scientific industry has just one more step to take. We have done about everything we could in progressive machinery and assembly. We have secured such experts as we could find to study the technique of our operations, including many things that were never thought of fifty years ago—safety work, for example. We must now endow scientific management with soul. When this is done, industry can claim to be for the benefit of management and men alike and the community as well. When this is done, when industry is endowed with soul, it can at last claim to be fully and finally scientific.

WHAT REPRESENTATION MEANS

Now what is employee representation? Rather than attempt to define it, I will try to describe the conditions that must obtain in order to secure it. Of course, mechanically, employee representation is

the institution of one or another kind of shop committee or legislature or council in which representatives of the management and men sit together and discuss problems of mutual interest. Well now, how may that be made effective? In the first place there must be full representation in all questions affecting wages, hours, and on through the whole list of industrial activities; don't leave out one. If the men do not have a share in the control of wages, the plan has no vitality. If you start with wages you might as well include hours, and if you continue with hours you might as well put them all in—they are all there. Every question that affects the relations of man and management must be susceptible of discussion between the representatives of the employees and of the management.

That does not imply, in my mind, any demand for executive control; that does not necessitate the bringing into your Board of Directors of representatives of the employees. It simply means that in questions which affect the men directly, that is where you want to put committeemen—call them what you will—who will represent the men and give the management the innermost feeling of the men in every decision affecting important questions.

Secondly, there must be joint conference. If your committees meet separately you lose the personal contact of man and management. The object is to get together, seated around a common table, not on each side of a common table but all together *around* a common table, and then face the subject in hand and debate it. See what you can find out about it. Go down to the vitals of the idea, lay every card on the table, see what the innermost feelings of the men and of the management are, and then as a result of that debate get together and understand each other.

There is something very refreshing, something very different in a point of view that the men have of the management and that the management have of the men after a discussion which has lasted hours. I have sat through these discussions which have gone on for hours, and after it is over you say, "Well, before I didn't quite understand his point of view." In the average case both sides can say as much if they will go to the limit, get right down to fundamentals, and explore the vitals of the subject. When they get through the debate, then let the agreement come by itself, because in each or both of two reasonable beings (and I assure you, Gentlemen and Ladies, that the average American workman and the average American manager is more or less of a reasonable human being), there is something which can be appealed to by one side or the other, if you only go at it hard enough and long enough. Ultimately you will find it, and the agreement—after all the debate and understanding that must arise from frank debate—will come by itself.

There must be easy, secret elections. You can well understand that a real representation is more indicative of the real feeling of the employees than representation where thoughts may have been influenced. There must be secret election in order that the unfettered opinions of the men can be brought to light. There must be no red tape. Red tape will tie up any plan and cause it to fail. The simplest plan is the best. Any

plan which can secure the results for which I am asking—and just these few points: any plan that secures those through an absence of red tape that will permit quick, instant operation, that is a satisfactory plan no matter what may be its details.

There must be absolutely no discrimination at any time on the part of the employer as against any one or any number of the employees for any such thing as race, sex, religious affiliation, and as it is stated in our plan "political or other organizations."—in other words there is nothing in our plan that would permit us if we so desire (when we obviously do not) to discharge a man or to refuse to listen to him simply because he happens to be a member of some labor union. When we take a man into our employ, and if we are willing to take him into our employ, that ends the matter. He is then one of the family and he is able to come up, after he has qualified by the brief period of residence that is needed, and to sit in council with us if he is elected. Take care in the beginning, because after a man is in, under a plan of this kind, you have no right to consider for a minute what he is or what he believes—he is one of the family and you had better treat him as such.

The last important point is that there must be executive supervision of such a plan. Just as we have experts in heat treating or progressive assembly or any of our thousand and one mechanical tasks, employment work, or safety work, so must we have experts in industrial relations. It may be difficult in these days of the birth of this new science to find these men, but they must be found. The best man in the country (indicating the Chairman, Mr. Young—Applause) is none too good to guide such a plan as this.

The management must understand the men and the men must understand the management. As soon as any such plan is in smooth operation it is going to operate both ways. It is not simply a question, as I have heard some employers say, "How can we get the men to understand our point of view?" The converse is just as true and the management, through this plan, must be able to understand the point of view of the men.

Contact between management and men used to be very close. Now, sorry to say, things are changed; yet we cannot ask or want to go back to the time when the owner of a business knew every man in his factory. Society demands large units because it needs large production, so we cannot go back to the small shop. Society is looking to employee representation to re-establish the contact between men and management. The man in charge of production of any great corporation cannot know every one of his employees, but through employee representation, if it is fairly and freely operated, he can feel the pulse of his employees and they can feel his pulse.

OBJECTIONS TO REPRESENTATION

There are certain objections that have from time to time been made to employee representation and I would hardly be frank if I failed to mention them. It is said, for example, that employee representation is merely an invitation to the men to come along and boost the wage scale.

Some people believe that. Some people say to us, "You have increased your wages since you instituted employee representation. Look, we told you so!" But as I have sat in these discussions I have found, frequently as not, a demand not so much for higher wages as for shorter hours; frequently, as many times as not, a demand for shorter hours even at the expense of higher wages. I can show you many decisions reached by our Works' Council in which hours have been shortened and wages decreased because that was the way the men wanted it.

A great many workmen, and perhaps they are the majority, think that they will get something while the getting is good, as it seems to be at the present time; but others—and many believe them to represent the thinking majority—aren't so much interested in mere wages as they are in the philosophical side of industry. They want decent living conditions. They want real life. They want something else besides hours of toil and high pay from sunrise to sunset.

In the second place, many people say to me, "Well, how do you prevent your men from electing poor representatives? How do you keep a bunch of radicals out of these councils? How do you know what you are going to get?" To all those questions I would answer, "We do not." We do not endeavor to keep radicals out of our conference. We do not endeavor to insist upon our men electing good representatives. We do not put up to them a strong propaganda to keep the best only on the councils. We do not need to because they take care of that themselves.

Among our employee representatives, for those who may doubt, the average age is 37 years, a pretty good average and not indicating in any way a bunch of young radicals as some people say, or a bunch of old pensioners as other people say. Three-quarters of them are married. There again is an indication of desirable stability. The average employment is over seven years. In other words, although they were not in any way restricted in their election of representatives except by the requirement for employment of more than one year, they have chosen to select men who have been with the company long enough to understand some of its ideals, and to feel that its ideals are not positively detrimental to their own interests. The majority own either stock in the company or their own homes.

As an example of the responsibility of the men of the kind that I have just described to you, the very first demands that came in were for increased wages. The workmen thought "Well, we have here a toy that will give us whatever we want." The representatives put up these demands. We examined them. We showed them our books, told them we regretted very much that our business could not stand an increase in wages, in the first place, and in the second place that the cost of living as it was at that time was lower than at the time of the armistice.

So with that explanation before them the men considered the case. They went back to their constituents and in every case the demand for higher wages was withdrawn. Again later on in the summer when the cost of living went kiting upwards again, they returned with other demands for higher wages, and at that time the management representatives were convinced of the sincerity and the reasonability of the re-

quests and demands put forward by the men, so they were granted. There you have the thing operating both ways.

We were also enabled to discover some things which, while we probably would have known of their existence if it had occurred to us to look up the records, had never really been driven home in our minds. We found that we had some men working for us seven days a week, twelve hours per day. Somebody kicked. He had a legitimate channel through which a complaint could come. Those particular men who were then relieved of that long work were, in order to find relief, willing to accept shorter hours combined with lower wages.

In other cases we have had piece work rates raised because the existing rate in one place wasn't right. In other cases we have had piece work rates lowered because they realized that that man was getting more than this one on a similar task and that this rate was the correct rate. That may seem unbelievable—workmen agreeing and telling you that they expect and agree to a reduction in wages—but they are the facts.

It is also said that employee representation, inasmuch as it is a committee system, ruins discipline. The average person who says so will quote the experience of the Russian army during the time of Kerensky, when through the institution of committees the discipline of the Russian army was shot to pieces. There is no reason why discipline should be in any way affected by employee representation or any shop committee system, if the effort is sincere and fair on both sides. Discipline is intelligent obedience, not skill in executing the goose-step. If a foreman is absolutely fair and square and acts on principle and not on personality, if he disciplines a man or discharges him because he has done wrong, then employee representation has nothing whatsoever to say against him. If, on the other hand, he discharges a man because he doesn't like him or because of some petty spite or because of something he doesn't understand, the man has a recourse. Several years ago the average employer in big factories took away from the individual foremen the right of hiring and firing and gave it to the employment manager. At that time it was said that that would ruin the foreman's ability to discipline his men. It didn't, and no more does employee representation, provided (and it is a big proviso) that the effort is sincere on both sides. I know a factory where the discipline is ruined because the foremen, every one of them, are afraid of the representatives and the representatives, every one of them, think that they have something on the foremen because of this new way of doing things. They don't realize that neither knows anything at all about what they are talking. They don't realize that they don't understand the scheme. They don't realize that the people they are hurting most are themselves.

ATTITUDE OF ORGANIZED LABOR

At the Atlantic City convention in June of this year the American Federation of Labor took considerable exception to shop committees in general. They said, for example, in the resolutions which were there passed, that the elections as a rule were unfair, that democratic organ-

ization was not permitted, that committeemen were intimidated by the management, and that the employee in pleading his case before the shop committee was not allowed such expert aid as he received through the person of the business agent.

I take it that experience means something. I have sat through meeting after meeting, not in one factory but in a half dozen, and I have talked with representatives of other factories and other companies besides ours, employee representatives as well as management representatives, and yet I have never seen a single reason why any one of those charges should be made or can be upheld. I do not know whether the American Federation of Labor would have that same view today as it did last June. A lot of water has gone over the dam since then and people are more skilled on this thing now than they were, but the facts are that committeemen are not intimidated, that the elections are not unfair, that democratic organization is permitted, and as for the employee representatives needing advice—let me tell you that the average employee representative, after he has had a little experience, can put up problems that it sometimes takes a lawyer to unravel. I know. I have sat up all night trying to match the intelligence of some weighty question, and I have gone the limit in trying to give the best possible answer. They are clever; they are brainy, and they are that because they are good Americans.

The object of organized labor, I take it, is to improve the conditions of men through the institution of a system of collective bargaining. Employee representation gives the same results more quickly and more intimately. I have no battle of any kind to fight with organized labor; neither do I think that organized labor has any legitimate cause for an attack upon the shop committees. They are different things; they are both seeking good results. If there are two ways of doing things it does no harm to go at it in both ways. I do not pretend for a moment that employee representation is a panacea for every ill. You can't institute a plan of employee representation and then throw up your hands and say, "All our troubles are over," because it is not any plan that counts, it is not the particular system that you happen to choose, it is the way you work whatever plan you choose—that is what counts.

You can't expect to get results too quickly. You can't expect to put something in and get dividends right away. You can't expect that the momentum of mutual education, the training of men by management and the training of management by men to produce results all at once. We have been doing things in the other way ever since the eighteenth century when the Industrial Revolution made big business possible. Now we are changing. You can't expect that transition to take place in a minute. Give it time; give it a sincere chance to work out.

THE HARVESTER STRIKE IN CHICAGO

Possibly it might be of interest if I said a few words on the so-called International Harvester strike in Chicago and its relation to employee representation. You all know that in July we had 10,000 men out on the streets. It happened in this way. We have committees in nineteen

of our twenty plants. In the one plant where there is no committee 400 men started to strike. What the strike was about, I don't think anybody to this day knows. Some demands were presented fifteen days after they went out. They were made up fourteen days after they went out, and as I say, I doubt very much if any of the 400 men who started the trouble knew why they stirred things up so that 10,000 men were soon out of work. In a few hours the 400 had the whole of this plant out on the street. Then a gang of excited men, joined by some strikers from a neighboring plant, marched over to our next plant. Nothing happened, except that about twenty or thirty men were pretty badly beaten up.

Next morning this other plant started to work. Every man, with four exceptions, reported for work, every man out of 1,800. So there can hardly be said to have been any quarrel with the company. The disorder outside was such and so many were slugged that the Works' Council recommended cessation of work. The company agreed because we did not propose to have any violence if we could help it. We told the men there was going to be partnership in wages and hours, so we thought they might as well help us settle the strike. In another works, three days later, the same thing happened. An augmented crowd of about five thousand clamored around in the streets and pretty soon a few of them went out and more men were beaten up. The Works' Council recommended cessation. But notice there was no strike except in the first plant which had no Council. Then, unfortunately for us, the street car strike and the race riots in Chicago intervened and it was about three weeks before we operated again, but we operated again at the end of three weeks because the Works' Councils in the various places asked the company to operate. We promised them we would not operate until they agreed it was safe to do so. We opened at their request and inside of one week were running normal again. That I call a tribute to the employee representation way of handling industrial disputes.

I was asked yesterday what I thought of employee representation in view of the fact that our steel mill in Chicago was just as much closed as any of the rest. The obvious answer is that there also the Works' Council invited us to close, and remember that the Works' Council is composed not only of representatives of the employees but of the management as well. That was forty-eight hours after the strike had begun, and I venture to say that if every other steel mill in South Chicago had been equipped with a Works' Council there would have been no strike because the morning the steel strike was called we had just exactly ninety per cent of men in our mills working. If every steel mill in Chicago had had ninety per cent of satisfied men working there wouldn't have been any strike.

THE WHITLEY COUNCILS

I don't pretend that our plan of employee representation is the only plan. There is the Leitch plan, organized as a kind of legislature. There are other plans beside that. All of you have heard of the Whitley plan in England. Many people say, "Why not adopt the Whitley plan and go

the same way England is going?" Personally I wouldn't want to go the way England is going, but that may be immaterial. The Whitley plan presupposes complete organization on the part of industry and complete organization on the part of labor.

I do not know how many laborers there are in this country. I do not know how many are members of one or another of the organizations which constitute organized labor, but it is safe to say that there is a minority of the men in this country who are organized. In England it is about 90 per cent, so I am told. In England it is lawful for corporations to organize for mutual benefit. Here it is said to be dangerous. We in this country are not organized either in industry or on the part of labor.

In the second place the English plan presupposes a large share of participation on the part of the government. For generations the British government has been skilled in participating in the handling and arbitration of labor disputes. Here we are just beginning. Our government is not yet skilled enough to participate in, and adjudicate, the differences between capital and labor or men and management. They are much better acquainted with each other, and if one can find some basis of contact where they can meet and work out their own difficulties, they will be far more satisfied than to submit to any intervention on the part of an unskilled government.

Thirdly, we have instituted vertical divisions for horizontal divisions which characterize the Whitley Plan. We have taken—and when I say "we" I mean the whole trend in this country that is giving birth to employee representation—our industrial society and divided it vertically. Here is a company from manager down to workman with all its interests identical. The old idea that capital and labor are deadly enemies has gone by the board completely. We have divided industrial society vertically and we have made it a family affair. There is no place in this country for anything resembling class division. There is no place in this country for class warfare of any kind or class prejudice.

• IMPORTANCE OF REPRESENTATION •

One final word: I believe that employee representation is a more important subject today than is profit sharing or any other of the many things that are considered in any industrial program. I believe it is important because it is the gateway through which every other consideration will be approached in the future. If you want a plan of profit sharing you had better wait until you have employee representation first and then the men can understand (which they do not now) the economic aspects of profit sharing. If you want them on the Board of Directors wait until they have gained through employee representation the experience you have acquired from years of endeavor and years of practice. If you want the men to participate heartily in a safety campaign let them help run it. In other words, employee representation is a basis for every future relationship between capital and labor, between men and management. Employee representation is a sincere endeavor to find a point of contact and to work upon that point of contact until the two are drawn so

close together that they are no longer two but one, striving together for the mutual interests of each and of both. I thank you.

CHAIRMAN YOUNG: Just an ordinary Harvester talk by an ordinary Harvester man.

We were to be favored with an address by Mr. Feuerbach of the Demuth Company giving an outline and a recital of experience under the so-called Leitch Plan of employee representation. We are sorry to say that Mr. Feuerbach has wired that he is unable to attend because of illness and his paper has been presented to The Chair.

EXPERIENCES OF WM. DEMUTH & CO. IN INDUSTRIAL DEMOCRACY

F. L. FEUERBACH, FACTORY MANAGER, WM. DEMUTH & Co.,
RICHMOND HILL, N. Y.

No doubt the most important topic in the mind and on the tongue of every business man today, not only in this great country of ours, but all over practically the entire world, is the existing unrest and unfortunate strife between Capital and Labor. Many of our best thinkers are deeply interested in the solution of this serious problem, feeling that this tide of discontent in its mad rush toward Bolshevism must be stemmed before it reaches the point where it will do a good deal more harm to all mankind than the bloody world-conflict just ended. The various systems under consideration, some old and some new, such as Shop Committees Plan, Employees' Representation Plan, Industrial Relationship and Industrial Democracy, may differ slightly or essentially in their application to practical business, but they all aim toward a better understanding toward representation in industry, which is the problem of the hour with business owners and executives, as well as the workers.

The plan of representation Wm. Demuth & Co. adopted at their factory in Richmond Hill, Long Island, in April, 1917, is that known as Industrial Democracy, introduced by John Leitch, whom most of you probably know as the author of the very interesting book, "Man to Man," which deals with this very important subject, and gives a very detailed and comprehensive description of industrial democracy.

As practically every man who talked to me about this system, in this country as well as in England and France, which I visited recently, seems to have a different conception of, and definition for, Industrial Democracy, it may be well at this time to give our version of it.

INDUSTRIAL DEMOCRACY DEFINED

To have Industrial Democracy is to have some internal plan of government in each industrial plant, whereby the employees may have a direct voice in the formulating of such policies as directly affect their physical, moral, social, and economic welfare, as well as that of their families. This means length of hours, character of work, physical surroundings under which they work, the moral influences that surround them, the freedom of self expression, and the question of wages or some form of profit and loss sharing. All of these things vitally affect the employee

and his family. Therefore, he must have a voice in their control, if we are to have Industrial Democracy.

Ethically it means a square deal in wages and working conditions. What a square deal in wages means, no living man can definitely describe. Some people consider the living wage as such—if we suppose that this expression can be defined, but under present conditions, and perhaps all future conditions, it appears a certainty that labor will not consider that minimum as a fair wage, nor is there in my mind any justifiable economic or ethical theory which makes it so.

Labor will continue to demand with even greater solidarity and persistence, collective bargaining with regard to wages, hours, working conditions, and all those matters which mutually affect employers and employees, and upon which selfish interests are bound to conflict from time to time. Whatever may be decided, and temporarily accepted as a fair wage and just working conditions will not stay decided, or really be decided, unless worked out in joint man to man conference between representatives of the two sides. This, in short, is the essence of Industrial Democracy, an organization and a spirit in which all concerned shall have effective voice in matters which concern all.

I do not advance this idea of democratic representation and personal contact in industry as a final solution of the so-called labor problem. This problem is too vast, too complex and is enmeshed too deeply in human passions to be settled off-hand by any method or system, however admirable in itself. I am afraid that no one really understands the whole labor problem, but I am convinced that Industrial Democracy is a wonderfully efficient teacher for both the employer and the employee.

The labor problem is much more than a class issue. It has steadily risen to the consciousness of mankind from economics to politics, from politics to ethics, and from ethics to a world issue involving the very safety and sanctity of governments and societies.

Better relations between employers and employees can best be arrived at by granting to the latter a greater share in the consideration of matters with which they are concerned and about which their entire life and existence center to a great extent.

Labor and Capital are meant to be partners, not enemies. Their interests are common interests, not opposed, and neither can attain the fullest measure of success and prosperity at the expense of the other, but only in company and by coöperation with the other. In an accomplishment of this sort the proper relationship of the money-supplying and money-receiving forces would naturally involve industrial peace, which cannot be secured by any conciliation or arbitration scheme thus far practiced or tried out.

Such schemes settle disputes, or at least try to settle them, only after they have arisen. Industrial Democracy means to settle disputes before they arise and by aiming to reduce to a minimum the development and intensity of hostile attitudes and putting in their place mutual understanding and the effective good-will to coöperate. The full benefits of coöperation cannot be realized unless there exists a spirit of friendliness among those who have come together to work for the common good of

all. Not much can be accomplished with a man who persists in believing himself always right, for to him it is the whole human race that's wrong. Cooperation means that individually-cherished ideas must at times be shattered and give way to the will of the majority.

In the past, the employer, generally speaking, regarded the laboring man simply as a necessary means to the productive process, whom he would buy as cheaply as possible, just as he would make his purchases for materials, endeavoring to make as much profit as possible out of both. Fortunately this attitude is undergoing a decided modification, but on the part of a certain type of employer it is still altogether too prevalent. Two influences are bringing about this rapid change in attitude.

In the first place, employers are discerning more clearly the meaning of loyalty, and now can see that this spirit cannot be obtained through the old autocratic attitude. They are beginning to realize that the growth of their business depends upon the growth of the people in their organization, and that loyalty, like electricity, works only when there is a return circuit.

The big man today realizes that up to the present time hands only have been employed, and regrets that he did not see years ago that all the humans in his place had not only hands, but also heads containing brains, capable of adding intelligence to their work, which means a larger quantity and better quality of merchandise. He realizes that he cannot get the activity and cooperation of these brains unless he first assures these people of a square deal, and, therefore, takes a new attitude that cooperation is far better than competition between employer and employee, and that fair dealing is the fundamental and basic principle on which relations between employers and employees should rest.

In these days of efficiency and economy, we all recognize—or will do so before very long—that the greatest waste in the world is the waste of our human resources, and it is quite natural that we start the big work of economy in our own organization.

Secondly, there is more general recognition of the fact that political democracy without a measure of Industrial Democracy or self-government is somewhat hollow.

The fact that American workingmen have been fighting in Europe to make the world safe for Democracy helps to suggest the ideal of a better, more thorough and truer Democracy at home, and it is generally conceded that the social and economic destinies of our country in the next few years depend largely upon the attitude of the employers toward Industrial Democracy within their respective establishments.

The workingman desires—yes, demands most emphatically in some cases—to be considered a human being, to have proper physical conditions surrounding his labor, to secure a sufficient return to give his family the right kind of a home and education.

Realizing the need of a better understanding between our employees and ourselves to stimulate an interest in their work and clear from our industrial pathway some of the difficulties which you all have faced from time to time, we installed, about two and a half years ago, a system of organiza-

tion government, generally termed and known as Industrial Democracy.

PLAN MODELED AFTER UNITED STATES GOVERNMENT

We took as example the United States Government, which having been successfully established and carried on for more than 140 years, seemed a pretty fair guide. We have a Cabinet, Senate, and House of Representatives. The Cabinet consists of the executive officers of the company, with Mr. Demuth as President of the Company, acting as its Chairman. This body is not elective, its personnel existing by virtue of position in the organization. It is primarily an executive body, and while it has the power to veto, the same has never been used, there being no occasion for it. It also has the power to initiate legislation, by making suggestions in a message to the Senate or House of Representatives, which, of course, may or may not be accepted.

The Cabinet meetings have before them the bills which have been passed by the Senate and the House, and also the minutes of all meetings and discussions, which give a very clear conception of what is in the minds of our people. The Cabinet deals with the larger and more intimate problems of management, which would naturally come before a meeting of executives. Any desired change affecting employees in the least manner is not framed as an order, but put in the form of a suggestion, stating the reason for same very frankly and clearly, and is sent to the Senate or House. No matter what its fate may be, it is sure of a full and complete discussion from every possible angle, and if the measure be rejected, the executives may rest assured that they have been prevented from issuing an erroneous order and saved from the results thereof.

The Senate also is not an elective body. It is made up of about thirty foremen and heads of departments, who are in positions of authority over the workers themselves. It elects a president, vice-president, secretary, and sergeant-at-arms, and standing committees, and special committees as the occasion may demand. Its power and practices are identical with those of the House of Representatives.

The House is the popular body of government, being elected by secret ballot by the whole body of workers. Each department has representation—thirty workers electing one representative, either man or girl. The representatives are supposed to act as counsellors within their departments, receive all complaints and suggestions from their fellow workers, and in turn acquaint them with the doings of the legislative bodies.

The Speaker of the House is elected, and he appoints committees, through whom business is transacted to a considerable degree. Each measure is generally referred to a committee to investigate and report, so that when the time comes for open discussion, all available facts will be at hand.

The meetings of the Senate and House are weekly and always in the company's time, which we consider very necessary for the success of the undertaking. A set of by-laws has been devised for the use of both bodies by a joint committee, and all their business is transacted in accordance with same. Any question affecting working conditions, safety, sanitation, wages, piece-work rates, etc., is brought up before either of the three

government bodies, and any recommendation decided upon after a careful discussion and deliberation is brought to the next body for their action. No change becomes a law until it has been approved by all three bodies. In that way we believe we have found a much better way of feeling the pulse of our people, in learning what they desire, and in avoiding difficulties rather than curing them, which is usually the case in the ordinary shop committee plan. We do not wait for the trouble to culminate, for the sickness to develop. The men hear the report and progress of their respective departments, learn about the troubles of another department, and are helping their fellow workers in getting over any difficulties that they may experience.

We can clearly see the actual formation of a threatening cloud. The open discussion of any dispute has never failed to avoid accumulation of such clouds and outbreak of storm.

Permitting the men to have a say in adjusting their wages removes this perplexing question as a field of dispute. The fairness with which the members of the House have always considered and handled all questions of this sort has been most remarkable, and has come to us as a complete surprise. Our experience has shown us very plainly that people learn to be responsible by exercising responsibility; learn to participate in decisions by participating in discussions—even though the experience may at times seem costly to all concerned.

I will give one little example that will show very clearly how industrial Democracy and the wage question work together.

Last fall twenty-five men of one of our departments were somewhat influenced by an outsider who had formerly worked for us and was then working for a competitor. He advised them that this would be an opportune time to strike for more money. The matter was brought to my attention. I called the boys together and said to them: "If there is anything that is not satisfactory, bring it up in your House, through your representatives. That is the place to air all your troubles and bring your difficulties. The next day, I am glad to say, the representatives of that particular shop came to the House and presented their case. A committee was appointed to investigate the matter and report at the next meeting. The committee came back with quite a detailed report, after having gone to the office to obtain figures as to the rate of pay a year ago, six months ago, and three months ago, and having convinced themselves of the true facts, reported back to the House of Representatives:

"We do not favor any change of piece-work rates for this department, because we find that the men are absolutely unfair in their demands."

The House voted to accept this report, and the twenty-five men went back to work.

Any man or woman is eligible for the position of representative, provided they have the following qualifications:

FIRST: They must be absolutely on the square, in order that their fellow employees may have undoubted confidence in their fairness and honesty, so that they may be entrusted with any and every mission which should be carried to the House.

SECOND: They must be able to speak and understand English, so that they may fully understand what is going on at the meetings and be able to report to their co-workers.

THIRD: They must have been in the employ of the company for at least one year. This gives us the assurance that the man knows enough about the institution itself and about the work so that he is fairly well qualified to take part in all discussions, by having some fundamental knowledge of the business as well as of his co-workers. This also excludes the possibility of having a labor agitator come into the place for a short time to have himself elected as representative.

We have a large sign hung up in our meeting room reading: "We come here not to convince or convict, but to understand," and while this served as a gentle reminder during the early stages of the game, it has become such a definite habit that this sign today is more ornamental than necessary.

PLAN INTRODUCED BY MR. JOHN LEITCH

No doubt you will be interested to learn how Industrial Democracy was first introduced into our organization by its father, Mr. John Leitch. His fundamental and most serious problem, of course, was to get all workers interested in their jobs, to make them one with the company, to introduce a spirit of coöperation which would reflect higher and happier pay for the men and a better product for the company. Recognizing Justice to be the basic principle of all relations to which every human being willingly responds, it was necessary to lay our foundation on that principle. If we wanted Justice we should have to "show them." All of our people, numbering close to 900, were brought together in the large shipping department of our warehouse, and Mr. Leitch explained the principle of Justice. He then described a dividend system showing just how we intended to work together—that we should not only govern ourselves, but that of all the savings made in the cost of production, one-half would go to the company and the other half to them. They warmed up a bit to the idea of getting some extra money, but otherwise they remained fairly cold. We held meetings once a week through five weeks, to adopt what was to be the business policy of the whole company—from President to the Office Boy—and which was to guide all our actions. The policy rests on the four cornerstones of Justice, Coöperation, Economy, and Energy, supporting the capstone of Service, and reads as follows:

JUSTICE

The fullest meaning of this word shall be the basis of all our business and personal dealings—between ourselves as individuals, between our Company and those of whom we buy, and between our Company and those to whom we sell.

Justice shall be the first cornerstone upon which we agree and determine to construct broader character as individuals and broader commerce as an institution.

We recognize that JUSTICE to ourselves necessitates taking advantage of every opportunity to do the best that is in us, and each day improve upon that growing ability.

We realize that merit must be recognized, whether in ability or merchandise. With this certainty, we cheerfully, hopefully, and courageously press forward to certain and unqualified success.

COÖPERATION

To accomplish the greatest possible results as individuals, and as an institution, we find COÖPERATION a necessity.

We recognize that business without COÖPERATION is like sound without harmony. Therefore, we determine and agree to pull together, and to freely offer and work with the *spirit* of that principle—COÖPERATION.

So shall we grow in character and ability and develop individual and commercial supremacy.

Differences of opinion shall be freely and fearlessly expressed, but we shall at all times stand ready to COÖPERATE with and heartily support the final judgment in all matters.

ECONOMY

As each moment is a full unit in each hour, and each hour a full unit in each day, so each well spent unit of thought and well spent unit of action makes for each victory and the final success.

When the hour, the day, the year, or the life, is filled with well spent ability—and an institution is composed of individuals who recognize the value of and so use their time, then success is controlled and governed and is no longer that vague uncertainty of a blind and unreasoning hope.

Recognizing that ECONOMY is time, material and energy well spent we determine to make the best use of them and so shall time, material, and energy become our servants while we become the masters of our destiny.

ENERGY

As energy is the power back of action, and action is necessary to produce results, we determine to ENERGIZE our minds and hands, concentrating all our powers upon the most important work before us.

Thus intensifying our mental and physical activity, we shall "make two grow where one was," well knowing that our Individual and Commercial crop of results will yield in just proportion to our productive and persistent activity. This power of ENERGY directed exclusively toward sound and vigorous construction leaves no room for destruction and reduces all forms of resistance. Having set in our business policy the four cornerstones of Justice, Coöperation, Economy, and Energy, we are convinced that the capstone of the superstructure must be

SERVICE

We believe that the only sound and sure construction of success as an individual or an institution depends upon the quality and quantity of service rendered.

We neither anticipate nor hope to be unusually favored by fortune, but we are thoroughly persuaded that fortune favors the performer of worthy

deeds and of unusual service. We, therefore, determine that our days and our years be occupied with such performances.

Quality shall always be the first element of our service, and quantity shall ever be the second consideration. Thus shall we establish not only the reputation, ~~but~~ the character of serving best and serving most.

Therefore, by serving admirably, we shall deserve and receive proportionately.

After accepting this business policy as a future guide for our work and actions, we then started to govern ourselves under this new dispensation, with the understanding that all rules and regulations affecting the employees were to be in the hands of the Legislature, subject to the confirmation of the Cabinet.

No limits to the self-governing zone were set, and subsequent events proved that no limits needed to be set. Employees given responsibility will honestly discharge it.

HOW THE PLAN WORKED

At the outset the representative system did not work smoothly. A few of the elected representatives did not attend meetings—some because they did not grasp the idea, others because they were afraid they might be called on to speak, and thus expose their curious English. But other members did catch the theory of representative government from the start. Some of course, at first believed that the whole idea was a fake, but they were willing to be convinced; and once they had the conviction of our sincerity, they went to any length to make the experiment a success. They knew and were in touch with the mass, and they learned and appreciated the mass psychology thoroughly in a very short time.

It is true that their initial interest was purely financial. These people had no practical conceptions of democracy, and democracy in business was something entirely unknown and foreign to them—almost as much as it was to ourselves. Representative government meant nothing to them at the start. They had heard vaguely of various assemblies, but they never had discovered that the form of government made much difference to the individual. They simply came to work to make a living and to get as much money out of their job as could possibly be extracted. A mighty few of them, like most laboring men, realized their responsibility in returning as much as possible for the money which they took out of the business. Each man worked for himself, showing very little concern about his neighbor in his own or the next department.

Coöperation to them seemed entirely superfluous and had to be taught in a practical manner, as preaching with the labor class usually does not go very far. They have heard too much of that in the past and received too many promises which were subsequently not kept, and a lack of response and confidence in preaching or ethical lessons is not their fault so much as the fault of those who are responsible for their disappointment.

The practical way we found to be our dividend system, and this is how it taught coöperation:

A number of men desired to celebrate an Italian holiday, and stayed away from work. At the next meeting of the House of Representatives it was announced that the dividend for the past two-week period would be only 12 per cent, but that it would have been higher had not the men taken the holiday. That is, a man who earned \$20 per week, or \$40 for the two-week period, received a dividend of \$4.80 instead of \$6, thereby losing \$1.20 because some other fellows did not work. It is one thing to stay away from work knowing that possibly the company and only yourself will lose money by your act, but it is quite a different proposition to realize that you are guilty of a loss of money to your fellow-workers. Dividends are due to mass action and coöperation is a mass force. The mass can bring in and create coöperation as quickly as it can cause disorder.

Our plan for paying dividends on top of wages as an incentive for better work and a pride in the man's or woman's job, and in the product which he or she manufactures is as follows:

At the expiration of a two-week period the efficiency of the entire shop is determined by the relative value of its output to its cost of production. Standards of production and cost have been established in each department and the savings occasioned by increased production and quality of work, as well as decreased cost and overhead are shared on the 50-50 basis with our employees.

Our first dividend amounted to 6½ per cent of the salary of each employee and has gone as high as 17½ per cent. These dividends are paid bi-weekly in a separate envelope marked "employees' dividend," and represent their share of profits derived by interest and better work—a bonus upon service.

To stimulate their efforts for higher dividends by the element of competition, we have arranged to award a prize—a large American flag—to that department which shows the greatest saving for the two-week period, in other words, the leader in the struggle for higher dividends; and they certainly fight hard for the privilege of displaying the Stars and Stripes in their respective departments for two weeks. The department which succeeds in securing the banner three times during a certain period is honored in some special manner. The last reward was a dinner given to all workers in the prize-winning department.

I recall going through the plant one day during the first month we had our dividend system and noticed, on entering the sandpaper shop, that one of the boys tried to attract the attention of his fellow worker who, however, would not be disturbed. Jack insistently called to Jim until the latter finally turned around quite indignantly and said: "Now, here, Jack, cut it out: you are stealing my dividends." This and many similar instances showed very plainly that the folks were getting interested, and time and again we could see very plainly that the dividend envelope was quite an incentive to them and that in return meant a good deal to us as far as quality and workmanship were concerned.

After the dividend was established for about three or four months, the House of Representatives came to a conclusion that some of the folks did not do as much to earn these dividends as others. For instance, some

would stay out on Mondays and take it easy, have a good time while those in the shop were working hard and earning dividends for them. They subsequently suggested in their House of Representatives that a committee be appointed to work out rules for penalty of tardy, careless, and disinterested fellow workers. The committee brought in the following recommendations which were unanimously accepted and approved by both Senate and Cabinet and have been in force ever since.

If any employee comes late or stays away without a proper excuse for one day during the two-week period he loses one-fourth of his dividends. If this happens twice he loses one-half, three times three-fourths, and if it occurs four times during the same period he loses all of his dividends.

This plan, remember, was a suggestion from the men themselves and not a penalty imposed by the employers.

In connection with this the question came up as to what should be considered legal holidays. Having a number of different nationalities it was quite natural that at one time a number of Polish people would stay away to celebrate one of their own holidays, and next week Italians would do the same thing. One of the representatives said at the House meeting: "This will never do. Every time a group of people stay away down go our dividends because it interferes with production and the idle machinery and waste of power increases our overhead." He then proposed a list of strictly American holidays, which again found whole-hearted approval of the other two governing bodies, so that any one celebrating any other holiday except those officially adopted would lose dividends.

ENGLISH CLASSES AND AMERICANIZATION

The folks realized in investigating ways and means to increase dividends that a great handicap was due to the fact that some folks did not understand English well enough, and the Ways and Means Committee suggested in the House that we introduce a rule that we do not employ any people who cannot speak English. Now, we had a good many men in the place who had been there a number of years, who couldn't speak English, so the only thing for us to do was to follow their suggestion and introduce English classes. The Board of Education established two classes for non-English speaking people, and out of every department quite a few of them flocked to the school.

There again we applied our 50-50 principle, as time spent in these classes is one-half in company time. In other words, school lasts one hour, from 4:30 to 5:30 P. M. We pay those who attend up to five o'clock, our regular closing time. In compliance with a recent request from the scholars the time has been extended to 1½ hours under the same arrangements, paying them for 4:15 to 5 P. M., or one-half of the time spent at school, the other half is their own contribution.

Besides the English language, we are teaching the first principles of Americanism, and I point with particular pride to a record of 95 applications for citizenship papers, which our Employment Manager filled out recently for some of our foreign-born employees.

WORKING HOURS CHANGED

One of the important accomplishments which was a direct result of Industrial Democracy was the change of working hours. We had been working fifty-three hours per week for a number of years, when in November, 1917, the question arose in the House of Representatives whether same could not be reduced to fifty hours. After a long and careful discussion at a joint session of House and Senate, followed by a mass meeting—usually held about once in six to eight weeks—at which the idea was fully explained to all employees, it was mutually agreed that we should try the fifty hour service for three months. Every-one pledged himself to a full honest 50 hours' service, promising to avoid tardiness and idle machinery, furthermore, that if the earning or production would be decreased, or if for any reason the change did not work satisfactorily, it was understood that everybody would be perfectly willing to return to the 53 hour schedule. Before the trial period was over the production was increased by about 8 per cent, which meant better income and saving for all concerned.

Encouraged by this success and the evident happiness of everybody around us, the Cabinet, in October 1918, suggested to both Senate and House to consider the advisability of changing to a 48 hour per week schedule. Some of our employees were somewhat reluctant as they doubted their ability to produce as much work in 48 hours as they had formerly done in 53 hours. To show our appreciation of their willingness to put forth their best efforts in making the change, we adjusted all rates, guaranteeing them from the start the same income as they had before. Consequently results showed no falling off in our production and when a few weeks ago the 44 hour question came up for consideration there was little hesitancy on anybody's part to try out this new change. At this time I am not in a position to give definite figures as to the production. However, several of our departments have made very satisfactory individual records so far.

LIFE INSURANCE

We have had a Mutual Benefit Association since 1902, which provides for free doctor service, a weekly sick benefit of \$6, and death benefit of \$100 at an expense to the members of 10 cents per week. As this field was quite well covered, the Senate turned its attention to life insurance, and within a short time after a thorough investigation by Committees of Cabinet, Senate, and House of Representatives, a plan for insurance was evolved and installed in December, 1917, whereby in case of death the beneficiary receives an amount equal to one year's wages, the maximum amount being \$3,000. The premiums for same are paid by the employees themselves by one of the percentages of the bi-weekly dividends. In other words if the dividends are found to be 15 per cent for a certain two-week period, 14 per cent is paid in cash and 1 per cent is retained for the insurance. As we have had sixteen deaths since inaugurating insurance, the few who did not believe in the wisdom of insurance at the beginning have been thoroughly and permanently convinced. By the people's vote every employee is thus covered by insurance.

LABOR TURNOVER

One of the important and most constructive functions of both Senate and House is the consideration of the labor turnover. For each meeting—the Senate convenes every Wednesday at 1:30 P. M., the House at 3:30 P. M.—a complete record of employees having left our service is given on a large blackboard, stating name, department, how long in our employ, and reason for leaving or discharge. The foreman of the respective department usually volunteers or is asked for detailed information in any doubtful case.

The men and girls, realizing that losing experienced help—and replacing same by green hands at an average expense of about \$100 in some places—means a reduction of dividends for all, do their level best to keep them at work. Many a disheartened boy or girl was induced by his or her fellow-workers to stick to the job and try it out a little longer, by offering to show them a more advantageous way of handling their work.

During the war, when we all experienced a shortage of labor, a few appeals to the mass to bring along friends to fill vacant positions in order to avoid increase in overhead and decrease in production—and consequent decrease of dividends—were quite sufficient to fill our depleted ranks, so that when most of our neighbors were constantly short of help, we actually had a waiting list of applicants.

RESULTS OF INDUSTRIAL DEMOCRACY

Since the installation of this system of shop government, each employee realizes that instead of his being a mere cog in a wheel, to be used or dispensed with at some person's convenience, he has become a useful and intelligent unit of the organization with a voice in its management, something to say about how long and under what conditions his best work can be done, and how much he shall receive for it. This has the effect of increasing his self-respect and respect for his job, together with a sense of his personal obligation to his fellow workers. It is giving him an insight into the problems that harass his employers and it creates respect for them and makes him willingly share their burdens. Above all, it awakens the sense of civic responsibility, inspires him to study our language and our customs, and in that way strikes a blow at what is perhaps the most insidious evil at the root of our republican form of government—the ignorance and indifference of the individual of and to the things that are of vital importance.

The reason for the successful operation of the industrial scheme, I believe, is due to the fact that the people are being educated to be self-reliant. With welfare work, etc., they think and feel that you are trying to do something for them, and it is looked upon by them as being too paternal.

We have been asked by business people and workers who are not very familiar with our Industrial Democracy plan, whether we shall continue with this form of government or whether it was simply a war measure used to pacify our men in these turbulent times and to be done away

with as soon as possible. I believe I can safely speak for the company, as well as for the employees, when I state most emphatically that our democracy plan is here to stay. Nothing would be more foolish than for either the employees or employers to try to do away with something which has been as beneficial to both sides as the Industrial Democracy plan.

As a sample of the splendid democratic spirit of being one family, I would like to refer to a most wonderful Christmas entertainment which was arranged by a joint committee of House and Senate, and to which the Cabinet and New York office force were invited as guests. It started at 3 o'clock with a minstrel show, followed by a few unavoidable speeches, and a splendid musical program, all carried out by the employees. Under a 10-foot Christmas tree, beautifully decorated, were about 300 presents, which Santa Claus—we had many volunteers for this job—distributed among those present. No one left the place until the conclusion of the program at about 7 o'clock and all the younger folks danced to the merry tunes of our Glee Club until 10 o'clock at night.

This new system of representation does not mean that the workers are to manage the business, any more than it means that shareholders shall manage the business. Management remains a factor by itself, the only difference being, that whereas, management had as its task the direction without personal relationship to the workers, now it directs and coöperates with these men as partners in the business. The management no longer represents only capital. It now represents labor as well. Labor no longer represents only itself, but now represents the community, and in a certain sense, both capital and management.

Frankly, we cannot say specifically whether or not Industrial Democracy has reduced the costs of production during the last two years. Our costs have risen as we expected they would, due to the same war conditions which affected everyone else. We did not in the beginning have any illusion that Industrial Democracy would keep our costs down to a pre-war basis. How much lower they have been than would have been the case if we had not had Industrial Democracy is largely a matter of speculation. We honestly feel however, that we have benefited distinctly from this point of view. We are convinced that under the old system we should have had a much more rapidly rising production cost, considerable difficulty with our employees, all of which would have increased total manufacturing costs far beyond the point to which they did rise.

In addressing the assembly of Mayors and Governors at Washington last March, President Wilson said:

"We are at last learning that the whole matter of the prosperity of peoples runs down into the great body of the men and women who do the work of the world, and that the process of guidance is not completed by the mere success of great enterprise—it is completed only by the standard of the benefit that it confers upon those who in the obscure ranks of life contribute to the success of those enterprises."

This very plainly describes our present conditions and makes clear to us the duty which lies before every business man. We must get away from our old time industrial autocracy and turn to a new mode of run-

ing our business, considering not only ourselves and our profits, but also those who work for us and help to make those profits, and have them share the benefits of their labor in the proper proportion.

CHAIRMAN YOUNG: The third number on the program is a discussion of employee representation by a man eminently fitted to do so. Mr. Tolsted has had an exceptionally fine opportunity of seeing plans at work and of seeing the plants in which these plans were not at work and through all of that experience, his keen analytical mind, the trained mind of the engineer, he has set out the high points and I think we are indeed fortunate this afternoon in having Mr. Tolsted present to us his analysis of the fundamentals of employee representation. Mr. Tolsted.

PRACTICAL ASPECTS OF EMPLOYEES' REPRESENTATION

E. B. TOLSTED, INDEPENDENCE BUREAU, PHILADELPHIA

The annals of the country are full of examples of misused power both on the part of employers individually and collectively and on the part of organized workmen. In the interest of the nation as a whole the disastrous effects of misused power must be eliminated. It must no longer be possible for employers by virtue of their financial resources and solidarity to treat workers unfairly, or for the workers through the open strike or the passive "strike on the job" to cripple industry.

To careful thinkers the solution lies definitely along the lines of a clear understanding by each side of its own attitude and of the problems of the other, and of their joint recognition of their relation to society. The result is bound to be in many instances the substitution of responsibility for irresponsibility, of coöperation for antagonism, of good will for ill will. This greatly desired result, the securing of industrial peace and efficiency, is so gigantic a problem that even the best thinkers in the economic field have as yet reached no definite practical solution. We are as yet in a state of flux.

Many workers appear not to be satisfied by good working conditions, shortened hours, and high wages; they strike even after these things have been granted them. No doubt some want a voice in the determination of these matters, although the dissatisfaction is largely due to the spirit of the times. It may be that the real desire is for first-hand information about the conditions which cause managers to come to their decisions. Probably no body of American men, for instance, would deliberately demand wages which they know would bankrupt the business which employs them.

Of the various plans for producing industrial satisfaction which have been advanced up to the present time, the one which is attracting the greatest attention is employees' representation. Some feel that this is just another short-lived fad; others think that it is here to stay. A safety man cannot help recalling the time when the safety movement was considered a fad of the moment.

Many employers, not hostile to union organization, feel that better re-

sults will be obtained through an employees' representation plan than through the customary union channels, because of the direct relation and the mutuality of interest which can be obtained. In effect, the usual employees' representation plan creates a company or household union, sometimes alongside a national union. There need be no conflict between the two.

There are at the present time about one hundred and fifty employees' representation plans in operation in the United States. The details of many of them have been published in pamphlet form or in current magazines. By personal investigation of approximately fifty of these plans, we have found that employees' representation may provide simply an orderly method for the adjustment of grievances; it may include machinery for collective bargaining with reference to wages, hours, and working conditions; it may be the means of eliciting from workers their hearty cooperation and valuable suggestions regarding processes, organization, and policies; or it may involve all of these or any combination of them. Its structural features may be very simple and the procedure altogether informal, or these may be highly elaborate. The power possessed by employees through their industrial representation may be that of "public opinion"—the authority of the representatives being merely advisory to the management—or the management may delegate to the employees final authority in regard to certain specified matters, or authority may be exercised jointly by the men and the management. I wish to emphasize the fact that in no plan which we have investigated have we found the measure of control implied by the term "Industrial Democracy."

For the purposes of this paper I shall regard as an employees' representation plan any plan which provides for committees of employees elected by their constituents to confer with the management in the consideration of matters affecting them, no matter how simple or how few. Ignoring wide variations in scope and form, then, I shall discuss in the limited time available some of the generally applicable facts established by personal investigation of plans used; and without attempting to analyze or even to state the underlying principles, I shall attempt to give some practical suggestions which may be found useful to those about to install plans or to those who contemplate doing so.

It must be noted at this point that the shortness of time during which these plans have been operating and the prejudices of their sponsors and opponents make investigation of results complicated and interpretation difficult. Having adopted a plan, the employer wants to believe it desirable; therefore, it is difficult to obtain adverse criticism from any except those who have never tried the plan or who have been forced into it. It is pertinent to mention, however, that many favorable comments have been obtained even from those who have been forced into adopting a plan. My statement of results embodies in it opinions of employees' representatives as well as of managers, and, as far as it has been possible to make it, is representative of present conditions.

In the following remarks the term "works committee" is used to refer to any kind of representation plan.

RESULTS ACCOMPLISHED BY WORKS COMMITTEES

Several years ago, Henry T. Noyes of Rochester stated that his own company, Art-in-Buttons, Inc., after over ten years of periodic departmental meetings during which the company and the employees had been working earnestly for their joint good, found that approximately 90 per cent of all complaints made by the employees were justified in whole or in part. Mr. Noyes hazarded the opinion that there must be under the usual form of management a tremendous aggregate of dissatisfaction incapable of elimination chiefly because the management knew little or nothing about it. Consequently we have not been surprised to find that the existence of a works committee not only brings complaints to light before they are too serious to handle, but that it eventually reduces the number and seriousness of complaints.

Almost invariably foremen have undertaken to reform their ways when their attitude of petty tyranny was the cause of grievances, and have endeavored to adjust complaints satisfactorily when first brought to their attention, rather than to allow their negligence to be the subject of discussion by committees, and thus also by the rank and file of employees, and eventually the object of a reprimand from the management. This means that complaints are more and more adjusted out of court, consequently the time of the works committee is reserved for more important matters.

While it is true that a majority of the matters are usually decided in favor of the complainant, it seems to be the feeling of most concerns that decisions are, in the main, altogether just. It should be pointed out, moreover, that in a large proportion of the cases it is immaterial to the management whether the decision is one way or the other, and it is obviously wiser to have the decision in such cases in accordance with the wishes of the employees. Many of the matters decided by the committees are such as have heretofore generally been left unsettled and allowed to become the cause of constant complaint and unrest.

Most of these plans are so worded that matters relating to discipline and discharge may be heard by shop or works committees, the same as other questions. In a few cases, the employees have been given unusually extensive authority in regard to such matters. The management of one company, for instance, granted to the employees permission to lay down the rules governing disciplinary measures. As a result, the conference board of the employees' association adopted rules and penalties governing all employees. The penalties imposed are somewhat lighter than is customary in most plants where the management retains absolute authority, being principally fines or suspension, rather than discharge, but they have the effectiveness due to their representing the judgment of associates rather than superiors, and this seems to result in a reduction of the number of offenses. In other cases the employees have imposed penalties more severe than the company would have done, and the company has been forced to request a modification of the penalties.

The Filene Coöperative Association, which for many years has had authority to amend or to initiate any rule affecting the discipline or working conditions of the employees of the store, has reduced the number of

offenses through its "arbitration board," which has final authority with reference to discharges. The Filene management goes as far as to permit employees to be represented by legal counsel at hearings. Mr. Cory, Vice President and Store Director, states in his genial way that he and his associates have been subject to some remarkable excoriations at these hearings. That this broad-gauged attitude has paid in an industrial relations sense is beyond question. The American Rolling Mill Company reports that discipline has been greatly improved as a result of the shop committee in its sheet metal and tin shop.

Many companies report that cooperation is greatly increased as a result of their works committee. The committees of the American Multigraph Company urged the management to discharge "slackers" at a time when the entire production of the plant was essential for war purposes. The committee of the Midvale Steel and Ordnance Company recently submitted a resolution to the management recommending that in laying off men, superintendents give preference to American citizens and in general endeavor to rid the works of radicals, Bolsheviks, and other undesirables. This resolution was passed upon favorably by the general superintendent and incorporated in an order which he sent to all of the department superintendents. The Prinz-Biederman Company attributes to its works committee the fact that many better class workers who had left the company returned to its employ.

One very definite advantage of works committees which seems to be reported without exception is that representatives take back to the employees from the meetings a more adequate appreciation of the problems of the management, and that this, together with the increased comprehension by the executives of the problems, desires, and ambitions of their workers, results in a much better understanding on both sides.

One board of directors showed its faith in the educational value of a works committee by authorizing the employees of the plant to elect a "board of operatives," to take over the complete management of four hundred houses owned by the company. A sum of money was set aside to be expended by the board of operatives on the repair and upkeep of the tenements. The company reports that while the employees have made several somewhat serious blunders in the management of the properties—such as putting a new roof on a house which should have been torn down—as a whole the education of the employees in the problems of management seems to be worth all that the company is spending on it.

One company reports that during the first few months after the establishment of its works committee system, production was increased about 20 per cent and expenses advanced less than 5 per cent, while another reports an increase of 15 per cent in production without an advance in wages. Both attribute the increased efficiency largely to the better plant spirit brought about by the works committees. The White Motor Company claims that the works committee was responsible for considerable reduction in turnover and absenteeism. The American Multigraph Company ascribes to its plan of representation a great reduction in the amount of tardiness. The Leeds and Northrop Company has observed a marked decrease in the amount of time wasted by workers since the shop committee was established. The same company reports that its works com-

mittee appointed a special sub-committee on housekeeping which conducted clean-up campaigns which greatly improved conditions of the plant. The "house of representatives" of the Edmund D. David Company established a suggestion committee and awarded prizes to employees for suggestions of improvements in machinery, methods, and designs.

Several concerns report that, while at the first election a number of "radicals" were elected, the employees soon learned to distinguish between mere talkers and competent representatives. This resulted in the election the second time of conservative persons who feel the responsibility of representing the employees effectively and winning the confidence and respect of the management. Several company officials with whom we talked stated that the employees' representatives were frequently more inclined to be conservative than the management's representatives.

Without exception, where a works committee has been in operation for several months, the company reports that it has revealed capacity for leadership among employees which otherwise would have been suppressed or have found an outlet in some undesirable channel. William Demuth and Company has made it a practice to regard its employees' representatives as the natural group from which to select assistant foremen. Its attention was called to this possibility by the recommendation of the representatives that a certain assistant foreman be removed because of incompetency. The management, after investigation, complied with their request and appointed the chairman of the workers' committee to fill the vacancy. The Joseph and Feiss Company reports that their works committee "has greatly developed leadership."

It has been reported that some of the best leaders developed by industrial representation have ultimately been forced out of the company by unpopularity. These men, elected by their fellows to represent them, because of their intelligence and spirit of fairness, agreed with the management too often to suit their constituents. Do not be discouraged if the representatives of the workmen disagree with the management. The men will distrust their own representatives if they agree too much with the employer. Do not educate the representatives too far ahead of the rank and file or they will be accused of being "company men."

A classification of cases which were settled during a four months' period of employees' representatives in three plants belonging to a large company is indicative of results in many other companies. Following is the classification:

Apprentice, back pay, charity, department, discharge, docking of pay, economy, employment, equipment, health, holidays, lighting, living conditions, machine equipment, over-time, pay methods, pay time, piece price, police, practice, promotion, quitting time, relief, rules, safety, sanitation, shifts, short pay, suspension, termination, theft, working condition, working hours, time clocks, repairs. The total number of cases for this period was one hundred fifty-four for the three plants, of which one hundred thirty-two were settled in the affirmative, that is, in accordance with the request as originally presented to the committee.

Our study reveals the fact that while minor matters of complaint involving personal discrimination are likely to be the first matters brought

before the committee, it is not long before the committee is required to consider broader questions involving a discussion of shop practices, efficiency, discipline, and company policies. Industrial representation has tended, I believe, to make lighter the task of management by reducing the causes of friction between employers and employees, and by arousing in the workers a constructive interest in the progress of the industry in which they are engaged.

INSTALLATION OF REPRESENTATION PLANS

Industrial representation is in successful operation in plants varying widely as to process and products, size and complexity of organization, and as to the character of the working force. None of these factors seems to determine the success, although each of them affects it and must be taken into consideration in working out the application of any plan to particular needs. But here are a few suggestions which I think it would be well for every one to consider when contemplating a plan:

Install it under peaceful conditions. One large company inaugurated a plan as the result of a strike, and the plan ended in another strike some time later. The company is now attempting to make a new start. To propose a plan to men on the verge of a strike is also almost certain to result in failure to win over the men.

To attain its highest success, a plan should be developed gradually, each step in so far as possible resulting from suggestions or requests of employees. By all means, do not impose a ready-made plan; let the men help work it out; it will be a better plan and they will feel that it is their own. Remember the attitude of our forebears toward English-made laws applied to the colonies. And no matter how good the plan seems to be, actual use will show need for changes.

See that the plan is simple in form so that procedure under it is easy to understand and to carry out. As to the specific form, we find that the best results have been obtained with the joint-committee. But give opportunity for free discussion, that is, discussion without the presence of the management. It has been found good practice to alternate joint and separate meetings, with final action taken only in joint meetings. At a banquet held recently by the Standard Oil Company of New Jersey for the representatives of the men and the management, one of the employees' representatives suggested the establishment of separate boards for the management and the men. This action was not especially desired by the representatives, who had already taken up the subject once and voted against separate boards, but the men felt that their delegates would not speak freely before their "bosses."

In some plans the committees deal only with working conditions and welfare work, such as light, ventilation, locker rooms, etc.; in some they deal with all matters which directly concern the worker, including wages and hours. There are drawbacks to both plans. On the one hand, committees which have been restricted in their activities have grown restless and felt that they were deprived of their just rights. On the other hand, committees which have been given free sway have sometimes failed to use judgment in the determination of hours and wages. In one plant,

it is said that wages were forced up, despite the company's claim that they could not meet an increase. The reply of the men was, "Raise the price of your product." Experience would seem to show that a middle course works best. Give your committee supervision over working conditions and welfare work; educate them through the use of this function to a better understanding of the position and problems of the management; then as they show themselves capable of handling the more serious problems, extend their authority toward grievances, hours, wages, absence, cost of living, community conditions, etc. In most cases, it will be found that the desire for a wider scope of activities will go hand in hand with the growth of ability to handle the bigger subjects.

We advise that every employee, man or woman, citizen or alien, be made to feel as far as possible that he has a part in the operation of the plan. In one plant, voting was restricted to citizens, but all were, of course, allowed to present grievances. A group of foreigners did not understand this point, and struck because they thought they had no means of presenting their grievance. After the plan has been formulated be sure that every employee knows what it means and who made it. The men first consulted will advise as to the best method to be followed. Use the plant organ again and again to supplement word-of-mouth publicity. Do not hurry at this, or, indeed, at any point. Frequently the management fatuously prides itself on its excellent plan, when the men know nothing about it. In a plant which we visited several months after the installation of a representation plan, almost half the men who could not speak English either did not know of its existence or had no idea of its purpose.

It is especially important to make it plain that the plan in no way interferes with membership in unions or with existing relations of the management with labor unions.

Keep adequate records of all meetings and make them accessible to all. The main decisions should be posted on bulletin boards in each department and published in the plant organ.

Usually best results follow holding meetings during working hours. In one case, which has come to our attention, the representatives requested that the conferences be held out of hours, as they would feel less constraint in voting as they pleased. As a rule, however, committees which meet outside hours have failed to hold the interest of the representatives.

This lack of interest is one of the foes of employees' representation. Many feel that after the first enthusiasm attendant upon any new enterprise has worn off, the committee will fall into the apathy characteristic of so many committees. This has not generally been true. It should never be the case, for the matter is of vital interest to both sides. As with any other form of human activity, the success of a plan is in a large measure dependent upon the standing and capacity of the men who sponsor the plan. The best men and their best efforts are the answer.

SUCCESS OR FAILURE

The degree of success or failure of any plan of employees' representa-

which it believes well designed and best devised to solve the problems of today, to lay the foundation for a better understanding and for a more friendly, fraternal, and coöperative relation in the future, and to remove all of the iniquities and injustices still present in our body politic. The program outlined by it comprehends an orderly, intelligent, and legal procedure for the removal of those iniquities and injustices, and in a progressive manner and not by revolutionary policies and by a destructive procedure.

The American workers realize that one of the first and great principles which will require solution is that one which shall determine to what extent the government shall control industry, regulate our industrial life, and limit the rights and privileges of a free people, or whether we shall revert to voluntary individual or corporate enterprise. It is upon the final decision of this question that many of our future relations and activities must ultimately be founded.

THREE SCHOOLS OF THOUGHT

We have three distinct schools of thought striving for supremacy in the solving of this great problem. We have the socialist, who, as you well know, believes that all instruments of production and distribution should be owned and all of our industrial activities should be controlled by the Government. These good but erring persons would establish an industrial democracy through the ownership of all means of production and distribution by the Government. The American Federation of Labor, the only organization able to speak for the workers, is emphatically opposed to that school of thought. It is opposed to the Government owning all means of production and of regulating all our industrial activities. Diverting ownership from private and individual to government ownership and control does not mean the establishing of industrial democracy, but creates in its stead a bureaucratic autocracy.

THE I. W. W. MOVEMENT

Then we have another school of thought known by what is termed Syndicalism, and it is better known in our country as the I. W. W. movement. The I. W. W. in its philosophy is socialistic. It believes in the paternalistic form of government. It differs only from Socialism in that it holds that the voting power or the right and exercise of suffrage is not efficiently designed to empower the workers to throw the private ownership of industry into the hands of the Government. It believes that this can be done only through industrial and economic action, and it proposes to organize all the workers into one great big union. Having organized all of the workers into one large group of workers it proposes at a given time to call a general strike and render Capital useless, and then take over the reins of industries and place them into the hands of the Government.

Since the development of Bolshevism the philosophy of the I. W. W. has altered. It no longer teaches that industries should be owned and controlled by the government. It has come to accept the philosophy of the Soviet form of government, recognized by Bolshevism in Europe.

Like the Bolshevist of Europe, the I. W. W. now advocates that the state itself should be destroyed and that industry should be operated by the men working in these industries, and that only those manually producing should be the dominating factors in our industrial life. It is proposed by these men and this philosophy, if it may be termed a philosophy, that the future parliament shall be the factory and the workshops, and that the institutions we now recognize as the state should be forever destroyed. It needs little on my part to make clear that the American Federation of Labor is unalterably opposed to that form of industrial ownership or industrial democracy. It spells industrial tyranny of the worst kind and does untold injury to the ideals of freedom, justice, and the pursuit of happiness expressed by that world hope, democracy.

THE AMERICAN FEDERATION OF LABOR

It is the viewpoint of the American Federation of Labor that the greatest happiness and contentment will come to men where the greatest individual freedom is allowed. To the same proportionate degree that individuality is limited and restricted, autocracy is established. We hold there should be left to the individual as much freedom as is consistent with the benefit of the whole. Only where individual freedom may be jeopardized and the collective good of all may be injured should the government step in and determine the rights of all and do justice to all. Only where certain activities or principles affect all men alike or where either by nature or by virtue of arbitrary rule, special advantages are enjoyed by a certain group, there should the government step in and seek to provide for equal opportunities and privileges. It is only in such instances and under such conditions that we believe the governments should function.

The relation between employers and employees is not a matter of legislation. This is a function properly and rightfully exercised by those directly concerned and interested. Employers and employees should jointly and collectively determine the relations of employment and by conference establish the standards and requirements which ought, and of right, should prevail. We hold that those immediately engaged in a particular class of manufacture or production, because of their experience and training and by reason of their interests and direct connection, are best able to determine the relation which should prevail between employer and employee, and the standards and the requirements which should be observed in the particular industry or craft.

We believe that employers and employees of each particular group of manufacture and of each distinctive process of production should jointly and collectively determine the requirements and standards of their joint enterprise. To illustrate: I am a photo-engraver by trade, a member of the printing industry. Is it not foolish to ask me to determine, as a citizen, what particular standards of production, what essential trade requirements, shall prevail in the mining industry or in the railroad enterprise, or in the metal industry, and of which I have no practical knowledge whatsoever and with which I am not conversant? So, it would be equally absurd to ask a miner or to ask a metal trades-

man or to ask men of any occupation other than photo-engraving to legislate or to regulate the relations, standards, and requirements which shall prevail in the photo-engraving craft.

The American Trade Union movement is founded on practical lines, tested by years of experience under the most diverse circumstances. We have builded up a movement based on a policy we believe the most practicable, the most efficient method of operation, a movement which is democratic in character, permits of individual freedom of expression and judgment and brings into harmony the hopes and aspirations and desires of all wage earners for an improved life and a higher civilization.

We want to build up our industries and industrial relations on a practical and not a theoretical basis. Much as we like to see ideals prevail, we can only give our approval to plans and policies which are practicable and which can be put into successful operation. In giving approval to private initiative and enterprise and disapproving the systems and relations proposed by the Socialists, Syndicalists, Bolshevists, and I. W. W.'s, the American wage earners are insistent that the old order of industrial autocracy shall pass and that a new order of industrial democracy shall enter. It is unfair and radically wrong to permit the old order and relation of master and servant to continue. This relation must give way to the more humane and modern relation of coöperators. The employer cannot and must not be permitted to say to the workers in the future as he has in the past: "These are the standards, these are the requirements which you are to observe if you are to have employment with me. If you do not like these standards, if you do not meet these requirements, then go on; I shall have nothing to do with you."

INDUSTRIAL DEMOCRACY

To the workers this is industrial autocracy of the same vicious form that was formerly exercised by the Kaiser when dealing with his subjects. This arbitrary and autocratic rule of employers must be destroyed and the ideal of democracy must be put in its place. The right of the workers to be consulted, the right of the workers to have an impelling voice in the management of business and in the determining of the relation, the standards, and the requirements of employment which should govern, must be permitted a full and free exercise. It is through collective action and by collective bargaining that the American wage earners intend to establish industrial democracy.

We believe the democratic control of industries can only be enjoyed wherever the workers are thoroughly organized and where they select their own representatives who with the representatives of the employers, determine the relations that should prevail and set up the standards and requirements which will be observed from time to time, and which experience and a thorough knowledge shows to be for the benefit of all concerned. The American Federation of Labor is not opposed to the organization of employers. On the contrary it favors the organization of employers. In doing so, it likewise demands for the wage earners that same right of organization, that same privilege of assisting and

helping each other, in determining the conduct of business. I do not fully understand the distinction made by some persons between industrial managers and capital. It is mainly with the industrial managers that Labor comes into a more immediate contact. Dealing with this subject in a practical way the relations and contact between employers and employees have always been in the main with industrial managers, and much to our regret, it has been the hostile attitude of many of these industrial managers, rather than the attitude of the real owners of industries, which has made for industrial dissension and conflict. It is a fact that many of these men believe they are serving their masters best by keeping down wages and denying their employees the right to be consulted in industrial affairs. It is this denial of equal rights and opportunities, this denial of representation and participation in our industrial life which is the real cause for the disturbance and conflicts in our field of industrial activities.

The right to democracy in industry is coming and is bound to become the prevailing condition in industry. He who seeks to deny that right however well he may manage the shop, however well he may pay the workers, whatever conditions of employment he may establish for them, if the workers are denied the right to organize, to express their ambitions, their aspirations, to participate in industrial affairs freely and collectively and democratically through their representatives, so long will there be industrial conflict and unrest, and so long will there be denied a proper agency and procedure for the orderly, proper, and happy adjustment of the relations between employer and employee.

SOLUTION OF OUR INDUSTRIAL PROBLEMS

If in dealing with the representatives of the workers, you find that these men and the workers do not understand your trade difficulties, you have no one but yourself to blame. It is only by inviting the workers and their organizations into your councils, by informing them of your trade difficulties, by taking them into your confidence and advising them of the trade problems which need to be solved, that you will find in them that intelligent responsibility which is essential for the harmonizing of interests and the adjustment of the difficulties and differences. Conferences between associated employers and organized workers having to do with the regulation of mutual rights are the solution of our industrial problems. They will make for industrial efficiency and bring into practical existence and application in our industrial affairs the ideal of democracy.

When workmen are given the right to help determine their destiny in life, their conditions of work, and their conditions of labor, then you will find that happiness and contentment which is so well expressed in our constitutional authority, that governments should be organized for liberty, justice among men, and the pursuit of happiness.

CHAIRMAN YOUNG: The next paper on "Labor Management and Collective Bargaining" is by Mr. William Leiserson, Billy Leiserson, as he is commonly known to us all. Mr. Leiserson has had a unique experience

and background for presenting his thoughts on this subject. He has worked in industry and now is a labor manager in industry. He has gone to college as a student and he has also been in college as a professor, expounding theory. He has been a decent, law abiding citizen for a long time and he has also been a government officer and a minister of the law. It is with great pleasure indeed that we will hear from Billy Leiserson.

MR. LEISERSON: That introduction reminds me of a story about Abraham Lincoln when he was nominated for President. Of course the man making the nominating speech said a lot of very nice things about him. When Lincoln read in the papers about it he was surprised some, and he met the man who made the speech a day or so later and said, "Say, that was a great speech you made about me the other day." "Yes."

"Don't you think you exaggerated a little?" The man replied, "Exaggerated! Why, I lied like the devil."

I have been asked by the committee which arranged your program to apologize for the absence of some of the speakers, that as far as they were concerned until this morning they thought all of them would be here. For one of them I can speak. I saw Mr. Matthew Woll in Washington yesterday and he was unavoidably detained on account of the hearing on the Steel Strike there and couldn't come, so that wasn't the fault of your committee.

When you hear me give my paper I am afraid you will think that I should have read Mr. Woll's paper, that I am presenting labor's side instead of the side of an impartial person, so because you might think that, I want to tell you in advance that I really am an impartial. I hold the position where I am paid both by the unions and by the employers, so I have to be impartial. I warn you in advance because you may not notice it in the paper.

LABOR MANAGEMENT AND COLLECTIVE BARGAINING

WILLIAM M. LEISERSON, CHAIRMAN, LABOR ADJUSTMENT BOARD, CLOTHING INDUSTRY, ROCHESTER, N. Y.

Labor management and collective bargaining are two phases of the general problem of industrial relations, and when we discuss them together the exact nature of the difficulties and complexities in the industrial situation today can be easily discovered. Labor management means control, discipline, and a business organization held together by rules, orders, and authority reaching down from an executive head at the top. Collective bargaining implies a questioning of that authority. It is based on the principle that an individual employee cannot effectively question the authority of the management. It says there must be no rules or orders affecting the income and lives of the wage-earners without the consent of those who obey them. It joins the individual employees into a union and forms a democratic legislative body representing both employer and worker for the purpose of giving to those who have to obey the laws of industry a voice in determining what those laws shall be. Labor management implies power, authority, and law-making in the hands of the

employer. Collective bargaining means democratic representation in the process of that law-making and democratic control of the exercise of that industrial authority.

Here we have the age-long problem of reconciling authority with democracy. Law and government we must have in industry as in all other human institutions, but the day of autocratic control is gone, at least in all Western civilizations. To maintain law and government in the industries of these Western countries, there must also be democracy, the consent of the governed. Without such consent, without such democracy, our industrial governors find themselves unable to control their organizations, or to have their laws and orders obeyed. This is the essence of the industrial problem today.

But, let me warn you. When we have found the difficulty, we haven't by any means solved it. After a hundred years of trying to reconcile authority with democracy in politics we have not yet solved that problem; and in industry the administrative difficulties are much more formidable. We have gone a long way in politics, however, and we have learned to settle political differences by means of legal machinery and orderly methods. We can go a long way in accomplishing the same thing in industry, if we but understand the problem and recognize the inevitability of democracy.

To get such an understanding, however, it is first necessary to give up the idea of placing blame or praise on individuals for the bad or good that may appear in the industrial situation. Not long ago I had occasion to discuss labor conditions with a group of engineers in New York, and they belabored me with the unreasonableness of trade unions in general and the crookedness and arrogance of certain labor leaders in particular. "Suppose," I said to them, "I were to blame all employers for the things I have seen many of them do. I have known employers who made it a practice to seduce girls who worked for them. I have seen inefficient employers unable to make profits because of poor management, who were sweating profits, nevertheless, out of their employees by squeezing down wages below the living point. I have had to prosecute employers for refusing to pay employees their honest earnings, and I have known foremen to graft on their employees and take rake-offs from wages. I know employers who blacklist and employ spies in the most approved fashion of Imperial Germany. Suppose I were to say all our industrial troubles were caused by autocratic, abusive, dishonest, and immoral employers?" No, Ladies and Gentlemen. It is fruitless to blame individuals for industrial conditions. If we try to pass judgment on individuals, then employers will be found more guilty than workmen, not because they are any worse, but because they have more opportunities for perpetrating injustices.

LABOR MANAGEMENT

With the naive notion that industrial ills are caused by bad men eliminated, we may take up the first of the two phases of the industrial

problem: namely, labor management. The employer borrows capital, buys or builds a plant and machinery and hires labor. He, or his agent, uses these factors in producing marketable goods, and he has to manage and manipulate them so as to leave a profit when all costs and expenses are paid. The title to the money he borrows and to the plant and machinery he uses belongs to the employer. From this he naturally concludes that the business is his own. He knows how he worked and sweated to build it up, and he gets the idea that the labor he hires is also his own, to do with as he will. If any one does not like the way he manages, he is not compelled to work under such management; but when a person agrees to sell his labor to the employer, he must be prepared to do as the management disposes. Thus the employer learns to treat labor on the same basis as his machinery and materials. They were all bought in the market and he paid the market rates for them. This was the employer's idea of justice.

But his labor could not be separated from the human beings that did the work; and that caused trouble. They revolted, went on strike, and asked for living wages, not market wages. The employer fought. If he had a small competitive business, he lost out and had to compromise with the strikers. If he had a large or trustified business, particularly if most of the employees were unskilled, he whipped the strikers and maintained what he called an open shop. It cost him a lot of money, but he was willing to pay the price to keep his business free from interference.

Then he discovered that labor had more than one way of revolting against the principle of management which regards labor as a commodity. He might prevent them from organizing a union and striking, but they could quit, as he had told them. They left as individuals, but at the end of the year when he counted up the people hired and those who had quit, he found that it wasn't a few who left him. His whole force had left. He was hiring as many people in a year as he had working for him. This in ordinary years when there were many unemployed. Then came more opportunities for employment throughout the country, and the supply of cheap immigrant labor was restricted. How his labor did quit then! He couldn't believe it. Instead of a new force every year, he was hiring two, three, four, and even as high as six forces a year. He awoke to the fact of labor turnover, and he saw that it could go as high as 600 per cent or more a year. It was the new form of revolt against his authority, and it not only cost money, but it caused inefficiency and decreased production. Some employers still think labor turnover is due to the peckishness of labor and to its roving disposition, but most of them are about ready to concede that management has something to do with it.

Those employers who studied the causes of labor turnover, soon discovered that management had a lot to do with it. They found that treating labor as a commodity led to class wages instead of wages based on personal efficiency, and that hiring, selecting, and handling of employees on the assumption that they are commodities does not give to wage-earners any incentive to stay on the job and do their best.

This realization was the beginning of a scientific system of labor management. It came to be called Employment Management or Personnel Management and employment managers or directors of personnel were hired to look after labor relations.

This was a long step in advance, but the old system dies hard. And it is not dead yet by any means. Foremen, superintendents, and other production officials were not going to give up their traditional authority to what they considered impractical young men with new fangled notions of kindness and consideration in the treatment of labor. They had come up through the mill, they were practical, they knew how labor had to be handled, because they had learned only too well from the knocks they had received when they were laborers themselves. So, most of the employment managers had beautiful plans and theories and charts and reports; but in actual practical authority they were clerks.

SERVICE RENDERED BY THE EMPLOYMENT MANAGER

But many of them were high-minded, persevering men and they had faith in the new profession that they were creating. They worked and they talked and they overcame difficulties and they demonstrated, in spite of all the opposition, that they could reduce labor turnover, that they could make labor feel more satisfied, more loyal to the industry—and that it paid. Then was the practical business man convinced. And from a skeptic he suddenly became an unquestioning believer. Whatever it was that the employment manager established successfully, a centralized employment department, a new labor record system, a plan of profit sharing, a bonus system, or a shop committee plan—that became the great remedy, the panacea that would solve all labor troubles. But, actually, what the honest and competent employment managers were doing was attempting to deal in an intelligent and scientific way with the personal or human relations between the laborer and his managers or employers.

They didn't find this a simple problem capable of a single solution. They had to restrict the foreman's power to hire whom he pleased and to institute systems of selecting men fitted for the work in hand by means of intelligence and trade tests. Instead of letting the men they hired learn their jobs without instruction, or by means of shouts and curses from the foremen, they introduced systems of training men and fitting them for the jobs. They heard the men's grievances and tried to find redress for them when they were just. They took away the foreman's power to fire a man from the plant. Instead, the man was sent to the employment department, and, if possible, he was transferred to another department. This, and much more, is what has come to be called employment work; and while much has been done on the various phases of it, we still have far to go before we can say that all the employment problems have been solved.

Long before the employment managers had undertaken this work, the safety movement had made great headway, stimulated very largely by workmen's compensation laws. At the same time, a number of large employers had instituted so-called welfare work. The employment man-

agers saw in these activities another phase of their own work. The health, safety, education, recreation, and general welfare of employees must be looked after if they are to work and live as human beings. The employment managers called all this Service Work and they extended their own activities to include Service.

Today this employment and service work has reached its greatest development. Every plant of considerable size has its employment and service manager or corresponding official. And yet today, we are having more strikes, more industrial worries and discontent, more revolts of the worker against the employer than ever before. Why? Is it because the development of employment and service work has been wrong? Yes and no. Yes, in the cases of those employers who thought they had in these activities a cure for all their troubles, a substitute for industrial democracy. No, in the case of those far-sighted employment managers, who saw that they were dealing with only one phase of the industrial problem, the personal relations, and recognized that another phase, the economic relations—that which has to do with wages, hours, bargaining, and democratic control of industry—would need other methods, other devices, other administrative machinery to be handled properly and intelligently.

LABOR DEMANDS VOICE IN REGULATING WORKING CONDITIONS

The American employer has pretty well learned the lesson of the employment and service manager. He is ready to go the limit in providing the best physical conditions, establishing service facilities, and inaugurating scientific employment methods. But the industrial world has gone beyond that. Labor is contesting the control of industry today, denying that the business is the employer's own, questioning the employer's claim of absolute right to fix wages, hours and conditions of employment, demanding a voice in making the rules and regulations of the factory which the worker must obey, and insisting that government in industry as in the State derives just powers only from the consent of the governed.

But this American idea, first stated in our own Declaration of Independence, that every man has a right to a say in making laws and regulations which he must obey, some employers are still fighting. They are not ready to give up their absolute control over their employees, to share their power over wages, hours, and industrial law making on an equal partnership basis with their employees. Like the monarchs of old, they offer to treat every employee with equal justice and consideration and to give to all what they call a square deal. But the King's justice and the King's square deal, was not what the people wanted. They insisted that there were two sides to the justice question, and they wanted and got representation so their own idea of justice might find interpretation in the law. Just so, labor to-day insists that there are two sides to the square-deal-in-industry question. The employer wants to remain an industrial monarch, and offers to his industrial subjects a square deal as he sees it. But the wage-earners idea of

a square deal differs from that of the employer. He insists on his interpretation and demands an *equal*, not exclusive (*Bolshevist*), voice with the employer in determining what square dealing and what justice in industry shall be.

THE END OF ABSOLUTISM IN INDUSTRY

The day is not far off when we shall all be able to see that there is no more reason for permitting the employer to have absolute sway over the income and lives of his employees, even though he assures them justice as he sees it, any more than it would be to give to the employees absolute control over industry on their promise to give the employer a square deal as they see it. When wage-earners control absolutely, we have Bolshevism, the Dictatorship of the Proletariat. When employers have absolute control of industry, we also have Bolshevism, the Dictatorship of the Plutocrat! Neither is Democracy or Americanism, and the American people will not stand for anything but democracy. Democracy means no absolute control by any group. All must have a say.

You will agree with this in the abstract; but the real test of your devotion to American Democracy comes in its practical application. Apply the principle to the present steel strike.

The officials of the Steel Corporation are quoted in the New York Times of last Saturday as saying that the real issue in the steel strike is the question of control. "Is the management of the plant to decide conditions of employment in the plant?"

There is no doubt that this is the real issue. But see what this means. The steel worker sees American miners meeting with mine owners to determine jointly what conditions in the mines shall be. He sees the same in the building trades, printing trades, clothing trades, and he sees the American Government itself through Director-General Hines making an agreement with railroad workers jointly determining labor conditions. In every kind of industry he sees that labor in America is beginning to get a voice in determining conditions in plants either through a company union or a regular trade union. But the Steel Corporation says, "No! In our industry we must decide the conditions in the plant." The steel worker scratches his head. "Isn't that 'All power to the employer?'" he asks. "Isn't the Bolshevist motto the same thing, 'All power to the workers?'" He wonders then: "Is Judge Gary a Bolshevist? All power to the employer! Dictatorship of Capital!"

And what does the American public see? It beholds mining, building, transportation, and most other lines of manufacturing organized on a democratic basis, with employers and workers jointly determining wages, hours, and conditions of employment; but the steel industry remains in the absolute control of the employer. A similar situation existed in Europe before the war. All Western Europe was organized on a constitutional democratic basis. Only Russia and Germany remained behind. From these two countries where absolutism prevailed came the two big dangers to the democratic peoples of the world. They are (1) Benevolent despotism, which treats its subjects well, and (2) Bolshevism, which means dictatorship by a small group. In the steel industry,

where absolutism prevails in this country, both these doctrines are promulgated. The Corporation refuses to give a hearing to representatives of its employees and says it spends great sums of money on welfare work. It denies that any one or any group of its employees has as much right to hire Fitzpatrick and Foster as labor experts, as the Corporation has a right to hire Close as welfare manager or Gantt or McKenzie King or any one else as labor experts. It says all power over employees belongs to the employer. This is a dangerous doctrine because of the ideas it breeds among employees.

Realizing that the days of absolute control over employees are fast passing, and that concessions to the democratic movement in industry must be made, many employers have established so-called Industrial Democracy plans, known by various names—Shop Committee, Works Council or House of Representatives. Whatever the name, they are designed to head off the kind of democracy organized labor offers and to prevent unionization of the plants. This has led organized labor to oppose company unions, but the movement of employers to establish collective bargaining plans of their own is not to be condemned simply because it is designed to prevent the kind of collective bargaining that the regular unions offer.

COLLECTIVE BARGAINING THE ONLY DEMOCRATIC METHOD

The essence of democracy in industry is collective bargaining. Whether it is private or public industry, democratic control can be secured only by the employees dealing collectively with the executives of the enterprise. Organized labor has developed certain methods and a certain technique of collective bargaining which wage-earners have spent years of struggle and sacrifice to establish. Naturally, they are jealous of any rivals. But we cannot assume that there is only one brand of collective bargaining. The employers' Industrial Democracy plans must be judged on their merits, by their sincerity, and by their success in establishing genuine collective bargaining.

Many of the plans provide for shop committees which deal only with safety, employment, and service problems. They have no power over wages, hours, and discipline. This is legitimate activity, but it is not collective bargaining. When an employer offers it to his employees as industrial democracy, he is either deluding himself or trying to delude his employees. In either case, he is playing with fire; for the wage-earners will see in the attempt only insincerity and deception on the part of the employer. In the end he will pay for it in opposition and hatred from his employees.

Many other plans have the form of collective bargaining, but not the real thing. Representatives are elected to take up with the employer all questions, but in actual practice the employer's absolute control of wages and discipline is not restricted, and if there is disagreement between the men and the management, no real arbitration of disputed points is provided. Some officer of the company has final authority to decide. This is a travesty on democracy. The employer holds to his

power, yet pretends to share it with his employees. Confidence between employer and employee, which is the foundation of all good management and proper labor relations, can not be built up on such pretenses. The employer has no confidence in his employees when he establishes such a plan, and they in turn will learn to have less confidence in him.

A few of the employees' representation plans are genuine attempts to introduce collective bargaining. The organizations created by these companies are real unions, but restricted to one plant or to the plants controlled by a single company. The Brotherhood organized by the Interborough Rapid Transit Company of New York proved it was a union by going on strike, and the works councils of the International Harvester Company in Chicago and Akron proved the same thing by voting not to strike when called to do so by a national labor organization.

To the extent that these organizations practice real collective bargaining, they compete with the regular trade unions and win away members; and this is a situation which the unions must prepare to meet by more efficient methods. But organized labor has nothing to fear from works committees, by which the employer tries to camouflage the exercise of his autocratic power with democratic forms. The employer may fool himself, but he can't fool the workmen who sense soon enough whether they have a real voice and vote in fixing terms of employment or not. Sooner or later they will go to organized labor and ask help to get the real thing, or an organizer will come along and show them what the real thing is. If an agitator can come along and win away the employees from a company union to an outside union, that is pretty good evidence that the company plan did not give them real democracy, just as it is pretty good evidence, when the company union wins away employees from organized labor, that it must be offering real collective bargaining, or else the employees wouldn't be satisfied.

With all the publicity that the so-called Industrial Democracy plans have received and with all the progress of organization of works committees, it should be remembered that the typical form of collective bargaining, the vast majority of collective dealings between employers and employees, is that carried on by organized labor. The number of plants having company unions is insignificant compared with the number of shops that deal with the regular trade unions. During the last four years when the works council movement has made such great headway, more wage earners have joined the ranks of organized labor than are included in all the company plans put together. Let us not over-emphasize the importance of these company plans of collective bargaining. Even if all of them were genuine, and most of them are not, they would be far from solving the problem of industrial control. Organized labor is growing very much faster and stronger than the competing movement launched by employers. Labor management, therefore, is face to face with the problem of adjusting its methods to the demand for collective bargaining as carried on by organized labor.

DEMOCRACY IN THE CLOTHING INDUSTRY

Now let me describe an industry where an attempt has been made to put labor relations on a democratic basis, where collective bargaining

with a union prevails, and where the administrative machinery necessary to make collective bargaining work satisfactorily has been created. I refer to the clothing industry. This industry employs over 200,000 people. It has four great market centers: New York, Chicago, Rochester, and Baltimore. In all of these markets it is now almost completely organized, and only a few firms are outside the agreement between the clothing workers union and the employers' associations. Observe that both sides are organized. There can be no real collective bargaining if only the workers are organized and enforce their will on the employers, any more than when the employers enforce their will on the employees.

In each of these cities there is an agreement between the employers' association and the local branches of the union. The agreements fix minimum wages, establish a working week of forty-four hours, provide for open or preferential shops or closed shops, prohibits strikes, and restricts the employer's rights to discharge by making him give a good reason for every dismissal.

The local unions of the various trades in the industry elect delegates to a central body, known as a Joint Board. The Joint Board employs managers and deputies, whose business it is to represent the employees in negotiations and in handling their grievances.

On the employers side, there is a similar organization. Each of the large plants employs a labor manager who has charge of all bargaining and labor control, as well as employment and service functions. For the smaller plants, the employers' associations employ labor managers who perform the same duties for groups of employers.

When there is to be a general revision of wages or hours, or when a new agreement is to be made, the Board of Labor Managers and the representatives of the union meet and work it out. When there are adjustments to be made that apply only to one shop, the individual or group of employees affected takes it up with the labor manager of the plant. If a satisfactory adjustment cannot be made, one of the managers or deputies of the union is called in. In the vast majority of cases, amicable adjustments are arrived at. Where such an agreement cannot be reached, the matter is left to impartial arbitration, for which permanent machinery is created by the industry itself—in effect an industrial court.

The employer's association of each city, together with the joint board of the union, selects an impartial person to act as judge of all disputes. Technically, he is the chairman of a labor adjustment board, consisting of the labor managers and the union representatives who argue cases before him. His salary and the expenses of his office are paid half by the employers and half by the union. He hears no cases of men who have stopped work. Strikes are illegal. The employer may suspend a worker, but if on appeal to the chairman this dismissal is found unjustified, the employee is reinstated and must be paid by the employer for the time he lost.

Here we have the machinery of democracy. The institution of the impartial chairman or judge is a recognition that law, order, and government must prevail in industry, that peace must be maintained, and the interests of the public conserved.

How is it working out?

Well, it hasn't solved the whole labor problem, nor has it eliminated all labor troubles; but it has shown that you don't have to have absolutism in industry, that you can get along without Dictatorship of the Plutocrat and Dictatorship of the Proletariat. It has shown that this attempt to maintain a dictatorship by capital is what puts unions on a war basis and fosters bolshevism in the ranks of labor. The plan is beyond the experimental stage. It began five or six years ago in the Hart-Schaffner and Marx factories of Chicago, and the success of it in these factories has spread it through the entire industry. It has taught the employers to respect union leaders who they once thought were crooked agitators, and it has made unions and their leaders have confidence in their employers and cooperate with them. It has enabled unions and employers to work together on such problems as the elimination of strikes, the introduction of machinery, time studies and standardization of occupations, increasing production, and maintaining shop discipline. Disputes on all these questions have not been eliminated. They never will be; but they have been settled, in a peaceful, orderly manner according to the laws of the industry, which labor and capital alike have had a share in framing. More than all this, however, the plan has enabled the union to take on a peaceful character and to concern itself with the questions just mentioned, which are the real problems of collective bargaining, instead of emphasizing war policies.

CONCLUSION

What then shall be the conclusion of our discussion of Labor Management and Collective Bargaining? For the reasons outlined in this paper, it is my judgment that labor management must adjust itself to include within its functions methods and policies of dealing with its employees collectively through organizations and representatives of their own. Labor relations are of two kinds: personal relations and economic relations. The first does not necessarily involve the question of democracy. Personnel management dealing with employment and service problems has developed during the last few years methods and policies for handling the personal relations in industry. But the economic relations need other methods and other policies. Representation of interests must be provided; machinery for industrial law making, for democratic decisions by majorities, and for interpretation and arbitration must be created. Because democracy in industry is inevitable, labor management must include personnel management and collective bargaining. The arrangements existing in the clothing industry show how the two can be combined, how management and authority can be harmonized with democracy, and how the two can be made to serve the best interests of all concerned—employees, employers, and the public.

CHAIRMAN YOUNG: I thought, instead of accusing you of reading Mr. Woll's paper, we might accuse you of reading Mr. Fitzpatrick's paper, Billy.

One day last week there passed over my desk a few newspaper clippings. One of them read as follows: "There are persons who constantly clamor. They complain of oppression, speculation, and the pernicious influence of accumulated wealth. They cry out loudly against all banks and corporations, and all means by which small capitals become united in order to produce important and beneficial results. They carry out mad hostility against all established institutions. They would choke the fountain of industry and dry all streams. In a country of perfect, unbounded liberty, they clamor against oppression. In a country of perfect equality, they would move Heaven and earth against privilege and monopoly. In a country where property is more evenly divided than anywhere else, they rend the air shouting agrarian doctrines. In a country where the wages of labor are high beyond parallel, they would teach the laborer that he is but an oppressed slave."

This is not a current clipping but an extract from a speech of Daniel Webster in the United States Senate in 1838.

The other clipping referred to the fact that a Y. M. C. A. worker who was teaching illiterate Chinese coolies their native language, found among Confucius' characters, more than four thousand years old, very definite instructions to resort to arbitration on all disputes.

Our discussion has been more on the practice of employee representation than upon the principle. As a matter of fact, I don't think there is anything new whatsoever in the principle of employee representation. Coöperation, brotherhood, frankness, justice, fairness were all preached by Confucius, by Aristotle, by the Disciples, by the framers of the Magna Charta, and by the signers of the Declaration of Independence, and all men subscribe to them and believe in them today. We are, however, making rapid and definite progress toward a perfection of practice, if not the principle involved.

The open season for the speakers is now on. There are some very simple rules governing the slaughter. No marksman is permitted to shoot for more than three minutes without the unanimous consent of the floor and in rising he must state his name and business connection. Ladies and gentlemen, the floor is yours.

DISCUSSION

MR. PORTER (Worcester, Mass): I am requested to ask the last speaker if safety committees are a good start toward this form of organization that he speaks of?

MR. LEISERSON: I think safety committees are a very good start, provided you always remember that you are starting and not stopping.

CHAIRMAN YOUNG: A bull's-eye, gentlemen.

MR. PHILLIPS (Central Iron & Steel Co.): I would like to ask Mr. McCormick whether employee representation and efficiency experts can figure with one another?

MR. MCCORMICK: Yes, they can. The practical application of it is

dependent upon the amount of interest that the employees can take in that particular form of democracy under which they are operating. I think there is no possibility of doubt that a man who has a share in the control of his own destinies will operate more efficiently because of that reason.

MR. LEISERSON: May I suggest in that connection that union officials in the clothing industry have told scientific managers who were working in some of the plants. "We are pushing up wages; we want to go further; we know we can't go further unless there is more production, so go ahead and show those employers how they can produce more, and God bless you—for then we can get more."

MR. J. B. DOUGLAS (Philadelphia): I would like to ask Mr. Leiserson what is the attitude of the garment workers on the question of physical examination?

MR. LEISERSON: There is no absolute position taken by the employees officially on the question of physical examination. They are divided on the question. But just now what the employees tell me is this. "We are in favor of physical and mental tests, but we want the employer examined as well as us. (laughter) because he controls our lives and our destiny, and he examines us when he may not be fit for the industry at all."

MR. J. B. DOUGLAS (Philadelphia): Isn't it a fact that many large employers, in introducing physical examinations, have started at the top and gone right down the line?

MR. LEISERSON: Probably they have. If I were introducing it, that is what I should do. I don't think you will have any trouble with employees when they know about the whole machinery, when they know that the employer has been examined, and that the foreman who isn't competent will be fired for that reason.

MR. NAYLOR (Bureau of Labor, Manitoba): I want to ask Mr. Leiserson a question. I am tempted to believe that the remarkable success of the arrangement under which he is working is due in a very large measure to the charm of Mr. Leiserson's personality. I want to ask him if he knows of a similar arrangement working equally well with some one else in his capacity?

MR. LEISERSON: I can plead not guilty, because I have been on the job only one month. It is very true, Ladies and Gentlemen, that leadership and personality have a great deal to do with it. The leadership in the union and the leadership of the employers have been of a very intelligent nature. In Chicago, the clothing industry has emptied the universities to put men in as labor managers. I can name at least six men who have left colleges. One man left the dean-ship of the College of Commerce of the University of Minnesota to become labor manager of the Employers' Association of Chicago.

The stove moulders have been working on this arrangement for years and years. The mine workers have been working on a similar arrangement for many years. You hear them talking a great deal, but you don't have a real strike in the industry unless somebody is trying to destroy the union. It is easy to arbitrate demands, but you can't arbitrate the question of the union. So I say that leadership and personality have a

great deal to do with the success or failure of such a plan, but that same leadership exists in all of the other industries.

MR. HAMILTON (American Radiator Co.): Mr. Leiserson has made one statement that struck me quite a perceptible wallop. It may have affected some of the others in the same way. He says that in this clothing arrangement, organized labor is working to increase production. The opinion that prevails in most circles is that organized labor wants to decrease production and increase the wage. I would like to know whether in your opinion they are actually making the effort to increase production.

MR. LEISERSON: I know a case where pressers came along and asked for \$35 a week. They were getting \$29. The employers said, "If we give you \$35 it will break up the business." They had the facts and figures there and showed them. They talked back and forth and threatened and all that. You know, whenever you do away with real war, you take it out in imagination, in talk. They finally reached an agreement. The increase in one case would have been from eight to ten per cent. If the employer gave \$35 it would have been an increase of nearly twenty-five per cent. The employers said, "If you will increase production so that the net cost to us will be only eight or ten per cent, we will give you that." The employees said, "We will try." They have been at it now for more than a month, and they are making good. They have done the same thing now with three other occupations. This is the clothing workers' union that is not affiliated with the American Federation of Labor. There is another clothing workers' union, the United Garment Workers, which is affiliated with the American Federation of Labor. In co-operation with the United Garment Workers, Morris L. Cook, a Frederick W. Taylor man, is working in several plants putting in scientific management. The idea you get—that organized labor is for decreasing production—is the same that organized labor gets—that all these company plans are fakes. Each is about as true as the other. You don't know anything about their policies, and they don't know anything about your policies: but when you get together and have an impartial Chairman, you find out because you have to talk to one another.

MR. ROSE (Goodyear Tire & Rubber Co.): I would like to ask Mr. Leiserson how production is going to be increased when the hours of labor are reduced to forty-four hours a week?

MR. LEISERSON: The employers have told me invariably that the reduction from forty-eight to forty-four hours a week has not decreased production one iota.

MR. GREENWOOD (Carnegie Steel Co.): If I understood you correctly, industrial democracy has been established in the coal mining industry. Why are the coal miners threatening a strike, if there is perfect harmony between them and the employers?

MR. LEISERSON: There are two answers to that question. When I said industrial democracy has been established in the mining industry, I said it was established just about as thoroughly as political democracy has been established in this country. Why, if political democracy has

been established in this country, do we have race riots, and why don't the negroes vote in the South? Because we have not established complete political democracy. It takes years and years to work that out. The mining industry has made a long step in advance toward industrial democracy, but it isn't anywhere nearly so far advanced as our political democracy; and our political democracy is not yet complete democracy.

Threatening a strike and actually striking are two very different things. What happens when you want to sell steel? You quote the price as so-and-so. The man says, "No, I can't take it; you ought to take so much for it." You bargain back and forth. The man tells you, "I won't buy and if you need his trade, you will be a little bit scared, and you will try to deal with him." Now all these threats of strike are just bargaining, manipulation, the bargaining method. Note this, that when you buy coal, the company quotes a price to you; when you buy steel, the steel corporation quotes a price to you. Why shouldn't labor quote its price to the employer? The beginning of industrial democracy is when Labor is permitted to quote prices. The mine workers are now quoting prices. The companies say these prices are too high, and they are bargaining.

I would like to bring this very important point out in connection with this matter. The coal companies issued a statement that what the men want (a 36-hour week) is very unreasonable, that it will cut down production, and it will cost the people of the country a billion dollars. The employees came back with the statement, "The only reason we ask this is because we don't want to lie idle three days in the week and make up forty-eight hours on the other three days," or, "We don't want to lie idle for five and six months in the year and then make it all up the other months." The company put up the proposition that continuous employment is not possible because there are no facilities for storage.

Now, if you don't have this industrial democracy machinery by which the employers and employees can talk these things over, you do not see that back of the demand of the mine workers is the request that this unemployment be not put entirely on their backs. You can't store coal at the mine. That is the burden that the public and the employer, as well as the wage earner, should bear; but the employers refuse or find it impossible to store coal, and the public refuses to buy in the summer for winter use. The employees now have to bear the whole burden, but because they have the democratic power to state their case they say, "If you want us to bear this burden, we will work only thirty-six hours a week, and it will cost you so much," or, "you will order coal in the summer and you will provide storage facilities." In other words, they have the means of bringing up their problem which they would not have without this democratic arrangement.

MR. FRENCH (California Industrial Accident Commission): I should like to ask Mr. McCormick this question: Imagine, Mr. McCormick, that three other plants were in close competition with your corporation, that the shop committee system existed in each, and that it was agreed in each shop that the wages and hours should be based on such and such a standard, and that they varied in each of the four corporations; how

would you stabilize the industry in those very important particulars?

MR. McCORMICK: The three plants all members of one corporation?

MR. FRENCH: Different organizations in close competition with you.

MR. McCORMICK: Would it not be likely that in all those plants there would be a certain market value of labor which would in itself economically tend to stabilize those wages without resort to any artificial means?

MR. FRENCH: I should say that it might not work out that way, and that there might be a difference in the wage rate which would be very important. The Central Trade Union idea is to have a minimum standard, and I wondered how you might arrange for that under the shop committee plan?

MR. McCORMICK: If the standard of living, or the standard of skill required were different in one plant from the other, I should think that the employers would have a reasonable answer for keeping that wage scale different. When all conditions are similar, and the plants are adjacent to each other, I see no reason why, economically, there should be a different wage scale. I think the point you are getting at is this: many employers object to a flat wage scale all over the country, because of different conditions in different parts of the country and in different shops. I do not know of any objection to a similar wage scale in adjacent shops where conditions are identical.

MRS. HOKE (Printz-Biederman Co., Cleveland): I wish to say, on account of the question that was asked about the decrease in production when the change is made to forty-four hours, that our production has increased because the people really have more efficiency when they don't work as many hours. The forty-four hour plan has been very satisfactory all the way through in our plant.

MR. DEBLOIS: I would like to ask Mr. Leiserson a double-barreled question. Mr. Leiserson, you have instanced the fact that political democracy after a great many years of effort has not been attained. That is perhaps the largest scale of effort that we could imagine. The shop union is the small union. The clothing union is the large industrial union. Why do you expect, as I think you do, better attainments from the large idea than from the small idea when political democracy, which is the wholesale scheme, has not worked out very well. That is one barrel.

MR. LEISELSON: Suppose we take them one at a time.

While it is true to a certain extent that Switzerland, a small country, is a purer democracy than ours, I think the reason it is a purer democracy is because it hasn't the problems that we have. The great problems of democracy have been worked out in this country, which is as big as all Europe put together. We have, in my judgment, more democracy in this country than there is in any other country, and we have it for one reason: because we have worked it out on a large scale; we have a lot of difficulties and we may not entirely perfect it for two hundred years, perhaps longer, because our problems are bigger. It isn't quite a question as to whether we have the perfection. The real question is as to whether we have the purpose to allow everybody democracy; and when we see a place where it isn't working out, we ought to fix it

up right away. The benefit of democracy may not be in efficiency. It is in the development of character, when everybody has a say. For the same reason you will let your boy of fifteen make a fool of himself and go away and not stick to your apron strings, because it would not be advisable for you in every case to tell him how not to make mistakes. You want to let him be free. You act on the democratic principle because you know it will develop his character. For that same reason I favor the inevitability of democracy; and the more problems the boy has to face, the better character he will be; the more problems a country has to face, the more democratic it will be, the more character among the citizen. The larger the country, the more climates, the more nationalities, the more problems it has to face, the more democratic it will be. That is why I think America is the most democratic country.

But you get correctly, I think, that it is my opinion that the organized labor kind of democracy is better today than the company union kind of democracy. I judge that, by the experience up to date. I am perfectly willing that there be real competition to show which is better. I have myself talked to union people, and I have showed them that there are some things in the company plans that they ought to get quickly or the company unions will get them.

Democracy will be worked out not by any one scheme. We want everybody to be experimenting with it, and while today I favor the national union because I see no way of establishing equal conditions of labor except through a national organization, if one can work it out through the company and do it more efficiently and get more democracy—the real thing—then I should be for that.

Now your next question.

MR. DeBLOIS: This is the second barrel. Let us take an imaginary industry that has not been unionized, that has no tendency toward it, in which the employers have not adopted any shop scheme of industrial democracy. Which would you consider the best way to attack the problem, by the union idea, organize your employees into a union, or start in the single factories and introduce the shop principle?

MR. LEISERSON: My usual way of answering a question like that in my industrial court is to say, "A judge never answers hypothetical questions." But I don't want to take advantage of my privileges. But there really is something in that, that a judge never wants to answer hypothetical questions, because every one of these things depends upon the circumstances in the case. When I was with the Department of Labor doing consulting work on these things, and I came into a plant and they wanted my advice about organizing shop committee plans. I said, "I don't know whether you ought to have one or not: maybe you ought to have a union, but I want to look through your plant first and see what the relationship between you and your employees is." Now if the union has never attempted to organize and the employer has never fired people because they did try to join the union—you see all the hypotheses we have to bring in—if there is the very best relationship between the employers and the employees (which is a very big hypothesis), it might do

very well. One of the men connected with our Division of the Department of Labor has actually told an employer, "It would be fine if you put in a shop committee plan, because you can do it better than the union could in this particular plant. Your relations are fine, but you are telling these employees always, 'Stick to your job, no absenteeism.' But when the armistice was signed, and you didn't know where you were coming out, you laid a bunch off, and as soon as you lack material in a certain department you lay them off. In other words you are making them irregular. Now if you will issue a statement to your employees saying 'Fellow workmen, or whatever you want to call them—we, the firm, acknowledge that in the past we have been making mistakes: we have in the past told you not to be irregular, but when our production methods were such that we couldn't keep you regularly, we laid you off and made you bear the burden. Hereafter we won't do that. If our production methods are such that we can't keep you working regularly, we will pay you for the time.'" He said, "If you will do that, then you can run a company union all right, and your men will be satisfied. The employer did it, and he has that arrangement now, and it is working well. But for an employer who is not willing to go the limit on a thing like that, I would say, the best way to introduce democracy is to have it come from the outside, forced on him, because he can't learn the lesson himself and somebody has to teach it to him.

MR. GREENWOOD (Carnegie Steel Co.): When this ideal condition of democracy is arrived at between the employer and the employee, have we any guarantee that they, with their combination, will not increase the high cost of living? Have they the power to take advantage of the consumer if they see fit to do it?

MR. LEISERSON: A very serious and important question. You introduced it by saying, "This ideal arrangement, etc." We are all standing for ideals. We are all working for Heaven on earth. If we are not, there is something the matter with us; but we are going in different ways toward it, and we are a long way from it, but the fact that we are a long way from it is no reason for stopping right here.

Now there is real danger that employers and employees will get together and hold up the public—very real danger. But before you come to that danger, you have a very much greater danger: that the employer himself will hold up the employee first and the public afterwards. Now that is the first arrangement. When the employer can dictate to his employees and dictate to the public, you have a very bad situation.

Then the union comes along—it is the next step toward this Heaven—and says, "Here you have got to divide this dictation business fifty-fifty." That is a step in advance, and I am for it. It is a start, like the safety business, and remember I am for it. The mine workers and the printing trades and the building trades usually don't have impartial chairmen and they are not as far ahead as this clothing industry. To bring in an impartial chairman is bringing in an outsider. The clothing industry is taking men from public institutions, your teachers and your professors, who are trained as public employees. That is another step in

advance. When I make a decision about wages, I always have in mind that if I have to pay \$60 for a suit of clothes—not on your life! And I think the people will think of that. They will frown on such collusion; they will destroy the whole arrangement and take the public point of view into consideration. It is another step in advance.

In connection with taking these men from colleges to act as chairmen, the union in its official weekly paper said, "The clothing workers have not only improved the conditions of the working people in the clothing industry, but the conditions of the professors in the universities as well." And they need it.

Now the day will come when the public will be on to its job. The public today is not considered by these industries because the public does not consider the industries and the people in them. It took a strike, a revolt, a revolution of the order-keeping authorities in the person of the police, to show the people of this country that they ought to pay policemen decent wages. It was bad, unjustified in my estimation, to have a strike of the law-keeping authorities, but you can't get away from the fact that every city in the country today will pay its policemen decently, because they have heard what happened in Boston—and they didn't do it until something happened. Something is needed to wake up the public. Some day the public will wake up about its teachers, about its professors, about its policemen, its firemen, and about the salaried employees in your industries—and Lord knows they need it. When the salaried employees strike, the employers will say, "Those people are on confidential relations with the employers; they know the secrets of their business and they ought not to join a union." Well, if they are on confidential relations, why don't you pay them for it? You pay the common laborer because he forces you; you pay the mechanic because he has a union that forces you. You don't pay the salaried employee because he doesn't organize and because he takes your advice. If he puts wages up, why, then the cost of living goes up; so he doesn't put wages up, and he is waiting for cost of living to come down. Some day the public will appoint these judges to take care of the public interests.

MR. R. M. LITTLE: I would like to ask Mr. Leiserson to give us a brief definition of democracy.

MR. LEISERSON: My judgment of democracy is that no one must have absolute control, that every one must have a say. We have worked it out in the church and in politics; we haven't worked it out in industry. That is all that I can define. Every one, no matter how low he is in your estimation, if he is an adult, normal human being, must have a say: and if he isn't educated, you have got to give him a say because otherwise you will never educate him. In this country we didn't have the public schools when we started. We didn't have the vote for every wage earner in this country until down to about 1850. Did you know that? In spite of the Constitution and the Declaration of Independence, a man had to have property to vote. Remember what Ben Franklin said about the mule? A man owned a mule. It was property. It was worth a certain amount of money. When the mule was alive the man had a

vote, but the mule died and he lost his vote, and he wanted to know whether he or the mule voted. The common people fought and by the end of the first quarter of the nineteenth century they got the right of manhood suffrage in this country. New York State didn't give it to them until the Constitution was made somewhere in the fifties. Then when they got the vote, everybody said, "Oh, what have we done? We have given all these ignorant people the vote; we will have to educate them," and that is why we have the finest public school system in the world.

-And so with this democracy—every one must have a say, whether he is ignorant or not, because you will never educate him unless you can see the dangers of his ignorance.

MR. R. M. LITTLE: I would like to present this thought: government by the consent of the governed. It comes then to a matter of degree—every man a say—does every man have an equal say of authority?

MR. LEISERSON: Every man has a vote, but that does not mean that every one has an equal say. It means—if what I am saying is making any impression on you people and you think I speak the truth and with authority—I will have more to say in anything you do than any one of you individually, because I will influence maybe a dozen of you to vote my way.

In a democracy every man has a vote. In the old country they used to start with the idea that all people are not equally intelligent. "How shall we find out if they are? Well, if they have a business, why they must be more intelligent." That is an assumption that I won't agree with. "If they have land they must be more intelligent." So they gave the landholders three votes and business people two votes and the rest of them one. In this country we say, "Every man is created equal." I don't believe we are created equal. I believe every man is created with equal opportunities, and he ought to have them. Every one of you ought to have equal opportunity to stand up here and argue the way I am. That is all, and by that freedom (of having each individual get one vote), the men who can influence the others by leadership, knowledge and other qualifications, will have more influence, more votes, so to speak but it will work out naturally. Also, there will be danger that men who are ignorant or passionate might lead other people away. True, but we must never be afraid, because a thing will be abused, that, therefore, we must not use it. No matter how efficient anything is for good, the more efficient it becomes, the more dangerous it becomes if it is abused. The sharper your knife, the better it is when you cut meat with it; but the worse it is when you cut throats with it. But we don't say, "Let's have dull knives because somebody might cut throats with them." We want our knives as sharp as possible, and then we want to make people intelligent so they will use them properly. We want as much democracy as possible. Give all citizens the vote, and they will be responsible to the public if we educate them and make them as intelligent as possible.

MR. E. W. CASE (New Departure Mfg. Co., Bristol, Conn.): I would like to ask Mr. McCormick whether he has in mind, or can give us, the percentage of labor turnover he has under his working conditions?

MR. McCORMICK: No, sir, it is small in actual figures. It is smaller than it was before we put in the plan. That may be due to the plan, or it may be due to a resumption of somewhat normal conditions following the close of the war. We have only been operating since about April 1, and I doubt very much if we can get any real indication of the answer to that question until the end of a suitable period, say a year. My impression is, as in the case of efficiency (having to do with the question which some one asked a moment ago) that questions relating to labor turnover will be answered satisfactorily by those who believe in employee representation.

CHAIRMAN YOUNG: There has been a very definite reduction of the labor turnover but, as Mr. McCormick said, it is not directly attributable to our plan of employee representation.

MR. LEISERSON: Let me tell you what the union does in regard to that. It makes an agreement with the employers that, "The following shall be the scale of wages for this season." The employers are awfully anxious to get out their stuff and they go swiping labor from one another. It upsets the wage scales, and the union has, in a case that I know of, issued an order that men who have gone to other places for \$5 a week more, did that in violation of the agreement. "You must go back to the other place because we have got to keep our word or we can't make this thing work." That is reducing the turnover in spite of the employers.

MR. MACLACHLAN: In connection with the Whitley scheme as carried out in England at the present time: it might be of interest to you to know that among the forty-three industries in the Whitley Councils, there has not been a strike. In the Whitley Council the representatives of labor have not had the privilege of speaking except at the request of the chairman or members in the Council.

It has been said a number of times, especially in the United States, that the Whitley scheme necessitated or presupposed complete organization on both sides. If you will change that word "complete" to "reasonable," I think you will get closer to the facts. There are operating in Canada at the present time Councils under the Whitley plan in which complete organization is not the fact. Reasonable organization is all that is necessary.

MR. McCORMICK: If you will read the pamphlets on the Whitley Plan, you will find that while the word "complete" may not be one hundred per cent correct, it indicates a strong desire. I do not remember the words, but there are various stages of industry described in the Whitley reports in which the industry can be catalogued until such a time as the organization is complete enough for it to operate under the Whitley Plan. The intent and the direction of the intent is organization.

MR. PALMER: Some little while ago a gentleman asked if there had been other plants operating under joint control, the success of which could not be attributed to the charming personality of Mr. Leiserson. I would like to know if Mr. Leiserson is familiar with the electrical contractors' industry. Some time ago I listened to Mr. Sullivan Jones

describe their Conference Club and their industrial citizenship, the definition of which he gave as, "The right of the employee to self-regulation and self-direction." Are you familiar with their plan in New York?

MR. LEISERSON: I am not familiar with the electrical workers' plan alone, but the building trades of New York City have for many years had a plan very similar to ours. They had a board of business agents of the union and a board appointed by the employers, which tried to settle all difficulties, and if they couldn't agree they had an umpire. That thing in my judgment was a mistake. They called a person in who was not familiar with the industry, and he usually split the difference, satisfying neither one side nor the other, and so, when the next case came along, they didn't want the same umpire, and that always caused difficulties which they never have gotten over. I think that when they have a permanent chairman who will be on the job and know the industry completely, then they will be able to take their plan very much further than they have gone so far. I think they have done a great deal in stabilizing conditions in the building industry in New York, and that has been going on for quite a number of years.

MR. C. P. TOLMAN: I would like to ask Mr. Leiserson: Are you familiar with the practice of conducting balloting in the locals of the unions?

MR. LEISERSON: Yes, sir.

MR. C. P. TOLMAN: Having in mind your definition of democracy, do you consider the unions as democratic as the McCormick organization is?

MR. LEISERSON: I am not able to say, because I don't know the McCormick organization, but I will say that I do know Mr. Young pretty well, and anything that he has to oversee will be thoroughly democratic. I will say that balloting in the union organization on the whole is just about as honest as the balloting for political offices in the United States. Not a bit better and not a bit worse.

MR. R. M. LITTLE: The tap root of democracy is the consent of the governed to the will of those in control. That means leadership. We American people are trained to recognition of the majority vote when one vote counts just as much as another. When you come to apply the principles of democracy to industry and you make it by majority vote, is it going to work?

MR. LEISERSON: I will say it will work in industry just about as well as it worked in politics, because I know of no other scheme, or kind of voting, that is half as good as this. This isn't perfect, by any means, but any other scheme—and many schemes have been tried from Grecian times down—any other scheme by which you give one man power is bound to fail.

CHAIRMAN YOUNG: The keynote of this afternoon's meeting is that after all it is the spirit of the plans that counts and not the word; it is the manner in which they are executed and not the mere phraseology of their structure that counts. Please bear that with you.

General Session: Americanization

October, 2, 1919

RICHARD A. FEISS Chairman

Joseph and Feiss Company, Cleveland Ohio

CHAIRMAN FEISS: While it is most unfortunate for me, it is fortunate for you, I believe, that I am forced to leave you very shortly, having been suddenly called out of town, and Mr. Price has secured Mr. Morey for my place.

I wish to add my little welcome to all of you who have come here to take part in this great meeting. I have indeed a great privilege and pleasure, although it is going to be curtailed, in being the presiding officer of record at this afternoon's meeting, because I think there is nothing more important than the Americanization movement in connection with the safety work that is the real work of this organization. It is not only the hand saw, the blade for the cutting machine, that has to be guarded, but there are a lot of things that affect citizenships and the individual. And so, it is mentally as well as physically that we should safeguard and I believe alongside the slogan "Safety First", "America First" would be a very good second slogan.

I feel sure that the thing you are going to hear today is going to be of that real kind of Americanization not tinged with any race fear or race prejudice, but the kind of Americanization the American needs as well as the foreigner. And I know of no one who better could introduce the subject than Mr. Allen T. Burns who we know so personally headed up the famous Pittsburgh and Cleveland campaign. I take great pleasure in introducing Mr. Burns, Director State of Workings of Americanization, formerly of Cleveland and now of New York and the United States.

PRINCIPLES AND METHODS OF THE AMERICANIZATION MOVEMENT

ALLEN T. BURNS, Director State of Workings of Americanization,
New York City

An Americanization worthy of America sums up the principles and methods of Americanization that are most effective. An Americanization as broad, as human, as ennobling as America itself, nothing else.

will compass the task that we think of and should think of under this much used and much abused term of Americanization.

To be sure, during the war we inevitably view the situation in a narrow, prejudiced, and biased way. We cannot take the general, broad, and inclusive view of America's tasks when we need to concentrate on a single great objective, as under the circumstances of the recent war. Doubtless, on that account, with the hysteria and fears growing out of the war, we felt that any difference, any variation, any non-conformity, was a danger to the welfare of our country, and for that reason we have been carrying on definite Americanization and think of it as a means of securing exact similarity or conformity, identity with some particular type of external form or set of performances.

But, if we think at all of America, we will know that America from the time of its earliest settlement was no such uniform, homogeneous group of people. America has given its great contribution to the world just because it drew from the riches and treasures and labors of all the past and has turned them to the good use of humanity.

It is such an idea of America that is adequate and only such that is adequate in fulfilling this task in which all of us are now so interested.

So, this afternoon let us turn away from some of the narrower views, some of those we have been driven to by war and its necessities and emergencies, and let us examine some of those great principles and practices of America which must be followed in an Americanization that is worthy of our country.

JUSTICE FOR THE FOREIGN-BORN

Nothing is more fundamental to America than justice. No abstract, obsolete justice is referred to but in this connection an even-handedness and fair play as between native-born and foreign-born. That is what the immigrant expects when he dreams of coming to the land of liberty, and it is with that standard that he judges America after his arrival.

So, whether America becomes the promised land to him or not depends very largely on the justice he finds, and today we are in grave danger on this score. Among the injustices practiced upon him, none are greater than that which is now to the forefront of trying to lay our industrial troubles at his door, attributing to the men who were good enough Americans to fight for us, to subscribe to the Liberty Loans for us, the underlying cause of our great industrial unrest.

We should all be thankful that Mr. Gary in his appearance before the United States Senate did his part in laying this bogey to rest, for he said, as you will remember if you read the testimony: "Throughout the war our workmen were loyal. While it is true that there is a radical element of foreigners at the present time, it is only doing justice to say that in my opinion the majority of foreigners were good citizens."

"Do you mean by foreigners," he was asked, "those not naturalized?"

"I include all foreign-born."

And yet in connection with this regrettable struggle in the steel industry, the cosmopolitan press is laying the trouble entirely or almost

entirely at the door of the foreign-born. A little thought such as Mr. Gary evidently had taken should remove that mistaken idea from our minds.

Will you just stop and think it was only a month ago we were raising a hue and cry about the demands of the railway organization made up of over ninety per cent native-born.

In this city last week or week before the miners were meeting, almost as foreign a group of working men as the steel workers themselves and they formulated a demand which is the subject of considerable anxiety and more than that, they formed a very close working alliance with these same foremost, from the native-born point of view, railroad brotherhoods. So that in the very near future it is going to be hard for us to pick between the native and foreign-born American, if we think we can explain our industrial unrest in any such easy way.

If you take the various steel towns affected by the steel strike, you will find that there is no consistency as to the foreign or native-born group in the towns that are closed or operating. To be sure Gary closed down and it is a little more foreign than Homestead which was open. Duquesne stayed open with sixty-seven per cent foreign-born and Sharon closed with only forty-two per cent foreign-born. So, I could go down the list showing the line did not run between the foreign-born and native-born communities in the success of the strikers pulling out or stopping complete operation in any mill.

In the same way, you will find the variations run in the proportions of the foreign-born in the various communities who have become naturalized. The mill town that shows the largest proportion of foreign-born adults seeking Americanization is the same great steel town of Gary, which only a week ago when I went down through there with a steel engineer showed no chimney showing smoke and in the steel engineer's opinion that would indicate it was entirely closed down.

STRIKING POLICEMEN ALMOST ALL NATIVE-BORN AMERICANS

Not only the question of any particular strike but all the general industrial, economic, and political unrest is thus unjustly attributed to the immigrant; and yet when you remember that most un-American police strike in Boston less than a month ago was made up almost entirely of native-born Americans and three hundred who had fought in our armies across the seas, you will see that there is something that underlies the situation deeper than native and foreign-born. So again the newspaper reports from Omaha indicated exactly the same situation there.

Take the most radical movements in this country like the I. W. W. and it has practically never been called to the public attention that every delegate attending the annual convention in Chicago was a native-born American. If you have studied the split between the Left Wing and the Conservative Group in this country, you will find in the Radical Group names like Reed, Young, Eastman, and in the Conservative Group such names as Hilquit, Meyer, London and Berger.

So again whichever way you turn, the Americans if they stop to think would realize that if they are trying to get rid of industrial unrest merely by attributing it to the foreign-born, it is like trying to clean the dirt in your room by sweeping it into the closet. It is as ungrateful and unfair as to put an unwelcome new-born babe on the doorstep of your neighbor to get rid of him.

Industrial unrest is a much greater problem than native and foreign-born. We are only further protecting the art of alienating the alien in making such accusations. We should be grateful to Mr. Gary for defining the issue as one of unionism and not of alienism.

But, there are constructive forms of justice in industry and elsewhere which it is necessary for us to practice and as we do practice them we most thoroughly and effectively unite the immigrant with us.

SAFEGUARDING THE IMMIGRANT

Americanization has been talked of almost altogether too much as we used to talk of religion, something that is a separate department of life, something you could shut off and use on Sunday and not use on the other days. Americanization is no more that thing. Americanization cannot be confined to any department of industrial, political, or educational life. Nor do I know of a better form of Americanization than the work that you men and those you represent are doing, the providing for the safety of the immigrant as well as for the native. That is the kind of even-handed, fair play that makes him a part of us, unites him solidly with us.

You men might well, it seems to me, have a section conference where the rest of us could be learners, where you would tell about the methods that are most effective in safeguarding the limbs and bodies of the immigrants because with his lack of knowledge of our language, his more direct coming into industry from the peasant life of the old country, you know how additional problems for you are produced by him.

Now the kind of Americanization for which we must plead is that which goes just as far in providing for him, not doing exactly the same thing you do for the American but making just as cock-sure that he is safe as that the native-born is safe. I am sure that is the kind of Americanization in which you believe because it is American justice.

Again, I suppose there is nothing in which you are more interested after your work of safety than our accident compensation law. You know that in some states there is a great difference made in the compensation paid according to whether the man is an alien, and according to where his family lives. Now, hunger and cold and all kinds of deprivation are no respecters of nationality. I have always found that the foreign-born family would suffer from cold and hunger as well as the native-born.

I plead with you because of your intense interests not only in American justice but in our accident compensation law to see to it that our alien feels that his interests are as adequately protected by American

laws as our own sons. There again is the kind of even-handedness which means general Americanization.

THE MCKEES ROCK STRIKE

Do some of you remember the McKees Rock strike, that bloody struggle of ten years ago? That and its settlement again showed the necessity not only of absolute justice but of giving the immigrant as fair a show as is given the native-born.

All of you are more or less near the employment service of the firms you are connected with. You are another one of the human elements of service. How far with our rapidly advancing science of employment have we considered that it might be relatively as profitable and human to give the particular personal attention to the immigrant employee as to the native employee? More and more you are studying personalities and capacities. But, how easy it is to do that with the native-born and to treat the foreign-born all as herds of cattle or as mere cogs in the industrial machines!

Some of our foremost plants, we find, are being careful to introduce as assistants into their employment service men who can speak to these men, coming into close understanding with their problems and possibilities and what they have to offer to the industry. This McKees Rock strike was brought about by a failure to do that, and its settlement by doing that for which I am pleading.

The pool method of production and wage payment according to what the gang turned out and not according to what each man turned out, was put into effect without any effort being made to explain to the working force, so that when they came to pay day and their envelopes differed from what they had been receiving and expected to receive, they struck: and the settlement was made largely upon the basis of the company agreeing to establish such assistants in their employment office as to make it possible for the immigrant workers to understand and confer with the company about their grievances and problems.

If we are to give the impression that America is a land of justice, of equal treatment and opportunity for all, in the development of our employment service we must be as careful as that to see that the impression and treatment given the immigrant is even-handed.

Just as much can be said about the need of justice and fair play to the labor union as to the employer, for one of the reasons that the immigrant is suspected of all this radicalism is that he has been like a flock without a shepherd, left in an unorganized state. He has been more easily the victim of those who would exploit his ignorance or his lack of familiarity with American conditions and because from the great American labor movement he has felt excluded. He has felt neglected and ignored by them as much as he could possibly feel in the case of the employer, so that it is a general plea for justice as a fundamental feature of Americanism, justice in our relation to the immigrant, which is so fundamental to his well-being and which is equal to what we Americans expect of America—what the immigrant himself has hoped of us.

PUBLIC EDUCATION

Another great principle of Americanization is public education. And here again the industry has been most progressive in helping public education and our school systems to find the way to educate the immigrant. The danger now is that many a plant here and there, having found successful teachers for the immigrant, shall be convinced that the whole problem of instruction of the immigrant can be handled under private auspices and at private expense. In this way there are springing up all kinds of royal roads to learning of English and citizenship.

There are classes in which foremen can be trained in four lessons to teach foreigners English adequately. There is perhaps no greater specialty than the teaching of a foreign tongue, and with all the good work that has been done in the industry, we can be quite sure that in the long run our great American school system is going to be the only adequate agency for meeting this problem. That does not mean in any sense that industry is to give up its part. Very often the easiest places for the classes are in the shops where they can be held immediately after the men are through their toil, where they do not have to go home and change their clothes and wash up and where they can feel perfectly at home. The practice has become wider and wider in cities like New York, Chicago, and Cleveland which have made the greatest progress in this work, of the industry helping to organize the class and looking upon the public schools as the means of furnishing the teacher, the standard of work and the general supervision. The Y. M. C. A., which is one of the pioneers in this field of work, has come more and more to this practice and is coöperating with the Americanization Committees in organizing classes, only to turn them over to public school systems.

The resources, the technique, the general right of the public and duty of the public to provide such education, I am persuaded America will not overturn when it comes to those who perhaps need more urgently than any others of our people the services of the public schools.

But, let me add one other reason why it is going to be increasingly more effective to use the public school system and let it be known that the classes are under its auspices. Industry has enough troubles, as has already been indicated, growing out of many suspicions, some true and some false, many of them false, to be embarrassed by any unnecessary suspicions among the working men. There is spreading the idea that there is some kind of industrial education—largely untrue but yet suspected—that the employer is going to put over on his employee, and that fear you can “pooh-pooh” at until you stop to realize that the best administration that New York City ever had was overthrown very largely because it was suspected that a very large employing interest had control of the public schools for the purpose of doing just that sort of thing.

So that in the matter of the educating of the immigrant, America can do nothing better than to reaffirm its practice and to preserve the responsibility of public education for the needs of the immigrant.

FREE COMMUNICATION

Very closely connected with public education in an adequate idea of Americanization is that of free communication, including free speech, one of those Americanisms which were inevitably restricted and interfered with by the war. But as we come back from that swing of the pendulum, we need to be sure that war necessities are not made peace practices.

There seems to be considerable danger that in the field of Americanization, our fear of differences of languages, identified with differences of loyalties in our minds, unnecessarily and unjustly will prevail under peace conditions. The result has been that many states have tried to enforce laws that would suppress the use of foreign languages in public assemblies. There has been a great deal of talk about the suppression of the foreign language press. Of course, that is all said without a thought about the century-old attempts that Europe has been making to suppress languages, because it was just that sort of policy that lay back of German imperialism and that policy that has broken the Central Powers. The attempts to suppress the languages of the subject people, their minorities, has resulted in breaking the Austro-Hungarian Empire into small fragments, for it is true, the more you attempt to suppress and coerce the use of a language, the more it strives and flourishes. All the world history points in that direction, so that there is danger that America shall disregard and fall into the errors of the European autocrats in this respect, for think what it means, not only in the way of creating opposition and resentment but in the direction of cutting off freedom. It means practically striking deaf, dumb, and blind most adult immigrants.

We all more or less have tried to learn a foreign tongue, and what facility, after we become adults, have we for reading, for instance, in another language? So that in all we say about schooling for the immigrants, don't think that the majority of the immigrants' information is going to come to him in the English tongue. That is contrary to human nature and practice. So whether as a fundamental of democracy the immigrant American keeps in touch with all that is going on in this country depends largely on whether he can be addressed in his own language and whether he can receive a newspaper in his own tongue.

VALUE OF FOREIGN LANGUAGE PRESS

There were some very startling indications of the usefulness of the foreign language tongue in the war. The much-discussed Committee of Public Information established a precedent for giving to the foreign-born in their own languages everything that the Government wanted any of us to see. In a letter the provost marshal has stated that whereas the provost marshal's office had expected the greatest difficulty in the registering of the foreign-born, he wanted to testify that the enrollment had been as nearly one hundred per cent and as easy among the foreign-born as among the native-born because the army had had the facilities of the foreign language press.

The same thing can be said of the Liberty Loan Division of the Treasury and so on through the Employment Service, through the War Savings Stamps, and through every one of the Government agencies that needed to mobilize resources and men for the great purposes of the war. The foreign-born responded so nearly a hundred per cent because we did not cut them off from free communication with us. In fact, there came to our notice many illustrations of how foreign languages through their newspapers and their addresses had shown us the way into this war.

For instance, there was a foreign language newspaper in Chicago, a German paper, that had gone just as unnoticed as another one that had been advocating kaiserism and German autocracy ever since its foundation. But this first paper, of which we had been just as ignorant as of the second, had been, since its foundation around the time of the '48 revolution in Germany, trying to tell German-Americans, and would have told the American-Americans if they had listened, that they must overthrow this outpost of autocracy in the world, proving it understood America's task in the world much earlier than America did.

One day there came to our desk in New York a letter from a Division Commander in France expressing much concern because the French were so misunderstanding of our purposes, and he proposed that we establish in France a French newspaper that would explain to the French what the Americans had gone into the war for. That same day there came in this report from one of our staff in the northwest, that up in a Swedish community where all the papers were now being printed in the English language, was one continued in Swedish. Upon inquiry for the reason for that, it was given that this paper had a large circulation back home and it was now at work explaining to the Swedes the American purposes in the war. That was just at the time when we were wondering whether Sweden might go over to the cause of the Central Powers. The thing that this General saw as a piece of military strategy in France, an obscure paper in the Northwest was doing for us in Sweden. Thus, if the great idea of American freedom of communication is not maintained, not only will we cause the utmost resentment and provoke a revolution, perhaps, more quickly than anything else can do, but also cut off the most valuable means of our Government's and our localities' getting and keeping in touch with the immigrant groups.

There is now a national organization, the sequel or successor of this foreign language division of the Public Information Committee, doing this work for the Government and every Americanization committee in local communities could do nothing better than form alliances with the foreign language papers so that when we announce special exhibits at our art museums, etc., the foreign-born would know about them as well as the native-born, or whenever there is a safety parade, he would know of it.

Whatever is of interest to the native-born is perhaps of greater interest to the foreign-born for we are as curious to him as he is to us, and he reads it with as great avidity as the American as the experiment of the Government shows that every attempt to enter into free, general communication with him was met eagerly.

SELF-DIRECTION AND SELF-ASSERTION

But, there is one other great practice and principle of Americanization, the greatest of all, that is also in my mind most effective in Americanization. It is all summed up in that phrase "self-determination". Whatever else the American is, we pride ourselves on being self-reliant and self-assertive more than any other people on the face of the globe. We are freer from traditional restraint and control and habit. We are more willing to sail uncharted seas. In industry, we are most familiar with its effect on production. We are constantly boasting that the reason American factories can turn out so much more merchandise is because the American is more resourceful, has more initiative.

We take pride that our army was as effective as it was because the ordinary private showed that same self-assertion and resourcefulness.

Now, that most peculiar characteristic of the native American is just as much a characteristic of the immigrant American for immigration is a great process of natural selection, whether we are talking about immigration in 1919 or 1619. It takes the same kind of people to break with their past, to pull up their own roots from where they have grown, and transplant themselves into a foreign soil! We scarcely realize, perhaps, how much the immigrant is exactly like ourselves in this most fundamental characteristic! That which brought our forefathers here brings these new Americans and it is because of this great insistence upon individual initiative and freedom that America is the kind of land and government it has come to be.

That being true, there is no more precious characteristic of this new America, no more tenacious characteristic, than this right of self-direction and self-assertion, and you may be sure that this fundamental ingredient of American democracy is going to be as much safeguarded by the new as by the old America. So, if there is any attempt to coerce to a conformity that is artificial, that is inhuman, our efforts are going to fail utterly.

AMERICANIZATION THROUGH GROUP ORGANIZATION

The most effective things that are being done for Americanization today are the things that could be well-defined as self-Americanization. If it were possible for us to take away this initiative, this self-reliance and self-assertion of the new America, we would never have an American left. He would become some kind of a puppet, but never that individual that makes up the great democracies.

Now, with that understanding, you will understand what your next speaker is going to tell you about why the Liberty Loans succeeded so well among the immigrant groups. It is because the immigrant groups themselves were called in by the Treasury Department to do that piece of work. In every single other task that we want immigrants to do the work, the immigrants themselves are often running far ahead of that which we are planning for them, and if it is planned by us as a program to be put over upon them, the failures are so numerous that it is no wonder we give up in despair as often as we do.

We will take a safety program or a health program, which is so popular now in American communities, and we devise them and we promulgate them and we promote them and we wonder why under heaven, for instance, the children's year took so little with the foreign group.

Mr. Rieg is going to tell his experiences in the Liberty Loans. On the fourth of July we were together at a great Italian picnic in Chicago where one hundred and twenty-five Italian societies that were founded primarily because of sickness and death were represented. That certainly was of health interest in Chicago. They were gathered to form a federation to call upon the resources of Chicago to help them. Well, the politicians were there. City Hall was well represented. They were wise enough to realize that the way to deal with the immigrant is to deal with his organization. The labor leaders were there. The foreign press was there. But, not a single representative of the health interests of the City of Chicago was present, apparently ignorant and blissfully ignorant of the affair.

Here was a group groping for ways to improve their own health, and largely because our own program was a self-made program and in no way related to their point of view. It will be no wonder if things go there as they do in other cities. The Italians will go groping on and the native Americans will go groping on and no program can be successful until the foreign population are made full partners in it.

I could go on telling you illustrations of how the foreign-born are Americanizing themselves through their coöperative activities, their self-directed, self-governing groups, but just let me sum up in closing that an Americanization that is worthy of America must include these fundamental principles of justice, public education, free communication, and self-determination, for only as we are loyal to the best in America will we make the new Americans the best Americans.

CHAIRMAN MOREY: To me one of the most significant things Mr. Burns has said is that the American problem is not just with the foreign-born, for I believe that many a foreigner brings the ideal of Americanism to America, and he has it in his heart more than some of those whom he finds here.

Our company employed about twenty-four hundred men last year, perhaps half of them are foreigners or descendants direct, and I find them tractable. I find them not the trouble-makers. The only problem with the foreigner seems to be to give him information, to make him understand. But, his mental processes ring true, and when we Americans in America can learn what Americanization is, then we will have a very much different problem. It is not just with the foreign-born.

I think it must have been with that idea in mind that the next subject was written, "The Immigrant's Part". Only part of our problem is with the foreign-born.

We are fortunate in having with us Mr. Hans Rieg, Chief, Foreign Language Division, War Loan Organization, U. S. Treasury Department.

Mr. Rieg has had wonderful experience with the Liberty Loan floatations and he can tell as much from immediate contact with this foreign-born problem as anybody.

THE IMMIGRANT'S PART

HANS RIEG, CHIEF FOREIGN LANGUAGE DIVISION
U. S. TREASURY DEPARTMENT, WASHINGTON, D. C.

You can take iron ore, smelt it into pig iron, and roll it into angle or round, as you desire. You can take a tree-trunk, saw it in two and shape from it whatever you want. You can take a huge rock, split it or chisel it as you see fit.

You can take any inorganic substance and by mere application of mechanical skill or chemical process change its nature and its shape.

But you cannot do this with anything organic. In plant-life you can only make desired progress in the process of changing shape or character by patient application of scientific methods.

In animal-life the same applies. When we finally approach the human being, it is obvious that the process of changing, reforming, remoulding of habit, custom, sentiment and language will be slow. This process must be scientific, sympathetic, and above all based upon the coöperating and coördinating consent of him, who is so to be changed.

You cannot make an American out of a foreign-born by force, nor in a day.

Any government which will attempt to nationalize its subjects of various racial origins by forcible or arbitrary method will ultimately come to harm. This is not idle theory, but established historical fact.

There are in the United States of America more than 15 million born in foreign countries; over 14 million more are the children of foreign born. Of these 29 million, more than 50 per cent speak and read either exclusively or preferably the tongue of the country of their origin. In the aggregate, they converse in at least forty-seven different tongues. They read 1,394 publications printed in 35 different languages. The combined circulation of these publications is about 14,000,000, and more than 8,000,000 individuals read nothing else, because they can't.

Thoroughly cognizant of these conditions within our country, and having an extended knowledge of the traits, customs, and languages of these many different racial groups represented within our population—gained partly through contact with and observation of them within our own land and partly through world-wide travels in their own countries—I fully realized that in order to arouse their enthusiasm in behalf of the financial enterprises of our Government as a consequence of our entry into the war, it would become necessary to conduct a highly specialized campaign.

When borne in mind that the Bureau of Publicity of the Treasury Department was organized May 7, 1917, and the campaign for the First Liberty Loan opened, but twelve days later, it can readily be seen that time was most valuable. Within a period of three days I proposed the formation of a distinct Foreign Language Division, formulated a plan of activity and organization, obtained the approval of W. G. McAdoo, then Secretary of the Treasury, was placed in charge of this Division and started operation May 11, 1917.

Just as scarce as time, was working material. Everything had to be dug up. Authentic and up-to-date lists of publications printed in foreign

languages, lists of national organizations of all kinds with members of foreign birth or extraction, statistics on the various racial groups showing where they predominated, how engaged, their leaders, etc.—all this had to be gotten, and gotten quickly.

I did the best that could be done under the many adverse conditions and showed noticeable results in behalf of the First Liberty Loan.

Immediately after the first campaign, steps were taken to organize more thoroughly this specialization along national lines. I was authorized to make trips to the various Federal Reserve centers, in each of which a Foreign Language Division was established. In addresses before racial groups, editors and publishers of foreign language publications, etc., I drove home the exigency of organized and undivided support of the government so that by the time the Second Liberty Loan was announced, a nation-wide, highly specialized campaign in its behalf could be conducted, which reached into almost every nook and cranny inhabited by foreigners.

A special poster was designed for distribution among the foreign-born. Special publicity material was prepared. Some twenty-odd thousand organizations, both civic and church, were directly appealed to, and racial group leaders, pastors, priests, and presidents of organizations were enlisted in the campaign. All these agencies responded most willingly, and seemed to welcome the opportunity of doing something for their adopted country.

As a consequence, the response to this Loan from that part of our population was amazing. Subscriptions came not only from least expected sources, but in most surprising manner, both as to numbers and amounts.

The interval between campaigns was used to extend and intensify the organization of the existing Foreign Language Divisions throughout the Federal Reserve Districts, steadily to enlarge the lists of organizations of all kinds with a membership of foreign extraction, to keep the interest alive and increase it wherever possible—preaching loyalty, patriotism, and 100 per cent Americanism at all times.

FORTY THOUSAND ORGANIZATIONS HAVE FOREIGN-BORN MEMBERS

So that by the time the campaign for the Third Liberty Loan was launched, contact had been established with more than forty thousand organizations and with every foreign language publication in the United States. Racial group committees in Foreign Language Divisions of Federal Reserve Districts ranged in number from eighteen to thirty-seven, representing as high as forty-three distinct nationalities, their number depending upon the number of their kind within the district. Steps also were taken to provide facilities to record and tabulate the support of these various nationalities to this Loan. This was done for a double purpose; first, to establish rivalry and thereby stimulate production, and second, to enable the Treasury Department properly to give credit where credit was due.

The tabulations of the subscriptions to the Third Liberty Loan, as reported to the Foreign Language Division of the Treasury Department either directly or indirectly through the Foreign Language Division of Federal Reserve Districts, show that thirty-eight nationalities produced

\$741,437,000, or 17½ per cent of the total amount subscribed, and 7,061,303 subscriptions, or 41½ per cent of the total number of subscriptions.

The showing in behalf of the Fourth Liberty Loan was even more gratifying: \$1,114,536,350, or 16 per cent of the total amount, came from those of foreign birth or foreign-born parentage, and the number of individual subscriptions was 10,614,632 or 46½ per cent of the total number.

The response to the Victory Liberty Loan, in proportion, came up to past achievements.

Backing up most intensified organization among all these various races and nationalities, the Foreign Language Division prepared publicity material in thirty-four different languages. Special posters, pamphlets, editorials, feature stories, news items, copy and cuts for display advertisements, and personal appeals published over the signatures of racial group leaders were given national circulation. Take just one item: A lithographed reproduction in colors of the "Americans All" poster, which had been especially designed for that part of our population, was circulated to the number of seven million copies as an art supplement through the foreign language press.

From all this it is obvious that this specialized work was not only necessary, but most productive. The actual results should be measured not only by the amount of dollars produced for governmental purpose but also by their benefits to the foreign-born which, I believe, are much farther-reaching.

Let me sum up a few of these benefits:

First, it has brought the foreign-born back to the thrift and saving he had learned as a child and which extravagant America had made him forget.

Second, it tied him to this country by a new bond, and laid the foundation of a deeper, better citizenship. A Liberty Bond has nothing in common with anarchy, atheism, and soap box Bolshevism.

Third, the unification of each race among its own people and of dozens of races in a great movement like this got them acquainted, blotted out racial and religious differences and merged all in Americanism.

Fourth, it has made every native born, the so-called *simon-pure* American, who has come in touch with this ground swell of foreign-born Americanism, have a deeper confidence in the future of our country and a holier appreciation of the liberty and democracy, which those who were born here take as a matter of course. From these many peoples from many climes, now all under one flag, we now have an outward and visible sign of that inward and spiritual Americanism which is evidenced by our country's motto, "E Pluribus Unum."

However, as stated, these results achieved, amazing as they are, could not have been achieved without specialization.

To employ similar means in behalf of Americanization is obvious.

It is equally as obvious that Americanization is one of the most important tasks before us. As already indicated, we have now been made to realize as never before the importance, both as to *quantity* and *quality* of that part of our population which is of foreign birth or foreign-born

United States, and that more than 8,000,000 individuals read nothing else but such. It is their only source of information. Information begets education. Take away from them this source and you will create most fertile soil for undesired, detrimental and sinister propaganda. See to it that this source of information is made thoroughly American and clean—this can be done—and you have the desired and necessary medium of national benefit.

The invaluable service which the foreign language press rendered to the government during the time that we were at war is a matter of indisputable record. Not only the Treasury Department, but the State, Army and Navy Departments of the United States, recognize it.

Equally as valuable service can these foreign language publications render in time of peace. I consider them an absolute and peremptory need, a need not temporary but lasting, as long as we have within our midst people not thoroughly conversant with the English language or totally unable to speak it, and as long as we shall welcome to our shores for either permanent or temporary residency, peoples from foreign climes.

Well do I know that there exists great difference of opinion as to this. Let me assure you that I, as fully as you, am cognizant of the extended criticism, in many instances most severe, and by no means always just, meted out to those publications which are printed in foreign tongues.

This criticism has come from various sources. It has been prompted by many motives, and neither source nor motive has always been pure and unselfish. However, some satisfaction is to be found in the fact that equally as great men have been for it as have been against it. No matter how eminent or wise a man may be, he cannot always be right. But when it comes to the advocacy of complete abolition of foreign language newspapers, then I shall make bold to assert that no matter which the source or who the man, they are absolutely wrong.

I make the claim, as already indicated, that the foreign language press was as necessary to the successful conduct of the war as it is necessary to the safe, harmonious, and orderly conduct of the forces of our Government in times of peace. My friends, it is as necessary as a law of gravitation to the flow of the waters of the Mississippi.

However, there must be a vital and most thorough change in fundamentals and general policy. Let me sum up what I mean by this in these words:

AMERICANIZE FOREIGN LANGUAGE PRESS

What we have had have been Italian papers printed in America, Polish papers printed within our country, Bohemian papers printed within our land, German papers published within the United States, and so on down the list. And that is wrong. What we must have are American papers printed in Polish, American papers published in Bohemian, American papers published in the tongue of Italy, American papers printed in German, etc. Just as the individual who comes to us from foreign shores with the intent to live here and to benefit from the advantages of our land is expected to swear allegiance to the Stars and Stripes and mean it when becoming a citizen, so must the foreign language press become

permeated with undivided allegiance to but one country. It must be the mouthpiece of unadulterated American patriotism and its keynote should at all times be full-fledged loyalty without reservation, to but one country, the United States of America.

No objection should be had to the conveying of information pertaining to the countries from which their readers come, but serious objection should be raised to the treatment—editorially or otherwise—of matters from any other point of view but the American point. It will mean the preaching of American doctrine pure and simple. It will mean the performance of one of the greatest, noblest missions which can be allotted to any one. It will mean that the foreign language papers will drive home to their readers, conversing in many tongues, not only the blessings of our land, but also their obligations toward it. It will mean the thorough and expedient unhooking of the hyphen, gradually embracing all our foreign-born within that great big family circle of "Americans All" and for "America First"—the greatest nation and the grandest country in the universe.

CHAIRMAN MOREY: The immigrant coming to our shores incidentally comes into contact with governmental agencies, but it is only indirectly that he thus comes into contact with Americanism as a political institution, but he does come into direct and immediate contact with our industries. That is where his family is concerned. That is where his bread and butter and clothes are to come from, and he is to be taken care of. As Americanism is interpreted to him through that contact, that contact is what he thinks of America.

Our next speaker will treat of the responsibility of the industry—what the industries can do in this matter. We will be pleased to hear from Mr. H. T. Waller, who has been with the Educational Department of the B. F. Goodrich Company.

WHAT THE INDUSTRIES CAN DO FOR AMERICANIZATION

H. T. WALLER, AKRON, OHIO (FORMERLY EDUCATIONAL DIRECTOR,
B. F. GOODRICH COMPANY, AKRON, OHIO)

The title of this paper could well have been reversed to read "What Americanization can do for the Industries", and the author would be most glad to discuss a paper under this heading. However, the Executive Committee have decreed a paper on, "What the Industries can do for Americanization".—we obey the mandate.

INDUSTRY OCCUPIES THE STRATEGIC VANTAGE POINT

Industry occupies a strategic position relative to the Foreign born. Industry has needed the man with the pick and shovel, the man with brawn, the man eager to make good, the man willing to work under all conditions and at all times. The industrial progress of this Nation has its foundation built by the supply of immigrant labor. Industry, however, during

the later years has come to recognize a much greater potential force in its unskilled labor than heretofore. It has come to recognize a terrific loss due to misunderstanding; it has realized also that only as understanding is created between employee and employer can best results be secured.

Outside of Industry certain social and educational forces have been working many years to create a better understanding of the foreign born situation. Many have recognized that only as a common language was used could the best of understanding be created and maintained, and to this end educational and social workers have been seeking to develop an Americanization consciousness that would appreciate the potential value of the immigrant. As the work progressed under private and organization leadership it soon developed that in order effectively to carry on Americanization work, in order to reach positively the great army of workers it was necessary to have classes and activities conducted where these people were brought together in natural groups. This place is the industrial plant. Watch the thousands of employees as they come to and leave work. They come from and scatter to all points of the compass. While in the plant and even in the departments of the plant are gathered large groups of these men who here, at least, have a common point of interest. It is the place where their daily bread is earned, and where they are earning that which will enable them to safeguard and enjoy the future. It has been found also that of all influences that are effective in dealing with the foreign laborer the influence of his foreman leads. Consequently, certain workers in this field have endeavored to develop a plan by which the largest number of foreign employees might be most effectively reached for the benefit of industry, for the benefit of themselves, and for the benefit of the community. For, after all, the interests of the one are the interests of all three, and injure the best interests of one and you will injure the best interests of all three. *For the basic interests of Employer, Employee, and Community are identical.* What then can Industry do? Occupying as it does the strategic vantage point.

RESPONSIBILITY FOR AMERICANIZATION WORK

Industry can and should supply within its organization a person or persons charged with definite responsibility for developing the best interests of the foreign-speaking employees in the plant. No outside agency can come in and do what this agency from within can do. It is necessary that Industry shall stick to its job of production and any work that is done must be so conducted as not to interfere with production, but this has a vital influence upon production, therefore, find a man or men with high purpose, social vision, and practical common sense, who will work together with the Foreman, Assistant Foreman, and American workers of Industry. The result will be an established point of contact with the foreigner that is bound to be of tremendous value. The men responsible for Americanization in the Industry must be men of Community vision, not men who are simply creating a department and a job for themselves. This latter point of view would be suicidal to the object desired. For when it comes to the question of instruction of the employees in the

knowledge of English, the ideal is the educational leadership of the community, namely, the Board of Education and the point of coupling the public educational forces to the industrial power is a delicate one and calls for splendid leadership on both sides. Industry can do more for the promotion of Americanization than any other single agency. In fact, Industry must do more, for it is to the best interests of Industry that it should be done. The type of community in which a man lives determines more than we now realize the type of production that he turns out. There is, therefore, a compelling economic force which determines Industry's place in this great problem.

INDUSTRY MUST TAKE LEADERSHIP IN AMERICANIZATION

Today we are facing the problem of a great labor shortage due to natural causes. The fact that foreign labor is returning to Europe is a natural thing, but if Industry and the Community had paid special attention to establishing a sympathetic, intelligent point of contact with foreign labor, the result would have been the establishing of permanent homes in this country on the part of the foreign laborer, to a very much greater degree than has been the case. Only in so far as we are able to establish this personal contact are we going to be able to stabilize labor. Industry must, therefore, take a position of leadership in the problem of Americanization, and where Community Educational forces do not recognize their responsibility for adult education, then Industry must and can take the leadership, and furthermore must see to it that there is a change in attitude on the part of the educational leadership in such a way as to meet the needs of the community which they are serving. One emphatic warning is essential in connection with this problem. Force, compulsion, paternalism should be shunned as though they were a plague. We do not want American citizens as a result of compulsion. Friendship is not a thing that can be forced. Friendship is the result of sympathetic understanding. Friendship will result in the building of an ideal community. Understanding will result in the creation of an ideal industrial relationship. It is possible to secure this through the point of contact established in Industry through the agency of Americanization leaders.

COÖPERATION OF INDUSTRY AND COMMUNITY

In the coöperation of Industry and the Board of Education there is a combination of Industry and Community that is bound to react most favorably upon the Individual, the Industry, and the Community.

Industry holds the vantage point of economic leadership. The solving of this great National problem will depend very largely upon the vision of industrial leaders who recognize the tremendous value of an intelligent understanding.

SAFETY ENGINEER SHOULD PROMOTE AMERICANIZATION

Safety work in Industry is an accepted part of industrial necessity throughout this country. Just what relationship the work among the foreign speaking employees would bear to the safety problem is compara-

tively easy to analyze. Every safety engineer will say that the best safety device known is a careful workman. Careful workmen are an impossibility if they are unable to understand instructions, both verbal and written. Every safety engineer should be an insistent promotor of Americanization effort. He, more than any other single department head in the Industry should understand the vital importance of a thoughtful, understanding working force. Only as every employee is able to understand and read warnings and instructions relative to dangerous machines is it possible to cut down the fearful fatality list, which is now a fact in our industrial life.

ESSENTIALS IN INDUSTRIAL AMERICANIZATION

Industry must then supply leadership, money, and coöperation in the work of Americanization. The leaders of Americanization also must take their position with the leaders of direct production, working with them in close coöperation in order that there may be developed an industrial life based upon sympathetic understanding and mutual helpfulness.

CHAIRMAN MOREY: The purpose of this session, as indicated by our program, is to ascertain, first, what an American is and, second, what we must do to make us all Americans.

We will now have a discussion of these splendid papers we have heard and I will ask Mr. George B. Fout, Supervisor of Night Schools, Youngstown Sheet and Tube Company, to lead that discussion for us.

DISCUSSION

MR. GEORGE B. FOUT: The first I have heard of these excellent papers is in hearing them presented here this afternoon, and the speakers preceding me have so well delivered their message and given you so much food for thought that it is hardly worth while for one who is so young. I don't mean in years but in Americanization work, to tell what the essentials are in these papers.

I simply want to say to you that I have been brought into the Americanization work by circumstances over which I had no control. In a community of fourteen thousand inhabitants, 97½ per cent of whom are foreign born. I was the first American-born leader who was willing to live among them, that I might be better able to understand them and to know their needs and try to work out their problem.

And, I want to say to you men and women interested in work for the foreign born, that although I have been a Y. M. C. A. Secretary and a religious worker nearly all my life, my happiest and most fruitful years have been the three years spent in East Youngstown, which did not have a very good reputation in the estimation of a great many people because of the things that happened there.

Our speakers have brought to our attention the attitude of the American to the foreign-born man, and what the American laboring man is thinking today about the foreign-born man working in the steel industry. I think I have had a good opportunity of discerning that this last week.

I want to say to you that, whether it is just or not, I am afraid that this crisis which is on us, instead of drawing the American-born workman closer to the foreign-born—this thing that has been brought about because of false leadership is going to work for his harm rather than his good.

If we are going to Americanize, first we have to decide what is American. If I should ask you men and women here today to select the American that you would want these foreign-born to become like, whom would you select?

(The audience expressed its choice as Theodore Roosevelt.)

Now I am going to emphasize what the last speaker has brought to your attention. As I have learned to know these foreign-born and to know their minds and needs, living among them and having them come to me with their woes and troubles and knowing their heart throbs, the thing that they need and are asking and longing for is for other Americans, not like myself but better than myself, who are willing to go down among them and live there and show them what to do, and let them know that their hearts beat with *their* hearts. If we expect to Americanize them, we have to be willing to do that, otherwise their so-called leaders are going to control them as they have done in the past and will do until we are willing to do it for them.

Just a few weeks ago when they had trouble in the Catholic church down there, they sent for one of their own nationality in Youngstown—a lawyer—to tell them what to do. He came and they got deeper in the mire than they were before. They went before the Mayor with their lawyer and committees requesting him to prohibit their priest from entering the church on the next day. It being just a few days before the strike was to be called, we were concerned, and they sent for the Americanization man who stands before you to go before the committee. I went and it was about a quarter after twelve on Saturday night when the factions were brought together. They are all satisfied now and the committee said I was the only man in the community who could do that because I was a native-born American.

I could tell you many instances where the work in East Youngstown has been developed and ideals have been given without a word being said about ideals, because I was willing to work and fight and give service to them so they couldn't refuse when I asked it of them.

A great many of the industries as well as their Americanization directors are saying that we must not let religion touch this question on any side at all. I want to say to you as a Protestant that I have lived in a community that is eighty-five per cent Catholic and have been before every foreign society and have attended many celebrations held in the interest of the Catholic Church. I have always been asked to speak at the meetings and have always spoken on religion, its needs and influence, and I have had the priest come and thank me for emphasizing ideals of what America stands for in home life and church life. I am not afraid of religion. They are the most religious people I ever came in contact with and they want it.

Last Sunday we had a lot of men shut up in the mill, and some of them wanted to get up an entertainment on Sunday night—a vaudeville performance or something of that kind—because the men couldn't get out. I am thankful to say that there were some men who had grit and sense enough to say "We want a religious service". I gave them a religious service last Sunday morning and again last Sunday night and they were all so well pleased that they asked for one during the week. I want to say to you, friends, industry can be religious and you needn't be afraid of it, either. I have been religious ever since I was fourteen years old and although I am not as good as I ought to be now, I believe in it and so do most of the men, especially the foreign-born.

NEED LEADERS WILLING TO MAKE SACRIFICES

Mr. Waller struck it when he said, "We want the men and women who are willing by their lives to interpret Americanism to these people." It is not only that we want it, but they want it more than we do. That is the most important thing in this whole problem—to have a leader who is willing to make the sacrifice and work twenty-four hours in the day if necessary.

Do you know that in these years, I venture to say, I have had fifty different organizations come down to East Youngstown that have looked over the field and said: "Oh, Mr. Fout, what a wonderful opportunity you have here. I would give anything if I could locate here." I said, "Yes, not anything, but it must be everything." They wouldn't give anything at all. They went away, all of them, and forgot all about the place and opportunity.

A very attractive worker called a few weeks ago. She had been over in France. I am an old bachelor and was in sincere hopes she would come and work. After looking over the field she said: "Oh, it is just the most wonderful field and the most wonderful opportunity." I said: "Are you going to come and do the work?" "Oh, no, I am only an investigator, but I am going to send down a worker."

I haven't heard anything from that organization, though. It is six weeks ago she was there and she promised to send some one in two weeks. I have come to the point where I feel like telling all investigators, "Please stay out unless you are willing to come down and do the work that ought to be done."

Let us know exactly what must be done and what we want to do along the right lines of Americanization, and then we will get where we ought to be in the Americanization problem, but it is only going to come by the sacrifices of those who really are willing to understand the foreigner and to sympathize with him in the efforts he is making in this his adopted country.

CHAIRMAN MOREY: Now let us have a good earnest discussion. We have touched some pretty deep things today and these gentlemen who have studied this problem and presented these thoughts are here to discuss them with us.

MR. R. D. HALL (Coal Age): I am one of those foreign-born of which

mention has been made today and I have been the subject in many years of the efforts of my friends to promote Americanization. I must say that I have not as a subject been very much impressed with the work that has been done; that my Americanization as it has come has come largely from my desire for Americanization rather than from the urgent efforts of the friends with whom I have been associated who have been very anxious to change my point of view.

MISTAKES IN METHODS OF AMERICANIZATION

I consider it possibly one of the hardest things in the world to start Americanizing anybody by a process of either compulsion or persuasion. I want you to get this into your head. I don't want you to think for one moment that it should be difficult for the foreigner to become an American because I do not think it is, but I feel very much. or I did feel when I first came to this country, in the position of a little child who had lost its mother and the mother it had was poor and the conditions of life were somewhat hard, and a rich person came along and offered to act as foster mother for this child, and every night before she put the child to bed, she said, "Don't you like me better than your own mother? Am I not a richer and a better and an altogether nicer mother than the one who bore you and took care of you in your youth?"

I think it is a mistake to attempt the naturalization system on the basis of running down a foreign country. It doesn't matter how much better this country may be than any other country, and I am prepared to admit all that you argue. It creates an antagonism in any event and any one who is an antagonist endeavors to say the very best on the other side of the question. You are so sure you have a good country—and you have it—that in time he will become a good citizen, and you can get him to wean himself from his neighbors who are of his own extraction.

I think sometimes that our Americanization work tends too much towards the political end. We Americans do not want any foreigner to become a citizen, to have the right to vote, until he feels that he is an American. Our tendency has been to give the foreigner a vote before he felt he was one of us. The last thing that should be given a foreigner is a vote. He should feel deep down in his heart an affection for the United States before he ventures to cast a vote. People used to say, "Well, why don't you become naturalized and get a vote?" It always seemed to me it was a crime almost until I had been thoroughly imbued with the ideas of America to cast my vote at all. I was perfectly willing to wait until a more perfect change of heart came.

I quite agree with the speakers who say that there will always be in the heart of every man a certain degree of affection for his native land. Please remember that the man who does not like his native land will never like our native land very much.

The man who has been the bad citizen from where he came and could never feel a responsibility to his neighbor and a feeling of gratefulness to him for his goodness will never be grateful to us for our goodness. If he is an ingrate, we do not want him. The man who has a live love

for his native land still resting with him after years of living in this country is possibly very much better an American citizen for that, because it shows he can remember his father and his mother and his childhood days and his little church and all those things which were dear to him and which will continue to be dear to him as long as he lives, and if you ask him to cast those things away, you ask him to cast away the very treasure of his soul and it is wrong.

Let us remember there are things in Europe that are sacred to every man and to ask him to change his point of view and to look with despectfulness toward it is all wrong. We should lead him to a higher and better life. It is some of those people who are most devoted to their native land who are most devoted to this.

I want to say something about other foreigners I have met—Magyars. When the war was on we were running more or less patriotic material in our paper. We also had posters and things of that kind and it wasn't for any purpose but creating patriotism. It wasn't long before the Szabadsag came to us and asked that some of the stuff we had run in the basis of the paper should be taken over by them. They used those cuts again and again. I know they were performing a patriotic service, and I think the statement made by Mr. Hans Rieg was not altogether representative of the facts because I believe there was a good deal of money given by foreigners of which we had no account whatever. I think most of them are very patriotic people. I believe they are determined to help the United States in every possible way, and the very best way for a foreigner to appreciate America after he has been in the United States a few years is to go back, and I assure you after he comes back from a trip abroad, he is a better citizen. I am sometimes sorry I have only been back once. They tell me when you meet a foreigner abroad who has been in America, he shows his true Americanism in his delight in seeing you. It doesn't matter how much he waves the flag, if he feels in his heart that he loves America, that is the thing for which we are aiming.

SALESMANSHIP THE KEYNOTE

MR. EUGENE J. ROESCH (New York City): It seems to me today that the keynote of the speakers and of the last speaker particularly is salesmanship.

We in America pride ourselves on our salesmanship. We are learning that in order to sell a product, you have to know your field and you have to know what you have to sell.

Now, let us consider this proposition from that standpoint. I feel, through years of residence abroad in my engineering work and in South America, that I have been better able to present America to the foreign-born because of that, and I would suggest that every man who expects to do real foreign work avail himself of some travel or connection with the foreign element. If he doesn't get abroad, let him go into the settlements in this country and study them.

There is one thing we have to realize and that is that America, just like the English language, is a growing thing. We have not stood still.

We have our ideals but they are growing, and so America is going on like a comet, dragging on more and more, and through accretion getting other ideals. We must realize, if we give anything, the people have something to give also. Give them a chance to give of their treasure.

It was my pleasure during the war to be connected with the Scoville Manufacturing Company in Waterbury and we had a number of problems at that time. We were prepared for unrest and also for keeping the health up, and all that sort of thing. I worked considerably with the Spanish and Latins. I like them. They are fine people. They are all fine people when you come to study them. They are all human beings—we must realize that.

STUDY CUSTOMS OF THE PEOPLE

Knowing a great many of the customs of the people, I will give you just one or two instances. There was one boy who was put among some Russians. He was a hot-blooded Spaniard who carried a knife. The Russians chipped him and the altercation was carried out into the street and, of course, he was arrested for drawing his knife. Our ideals are different and the judge who sentenced him to about two months on a very one-sided hearing didn't understand the custom of the Spaniards as I did. When he was in the jail in New Haven, some lawyer, the sort of chap who preys on the ignorance of people, offered his assistance. There again we get the wrong thought. We should suppress those gentlemen. If you want to Americanize these people, get them when they are in trouble and be a real friend, and you will get them by digging deep into the roots of their soul.

This boy, fortunately, had had some contact with us and he refused the aid of the lawyer and said that he would wait until he got into communication with me. I went to see him and told him it wouldn't be long before he got out. He was ready for a little dressing and he got it. In a few days he was free and he came to me and said, "Here is a hundred and fifty dollars. If I get into trouble, or if I gamble, you just give this money to the Red Cross."

Well, I am glad to say, gentlemen, that at the end of thirty days, the end of probation, he had reported either personally or in writing every day. I made that boy a leader of a number of Spaniards.

So on, one after another—rental troubles, oppression by landlords—get them and carry the case over. Use all influence, whether legal or not, fight for them and they will fight for you and this country.

Then we came to the flu. If you will pardon, this is a little personal experience, but it will show you what can be done. We had hundreds of men quartered in barracks, quartered on what is called Golden Hill. They consisted mostly of Portuguese, Spanish, and some limited service men, all the way from two hundred fifty to three hundred fifty people sleeping in barracks, perhaps seventy or eighty on the floor. We were rather concerned about the health of these men during the epidemic and so it was my job to sell those fellows precaution and health. I won't go into details. Every man who understands the things that promote human

beings to action knows the many ways with which you can work with leaders and groups and enthuse them. But, I want to say this, that those boys cleaned their teeth, took their baths, kept their windows open at night, exercised vigorously, and not one case of Spanish influenza developed among my boys on Golden Hill. Whenever there was a case of cold, the boys came themselves for the medicine.

They have their ideals and love of their home, of their games, and they had a chance to show some of our American friends their way of indulging in sports. I remember one evening when the American girls and men of the plants, and some of the boys from the office, about two hundred of them, saw an improvised Spanish bull fight. The bull was a human being but he was a pretty good representation of a bull. It was a total surprise to me except that I knew something, but not what was coming off. I let the boys figure out their own entertainment and do their part. In that way they imbued there, some of our spirit of fair play.

JUSTICE AND FAIR PLAY

I want to say if you expect to Americanize our very big population, you must not patronize them. You must sell them the idea of justice and fair play because you know them and have studied them and have put your best front foremost. We do not do that with our foreign-born. That is our trouble. We try our best to sell our goods, but if we expect to influence the foreign element of this country, we must really sell them the American idea.

MR. M. L. FEELMER (Local Council, St. Louis, Mo.): The addresses made by our speakers, the criticisms rendered in review of these speeches, the address made spontaneously by my English-born friend over here, just brings out a thought, and that is, that after all, when we talk about Americanizing the foreigner, there is just a trifle of a feeling of superiority in us.

Now, we have some very nice nicknames. The Frenchman we call a "frog". We forget that Dumas, Balzac, and a number of others were "frogs". The Italian we call a "dago". So was Dante. The German is a "dutchman". So were Goethe and Schiller. And, so it goes all the way through.

I have as yet to hear the first speaker bring out a very important point—to sell this great, wonderful, splendid country to its native citizens. Your foreign-born citizen usually knows more about America and its institutions than you do yourself. If you want to know America, if you want to know just how wonderful, how big, how great, how everlastingly beautiful American institutions are, let some foreigner tell you why they are so wonderful. You can't realize it unless you leave your own native land and compare conditions in foreign countries with those conditions which you, by an accident, have enjoyed all your lives and have taken as quite natural and as your just dues.

MR. WILES (Director of Americanization for the City of Cleveland): As an Americanization worker, I can say there has been no movement to discredit any foreign nation or any foreign tongue or any foreign prac-

tices, as they may be practiced there; but this is America, a country of amalgamation, and all that we are after is simply to continue the amalgamating or the melting or the weaving or the mosaic, or whatever else you want to call it. We are simply trying to bring people together. We are not trying to get a fellow to forget those things he loves in his motherland!

I never speak to a group of foreign men but what I make that point clear, Mr. Chairman: We are trying to get you to learn the language of America, not to forget your own language! That is the keynote.

Let's go away from this meeting this afternoon with this one thing which we will do: Whatever Americanization may mean, I am going to begin at the beginning, and the beginning of the Americanization movement in the minds of the sanest thinkers of this country is the acquirement of the language of America by those who do not know it. That is the beginning.

Now, in your factory, in your community, in your city, if the industry, if the Board of Education, if the social workers, if the Y. M. C. A. is not carrying on a program to bring that thing about, then it is not carrying on the first step of Americanization.

I want to take exception to the first speaker. It makes me a little peeved because you say a foreigner can't learn the American language just because you can't learn French! My trying to learn French in America is an entirely different thing. These people are living in the English language, speaking the English language, thinking in the English language! I promise you that we can take any man, fifty years of age or over, who has never had a day's schooling in the homeland, and we can give him a fairly good use of the English language in a year! Then, through a longer process we will give him those ideals of America, if he hasn't had them, and I know that most of them have them before they even come to America! Then, the last thing is citizenship. Let's confer that upon him after he has been associated with the ideals of this country. Let's teach him the sacredness of that citizenship so he will vote intelligently. But, we will never get very far until we have first taught ourselves the lesson of voting intelligently!

Mr. HANS RIEG: In direct reply to your statement, Mr. Wiles, you here in Cleveland no later than two days ago had an actual and practical demonstration of what can be done with fourteen different nationalities of foreign-born within less than three months' time. I have reference to the exhibition drill of the Americans-All Squad. My friends, those fourteen different nationalities three months ago couldn't speak a word of the American language. Today they converse in the American language, sing in the American language, and drill according to commands given in the American language.

But, how was it done? Not by coercion! Not by the employment of arbitrary methods. The Colonel to my knowledge worked on that thing for two years, and one of the first things he did was, he almost daily came to my office and afterwards went to my clipping bureau; he kept at his work until he speaks rather fluently about eleven tongues. He

put himself on an absolute basis of equality with the men, but he showed these fellows. "though I am your superior officer and I have control over you to command, I consider you just as good a man as I."

Now, one more thing, again coming to the value of acquiring the language of a land. There have been and there are today, decided efforts of coercion in so far as to forbid and handicap the use of a foreign tongue. That will place in the pathway of Americanization an almost insurmountable obstacle. So, may I ask you gentlemen if you are interested in Americanization, to use your individual influence on these men in the halls of Congress in Washington and prevent them from advocating such laws. They are unwholesome! They are retarding our progress.

MR. VERMILION (Akron, Ohio): In Akron we treat Americanization as a community problem. We have coördinated every agency, not only the industries. Y. M. C. A. and all the agencies of the men, but we have organized all the women, women's clubs, home and school societies, missionary unions, and every agency in Akron today is coöperating and working on this American program: not that any of us are taking a superior attitude but the women of the city of Akron are going into the homes of these folks and sitting down and visiting with them.

We are organizing classes now. We have ninety-seven classes in operation with a total enrollment of about fourteen hundred men and women. We invite you to come down and see for yourselves the practical working of what we think is a practical plan.

I have before me here two men, plant directors of two of the largest factories representing employers of forty-seven thousand men, sixty per cent of whom are foreign-born. These two men are the point of contact between the industry and the Board of Education. The Board of Education furnishes the supervision and these men are getting the foreign-born into the classes in the industry. They are not only getting the foreign-born, but Mr. Watson called me the other day and wanted a teacher for twelve Americans who could not read or write. He has approximately one hundred colored men who cannot read or write, and they are in the classes.

This is a community problem. We cannot wait for the Federal Government to solve it. We can't wait for the State. But, you gentlemen, in your respective communities can do the same thing that we are attempting to do if you will just go about it. If you could see the eagerness with which these fellows want to get into the school, with which they want to learn English and with which they want to take the higher studies, you would get an inspiration that would make you want to get started in the work and on the right line.

CHAIRMAN MOREY: Mr. Wiles, what do you think of this matter of compulsory abolition of the foreign tongues?

MR. WILES: I think in this Americanization program, there is no reason why we should touch that at all. These groups are here, have been for a good many years. If there is anything wrong with them, it is our fault. This is a great problem of neglect. It is a great question of oversight and we have simply let things go by until they went from

germs to pus, that is all there is to it, and we haven't any time now to talk about major operations.

We have a great problem of reconstruction now. The foreign press can render me a greater service in this matter than the American because I can get a message across that I can't in the American. I use foreign speaking men and women and I use the foreign language newspapers, but the thing I am hoping for is the time, which will come, when we won't need them. If we can carry this English program through, we won't need these things.

If you will pardon the reference, I lived in a very strong German town before the war—forty-seven per cent were German. The leading newspaper was German, but the boys and girls in the high school didn't read that newspaper. They were the third generation. They read the American papers, and this paper was just about on its last legs, because the old families had passed away. The old advertisers were still using it, but the newer generation was reading the American papers. But, I say, if that will help the old folks, the Lord bless 'em and let 'em have it; but in two or three years, there won't be any demand for it.

MR. A. M. CONLIN: This talk seems to be about giving the English tongue to the foreigner who wants it. How about the foreigner who doesn't want it, the fellow who cannot read or write in any language? How are we to give it to him?

MR. ROESCH: As I said, the keynote of our problem is salesmanship. If you are going to Americanize your people, you have to study them. The first step in any salesmanship is thorough investigation of your problem. If you will investigate it in a sympathetic way, you will find a way to proceed. Take the one step and the next step will follow the same as when you are behind a closed door, you get that lock open, and when you get into the room you will know what to do.

MR. CONLIN: That doesn't answer my question. Love for your fellow neighbor is a fine idea, but supposing your fellow neighbor doesn't care to be loved. I have been associated with the foreign element for a number of years, but the farther I go the less I think I know of the problem. You can't advertise to ignorant people. You have to advertise to thinking people, that is why you have a sales talk.

CHAIRMAN MOREY: Don't you think your problem is to improve your salesmanship?

MR. PALMER (Equitable Life Assurance Co.): In reading an interesting book this morning, "Ancient Peoples at New Tasks," I came across a paragraph which, to my mind, is applicable to this question. Dr. Greenfield of Labrador says, "If you want to convert people, do something for them that they understand and get their confidence, and through some direct evidence that you are going to do something for them, educate them that you are sincere."

CHAIRMAN MOREY: Our hour is late and we must close.

For my own use, I have drawn up a little memorandum as a result of what I have heard. First, I am going to study what true Americanism is. Second, I am going to try to be an American myself. Third, I am

going to see that my company is American in its attitude, by reflecting justice and fellowship to these men. Fourth, I am going to see that my community reflects this same American attitude, and last, to do what I can to sell this Americanism of the heart and of the mind to these foreigners.

Adjournment.

General Round-Table Meeting

October 2, 1919

THOMAS STANION, Chairman

Manager Safety and Sanitation, Aluminum Castings Company,
Cleveland, Ohio

GENERAL MANAGER C. W. PRICE: I want to give myself the pleasure of introducing the Chairman of this morning's session—Mr. Thomas Stanion. He was formerly with the Commonwealth Steel Company, and now with the Aluminum Castings Company, with headquarters in Cleveland.

Tom Stanion has been one of the most valuable men in the local organization. It was Tom Stanion who was the leader of the splendid school for safety supervisors that graduated a hundred and thirty-three men here in Cleveland.

I take great pleasure in introducing Tom Stanion as the Chairman of the Round-Table Session.

(Mr. Stanion took the chair.)

CHAIRMAN STANION: I think all of you know "C. W." just as well as I do. You know whatever he says must be taken with a liberal amount of salt. (Laughter.)

The National Safety Council came into being through the need of an opportunity to interchange ideas—a need and a desire for a clearing house where the experiences of one plant could be made available for others; and naturally out of such an organization at the start there came some very lively Round-Table discussions, such as we are going to have this morning.

These Round-Tables have been continued through the various Congresses, and each year with an increasing amount of enthusiasm and interest. Some people might think we are getting so far along in our safety work and know so much about it that it is not necessary to have these Round-Table meetings any more, but such is not the case, for this safety work is a generation's job.

MECHANICAL, EDUCATIONAL, AND SUPERVISION

As we have gone along in the development of safety work, the activities have defined themselves into distinct channels. There has been the mechanical side, the educational side, and the supervision side. This morning we are going to turn our thoughts particularly to these three points. There are some who say one is more important than the other. After we have heard the discussion this morning we shall have an

opportunity of knowing better where we feel the emphasis should be placed.

Our first speaker is one who not only has made a deep study of his subject, but he has based it carefully, methodically, and accurately on the facts available. He will tell you nothing about any theories that some good people think are good. He will tell you of the facts, and the things as they are. I am happy to present to this meeting this morning Dr. Lucian W. Chaney.

IS INDUSTRIAL DEATH NECESSARY?

DR. LUCIAN W. CHANEY, UNITED STATES BUREAU OF LABOR STATISTICS,
WASHINGTON, D. C.

This is a serious question. A negative answer is greatly to be desired. If such an answer is ever to be obtained it will be because the safety men of the country have faith in its possibility and energy according to their faith. I am very glad therefore to have the opportunity to press upon your attention my conviction that no less an ambition is worthy of the achievements and capacity of American safety men.

Consider your record for a moment. What have you done already? In 1907 the severity for the iron and steel industry was not less than 21.6 days per worker; in 1910 it was 15.9; in 1913, 13.9; in 1917, 12.2 days. It should be remembered that this last figure though not much below the preceding high point in 1913 was secured under the enormous difficulties of war conditions.

You have established a descending series which if it can be maintained even at a lessened speed will approach the zero line. A preliminary figure for 1918 shows 10.9 days.

This downward trend is even more convincingly indicated when five-year periods are considered. The five-year period ending with 1911 had a severity rate of 15.0 days while the five-year periods ending in 1916 and 1917 had each a rate of 11.0 days. Blast furnaces, one of the most hazardous departments of the iron and steel industry, show a steady decline from 31.9 days in the period ending with 1911 to 16.7 in the five years terminating in 1917.

This is a good record. Can it be continued, perhaps accelerated? I am here to urge that it can and to indicate what I regard as one of the important means to that end.

Very early in my contact with the industrial accident problem two impressions began to harden into convictions. They were (1) that the accepted method of estimating industrial hazard by means of a frequency rate was wholly inadequate, and (2) that the factor of personal "carelessness" was being overstressed very greatly.

As a result of the first conviction I made an elaborate study in my first extended publication of the time lost through temporary disability. Since the deaths and permanent injuries were excluded this compilation had very little significance. From this point severity rating has progressed, due largely to the efforts of the U. S. Commissioner of Labor

Statistics, to the development of what may fairly be regarded as a standard system. This system is now used by the International Association of Industrial Accident Boards and Commissions¹ and is recommended by the statistical committee of the Council².

As a result of the second conviction I attempted, immediately, the working out of a system of severity rating in the Bureau of Labor Statistics to apply it in testing the relative effect of efforts directed toward the men and those which I included under the designation, "engineering revision."

I can do no more in the time allotted me than summarize the results of these studies. For details I must refer you to the published articles.

WHAT THE SEVERITY RATE SHOWS

It is evident, on a moment's consideration, that certain classes of accidents are much influenced by the conduct of the men, while others are more removed from their control.

I first found that in cases, such as the handling of objects and tools, where the conduct of the men was clearly a very influential factor that the frequency rate was normally high but the severity rate was comparatively low. Following the matter from year to year showed that very often a notable decline in frequency might be accompanied by stationary or even rising severity. This means that the result of effort directed to the behavior of the men is influential mainly in diminution of minor accident and may be accompanied by an actual increase in accident cost.

I then considered such causes as showed marked severity and which had, in the course of time, had a considerable decline. I found, without exception, that a conspicuous decline in severity could be correlated with definite engineering improvements. It is worth while to put some emphasis on this point. I have been diligently looking for some years for a case of important saving in accident cost which was not related to "engineering revision." I have not found one.

Let me illustrate, in blast furnaces under the old conditions "break-outs" of molten metal were distressingly common and often accompanied by serious losses of life. With improved construction, in a well built modern furnace, such events are of rare occurrence.

In a group of blast furnaces with which I was particularly familiar it was possible to trace step by step an improving severity in deaths from asphyxia and the structural changes to which it was evidently due.

In open hearths the causes most prolific in death in the earlier days were cranes and hoists, molten metal and power vehicles. Here too it was possible to trace with perfect definiteness the parallel course of "engineering revision" and a declining severity rate. Singularly enough, in the particular group of open hearths used for purposes of study, the frequency rate in the handling of objects and tools markedly decreased but severity *increased*.

¹See Bulletin 238 U. S. Bureau of Labor Statistics, Page 32.

²See Proceedings National Safety Council, 1918, Page 30.

Nowhere was a decline in the severity rates more clearly to be attributed to engineering change than in yard operation. The provision of adequate clearances, the elevation of tracks, the construction of viaducts and subways, improvements in methods of transporting hot metal, these and many other changes conspired to bring about a more satisfactory condition. Nothing at all comparable with the reduced severity due to these changes could by any stretch of the imagination be attributed to the exercise of greater personal care.

Tracing conditions thus from department and finding that marked saving in accident cost was always associated with more or less definite engineering improvement was suggestive if not convincing.

Since death is the great element in accident cost it becomes significant and important to examine the death record.

CAUSES OF FATAL ACCIDENTS

It was possible to do this in 372 cases. It was found that in 57 per cent of these some engineering remedy was suggested after the death. A group of 72 cases of later date similarly analyzed showed 58 per cent might have been saved had it been possible to apply the remedy in advance.

I have elsewhere pointed out that there are two elements of weakness in this study. They are (1) the material considered is to a considerable degree of an early date when the safety movement was beginning and when the conditions would naturally favor the discovery and remedy of a high proportion of engineering defects and (2) the judgment of my colleague in the Bureau of Labor Statistics and myself might have been at fault in studying the individual records. It was necessary to take these records as they stood. No correction or amplification of them was possible.

I determined therefore to examine some extensive records in which safety committees had set down their judgment regarding the accidents coming under their jurisdiction. These studies had been made with very great care and with every opportunity to correct imperfect records and secure all the data which could shed light upon the cases.

The results of this effort to let the safety committees speak for themselves was published in the Monthly Labor Review for December, 1918.

A SAFETY COMMITTEE'S SIGNIFICANT REPORT

The committees had gone on record concerning 1,642 cases during a period of three years. The analysis is most suggestive. The committees found that while but 7 per cent of all injuries were amenable to engineering revision 57 per cent of deaths and major mutilations could, in their judgment have been prevented by proper engineering measures. It is a rather striking coincidence that this is precisely the same percentage which was assigned by my colleague and myself to this group.

Turning now to deaths and major mutilations numbering 207, of which 68 were included in the tabulation just considered, I found that the committees had reached the conclusion that engineering remedy wa

possible in 65 per cent of the cases. No effort was made to criticise the findings of the committees. The record does not in all cases seem to fully support their final judgment. But in many such cases it is evident that the committee had additional information which had not been incorporated in the summary record.

I have thus presented in barest outline the steps which have led me to my present position on this subject. My conclusions may be summarized in the following statements:

(1) The general frequency rate is an index of the prevalence and fluctuation of minor injury. The reduction of this type of injury depends on an educational program whose final effect is to cause the men to do their work in a safer manner. A rising frequency rate may indicate one or all of three conditions (a) no educational program or a poor one, (b) a good program administered with poor judgment or with insufficient vigor, (c) industrial conditions which might for a time overbalance any program however good.

(2) The general severity rate is an index of conditions in regard to death and major injury. The reduction of this type of injury depends in very large measure upon the procedures included in the expression "engineering revision." When the severity rate rises there should be immediately a very searching inquiry for possible imperfection in the engineering program. It is almost certain to be discovered that some unobserved lacks on the engineering side are responsible for the rising rate.

THE WRONG KIND OF EDUCATION

A word about the type of educational effort. I am convinced that what may be termed the evangelistic type goes very largely wide of the mark. Nothing more significant has recently been published on this topic than the letter from a workman in the July number of Mr. C. B. Scott's Safety Bulletin. I quote: "The safety man depends too much on his talk. We employees don't need so much safety talk any more. What we need is more of the *practice* of safety in our plants."

My judgment is this, that our educational effort should be directed primarily to the development of skill rather than caution. The experienced man is at times a taker of chances to the point of recklessness. Notwithstanding this he is very rarely hurt as compared with his much more cautious but inexperienced fellow worker who has just come on the job. The evidence on this point is abundant and convincing.

I have also a strong antipathy to much of the safety propaganda because it antagonizes the men. The constant emphasis on "carelessness" as the great factor in accident occurrence is recognized by the more thoughtful workers as being unjust and injurious to them. They resent this improper emphasis.

What stands in the way of an "engineering revision" sufficiently thorough to reduce industrial death a long way toward the vanishing point? In my judgment there is only one thing. The cost. I think we have materials strong enough and men skillful enough but the price seems too great.

I must not be understood as asserting that there is not a limit beyond which industry cannot go in expending money for the prevention of death even. What I do urge is that we have gone, up to the present time, only a little way toward the reasonable limit.

The condition has in it a challenge to you safety men of America. It is for you to decide whether American industry shall distinguish itself by the breadth and thoroughness with which it applies every known and ascertainable engineering remedy to this industrial death problem.

CHAIRMAN STANION: Our next speaker is one who has had a wealth of experience in contact with men in an industry where there is an extra hazard. I take great pleasure in presenting Mr. L. A. DeBlois.

SUPERVISION AS A FACTOR IN ACCIDENT PREVENTION

L. A. DEBLOIS, E. I. DU PONT DE NEMOURS AND COMPANY,
WILMINGTON, DEL.

So long as mechanical, electrical, and physical power are applied to meet the needs of industry; so long as chemical reactions go on; so long as we continue to apply these forces, human interference with them will lead to human injury. The forces themselves are comparatively simple to understand, and they can be readily enumerated. The manner of their application to each industry, however, runs into thousands tens of thousands, hundreds of thousands, and perhaps even more.

We have something else to consider—the long list of contributory circumstances that may have almost a direct causative effect on injury occurrence. If you will take even the simple example of a carpenter's hammer and try to figure out how many different ways accidents can be brought about through its use, you will find no trouble in putting down about fifty.

Can we not, therefore, say that in the use of these forces there are a million or over a million ways in which accidents can happen? If you admit this, what are we going to do? Shall we design a million different safeguards, or shall we educate our thirty-five million working men and women in one million different ways of preventing accidents? That is the question.

Turning first to the matter of engineering revision, which I take to mean structural and mechanical betterment, including mechanical guarding. I think we shall all agree that up to this time engineering revision has been applied most successfully to these three general matters: First, to general conditions; for example, space and light. Second, to the guarding and covering of the well recognized and general hazards, such as belts, gears, cutting tools, etc. Third, to the guarding of the more serious hazards which are peculiar to the industry and which naturally attract our attention because they cause serious accidents.

It seems to me quite natural that the effect of the application of engineering revision, especially in the latter case which I have just mentioned, should be to diminish the number of the more serious accidents. But I think we shall also admit that this application affords

more protection under the conditions of normal operation than under the conditions which arise out of the necessity for repairs, adjustments, and accidental or unusual situations. And yet, I fancy that a careful analysis of the majority of our operating plants would show that the pay roll hour exposure to accidents is about one-third to the abnormal, and two-thirds to the normal conditions of work.

Furthermore, the results of engineering revision, whether general or specific, are practically worthless unless followed up by continued supervision. For instance, space and light conditions must be maintained, and safeguards must be kept in place and in good condition. Engineering revision, in itself, is but one form of applied supervision. Engineering revision without supervision is almost impossible of conception.

Turning now to the broad subject of education—safety education as meaning the control of the mental side of the situation, opposed to the mechanical and structural—we find ourselves facing about the same difficulties that we face with engineering revision.

We can, indeed, paraphrase the three most successful applications of education to our work, and if so, they will read about as follows: First, general education, such as the necessity for care and first aid, and so on. Second, special education on frequent, well recognized, and general hazards. Third, education on the more serious hazards special to the industry. This is the generally accepted program in all safety educational work, and is well defined in the developed activities of the National Safety Council. I am inclined to believe that our troubles do not come from failure to accept these principles so much as from failure to use judgment in their application.

We have reared our modern system of accident prevention on two axioms: First, that 60 per cent to 70 per cent of the accidents are due to the carelessness of the individual (and sometimes the percentage is placed even higher), and the second axiom reads that the foreman is the logical point of attack.

Now, we have all accepted this, and we have all seen it in print, and I think we all believe it. I want to ask you this question: If the employees are to blame for 60 per cent to 70 per cent of the accidents, why do we center our attack on the foreman? Your answer is that it is because we can reach the men better through the foreman, and because the men adopt the attitude of the foreman.

Admitted. But if this is true, does it not directly imply an obligation on the foreman's part, and should we not credit him with a definite share of the 60 per cent and 70 per cent of the accidents that we blame on the man? Why not say that half of these accidents could be avoided by getting the foreman in line, and therefore that one-half—30 per cent to 35 per cent—are blamable on the foreman?

RESPONSIBILITY OF THE MANAGEMENT

Now some one is responsible for the conduct of the foreman. It isn't the employees. It must be the management. If it is responsible for his conduct, it is also responsible for accidents caused by his misconduct or

his derelictions. Then, why should we not say that this 30 per cent to 35 per cent of the accidents that I want to see blamed on the foreman should be blamed not on the foreman but on the management?

You will say "Yes," perhaps, to the thought of supervision being effective in lessening accident production, but you will also say that supervision does not remove the cause of the accident. Ladies and Gentlemen, neither does the application of engineering-revision remove the cause. The primary cause of your accidents is the application of power, and you do not remove the *cause* when you surround that machinery with a safeguard.

When it comes to the actual analysis of accidents to determine the responsibility, there is a wide opportunity for divergence. A manager may be inclined to overestimate the blame which should be attached to his employees while a foreman or a safety committee may over-emphasize the importance of engineering revision. In point of fact, either engineering revision or better supervision may be remedies of almost equal value.

As an example, to show the different conclusions that may be reached let me cite the 207 fatal accidents that Dr. Chaney has just quoted. I merely want to illustrate how, if you attack the problem from different points of view, you get different results, and I am going to twist Dr. Chaney's figures to meet my needs. Purely on the basis of the accident descriptions as quoted, I re-analyzed the cases and arrived at this:

Fault of employers—susceptible of engineering revision	37 per cent
Fault of employers—lack of proper supervision.....	34 per cent
Fault of injured or fellow employee.....	22 per cent
Unavoidable trade risk.....	7 per cent
	100 per cent

This, as you see, puts 71 per cent of the blame on the management which is not greatly out of line with Dr. Chaney's 65 per cent, but whereas he has concluded that a total of 65 per cent is susceptible to engineering revision, I find only 37 per cent so attributable, and believe 34 per cent to be corrected by better supervision. This 34 per cent plus 22 per cent due to fault of injured or fellow employee almost make the 60 per cent we usually blame on the men. I think we are both right but are simply looking at these accidents from a totally different point of view.

SAFETY SHOULD NOT BE A SIDE SHOW

In the speaker's mind, the solution of this tangle of responsibility lies in the manner in which safety is introduced into the plant by the management. There are two methods: Safety may be made a part of the business of production, operation, or whatever the function of the business may be; or it may be put on as a sort of "side show," endorsed by the management. If it is a side show it will be conducted by the safety engineer as a separate little enterprise. Some men will be interested and some will not. There will be meetings, literature, and committee

but it will be always regarded by the men as something outside the big tent. The more efficient it becomes, the more will foremen and others look to it and its committees to detect hazardous conditions and have them remedied; the more often it will be said, "That is work for the Safety Department."

But compare its organization with that of the entire plant—with the foreman, for instance. How can so few men detect one million defects and five million bad practices, apply the remedies and see that they are maintained? Are they in better position to do this than the foremen themselves, providing the latter are aroused to the proper pitch of interest?

Let us trace the alternate course of development. The manager states to his men, "We will not only produce a product in quantity, of quality, and with efficiency, but we will produce it safely. The productive organization will do this. I will require it of my staff. My staff shall require it of my general foreman. He will require it of his foremen, and they in turn of their men. We have a safety engineer, and he will advise us when we ask him but *we* are responsible for results. Call your men together and explain to them, and I will see that it is followed up."

Safety meetings are called and conducted not by the safety engineer, though he may arrange the details, but by the next highest in authority in the productive organization. Foremen's meetings are called by the general foreman. A foremen's safety committee is appointed, not for the purpose of assisting the safety engineer in his work, but for the purpose of assisting the whole body of foremen. Since it is not practicable to detach the whole body for the purposes of joint inspection. The committees' findings are reported at the meetings and discussed by the foremen. It is recognized that it was the individual foreman's duty to discover and remedy such conditions prior to the visit of the committee, and not primarily the duty of the committee. The committee follows up. If the committee cannot find a remedy to recommend, the safety engineer is directed to investigate and report in writing.

It is by such means as this that accident prevention supervision can be introduced into an industrial plant as an integral part of the work, and the conflict that otherwise arises between production and safety is largely avoided.

AN EXAMPLE OF SUCCESSFUL SUPERVISION

If you will allow me, I wish to digress a moment to show you the results of what I think is one of the most interesting analyses of conditions in industrial plants. The plant in question was built for war purposes at the time war was declared on Germany by the European powers, and was designed for a duration of about a year and a half or two years. It was actually in operation for four years, and toward the end of 1918, and possibly toward 1917, not only was engineering revision at a standstill, but I believe on the downward course. In other words the plant was deteriorating very rapidly. The temporary guards that had been put up were falling apart, and had not always been replaced

medium of the committees. I'd like to hear Mr. Young's viewpoint that in his organization, the International Harvester Company.

MR. A. H. YOUNG (International Harvester Company, Chicago): have the most profound respect for the speakers who have given us talks and papers this morning. Dr. Chaney long ago blazed trails; I have visited a great many safety organizations which have been highly advertised, but never have I met the sustained perfection in safety organization that exists in E. I. du Pont de Nemours and Company. There I know that the work has begun at the top; that the management has been sold the idea.

So far as safety committees are concerned, I believe they are necessary and can be made permanent. They certainly do serve to keep up a certain necessary amount of propaganda, but more and more I am coming to the viewpoint that we have gotten past the stage where propaganda is necessary. Safety is a pretty well established and going concern. Rather than have our overhead safety organization heavy, and acting separately and specifically on the problem by itself, I believe our safety work should be concentrated within our own organization, and safety more and more an integral part of the production program.

ENGINEERS AND MANAGEMENT

I think our problem is increasingly going to be not so much with men. That is easily solved. It is standardized. The approach there is well thought out, and experiences are so great now that we can apply the lessons of the past without much trouble. But if we go higher up to our engineers in the drafting room who lay out the new plans, and ask them to consider safety, we shall go forward toward our ultimate goal much more rapidly.

Dr. Chaney and Mr. DeBlois have furnished some thought as to the possibility of accident prevention right in the drafting room, and the consideration of the design not only of buildings, but of the equipment and placing of the equipment. That exists in many concerns today. I think beyond that, that Mr. Whitney's educational work in the college is going to be increasingly important; that our engineers, when they go to the drafting room, when they first come from our colleges and universities into industry, will have a fundamental, sound conception of accident prevention.

But that isn't going to get us where we want unless the president of the concern, the general manager, the plant superintendent, the general foreman, the sub-foremen, the gang leaders, and the whole organization are thoroughly sold. I don't think we can overemphasize the importance of getting away rapidly from the habit of placing the responsibility upon the employee. I have with others preached that two-thirds of the accidents were preventable by the eradication of carelessness on the part of the individual workman. I see my error and I think we can't quickly get away from that practice and instead, hold the owners of the business responsible; it could be conclusively laid on their shoulders. Just such papers as those of Dr. Chaney and Mr. DeBlois this morning

MR. S. D. HUBBARD (New York City Department of Health): I have listened with a great deal of interest to the remarks of the two preceding speakers, but it seems to me that the correction of this situation lies in a step still further advanced than has been so far brought forward to this Round-Table.

UNIFORM STANDARDS

I believe in the adoption of standards. I believe that for a municipality or a state, or the United States, for that matter, to permit the construction of plants where accident liability is great, which safety engineers in advance can practically foresee, should be prevented.

Definite standards should be adopted by each state, and each municipality should in turn re-adopt these standards, and should see that they are made effective.

MR. E. S. CHAPIN (Pennsylvania Railroad, Philadelphia): Mr. Hubbard touched on a point which is very dear to my heart because we are operating in about thirteen states. We have standards in different states which are all different. Now, for heaven's sake, let's have one standard so we know what we're doing. I have to be a lawyer in thirteen states to know what I am doing.

MR. V. R. HUGHES (Pacific Gas & Electric Co., San Francisco): Our experience has been that our accidents from the defects in or the lack of guards are about four per cent of our total accidents. We have laid a great deal of stress on our safety committees. We have gradually reduced the accidents through these safety committees. In 1913 the fatal accidents were sixteen; in 1914, eight; in 1915, six; in 1916, eight; in 1917, five; in 1918, four; and so far this year there has only been one—out of about five thousand employees.

The cost of these accidents in 1914 was \$51,000; in 1915, \$35,000; in 1916, \$48,000; in 1917, \$42,000, and in 1918, \$34,000—so that the severity of the accidents is going down continually. We have spent about \$25,000 for guards and safety devices in that time.

MR. M. J. FLYZIK (State Safety Board of Washington, Olympia, Wash.): I am speaking particularly about mining. There is a general hazard to each industry, and with that is also a special hazard. Forty-eight to fifty per cent of the accidents in our state in the coal mining industry are due to one cause—the roof falling on the men.

The responsibility may be divided equally between the workmen and the management. The roof comes down because of the failure of the workmen to put up the wooden supports. Now, either the supports are not delivered to the workmen by the management, or the workmen fail to put them up after they are delivered. We must remove the cause. We propose to hold the management responsible for the delivery of the necessary material, and after that is done we insist that the workmen be compelled to put that material up.

I think we should pick out the special causes first. If forty-eight per cent of the accidents are due to one cause, then we in the mining industry should concentrate our efforts toward the elimination of that cause.

What is true of mining is largely true of other hazardous industries. We may have a hundred causes, but you can trace about fifty per cent of your accidents to about three or four causes.

I have arrived at the conclusion that the foreman cannot devote much of his time to accident prevention. He is continually pushing his men to get out production. Therefore, if we want to do anything along the line of accident prevention, this work should be assigned to neutral men—safety engineers.

MR. A. T. MOREY (Commonwealth Steel Co., Granite City, Ill.): I am a frank believer that the safety committee has been a wonderful factor in accident prevention. I think they are going to remain so. It is by their work that we have been bringing to the management and to the foremen their sense of responsibility. What I have heard said here this morning about putting the responsibility on the foreman and the management is simply an indication that that education of the management is being brought to a successful consummation. I have always longed for the day when the responsibility can be put right on the management, because they control the situation—but, gentlemen, don't let us get away from the recognition that we absolutely need the cooperation of the men on the job, through the safety committees.

CHAIRMAN STANION: Our time is now up. This is the conclusion of one of the best Round-Tables we have ever had. We certainly appreciate your enthusiasm and your getting up early to get here. The meeting stands adjourned.

Safety Education Section

October 3 and 4, 1919

FRIDAY NOON SESSION

ORGANIZATION MEETING

THE meeting convened at 12:30 P. M. General Manager Price presiding.

CHAIRMAN PRICE: I believe that Dr. Payne in working out this wonderful plan of systematically teaching safety to children in the schools has made the greatest single contribution that has ever been made to the Safety Movement. And I further believe that during the next twelve months the greatest contribution which the National Safety Council will make will be through its efforts to reach every school in the United States, and induce them to adopt this plan.

This meeting is called for the purpose of considering the practicability of organizing a section of the National Safety Council, to be known as the Educational Section, and primarily for the purpose of quickly reaching the schools with this great message.

I want to call on Mr. Whitney to outline the plan and purpose of this Section. No one in the National Safety Council has shown more interest in school safety than Mr. Whitney, and no one is more competent to speak on the subject.

MR. A. W. WHITNEY (National Workmen's Compensation Service Bureau): We have been feeling our way in the educational work of the National Safety Council, and taking new steps only when we felt pretty sure of our ground. We seem to see now, however, a great field stretching out ahead of us which will require our best endeavors to develop with a wisdom and energy commensurate with the opportunity.

The next step seems to be the formation of an Educational Section. The work so far has been carried on by a committee. We now need a body back of and around the committee which may gather up and focus all the needs, opportunities, and energies which it is now so evident exist.

We need a forum in which the technique of the educational problem can be discussed and developed and recorded. The problem of teaching

safety is quite as technical as the problem of guarding machinery, or of organizing shop committees, and if a forum is needed for the discussion of these problems, a similar forum is needed where the educators and those in need of the results of education can discuss the problem and the solution of the problem in detail.

The educational field, aside from the work with safety supervisors and shop foremen, which is being otherwise taken care of, falls into two main divisions: The work in public and parochial schools, and the work in technical schools and universities. It will therefore be necessary almost immediately for practical purposes to split the Section into at least these two large divisions.

Of these divisions, however, the one that is in most obvious need of the help that a section can give is that of the public and parochial schools. We have now, thanks to Dr. Payne and the St. Louis schools, a practical plan for teaching safety in the primary and secondary grades. The plan needs pushing. A section can be of some use in developing ways of approach to the schools and the public, but its main use will be for the development of the detail of teaching safety in its actual application. Most schools, most teachers, will have to be handed the plan complete; they cannot be depended upon, at least at first, to work out satisfactorily the details of its application;—I mean, for instance, such things as arithmetic examples, problems in geography and in nature work, the development of safety situations through drawings and dramatic expression, and ways of developing children's committees. A mass of such detail must be accumulated.

I conceive that one of the main functions of such a section will be to develop and classify and publish such material so that no school will be so backward as not to be able to put safety work into its curriculum.

It is easy to imagine other ways in which such a section will be useful. It is not necessary now, however, to see the whole field, only enough to know that such a section is needed. Nor is it necessary on this occasion to develop the peculiar needs of the university situation. That is another story, although quite as important and interesting.

CHAIRMAN PRICE: I am going to ask Dr. Payne, the author of this wonderful book, to express himself in regard to the value of such a Section in the National Safety Council.

DR. E. GEORGE PAYNE: I hardly know what I ought to say to this body here today. I have been speaking so much this week, and probably most of you have heard me in one place or another.

After all, the most fundamental problem in connection with the Safety Movement, as I said this morning, seems to be one of education. And the most significant part of this Movement is that of public school education in accident prevention, because after all, you know as well as I that the problem of getting the ideals and practices of safety is a matter of education.

We instill the ideals and instill them most effectively not after one reaches adulthood, but during the period of plasticity, when the child is in school and when he is being educated.

Now, first, let me say here that the public has hardly realized what a treasure they have in the teaching profession, in the body of teachers, in carrying out this Safety Movement. Whenever I talk to business men about the safety proposition in teaching they merely tell me they think the way to do it is to get a policeman to come in and talk to the children about safety, or some one else who is interested in safety. You can't teach safety that way.

In St. Louis we have three thousand teachers—three thousand school-rooms. We have about a hundred seventy-five school buildings. Think how many people you would have to have to get around, talking all the time, once each year in every school-room! You see it is absolutely impossible. Simply to go into the room once a year to ask them to observe certain rules of safety doesn't teach them anything. The teaching of safety is like teaching table manners, or teaching anything else—it is a long and laborious process.

Now, what can an Educational Section of this Council do to help get that over? It seems to me they can do a great deal. In the first place, the idea of teaching safety must be sold to the superintendents and the school men of the country. Every superintendent is facing a situation of this kind: He has in a large city two or three thousand teachers whom he has to keep harmoniously working in connection with his plan. Whenever he comes to them with a plan of introducing another subject why, they simply throw up their hands and say, "That is an impossibility. We already have fifteen or twenty."

You have to convince this superintendent that there is a way to teach safety and teach it effectively and satisfy his teachers without the additional work of another subject added to the curriculum. That is the proposition you have to put over.

Of course, we who are on the educational side taking the lead in this Movement are going to do all we can regardless of the National Safety Council or any other organization, because we are committed to it and believe in it.

After all, we have to sell the idea to the school people, and that is particularly true in the smaller communities. I think it is true in larger ones, too.

I think an Educational Section here as a clearing house can do a great deal in bringing these people to see the necessity for this kind of work. Then, I want to say further, that the point Mr. Whitney made here can't be emphasized too much. You can't put in one book everything that is to be said on this. No one man can work out the problem in all its details. We have made a starting in this direction, and school people all over the country, as they continue to work out this problem, are going to present material that will be invaluable to serve in communities where by they may select that material best fitted for the work and turn it over to Mr. Price and let him and his office do the rest in bringing it to the attention of the superintendents of the country.

I think, then, the greatest thing we can do is to assist and let the school people know we are back of it. For instance, instead of suggest-

ing that we have lecturers brought into the schoolroom, let us say to the teachers, "Here is a problem of accidents in the community. Here are children being killed and injured every day. It is your problem, and here is material with which you can help them." But don't try to take the problem away from them by suggesting that some outsider do the work for them. If you do, they cease to take interest and responsibility, and you will be holding the bag, because you can't do it on the outside. You might just as well have some one come in from the outside and lecture to the children on manners and the things they ought to do in the home and expect them to do it. The father and mother are on the job to train the child in the way he should go at home. The teacher is on the job to take care of the school activities, of which safety education is an important part, and we can't deceive ourselves about that. What we can do is to help that teacher do her job more effectively and show her that you appreciate it when she is working along that line.

That represents, it seems to me, what this division could do, and the direction to which it could devote its efforts effectively, and it would be a clearing house in which we could discuss all these problems at least once a year.

CHAIRMAN PRICE: This discussion would not be complete without some expression from our newly elected President of the National Safety Council—Mr. Richards. Mr. Richards, will you express your thought and the attitude of the Council regarding this work which lies before us?

MOST IMPORTANT WORK BEFORE THE COUNCIL

PRESIDENT RICHARDS: The Council is so new in this work that I am not prepared to express the consensus of opinion of the Council. In fact, I don't think it has really been formed. Speaking for myself—not individually, but as President of the Council—I deem it the most important work that the Council has before it now.

It has seemed to me for many years that if we could begin educating the children to be careful, to realize the danger of public, private, and home accidents—the same as the mother teaches them their prayers, and the school teachers teach them arithmetic or spelling or anything of that kind—that in twenty years from now the job of the National Safety Council in wiping out avoidable accidents would be completed.

We have a start that nobody can ever set us back on. I think it is the greatest work the Council has before it. If there is anything I can do officially or personally to give it standing before the communities in which we all live and have our interests, I am certainly willing to devote more time to it than I would be to any other matter.

I think if each one of us will only take this home to the community in which we live and do something ourselves to get it started in the schools, instead of leaving it to the General Manager or "George" or somebody else to do, we will accomplish wonderful results.

Take in the cities of Chicago and St. Louis, you have probably in the combined communities ten thousand school people. Now, think what a wonderful force it would be to the safety movement to have those ten

thousand educated people saying something to the children once a week, or once a day, or once a month, and think of the number of people that would reach! And then you can realize what this educational program can do.

CHAIRMAN PRICE: Mr. Arthur T. Morey, of St. Louis, has been one of the presidents of the National Safety Council, and is the Chairman of the Public Safety Committee of our Local Council. Mr. Morey, will you give us your thought on this subject?

MR. ARTHUR T. MOREY: Friends, this is a time I think we have all looked forward to—the formation of the Educational Section, and getting it into its own.

It seemed to be necessary to go through the process of getting the industries interested in safety work before we could get public safety on the map. As a natural part of safety, public safety work comes in with great importance in the school. I wish that those here this morning could spend a morning with Dr. Payne at the Wyman School in St. Louis, and see this wonderful method he has evolved in actual operation. I think in all my life I never spent a more interesting morning than that morning.

They have woven this safety idea all through their study. They didn't take up safety as a separate thing, but tried to weave it into the lives and thoughts and habits of the children. Their arithmetic problems involve thinking safety. Their essays, their English compositions—instead of writing on their books, "The horse is black, the cow is white," they have, "In crossing the street, first look to the left, and then to the right," or some little safety thought constructive along that line.

If we are going to get at the source of things, that is what we must do when we take up accident problems. We tabulate the accidents that have happened and put them under the classification of causes, and then try to eliminate the causes. And when we study causes, we get right back to the child life and see that if we can teach these safety ideas to the children while young, and get them into the fiber of their lives, thoughts, and habits, why, we are going to get somewhere.

There is nothing more important than the development of this Educational Section. I think the Council should be congratulated for having arrived at this point.

CHAIRMAN PRICE: I am sure we shall be interested in having the thought of Dr. Evans, the author of the Health Column in the Chicago Tribune.

DR. W. A. EVANS (Chicago Tribune): I thought when Mr. Price first talked to me about Dr. Payne's book that it was to be a textbook for use in schools. I discovered as I read it that it was a book written for teachers, and that the purpose of it was to stimulate the thought of the teachers to the end that they might learn to do a certain thing. I found, too, that you miss the philosophy of it if you read it hastily, or if you read it other than thoughtfully.

Now, I have been in public health improvement work for about a quarter of a century, and I have been engaged in teaching for nearly thirty

years. About one-half of all the deaths are due to accidents, and anything that promises materially to reduce the number of accidents will make a material reduction in the general death rate. Likewise, anything which materially reduces the number of accidents of all characters will materially reduce the rate of disability from disease, disorders, and accidents collectively.

If you read Dr. Payne's book you will discover in the field in which the Safety Council has been working, there are results that prove your work has paid. There has been great reduction in the different types of accidents that naturally or normally occur in industry or in those fields in which you are engaged, but at the same time, there has been a growth or increase in the accident rate in what are known as public accidents and, as he very clearly shows, an increase in those rates that pertain particularly to childhood.

And that is one reason for broadening your field of activity and going after children—but that is only one of the reasons. As he has said to you, childhood is the period of plasticity. In dealing with accidents, you are, as a matter of fact, endeavoring to change the habits of the people; and it is difficult to change the habits of adults. You improve the possibility of a successful accomplishment if you begin with childhood, and bend the child mind to that particular method of thinking.

What you are endeavoring to do is to create a type of alertness in the minds of the individuals. While the main theme in the mind will be the particular thing which occupies it—the trade or profession, or the line of thought of the individual—you are trying to train that individual to carry in the back of his head constantly that there are certain principles of self-preservation, which must be automatically carried out—certain hazards that must be both physically and mentally considered, and constantly considered if results are to be obtained.

In other words, it is your job to change the mechanism of thought of individuals. When you undertake to do that you are confronted with great difficulties. The possibility of successful endeavor is greatly increased if you work with children rather than with adults.

I'd like to suggest this one other thought: Children are very apt to accept the facts which are put before them as facts without very much criticism or analysis of those facts. As a general proposition, the statements that are made in the textbooks that are commonly employed are not statements which are germane to the lives of the individuals of the community; and certainly not germane to the lives of the children. The quality of the matter presented by the textbook, its avenues of approach, will be improved if in those textbooks we make use of the events that come into the life of that child—its life in the home; its life in the school; on the street, and elsewhere. We can put into the reader and speller and arithmetic and geography—and into play as well as in study—little statements of facts relating to accidents, accident prevention, and various related subjects, in place of some of the things that are there now. That would suddenly and indirectly teach accident prevention, and do it with that degree of authority that is carried to the child mind by the facts presented in the textbooks that are used.

CHAIRMAN PRICE: I think the time has arrived when possibly we are all ready to consider the practicability of organizing a Section of the National Safety Council on Education. I think a resolution possibly would be in order at this time.

ORGANIZATION AND ELECTION OF OFFICERS

MR. ARTHUR T. MOREY: I'd like to move that this meeting here and now organize itself into the Educational Section of the National Safety Council; that you as Chairman of this meeting appoint a committee to work out the details of organization, to adopt proposed by-laws for reference to the Executive Committee of the National Safety Council, and consider all of those whose presence here indicates their interest in the work as the initial members of that Section; and that we now proceed to the election of the officers for the first year.

PRESIDENT RICHARDS: I second the motion.

CHAIRMAN PRICE: Any discussion? All in favor of the motion manifest the same by saying "Aye"—contrary, "No." The "Ayes" certainly have it.

(The motion was unanimously carried.)

The form of organization which we have followed in the other sections, and I would suggest that we follow it here, is a very simple one; namely, to have a Chairman, a Vice-Chairman, and a Secretary; it being understood that the Chairman will appoint such committees as will be needed in the work of the Section.

The Chair will be glad to listen to any nominations for the Chairmanship of this Section.

MR. R. E. BLOK (Atchison, Topeka & Santa Fe R. R., Amarillo, Tex.): I move that Mr. Whitney be Chairman of this Section.

(The motion was duly seconded and carried.)

CHAIRMAN PRICE: Will some one make a nomination for a Vice-Chairman.

PRESIDENT RICHARDS: Mr. Chairman, I would like to suggest that if Dr. Payne is willing to serve as Vice-Chairman of this Section, it would be entirely appropriate that he should do so. The two men who blazed the trail for us ought to be at the head of this Section. I therefore take great pleasure in proposing the name of Dr. Payne, and I sincerely hope he may be able and willing to accept that position.

(The motion was immediately seconded.)

CHAIRMAN PRICE: I was just going to say, Mr. Richards, that we don't ask people in this movement if they will—we tell them they are going to.

(The motion was unanimously carried.)

I indicated in my outline that a Secretary to look after the details of work should be elected.

MR. C. L. LAFONTAINE (Great Northern Railway, St. Paul): No man is more interested in this Section than the man I want to propose as its Secretary. I believe he has said to you here today that he was interested—therefore he admits it. He has also said there was no question of

a refusal to serve after once being nominated and properly seconded. I therefore am going to propose the name of C. W. Price as Secretary of this Section. (Applause.)

(The motion was immediately seconded, and carried unanimously.)

CHAIRMAN PRICE: I want to say it is a very great pleasure to accept that position, and I do accept it because of my deep and sincere interest in this great movement. I want to say to you that not only individually will I do my utmost this next year to put this across, but my whole staff of thirty-five I am sure will stand by me in attending to all of the details of carrying out this plan. (Applause.)

I should be very glad to have an expression, if it is only just a word, from any one in this room in regard to this great movement that we are about to take up. I will ask Dr. Dana Webster of Indianapolis to start the ball rolling. I have known his interest in schools for a number of years.

DR. DANA WEBSTER (Indianapolis): While I have been sitting here and thinking of this question of teaching children, I have been thinking why it is that the National Safety Council and all others didn't think of this matter first when the Council was started, so that we could have been training our children all these years. I can't quite comprehend why we have missed so much—I include myself, of course.

There is another thing: There was a great deal of interest shown today in regard to Boy Scouts. I don't know but it would be a pretty good idea to have the Boy Scouts represented here next year. It would be a mighty big thing if every city throughout the United States that has Boy Scouts could send a delegate. I think that would be a wonderful thing and I should like to see that taken up.

MR. C. B. CONNELLEY (Commissioner of Labor and Industry, Harrisburg, Pa.): Pennsylvania has passed a law in the last legislature that it is absolutely compulsory to teach safety first in the public schools of Pennsylvania. (Applause.)

Now, there is much for this section to do. I feel that as far as Pennsylvania is concerned, my colleague Mr. Coke of the Americanization Department there will be only too willing to help out wherever he can in this work. Of course, we in Pennsylvania will have to because the law says so. Being a member of the School Board in Pittsburgh, and having such men as Mr. Alderdisan and Mr. Oliver—and, by the way, they were safety-first men years ago—I think we shall have no trouble. We shall be glad indeed to further or give any help we can in the other states, but as far as we are concerned, we in Pennsylvania must do our duty. (Applause.)

CHAIRMAN PRICE: In this recent scrap we had with Germany the boys in khaki across the line in Canada stood shoulder to shoulder with the American boys in winning the victory for democracy. It seems to me very fitting that Mr. Morley, the General Manager of the newly organized Ontario Safety League, should tell us whether he is going to stand with us, and what he is going to do up in Canada.

MR. R. B. MORLEY (Ontario Safety League, Toronto): Mr. Webster

made the statement that he didn't understand why the National Safety Council and other organizations did not take up this work of educating the children, and just to clear up some misapprehensions on that subject, I want to say that the Ontario Safety League started over five years ago at that end of the game.

We are great believers in the fundamental practice of teaching safety to the children. Practically all of our work has been done on a basis whereby the school boards interested paid in part for the work that we were doing in the schools. That is to say they paid for bulletins, letters, etc., I don't mean that they paid for the overhead or anything of that sort, but paid the actual cost to the state.

We are getting results with the children. There is absolutely no doubt about it at all! There is a story that some of you might perhaps like to hear, because it is a story that always strikes me as one of the classics of safety.

Some three or four years ago we went to all of the schools in Toronto and talked to children in thirteen hundred different classrooms. After the meetings we would distribute little celluloid buttons to the children. Some few days after I was in one of the schools I met a little child of six passing along the street, and she called to her friend who was just a little farther on, "Here, Liz', come on over! Here's the man what gives you the button what keeps you from being run over." (Laughter and Applause.)

CHAIRMAN PRICE: Beyond all we men can say, it is important that the women express their opinion of this great movement. The women are the conservers of child life in this world. I don't know of anybody in the room more competent to speak than Miss Nesta Edwards, who did such a splendid piece of work in Wisconsin and other parts of the country. Miss Edwards.

MISS NESTA EDWARDS (Chicago): Somebody said yesterday, "God bless the women," and so why not the men? This morning at the women's division the question came up of organizing a section for the women, and it is going to be the pleasure of that section, I know, to coöperate from top to bottom with this division that this morning is bringing to all of us such a wonderful vision.

You only have to go to a safety meeting of children and you will be on fire for safety for the teeming life of the children that sit before you.

Let me end with a story. I will steal a man's story, but I don't see him here, so I guess it will be all right. "The other day," a man said, "I had a wonderful children's meeting. I went home, and the next day the father of one of the children said to me, 'Good heavens, Charley, what did you say to my boy?' 'Why, what do you mean?' 'Well, when he went to bed he came and threw his arms around me and said, 'Dad, you will be safe for my sake.'" That child had taught him more safety than weeks of safety meetings." (Applause.)

CHAIRMAN PRICE: Do you know, friends, that in the big auditoriums of public schools of Cleveland during this week some of the eminent men of this Council have been speaking to large numbers of children? I

don't know of any one who has been more enthusiastically interested in reaching the children than Mr. Adams, of Aurora, Illinois.

MR. H. B. ADAMS (Aurora, Elgin, and Chicago R. R., Aurora, Ill.): Mr. Chairman, I believe in dreams coming true. Some years ago we started to educate the scholars in the schools of Aurora, Illinois, and I took it upon myself to visit the schools. I made little talks from the primary up through the high schools and some of the teachers met it with a great deal of disfavor because it broke into their regular routine and got the children to thinking of something besides their regular lessons.

So I met with some discouragement, but by the time I had talked to most of the schools in Kane County, the teachers began to sit up and take notice, and some of them in whose rooms I had previously spoken afterward asked whether they had offended me so I would never come back again. And today the teachers are beginning to reach out for methods of teaching their children safety-first principles.

When I went to three high schools here day before yesterday and spoke to three thousand children on safety, the principals and teachers in those high schools were so enthusiastic that they would hardly let me get to the platform to speak. When I got through they would hardly let me get out to go to the next place. You know those children are just preparing for the football season, and they have class yells and high school yells and football yells, and I introduced a yell for them, in all of those schools. I gave it to them—"Think of Safety First"—and their cheer leaders came up on the platform in each one of those schools and led that cheer and you could have heard it clear down town if the windows had been open.

The boys and girls of that age are the ones we have to interest. They are the ones who are going to take our places in this work. If we incline the twig in the right direction the tree will grow straight. You can't stop this Safety Movement—that is all there is to it!

It is like the old gentleman from the country who was on an inter-urban car for the first time. He and his wife sat in the car and they looked and saw nothing hitched to it in the shape of an engine, and the old man said, "We'll never start!" But it did start—slowly, gently, gradually, nicely—that is the way they always do, so you hardly know they are starting. (Laughter.) It kept going a little faster and faster and the old gentleman got so scared that he grasped the seat in front of them with both hands, looked in every direction, and wondered what was going to happen next. He said, "Maria, by Jove! we'll never stop."

And that is the way with this Safety Movement. It started slowly several years ago, but just look at it now! We can now reach 70,000,000 people through the schools of this country, and we are going to do it, and this is the start! (Applause.)

CHAIRMAN PRICE: Ladies and Gentlemen, when the committees worked out the program for this great Congress, they selected the four outstanding subjects that are now occupying the thought of thoughtful people. One of those subjects is Americanization. I will ask Mr. Bach, who is at the head of the Americanization Movement in Pennsylvania, to tell us what he thinks about this movement.

MR. E. E. BACH (Director, Americanization Movement of Pa., Philadelphia): There is this other side to it—linking it up with the home and in the industries with the foreign-born. I am very much interested in the foreign-born side of the whole problem. That is the thing you have been interested in to begin with, before you started this large Safety Movement, and the foreign-born are occupying your minds very largely today, I am sure.

Because of some of the things that are being said: because of some things that have happened in the last few weeks, it seems to me that the problem of safety must come back to that great institution of a common people for its solution, as have come all the great problems—the public school.

CHAIRMAN PRICE: I'd like to have volunteers now, just for a few minutes.

MR. F. S. CRUM (Prudential Insurance Co., Newark): This is a day and hour when we are thinking a great deal of the conservation of man power. Now, as a matter of fact—and we have to deal with facts in our business—by the time the population reaches the age of twenty, one-half of all who die from fatal accidents are dead. Unless we begin our safety movement before that period of life, one-half you might have saved will already be killed. That is the important thing to think about.

In New Jersey we have a state law practically requiring the teaching of safety in the schools, but it is not always in force. Now, if you will attach this Council to that movement and give it the necessary kick forward, you will do New Jersey a great service. (Applause.)

MR. J. C. CLARK (Oregon Short Line, Salt Lake City): I think that it is the grandest thing that ever happened. In my work on the railroads I have visited a good many schools. I have had a number of school superintendents ask me what interest the railroads had in safety in public schools. There are two very good reasons for this interest.

The first, of course, is from the humanitarian standpoint. We don't want to see any children injured if they can be taught to protect themselves against injury, and that is the greatest thing we can do.

But there is another reason from a purely selfish standpoint. We draw our employees largely from the towns along our road. If the schools in all of these towns will teach safety, when those boys and girls come to us for employment, we have a better class of material to draw from. They are safe to start with, and it lessens our task of teaching safety after they become employees.

I am glad, indeed, that the Educational Section has been created because I hope that they will be able to give me information, and I feel it would be a definite advantage to every railroad man and to every industry if they can outline a plan, something definite, so that we can go to the superintendent and say, "Here is your plan. Put it into effect."

MR. H. P. COFFIN (Secretary, Oregon Division, National Safety Council, Portland): Seven years ago the Public Safety Commission was organized in the city of Portland. We started in on education primarily in the public schools, and I, myself, have talked to some thirty-three thousand

children: the result being that for three months after we finished talking to those children there wasn't an accident to a child of school age in those schools. (Applause.)

Our accident records in the schools have been reduced right along, so that we have very, very few. I acted in conjunction with our fire marshal, when putting over the fire-prevention campaign, and it is a fact that we reduced our losses from \$2,000,000 down to \$200,000 a year. Figures will prove it.

The fire marshal and I gave fifteen-minute talks. When he got through with his talk, he would say, "Boys, I am going to make you all fire marshals. Every one of you in this assemblage is a fire marshal, but in your own home. Now, when you go home I want you to do your part and see if there are any fire hazards."

And in the same way I talked about accidents; keeping off the streets and safe-guarding themselves and those who depended upon them. Here is a little story that is absolutely true. One of the school commissioners was sitting at home near the grate smoking a cigar and he threw a lighted match into the waste basket. His little son jumped up and said, "Daddy, you mustn't do that. I'm fire marshal in this home and if you don't stop I'm going to report you." (Applause.)

When I spoke to a large assemblage of four thousand people at the World's Insurance Congress at San Francisco, I closed my remarks with, "Safety first should be used not in jest but in earnest. When a person sees those two words 'Safety First' it should be an incentive for that man to stop, look, and listen. It should be as sacred as the sign of the Red Cross."

CHAIRMAN PRICE: I now want to turn over the gavel to our newly elected Chairman of this great Section—Mr. Whitney. (Applause.)

CHAIRMAN WHITNEY: I want to thank you for giving me this opportunity of being connected with this wonderful work. If I were less selfish I think I should try to persuade you to turn it over to one better qualified, but I am not so unselfish as that. And besides, I have Mr. Price and Dr. Payne here to rely upon, and I could be pretty bad and get away with it with two people like that.

Mr. Webster said (I believe it was he) that unfortunately this work wasn't undertaken seven years ago. Perhaps it is in retrospect, but it seems to me this is a natural development. The Safety Movement had to be acted upon on its most objective side, and it had to get up a momentum and become a really recognized spiritual movement before we could get it into education. This is not only a spiritual movement, but it is practically a religion, and with that stamp on it, it is ready to go straight into the educational system as a tremendous, not only material, but spiritual force. (Applause.)

Mr. Price reminds me that everybody here is supposed to sign a card which has been given to you. You will then become charter members of the Section, and you will be sent literature as it comes out. We shall also expect real service from you. It is up to every one of you to go back and see if you can't put this thing into the schools in your own home towns.

MR. J. H. SNYDER (Columbus): I'd like to suggest a word. Every reform, every fight we have made against the enemy of humanity in this country has succeeded largely by putting it through the schools. We only need to look at the temperance question. The Women's Christian Temperance Union took their fight for temperance to the schools, and won. Now, starting this same way, our safety movement cannot fail.

MR. H. B. REYNOLDS (Pennsylvania Lines West): I wish to state that I took up the question of introducing safety into the schools a year ago, and Superintendent Hines of the state of Indiana has incorporated that in the teachers' manual from the first to the eighth grades as a part of the curriculum every day. (Applause.)

MR. H. E. MEGINNESS (Pennsylvania Lines West, Indianapolis): Some time ago I had the very great pleasure of addressing eight hundred Sisters of Charity, who were teachers in the parochial schools of the Sisterhood of St. Mary's of the Woods, Terre Haute, Indiana. They have placed in their schools a course of safety study, the same as Mr. Reynolds mentioned. This Sisterhood teaches in the parochial schools from Boston to Chicago. (Applause.)

CHAIRMAN WHITNEY: Is there any further discussion? If not, a motion to adjourn is in order.

CHARTER MEMBERS OF THE EDUCATIONAL SECTION

Chairman: A. W. Whitney, General Manager, National Workmen's Compensation Service Bureau, New York City.

Vice-Chairman: Dr. E. George Payne, Principal, Harris Teachers College, St. Louis, Mo.

Secretary: C. W. Price, General Manager, National Safety Council, Chicago.

H. B. Adams, Safety Supervisor, Aurora, Elgin & Chicago R. R., Aurora, Ill.

E. E. Bach, Philadelphia, Pa.

C. T. Bailey, Safety Agent, Salt Lake City, Utah.

L. E. Barnes, Ansco Company, Binghamton, N. Y.

Miss Harriet E. Beard, Detroit Normal Training School, Detroit, Mich.

Bert Bertram, Safety Agent, Atchison, Topeka & Santa Fe Ry., Arkansas City, Kans.

R. A. Beyer, Americanization Director, Central Tube Co., Pittsburgh, Pa.

A. H. Bissmeyer, The Cincinnati Milling Machine Co., Cincinnati, Ohio.

R. E. Blok, Safety Agent, Atchison, Topeka & Santa Fe Ry., Amarillo, Tex.

George F. Buehler, Great Northern R. R., 633½ University Ave., St. Paul, Minn.

P. S. Case, Union Carbide Co., Niagara Falls, N. Y.

J. C. Clark, Asst. to Gen. Mgr., Oregon Short Line, Salt Lake City.

Mrs. J. C. Clark, Salt Lake City, Utah.

G. E. Clarkson, 805 Hartje Bldg., Pittsburgh, Pa.

Harry P. Coffin, Public Safety Commission, and Secretary Oregon Division, National Safety Council, Portland, Ore.

W. Commet, 1013 Penn St., Pittsburgh, Pa.
 Clifford B. Connelley, Department Labor and Industry, Harrisburg, Pa.
 Frederick S. Crum, Prudential Insurance Co., Newark, N. J.
 A. L. Cunningham, Safety Agent, Penna. Lines West, Pittsburgh, Pa.
 Mrs. L. Luella Cox, Indianapolis, Ind.
 Louis E. DeArmand, Public Safety Commission, Davenport, Iowa.
 Edw. R. Dejon, Safety Engineer, Winchester Repeating Arms Co., New Haven, Conn.
 Miss Nesta Edwards, Chicago, Ill.
 L. C. Espersen, Claim Agent, Chicago, Great Western R. R., Clarion, Ia.
 Dr. W. A. Evans, Chicago, Ill.
 R. E. McEwen, 212 W. Washington St., Chicago, Ill.
 M. L. Fellmer, Secretary, Central Mississippi Valley Div., St. Louis, Mo.
 J. G. Fitzhugh, Galveston, Tex.
 J. E. Ford, Evansville, Ind.
 S. M. Galaty, Safety Inspector, 226 W. Jackson St., Chicago, Ill.
 Mrs. S. M. Galaty, 508 N. Humphrey Ave., Oak Park, Ill.
 G. M. Gilchrist, Groton School Board, Groton, N. Y.
 Geo. W. Greenleaf, Inspector, Indianapolis, Ind.
 Isaiah Hale, Safety Supt., Topeka, Kans.
 J. H. Hanson, Rochester Local Council, Rochester, N. Y.
 Dr. A. M. Harvey, Crane Company, Chicago, Ill.
 G. G. Hellmuth, Chicago, North Shore & Milwaukee R. R., 72 W. Adams St., Chicago, Ill.
 R. N. Hemming, Ft. Wayne & Northern Indiana Traction Co., Ft. Wayne, Ind.
 B. J. Hine, Scovill Mfg. Co., Waterbury, Conn.
 W. J. Hockett, General Electric Co., Ft. Wayne, Ind.
 Homer J. Hodson, East St. Louis Ry. Co., East St. Louis, Ill.
 William P. Howell, 333 West Houston St., New York, N. Y.
 G. R. Huggins, Finch Pruyn Co., Inc., Glens Falls, N. Y.
 C. A. Judd, Safety Agent, Atchison, Topeka & Santa Fe Ry., LaJunta, Colo.
 R. McA. Keown, Industrial Comm. of Wis., Madison, Wis.
 Miss Delight Krauss, Cleveland, Ohio.
 C. L. LaFountaine, General Safety Supervisor, Great Northern Ry., St. Paul, Minn.
 L. A. Lewis, Police Bureau, Portland, Ore.
 F. Linton, Supt. of Schools, Mingo Jct., Ohio.
 A. H. Lintz, National Safety Council, Northeastern Ohio Division, Cleveland, Ohio.
 R. M. Little, Director, Safety Institute of America, 14-18 West 24th St., New York City, N. Y.
 G. H. McClain, College of Medicine, University of Cincinnati.
 H. E. Meginness, Safety Agent, 807 Majestic Bldg., Indianapolis, Ind.
 Arthur T. Morey, General Manager, Commonwealth Steel Co., Granite City, Ill.
 Mrs. Arthur T. Morey, St. Louis, Mo.

R. B. Morley, General Manager, Toronto, Canada.
S. B. Murphy, Pennsylvania R. R., Pittsburgh, Pa.
D. R. Paddock, Indianapolis, Ind.
J. C. Kinney, Jr., College of Engineering, Milwaukee, Wis.
W. R. Rasmussen, Multnomah Hotel, Portland, Ore.
Mr. and Mrs. D. K. Rawlings, Salt Lake City, Utah.
H. B. Reynolds, Supt. Safety Bureau, Pennsylvania Lines West, Pittsburgh, Pa.
Mr. and Mrs. R. C. Richards, Chicago & Northwestern R. R., Chicago, Ill.
A. Richardson, Grand Mere, Quebec, Canada.
R. Riege, Gilbert & Barker Mfg. Co., Springfield, Mass.
E. P. Roberts, Akron, Ohio.
Harry Robinson, Crockett, Calif.
J. Albert Robinson, Providence, R. I.
Capt. J. Robbins, Windsor, Canada.
E. J. Roesch, 1556 Broadway, New York City, N. Y.
A. L. Rose, Akron, Ohio.
A. Ryder, 15 Park Row, New York City.
Robt. L. Schmidt, Louisville, Ky.
W. D. Schofield, Miami, Ariz.
H. V. Schreiber, Johnston, Pa.
Frank Shattuck, Neenah, Wis.
F. H. Sibley, Lawrence, Kans.
Carl L. Smith, Public Safety Field Secretary, 168 N. Michigan Ave., Chicago, Ill.
L. J. Smyth, Kansas City, Mo.
J. H. Snyder, Columbus, Ohio.
Herman Spoehrer, St. Louis, Mo.
J. H. Stadelman, Wilmington, Del.
Thomas Stanion, Aluminum Castings Co., Cleveland, Ohio.
W. P. Strickland, General Inspector, Long Island City, N. Y.
Geo. W. Stone, Niagara Falls, N. Y.
Mrs. J. E. Trussell, Port Neches, Tex.
J. E. Trussell, The Texas Co., Port Neches, Tex.
Harvey N. Tuttle, Pollak Steel Co., Cincinnati, Ohio.
F. M. Ward, Otis Elevator Co., Yonkers, N. Y.
Dana Webster, Indianapolis, Ind.
Carl Wiemkem, Boy Scouts of America, E. St. Louis Council, E. St. Louis, Ill.
T. G. Wilkinson, Care Elkhart Carriage and Motor Co., Elkhart, Ind.
J. S. Windisch, Brown Hoisting Machine Co., Cleveland, Ohio.
W. E. Wooley, Safety Education, Detroit Ford Motor Co., Detroit, Mich.
Earl F. Varnum, Commonwealth Steel Co., Granite City, Ill.
R. S. Vitt, Coroner, St. Louis, Mo.
Charles N. Young, National Workmen's Compensation Service Bureau, New York City, N. Y.

SATURDAY AFTERNOON SESSION

THE meeting convened at two o'clock. Mr. A. W. Whitney, General Manager, National Workmen's Compensation Service Bureau, presiding.

CHAIRMAN WHITNEY: This is the day on which we put safety education on the map. The exercises really began yesterday when a movement that has been slow in gathering momentum came to a head in the formation of an educational section.

It does indeed seem strange that seven years passed by in the life and work of the National Safety Council before this step was taken. I maintain, however, that the development of the activities of the Council has been normal and that education has come to the front at the natural and appointed time.

A miracle has happened in these years. Doubtless that little band of devoted men that laid the foundation for this structure at Milwaukee seven years ago had a lofty faith and vision of the future, but I venture to say that the imagination of no one of them comprehended the wonder and might of the stream of spiritual energy that was there unloosed. Nor can we safely prophecy with regard to its strength and purifying influence in the years to come. It is as though workmen blindly digging for a foundation had struck a stream of pure water gushing out from the depths of the earth. They thought they were building a workshop, the building turned out to be a temple.

I have been curious to explain this miracle. Safety at first sight is not an idea to conjure with, it is almost negative in its appeal and seems to limit the adventure and zest in life. Where then does it get its superhuman strength and beauty?

This is the explanation that I make to myself. Of all the riddles of a difficult world nothing is more inscrutable than an accident. What powers or processes in heaven, or earth, or under the earth are furthered by the crushing out of the life of an innocent, happy child? What manner of bargain is this in which joy and merriment, in which a parent's love and pride are bartered for bleeding flesh and ruined hopes? I give it up, it is past understanding. There is only one thing I see clearly and that is to stamp it out, to make the world over into a place where such damnable things shall not happen, to make the world a place that shall be animated by a purpose and not by soulless chance.

The other side of the bargain is to be found if at all here—in the purifying, cleansing rush of this mighty purpose. This was the stream that the workmen unearthed and it seems verily to flow from the foundation of the universe.

Two things then are explained: First, why safety education belongs in the school. It belongs there because the child has the right to have this great moral force in his life. Second, why safety education has been so long in coming. It has been so long in coming because it could not be taught as it should be taught until it had taken on this moral, this spiritual quality, until it had gained the momentum that would carry it surging into the heart of life.

I don't think I can call on anybody who is so well fitted to interpret the place of safety education in the safety movement as Mr. Little. The address of Mr. Little last year at St. Louis, and the address last night of Mr. Richards are, I think, generally felt to register the high water mark in the messages that have been brought to us in this movement.

THE PLACE OF SAFETY IN EDUCATION

R. M. LITTLE, DIRECTOR, SAFETY INSTITUTE OF AMERICA

As I have listened to Mr. Whitney and Dr. Payne talk upon safety in education I have wondered if I really had anything to contribute to the thought of the conference upon the subject. I will offer, however, what has been running through my mind knowing that it will be adequately supplemented and filled out by others. It seems to me that to approach this subject, "The Place of Safety in Education," we should first define for ourselves what is the object of education; for, unless we have a rather clear idea of what an education is for, we cannot very well define the place of safety in the organized educational work of our country.

TWO THEORIES OF EDUCATION

There are two principal theories of education, which theories we will have to deal with in placing safety and safety material in the curricula of the common schools, the secondary schools, the technical schools, and universities.

We inherit the theory of education which is theoretical and cultural; principally the training of the mind, an ideal conception of education. This view of an education is broadly held in our country notwithstanding that we are a new nation and rather a practical people. We inherit it from the past and as I apprehend there is running through the entire educational thought of our country a very strong feeling that as a new country we need the cultural values of education to be emphasized for themselves.

There is also the practical idea of an education: the dealing with things as they are in a very concrete and definite way, the endeavor to educate boys and girls, young men and women, to articulate themselves harmoniously with their environment and to deal successfully with the practical affairs of life.

These two theories perhaps could be stated in another form something like this: The purpose of an education is not to enable one to make a living but to live a large, full, and enjoyable life. This is the cultural conception of an education. The practical view of an education is that it is to equip one with knowledge and technique to make a living and to help fulfill the ordained mission of the human race, to subdue the earth and all the things which are therein and make them contributory to one's happiness and comfort. Now I think if we over-emphasize either one of these theories of education that we will not have before our minds the full object of an education. There are values in both of them, the

theoretical and the practical, the cultural and the popular. Education is not only to enable us to make a living but to live a life. The object of an education is to develop within one that mechanism of thought and power by which he can grasp the world of affairs and live in harmonious relationship with it; and also to grasp the world of thought and the abstract principles of truth and duty and feel their influence and power.

OVER-EMPHASIS OF CULTURAL IDEA

Let us think for a moment concerning the over-emphasis upon the cultural idea of an education and the neglect of the practical view. How impractical some people are who have finely-trained minds! This fact may be illustrated by one of the foremost educators of our country, a gentleman who is a student and a philosopher of the whole subject of education. Yet some years since when he was at the head of a school for education he would walk through the corridors and rooms oblivious to what was going on around him because his mind was absorbed with the abstract theories and philosophies of life. This was not only true in the institution but in his home likewise. He and his talented wife were accustomed to give lectures on education and leave their children at home with the maid. They were blessed with two active lively boys, who one day were experimenting in the bathroom turning the bath tubs into lakes on which to sail their vessels. Having turned on the water with full force they inadvertently forgot that the faucets were running and left the room and there was a flood. The neighbors in the apartments below received a copious portion of the flood, which caused them to notify their landlord that either they would move or their talented neighbors above would have to move out of the building. Some of the professors of the university said that the educators' family needed a practical education because they were so filled with the higher processes of education that they could not coördinate themselves with the cosmic processes.

Another illustration occurs to me of the dangers of having only a theoretical education in this practical world, by a visit which I made to one of our interesting New York cities where there is a fine community house in which the civic and social activities of the community are centered. After I crossed the threshold I was told that I could not visit one end of the building because it had suffered from a disastrous fire. It seems that a club of young women had had a meeting in one of the club rooms on the second floor some time before, which club was in charge of a very gifted young woman, a graduate of one of our splendidly-equipped colleges. As it was in the fall of the year they had a bright fire burning in the fireplace. When the afternoon was over the young lady in charge, in setting things in order, took the burning back log and put it out of sight in a closet without observing fire regulations. A fire broke out and destroyed one side of the beautiful building and caused the loss of many thousands of dollars. These may seem to be extreme illustrations, but really they are not, because often well-educated and gifted people are found to be most impractical.

It is quite possible in the emphasis upon the training of the mind in

abstract truth, in the beauty of knowledge, apart from the practical world of affairs, to become so out of harmony with environment as to be ineffective. The result is a lack of a well-rounded and symmetrical development of mind and character, which, it seems to me, should be the object of an education.

THE PRACTICAL TOO STRONGLY EMPHASIZED

Now take the other idea of an education, the practical—the dealing with things as they are—and put the emphasis upon it to the neglect of the theoretical or the ideal, and do we have the right object of education? I fear that we do not, and if we safety men insist that the curricula of our common, secondary, and technical schools shall place the emphasis so strongly upon material things and relationships as to dull the fine sensibilities of idealism and abstract thought, we also will weaken the educational life of our country and will not appreciably decrease accidents and certainly will not prepare ourselves against national disaster.

THE GERMAN IDEA

The one great nation of our time which has stressed the technical view of education as against the theoretical is Germany. The German people are educated, but in the last two or three generations they placed the emphasis upon technical education almost to the exclusion of the ideal and cultural values of education. When pupils had finished the grade schools most of them were allotted to various trades and vocations, some were sent to the preparatory schools for technical courses which they completed in the thirteen technical universities. When students entered the universities they were assigned courses of study and placed under professors who practically made them machines to grind out in the laboratories the secrets of Nature, that Germany might be a nation of applied science. She did become a nation of applied science in a marvelous degree, but in the over emphasis of the technical side of education much of the idealism and mysticism of old Germany was neglected and greatly lost its influence in the modern state. Not only did the General Staff of the Army and the Kaiser and the Court, but also the dominating educational opinion of Germany became thoroughly materialistic; therefore, the world cataclysm. It was perfectly clear why the General Staff should want the war and world conquest. One could well understand how the Kaiser and his advisors might want the war and world conquest, but some of us were baffled for more than two years after the beginning of the war to understand how the professors of German universities, men who were devoted to the search for truth, could themselves stand so unitedly behind the Government and General Staff for the ruthless prosecution of the war. Professor Vernon Kellog has told us why it was that the dominant mind of the German universities supported the war policy so whole-heartedly. The minds of the professors became technical and materialistic. They had embraced the Neo-Darwinian theory of the universe that the strong should rule over the weak, that by being strong there was a natural necessity to rule, and that the strong, well-equipped nation of technical skill had

not only the right but was under necessity to subdue and rule over the weak peoples, and to trample them under its feet and to destroy them unless they submitted to its rule. Germany furnishes us a tragic illustration of the results of over-emphasis upon the technical, materialistic object in education.

Neither the cultural nor the technical view of education is altogether right and both are wrong when they are separated the one from the other. Pursue an education for cultural values alone and it is a mistake, but not so great a mistake as to pursue an education for technical values alone. Either view alone is a mistake and might lead to ruin, but bring the two together and let them both be the object of our educational system.

EDUCATION FROM THE BIOLOGICAL POINT OF VIEW

I think it was the late Professor James who said in his lectures on Psychology for Teachers, that to build our conception of the purpose of an education we must recognize the great facts of biology. This idea appeals to me because I think of education in terms of life first of all. Let us consider the subject, therefore, from the biological point of view. Perhaps you may not agree with the view that we are just a development from lower levels of life and that the human family has inherited the instincts, passions, and desires of the animal life below us. But there are great fields of facts to support the view. Through the processes of evolution we have arrived as men and now constitute the human race, but we are not altogether cut off from the lower animal life and we retain many of the same traits which obtain in the animal world. Consider the subject of education from this point of view: An animal is provided with instinct, memory, and association, and by this form of education it is able to protect itself from the stronger animals, from the elements of Nature, and, marvelous is the safety practice of animals! It may be that the life of every wild animal is a tragedy as Seton Thompson affirms, but at the same time the animal has developed a wonderful power to adjust itself safely to its environment, and I doubt that 12 per cent of them die each year through accidents, which some authorities claim to be the ratio of accidental death among men.

I was sitting in my room on the sixth floor of the hotel this morning listening to the din of energy in the City of Cleveland. I could hear the thump of the car wheel as it passed over the joint of the rails, the hammer in the shop, the noise of the mills, and around and above all this a sort of symphony of sound. What was it? The energy of man's development and education which is being released in gainful occupations. But I also thought of the accidents which are taking place, the deaths which have occurred, the people who are being injured notwithstanding that this is "safety week" in Cleveland. Then I thought of the times I have visited our great manufacturing plants and have observed the men at work in the midst of moving machinery and their efforts as a part of the great constructive forces. Again, my thought turned to the congested traffic on the streets of our cities and how the thoroughfares are full of the energy and contingencies of our rapidly-moving life. To avoid accidents on

the highways, in the mills or the mines requires almost perfect mechanical organization and operation and also education of the individual to safe practices and habits which are unfailing.

We are being educated instinctively and by lessons to save ourselves amid these processes but I doubt if in the development of our artificial, man-made life we are more safe against the destructive forces than are the animals out in the forests. As I sat and looked out from the window, thinking of Cleveland and its din of energy and power moving in all directions, and people being hurt in the midst of it, I also thought of one pleasant afternoon on the French River in Canada when I was fishing for bass and of how safe the bass were in the lake that day, so far as my skill as a fisherman was concerned, and of two little mink in their glossy silk fur which came out of the rocks and swam across the river, and of the hawk flying in the blue above, the insects of the air, and the birds in the trees. As I reflected upon these contrasting scenes it seemed to me that the birds of the air and the fish of the sea and the beasts of the forests are more perfectly adjusted to their environment than men are adjusted to theirs. In other words, the instincts, associations, and memory of animals are as great, or of greater protection to them against accidental injury and death than are the instincts of self-preservation and an education for the human family. With the biological conception of education as a root idea the question may rightfully be raised—Has not our education in protection and safety lagged behind other elements of our development? It seems to me that it has. The opportuneness, therefore, the necessity, for the National Safety Council, which is gathering together the collective experience of industry for safety, to carry its message and practical methods to the schools, and for safety material to be incorporated in the curricula. Our educational processes should not only enable us to relate ourselves harmoniously to the world of affairs but also relate ourselves to the principles of abstract truth and duty and unless we have an educational system which will correlate life to our complete environment we shall not have that educational system at work which we need for the formation of our national character.

SIMPLICITY OF DR. PAYNE'S BOOK

One thing which I like about Dr. Payne's book is its primer-like simplicity. It is intended for the children in the grade schools, most of whom are below the adolescent age and in that period of life when the mind is not abstract or theoretical but receives its impressions and information from concrete facts and relationships. Only in and after the adolescent period does the mind become reflective and move in the higher sphere of abstract principles and relationships. It is wise, therefore, to provide safety material to be incorporated in the curriculum of the grade schools of a very simple and concrete nature, suitable to the needs of children who are interested in and dealing with concrete things and through them receiving their appreciation of truth and reality. This is the psychological and pedagogical value of Dr. Payne's book. He has gathered up the "Abc" material from the safety movement and arranged it in suitable les-

sons for the instruction of children to meet the practical needs of their lives. It is quite important that a child on its way to school shall have some knowledge about what to do and not to do lest it be injured. So also in the school, and at play with its companions, and in the home, and every other place the child needs instruction as to safety. The grade school is the appropriate place to teach the concrete simple facts to children, which will enable them to develop that inner mechanism of thought to grasp this outer world of controlling realities and not be hurt thereby. The Safety Council, however, should not stop with this primary instruction in the grade schools but the lesson should be carried upward into the secondary schools and also into the technical schools, colleges and universities, because in them our future leaders are being educated and trained for life's work. There our future engineers are receiving their impressions as to practical values of life. They are the students who in a few years will have charge of our great constructive processes and programs. They will be the leaders to carry forward improvements and refinements as regards the factor of safety in the operation of our industries.

SAFETY IN CONSTRUCTION

Of course every engineer calculates upon a reasonable factor of safety for construction and operation in the main, but is it not true that they have not carried their thought and imagination forward far enough to include the safety factor in all our operations? I am quite convinced that this is true. The engineer's position in business is like that of the architect or any other professional man. He must satisfy the Board of Directors and the Finance Committee of the corporation which he serves. They determine how much money can be spent on the factor of safety in construction and in engineering-revision and mechanical safeguarding. It is always a question whether or not he can carry safety to the nth degree. But there are great influences at work to awaken the intelligence and consciousness of finance committees upon this subject.

EDUCATING THE CAPTAINS OF INDUSTRY

The safety movement is enlightening the minds of the captains of industry. The forty-one State Compensation Acts emphasize the economic loss of accidents and occupational diseases. There is a growing appreciation of the value of human life and in the future it will not be so difficult for trained engineers when they submit their plans to executive and finance committees to persuade them to appropriate sufficient money to have their industrial plants constructed and equipped for safety of operation and the preservation of life and limb of the workmen.

SAFETY EDUCATION IN TECHNICAL SCHOOLS

It is quite possible in our zeal to educate workmen to safe practices and habits that we unconsciously hold them responsible for accidents in too high a degree. Careful studies have revealed the fact that the severity rate at least is more affected by engineering and revision of plant struc-

tures and equipment than it is by education of workmen. The primary responsibility for safe and sanitary work places rests upon the management. The management, however, is dependent upon competent engineering service to make work places safe and sanitary. In order that competent and conscientious engineers, imbued with the idea of safety in operation, may broadly influence the physical conditions of industry it is necessary that they be educated in the technical schools in the principles of safety and its larger values. To accomplish this object it is necessary that we carry the message of safety into the technical schools and universities, to the faculties and to the students. During the last year one of the most fundamental services which the Council has rendered was the encouragement of Dr. Payne to prepare his book for the primary schools, and also the sending of a qualified engineer to the universities and technical schools to converse with the faculties and tell them the story of safety and its need, and getting the safe practices leaflets introduced into these schools and these vital ideas at work where our future leaders are being educated. This is beginning at the source of influence in the schools where the little children are receiving the impressions which form their habits, in the technical schools where the engineers are receiving their ideas and ideals of professional service. As safety is first an attitude of mind and then a habit of life we will make more progress in eliminating accidents and prolonging life by developing the proper attitude of mind and habit during the years of education.

PLACING RESPONSIBILITY FOR ACCIDENTS

There is another thought which I wish to call to your attention; namely, that philosophy concerning accidents which holds them to be unavoidable and their cause often mysterious and inscrutable. The result is a belief that accidents cannot be prevented. The safety movement has demonstrated that they can be. The popular belief, however, is that accidents are just accidents,—something untoward, unlooked for, arising out of the contingencies of life which cannot be foreseen and provided against. It is this idea which frames the legal definition of an accident. This philosophy has even influenced the minds of legislators to declare that some things are the acts of God and we have been disposed to hold the Supreme Being responsible for some of the most unhappy occurrences in life. I am disposed to absolve the Deity from responsibility and charge the occurrences largely to the stupidity and ignorance of men. It is sort of a convenient philosophy to roll on to the Supreme Being the responsibility for things that belong to you and me in the development of our intelligence in the world of affairs. As it has been given to us to subdue the earth and make it serve our purpose there has also been given to us an intellect to be trained and educated to understand the forces of Nature and our relationship to the world of affairs that will enable us to live in harmonious relationship with all mundane things. Our educational development in this respect has been retarded and it needs to be facilitated by the safety movement. What mean our senses of sight, hearing, smell, touch, and taste, and our powers of reasoning, of memory, and of association, if they

cannot serve us to correlate our lives practically with the outer phenomena of the world. Our Creator has done his part in our endowment. We must do our part through education to enjoy the values of a harmonious life. I do not think that our educational processes will bring us to perfection, but when we recall the awful wastes that are occurring today not only of life and limb but also of material, and when we think that in a great city the hazards to life are greater than in a secluded spot where one is in tune with Nature, one cannot help but feel that safety certainly has its place in the educational system. What is needed is the attitude of mind, the practical methods and the realization of their values, and the putting of them to work, and they will help us to define and realize the larger object of education and make us a happier and more useful people. I cannot think that the incorporation of safety in the educational system will militate against the richness of life upon the cultural side.

TWO ELEMENTS NECESSARY IN EDUCATION

How can we maintain a cultural life if we do not have a healthy and whole life? The body is the temple of the spirit. The health and well-being of the body affect the vitality and beauty of the spirit. Only as the mind and spirit are educated to a proper control of the body in relationship to the world of facts and forces is the education of the mind symmetrical and complete. Educators and philosophers as well as practical people have devoted considerable time to debate of the value of the theoretical as opposed to the practical and the practical as opposed to the theoretical values of education. It seems to me that the values of both elements ought to be recognized because of the biological facts of life.

Life is not separated into compartments. Only for convenience of thought can we differentiate between the theoretical and the practical. One can hardly think of culture as belonging only to disembodied spirits but rather as characterizing a personality tabernacled in a physical organism. If one's physical organism is properly related to the physical world about him, his mind may be filled with the good, the true, and the beautiful, both of the visible and the invisible world, and he will have a healthier, safer, and happier life.

SAFETY MOVEMENT BOTH PRACTICAL AND IDEAL

It seems to me that the incorporation of safety in education strengthens this composite ideal of education. The safety movement is not only practical but it is also ideal. Much of the motive power of this great movement comes from idealism. Safety in education therefore will help to clarify the object of education and unite the practical and the cultural values and meet the needs of our great nation.

America should not become less technical on the engineering side nor should she become less cultural on the ideal side, but her technical skill should be infused with the spirit and imagination of idealism which will enrich the educational motive and beautify the entire life of our country. I hope that America will never become as Germany was, cursed by the philosophy of materialism to the obscuration and deadening of the

higher sensibilities of the mind and spirit. But America cannot fulfill her great mission without an increased technical skill which needs to be touched and infused with the spirit of idealism. We walk the earth but let us walk it in safety with our eyes to the skies.

CHAIRMAN WHITNEY: A year ago at this time we knew just as well as we do now that we wanted safety education in the schools but we didn't know how to put it in. We were in St. Louis at that time holding our Congress and we talked to the school authorities there about our need. The result was that Dr. Payne came forward almost providentially and before we knew it, had actually done what we wanted. It was an accomplished fact before we recognized it.

A plan was evolved and tried out in the St. Louis schools, and has proved successful, that seems to have completely solved the problem of getting safety into education, in the public and parochial, the primary and secondary schools.

I want to recommend this plan to the people of Cleveland. I was in the St. Louis schools, seeing a demonstration of the work when the teacher called on one of the boys to explain why they ought to be safe. He gave a number of reasons and then he finished off with what seemed to him one of the strongest reasons, that is, if St. Louis were to compete successfully in the race for population, she had to keep all her population. I think that would be a valuable thing for you Cleveland people to remember.

I take great pleasure in introducing Dr. Payne, Principal, Harris Teachers' College, of St. Louis.

TEACHING SAFETY IN PUBLIC SCHOOLS

DR. E. GEORGE PAYNE, PRINCIPAL, HARRIS TEACHERS' COLLEGE
ST. LOUIS, MO.

I hope that you won't expect from me a brilliant address, because I have merely come to tell you, as simply as possible, how the children may participate in the great movement of conserving human life.

It seems to me that this week has been largely an educational week. I came here to attend the Safety Congress, but in every session I have attended it seems to me the emphasis has been put on education and rightly so because, after all, safety is education and education is safety.

I should like without any preliminary introduction to enter into what I have to say this afternoon. What I am going to attempt to do is to give as nearly as I can a picture of what goes on in teaching accident prevention.

To be sure, it would be most desirable if we could take you into the schoolroom and see the children in action, but that is impossible. Some of you have seen the children in action and I am sure it is much more impressive than anything I could tell you of what takes place in the schoolroom.

MAKE THE CHILDREN A PART OF THE MOVEMENT

In the first place, the fundamental principle underlying our effort is to make the children a part of the safety movement just as we make them a part of the movement in the acquisition or the development of health, or in the acquisition of ideals and the practice of thrift. Our whole notion is to induct the children into a welfare movement. In other words, the children are living in a community of which they are a part and we want them to realize the ideals and the problems of that community. We think there is no bigger problem or no more important ideal than the realization of safety in the community. Underlying what we undertake of an intellectual sort is the effort to make the children responsible for the conduct of the school community.

Consequently, the whole idea is that the children shall engage in this work. The procedure is totally different in the education of a child from what it is in the education of an adult. I may tell you something that lies within your experience and you understand it and interpret it properly, but when we deal with children, if we educate them we have to induct them into the experience. Therefore, in the education of a child, we must rely much more upon getting the child into action and making him a part of it than in the case of an adult. Yet, every one of you knows that when you want to learn a thing, or when you have a problem, you learn it or solve the problem by bringing yourself to face the problem and work out its solution. You start with an interest. You get into the thing you want to solve, you go into the sources and you work out the details of the problem. That is what we are attempting to do with the children. We are making the children the central figure in the activity. The children do the thinking.

THREE METHODS IN ACCIDENT EDUCATION

There are three specific ways in which accident education is carried out. One is by introducing into the curriculum in the schools—into the various subjects such as arithmetic, language, reading, and the like—accident prevention instruction. The second is by having the children, not the adults, construct plays and the children give those plays or pantomimes illustrating accident situations such as you will see here this afternoon. The third is the organization of the whole school—not the teachers, but the children themselves,—with the idea that they shall be responsible for the welfare of the community in which they live. That, after all, is education. That, after all, is the only way education can go on.

People have not come to that view very rapidly because of the simplicity of the community of a generation ago, the community in which our fathers lived. But, in the modern, complex community, the city, you can't equip the child to participate in the life of his community by telling him what to do. You can only equip him properly or train him by allowing him to participate in that life; to live that life during his career when he is getting his education and he is preparing for those larger relations of life.

Let me give you a very few illustrations in order to make very clear what I have in mind in regard to making the instruction in accident prevention education a part of the curriculum.

ACCIDENT PREVENTION INSTRUCTION, A PART OF CURRICULUM

In the old way we learned civics—for instance about the activities of the city—by having a book and putting it into the hands of a child and letting him read about the subject under consideration and then come to class and sit in a chair and answer questions the teacher asks. We didn't ask whether it affected his behavior when he went out of the schoolroom. In fact, we never tested it very definitely to see whether the information had become a part of his life.

A lesson in civics as taught today reverses the situation. During the past year we were studying municipal activities,—the activities of the Police Department, the Executive Department of the city, the Mayor's Department, the Street Department and the Coroner's Courts and Inquests. Fortunately Coroner Vitt invited us to send a group of children to witness a coroner's inquest. The first thing was to allow the children to select their representatives to go and bring the information back to them. In the very beginning the children delegated persons to bring them information regarding things they wanted to know about.

The outcome of this visit was interesting, and was typical of what is going on in a civic class. The boys who came back said to the principal, "We must do something to eliminate accidents from this community. We must do something to see that children do not engage in those activities that endanger their lives."

The principal asked him what he had in mind. He said, "We went down there and heard the story of how the boy was killed. Two boys were going to a show and one said to the other, 'Let us take one last ride before going into the show.' How prophetic that was! One of them fell from the trailer of the street car on which he took the ride, both legs were cut off, and later he died."

This boy said, "There are boys in this school who jump on cars every week. I have jumped on them myself. We must see to it that no boy is ever permitted to do things of that kind." Isn't that accident prevention?

The principal said, "What are you going to do about it?" He replied, "I think we ought to tell the school."

"All right. Get your story ready." They got a group of children and practiced until they had a good speech. Then they began in the kindergarten and went throughout the school, and told the story they had impressed upon them.

Do you think the children of that community jump on street cars? No, because they got that story from the heart. They are learning to participate and get the experience first-hand.

And think of the ability in English that the child acquires in work of that kind! Think of the latent ability he finds in the expression of his thoughts! He learns more English in one exercise of that kind than he

learns in a month from books. Take as an illustration, some of the arithmetic problems he makes up:

ARITHMETIC PROBLEMS

"If there are 700,000 people in St. Louis and 510 are killed by accident, how many would be left? What per cent are killed?" Or:

"There are 99 people killed by automobiles and 37 by street cars. If 4 times the number killed by automobiles are killed in other ways, how many people will be left out of a population of 700,000?" Or:

"There are 464 people killed in St. Louis in the year 1918. If this number could be cut down 10 per cent by safety first, how many people will be killed in the year 1919?"

Isn't that better than to give the child a problem from a book to solve? Take this one:

"If the population of the United States was 91,972,266 in 1910 and the accidental deaths are 54,300, to what would the population of the United States be reduced by accidents alone in ten years if population did not increase in other ways?"

These are problems made by the children. Now look what the child has done in order to get the information! He has gone to every available source. He has searched out the statistics, census reports, all the information from the teachers, and he is taking it home to the parents. The parents have participated in getting his lesson for him. Aren't those problems as important as the problems you had in school?

The greatest value is that the child not only gains power in English construction but he gets a great deal of information and it must be correct information,—because the teacher sees that it is correct.—in regard to the actual accident situation, and it leads not only to the discussion in the home but in the school, of the actual statistics.

Not only is this true, but he takes those figures and throws them into tables and graphs. Isn't that the kind of problems we are interested in today?

DRAWINGS AND SLOGANS

Take drawing. You no doubt have seen the drawings here at the Armory this week, which are typical. A drawing of the American flag with the slogan, "Make it stand for Safety." "One Man at Work is Worth Two in the Hospital." "Don't taste everything you see. Safety First"—and this was a picture of a child on a chair drinking from a bottle taken from the medicine shelf. "Any Fool can be careless."

In other words, in drawing, instead of drawing scenes from nature—which is perfectly all right and I have no objections—the child draws the things with which he is familiar. I am not advocating this as the whole educational program. I am merely trying to show you what can be done in the school exercises.

SAFETY CORRELATED WITH READING AND ENGLISH

Or, take a reading lesson. In the reading class we assign newspapers and magazines as the subject matter for reading, with the purpose of

developing the safety idea, and with the idea that the children are to select an article that they think is worth while for the class to have. They know, further, that if the article selected is thought sufficiently valuable by the class, the members vote to select the article and put it in a scrap-book as a possession of the school.

Think of the stimulus to the child when he goes out to get something to share with his fellows and those of future classes that come into the school! You can imagine how much he reads, how much he discusses what he reads! Parents have told me over and over again that they have learned more about safety since this plan was introduced than they ever knew before in the schools because the parents were naturally the source and had to be able to help the children out. They had to be interested in the school work itself.

Then the child brings his article before the class. Teachers have told me that children make more progress in one lesson of that kind than in the ordinary assignment given to classes in one month.

Take the English lesson where we assign to the children a real or imaginary incident as an oral composition, and then we let it be known at the time that those who present the best selections, those who make the best effort, will be given the opportunity to present this, provided the class thinks it worth while, to the other classes in the school.

I am afraid you might get the idea that there isn't a great deal that is ideal for the children with this plan. I want to read you a few speeches that were written by the school children. The first is by a girl twelve years of age.

SAFETY SPEECHES BY CHILDREN

"There is something at this present time that must be taken care of, something that if not prevented will cause great sorrow and suffering. The boys, returning from the dangers and horrors of war, hope—long for—the safety and quietude of peace. Is this country safe for them? It is certainly not safe when two hundred twenty-five men, women, and children die each day from causes, most of which are preventable. If you can picture five schoolrooms, each containing forty-five lifeless persons, whom you might have kept healthy, helpful citizens of the United States, then you have some idea of what goes on in this country each day. We know that some of our valiant boys will not return while others will come back crippled. But there is a very great reason for this, a reason that will never in the history of the world be forgotten. Every day we see in the paper the glorious list of those who died that we might live and live better. It is only just and fair that we do our utmost to improve our country by saving the lives for which our soldiers died.

"The boy who in a careless hurry and flurry loses an arm, is he to be classed with the soldier who gave his arm? Was there a reason for him to rush heedlessly across the street to arrive at, not his destination, but an accident? He paid dearly for his act, and his parents will feel the loss as much and more than the boy himself. The man who hit the boy is to be considered. He will have the memory of it all stamped be-

fore his eyes for years. The parents, the man, and others had really nothing to do with the accident, but still they carry the responsibility.

"Now, look at the wounded soldier. At first sight of him, the loving old mother feels a shudder passing over her, and then quickly quite another feeling prevails, a feeling of pride and respect for that brave boy of hers. Every one that sees the boy shares her feelings. He is welcome wherever he goes. Now, compare these two boys that I have mentioned. See the numerous things they prove, among which one stands out strongly: that bravery or courage does not mean carelessness.

"During the last war the government found the people ever ready and willing to help. Now that this great question has come to the fore, the question of safety, can't we see our duty and do it? A tedious battle has been fought and won, and now this battle also must be fought and won. We shall be fighting in more than a just cause, fighting because people of our country are being killed by that ever-prevalent tyrant, carelessness. When we hear that people of our own nation, our brothers, are being killed, don't we feel a stirring, a quivering about us, a resolve to do our part in the work? We fought to make the world safe. We have heard that expression time and time again, and to a certain extent that has been successfully carried out, but not quite. While people suffer death caused by a tyrant, we are not finished. When we entered the last war, we went to work with the idea of winning. Very soon we saw something else. We saw that we must win quickly. As soon as this thought took root, things began to change. Very soon victory was ours! Just so it will be in this case. The sooner we get at this thing, the better. But remember, place 'safety first' first safely in your own mind and then in the minds of those about you."

That was the effort of a twelve-year girl and that was her expression. Take another of a similar character:

"Do you read the newspapers? Have you noticed how many accidents happen daily that might have been avoided? Not one day passes but what some one is either seriously injured or meets death simply through carelessness. We used to think that accidents were necessary, but now we know that it is not only possible to prevent them, but that it is our duty to do so.

"Some one might ask, 'What can I do? How can I help to promote safety?' Your teachers have given you safety rules which you should follow. Knowing them is not enough. You must use them. If the simple rule, 'always be careful,' be followed on the street, in the home, and at school, what a number of accidents might be avoided. We should be constantly on the alert, not only in regard to our safety but in regard to the safety of others.

"I am afraid some of us do not realize how important this safety-first movement really is. Let me quote some statistics to prove to you the seriousness of this matter. We think that the number of deaths in our army was great. Yes, it was great, sixty thousand. But think of it, in the year nineteen hundred seventeen, seventy-five thousand lost their lives through accident. Fifteen thousand more than in this great war! It is also estimated that one out of every eight persons in the United

States is injured yearly. And when we know that war's casualties were necessary, while those from accident were not, shall we sit by without an effort to reduce that number? Think of your own family. Would you want one of them crippled for life, possibly, through your negligence? It is a fact that the greatest number of accidents occur in the home and on the street. Out of twenty-nine thousand accidents in Chicago, fifteen thousand occurred in the home.

"Thousands of others will meet a similar fate unless we all unite to help free the country of avoidable accidents. By the combined efforts of men, women, and children, we won this war on autocracy. By the combined efforts of all of us, we shall win this great war on accidents."

If I could have the time this afternoon, I could give you many incidents of that kind of work that are coming out of classrooms every day. Let me give you a list of questions asked on examination:

EXAMINATION QUESTIONS

"Describe the correct way to get on and off a street car. What must you do on the discovery of a broken wire? What is the danger of spitting in public places? Name five public safety devices with which you are acquainted. What may the automobilist reasonably expect of a pedestrian? Give one important precaution regarding the handling of firearms. Tell how to call the fire department. What is the location of the box nearest your home? What number do you call for the police? Name five ways by which you can distinguish a careful person." That is the type of problem that acquaints the child and shows he has been studying the real problems of the community and not some imaginary one.

DRAMATIZATION

The second point, the dramatization or pantomime, will be shown this afternoon, by Cleveland school children.

THE SCHOOL SAFETY ORGANIZATION

I want to speak just one moment of the school organization, the use of the children themselves in the safety movement. The children are led to feel their responsibility for the safety of the community, not only the children in the school, but the children as they go to their homes from school and from home to school.

I went into a building a short time ago and found a group of children interested in discussing some problem. I asked them what they were discussing. They said, "We are discussing safety." I asked them whether they were doing anything to promote safety.

"Yes. We have children at all the crossings where the policemen are not stationed to take care of the primary and kindergarten children."

They told me also of an incident of the morning before in which the policeman on a very dangerous crossing had to go down to testify in a case. The children had gone there and had taken charge of the crossing and had seen that the younger children were safe. When I inquired at the school, not one of the teachers knew of it. The children had taken

care of the need because they had been led to feel they were responsible for accidents in that community.

Here is another incident: I went into a schoolroom where a group of children were meeting and discussing safety along with health and clean school yards and proper care of books, and other questions. They had their president and secretary and various committees, and the children freely participated in the discussion. They were making reports of what they had done in the past week, and one boy reported he had noticed the morning before that the policeman was not on the crossing and no committee was there. A boy quickly jumped up and asked, "Did you say you came by the crossing and there was no policeman or committee?" He continued, "What did you do?"

"I came on to school."

"Why didn't you take care of those children?"

"It wasn't my duty."

"Do you mean to say you saw those children in danger and in spite of that fact, you didn't step in and help them across?"

He said in answer, "It wasn't my duty. I was not on the committee."

"The gentleman does not seem to understand the question. I want to know whether you left those children in danger with the possibility of crippling or killing a child?" And, the room broke out into spontaneous applause that showed they felt the ethical nature of the point involved. This boy went further. "You are simply jealous because you were not assigned this duty." When once the children are made to realize their responsibility, how they take hold of it!

I could go on and give you incident after incident but I do not want to take too much of your time. I want to say, after all and fundamentally, this is a process of democracy. That is what it means to me and that is why it is so ideal. It is a democratic community of which every child is a part and he feels his part in the community. A child can't grow up and learn how to feel his part in it by mere reading.

If the children in the community are going to be able to participate in the life of the community, engage in it as a unit of the organization in an effective way, they must have experience in the schoolroom. That is what it means to me. It is a democratic community and we are training those children for life in a democracy.

(Audience expresses its appreciation of Dr. Payne's address by rising and applauding.)

CHAIRMAN WHITNEY: I wonder if I can't call on each one of you to get on the street crossing and be a committee of one to carry this message into your own home-town instead of your schoolroom.

The next thing on the program is a demonstration by the Cleveland school children of a part of this safety idea in the schools. This demonstration has been worked up entirely here in Cleveland and is under the direction of Miss Bryce, the Assistant Superintendent of one of the schools.

DEMONSTRATION BY CLEVELAND SCHOOL CHILDREN

MISS MARY HANRAHAN: It was Dr. Payne's intention that the school

children should explain this, but we did not understand that until it was too late, so please remember that I am reading the part that a school child would give.

"Science has shown us that disease is caused in a great measure by germs that have collected on the hands during work or play. These germs can easily be carried on the food to the stomach where they can get in their deadly work. In the first picture you will see a little boy with dirty hands ready to eat his dinner, but his parents are too wise to allow this. See what they do."

[The first scene depicted a family of three, the father, mother, and little boy, ready to partake of their meal. The parents notice that the boy's hands are dirty and send him to wash them. He leaves the table, washes his hands and returns to show his parents that his hands are clean. He is then permitted to eat his dinner.]

"Another way that the spread of disease can be prevented is by brushing the teeth after meals. This is equally as important as washing the hands before meals. Germs lodged in the crevices between the teeth can thus be exterminated. Let us see if the boy in the next picture has learned this lesson."

[In the second scene, there is the same family group, at the end of the meal. The boy is shown brushing his teeth.]

"This scene, I think, will fairly illustrate itself. I hope that every one in this audience after seeing it will know the necessity for using a handkerchief when coughing or sneezing and be ready to inform any one of this fact if he neglects to do so."

[In the third scene a group of girls are playing jacks, all coughing and sneezing, but using handkerchiefs to cough and sneeze into.]

"No person can be healthy unless he breathes fresh air. How is he to get it when he is not out in the open? By having the room he is in properly ventilated. We usually see to that during the day; but it is of great importance that we have fresh air to breathe during our sleeping hours. The next picture will show you what should be done before retiring for the night."

[In the fourth scene, a boy is seen opening the windows from the top before retiring.]

"Who would have thought the little fly could spread disease as it does? The tiny hairs on the fly's legs collect the germs, and then the fly shakes them off right in the most convenient place for them to begin their work. Swat the fly! This boy shows us how to do it."

[In the fifth scene, a boy with a fly-swatter is chasing flies. He shakes his head when he misses one, and nods his head with approval when he kills one.]

"Often we meet with what is apparently a slight injury; as a cut or bruise; and so pay little or no attention to it. But, how often do we have to pay for this neglect? It sometimes results very seriously. In order to avoid trouble or be on the safe side, always give the proper care to a wound, no matter how slight it may seem. Watch closely and see how it is done."

[The sixth scene depicted a mother sitting at a table when the little

child runs in to her with her finger cut. The mother immediately washes the wound with an antiseptic and bandages it.]

"How many lives could be saved if we all knew how to resuscitate a person that has been rescued on the verge of drowning! If you do not know, the two boys in the next scene will show you how."

[The seventh scene depicted one boy, who was supposed to have been rescued from drowning, lying flat on the ground, and the other boy was working to restore him.]

"How many accidents are due to carelessness at home. Let us all try to make our home a safe place to live in. Did you ever have the experience that this boy is having? I hope we will all pull out every nail that is not in its right place, as this boy will do, and so avoid accidents."

[The eighth scene depicted a boy picking up a stick with a nail sticking out of it. He finds a rock and drives the nail out.]

"Sometimes we realize there is danger in doing certain things, but through carelessness or thoughtlessness we pay no heed. Don't step on a ladder without giving it a thorough inspection. Falls from ladders often result in permanent injury or death. Let us remember the old saying. 'A stitch in time saves nine'. I hope that after seeing the next picture we will all have learned that a defective stepladder is very dangerous."

[In the ninth scene, a boy is walking up a shaky stepladder when another boy calls him down from the ladder and together they tighten the bolts, and otherwise strengthen it. The ladder is then ready and safe for use, so the boy again mounts it.]

"A frequent source of accident is the use of coal oil in making a fire. Persons may be ignorant of the danger in using oil on fire or may think that nothing can happen to them, and do what this mother and father want to do in their hurry to build a fire. The child is there, fortunately, to correct them."

[In the tenth scene when the child sees the father and mother about to use oil to make the fire, she persuades them not to by bringing to their attention an article in the newspaper which proves to them the wisdom in not using oil on fires.]

"Have you ever been guilty of dropping a match and not picking it up? More fires occur monthly from carelessly-placed matches than I could count on my fingers one hundred times. We should always have a place for everything and keep everything in its place. See what this sensible little housemaid does."

[In the eleventh scene, while dusting, the maid finds a match on the floor and places it in the match box where it belongs, nodding her head in disapproval of the carelessness of the person who dropped the match.]

"I read in the newspaper the other day of a little boy burned to death simply because his mother, either through fright or ignorance, did not use the proper method of extinguishing the flames. Maybe if she had seen this picture, that awful accident would not have happened."

[In the twelfth scene, a boy runs in with his clothes aflame, evidently. The boy is wrapped in a rug picked up from the floor and the flames thus smothered.]

"Have you ever seen children putting pins in their mouths? I have, more than once, and what a dangerous practice it is! The next picture will show you a mother at work making a dress. Instead of having a pin tray at hand, she uses her mouth for one. Her little daughter, realizing the danger, brings her a tray and so avoids trouble."

[In the thirteenth scene, the mother is fitting a dress on one of the little girls, holding the pins she is not using in her mouth. One of the little girls runs up with a tray and tells her not to use her mouth for this purpose.]

"We not only want to make our home a safe place, but we want to safeguard our lives while we are out on the streets. A very important rule to follow in crossing streets is, I think, 'Use your eyes, not your tongue'. One of the girls in the next picture is reminding the others what to do in crossing the street."

[In the fourteenth scene, the girl who is instructing the children how to cross the street, advises them to watch the traffic coming from the left until they are in the middle of the street, and then to watch for the traffic coming from the right.]

"How many of us are guilty of throwing a banana peel on the sidewalk or in the street! I wonder if we realized what a serious accident might have happened. This little girl is indeed fortunate to have escaped injury. See what she does with the peel."

[In the fifteenth scene, a little girl is walking along the street when she slips on a banana peel which another child has just carelessly thrown away. She picks up the banana peel and throws it into a waste paper box, where it can harm no one.]

"How many accidents could be avoided if bicycle riders were careful! Never try to beat an auto or street car at the risk of your life. We will show you in the next picture what a sensible rider does."

[In the sixteenth scene, the boy attempting to cross the street, looks in both directions before he does so.]

"None of us wants to be selfish, and so at the risk of health we do what this little girl in the next picture is doing. Fortunately her companion is wiser than she is."

[In the seventeenth scene, the little girl offers the other one a bite of the apple she is eating, but the latter refuses, because she knows better.]

"This next picture, I am sure, will appeal to every boy and girl in this school. We have all learned why it is necessary to carry our pens and pencils in a closed case. See what might happen if we are thoughtless in this matter."

[In the eighteenth scene, a boy is seen reading a book while walking along the street. He has a pen in his hand, which he is twirling with the point outward. Another boy, coming toward him, runs into the pen, but his coat was thick enough to save him from injury. He takes a case from his pocket and explains to the other boy that that is the proper place to carry a pen.]

"We are old enough to carry an umbrella and so must know how to do so. One of the girls in the next picture evidently must be taught how."

[In the nineteenth scene, one girl is crossing the street with her umbrella down before her eyes and, therefore, does not see the girl who is coming toward her. This girl, however, steps out of the way, but shows the other the danger of carrying an umbrella in that way and shows her that she should carry the umbrella over her head and not before her face.]

"The upper rooms of our school have appointed safety committees whose duty it is to stand at the street corners when school is dismissed to guard and caution children in crossing streets. Watch a few of the Committee at work."

[In the twentieth scene, the committee holds back or sends on groups of school children as they come to the street crossings.]

CHAIRMAN WHITNEY: That is all of that part of the entertainment.

Several have expressed the desire to have a round-table about this subject, as Dr. Payne and others are here.

MR. CHAS. B. SCOTT (Bureau of Safety, Chicago): I should like to suggest that the method of resuscitation in drowning that was shown in the demonstration is an obsolete method and that the prone pressure is the better method of resuscitation. Several men from the National Electric Light Association are here, and I should be pleased to have them give you a demonstration of this method if you would like to have it. It is the one approved by the medical authorities.

CHAIRMAN WHITNEY: I think we should like that very much, Mr. Scott.

[Two members of the National Electric Light Association come to the platform to demonstrate the proper method of resuscitation, giving the following explanation:

DEMONSTRATION OF PRONE PRESSURE METHOD

"I am supposed to have had this man cleared from the current and out of the water. The first thing to do is to take him and turn him over, putting his left arm forward, his right arm across the body, turning his head to one side, clearing his mouth of any false teeth, chewing gum, tobacco, or mucus. Then straddle your knees just behind his pockets or hip bones. Put your hands on the lower ribs, tips of the fingers just out of your sight, thumb alongside the fingers, little finger on the lowest rib. Stiffen your arms and rock forward. Release, removing the hands. Repeat fifteen times per minute, just like this.

"Now, it is very important to get your hand just in that position, no higher, no lower. If your knees are correct, you will notice that when I rock forward, my arm is perpendicular to the floor and the upper part of my leg is perpendicular to the floor. You don't want to go too far forward.

"Continue that resuscitation for four hours or until the patient is breathing of his own volition. Do not move the patient or allow him to be moved unless in very severe weather or because you are on rocky soil. After he has become conscious and is breathing, make him comfortable and do not leave him for some continued time.

"Operate on the patient right where he fell. Do not permit him to be

moved. Bring the doctor or hospital attendant to the patient and not the patient to the doctor or hospital attendant.

"Another point is that when the patient becomes conscious or is breathing again, do not allow him to get up.

"This is the method that is now approved by the Third Resuscitation Commission and by the various national organizations that have had it up. Booklets on it can be obtained from the National Electric Light Association, Engineers' Societies' Building, New York City."

QUESTION: Suppose the man's lower ribs were broken, what would you do?

ANSWER: Exactly the same way. When the lower ribs are broken, there are only two ways of resuscitation, one by the prone pressure, or Schaefer method, one by the Sylvester. In both cases they use pressure on the ribs.

QUESTION: Don't you think you would be liable to puncture your lungs by using that method if the ribs were broken?

ANSWER: In the case of a layman, it would be hard for him to determine that the ribs were broken.

QUESTION: I know of a case that had to be sent to Arizona.

ANSWER: I have handled some hundred odd cases and we haven't run into one yet where the ribs were broken.

QUESTION: In the case of electrical shock, don't you think it is better to drop them several times?

ANSWER: We don't believe in wasting the time, but I have heard that they have gotten very good results in the Queen Electric Lighting Company—they drop them three feet and drop them twice at any rate. Mr. Strickland is the only one using it to any great extent, to my knowledge. A number of other companies are not using it, feeling that they don't want to use up the time. We train our people to get to the man, flip him over, and begin work as soon as possible.

QUESTION: How long should a man keep up the work?

ANSWER: Possibly fifteen minutes. I should advise relays of fifteen minutes.

QUESTION: How long after the man has been drowned or shocked can he wait before you commence this and be successful?

ANSWER: We train them to get to him within a very few minutes. I think three minutes.

CHAIRMAN WHITNEY: Dr. Payne has to leave very soon to catch his train. Perhaps, therefore, we had better get at the discussion of his work.

DISCUSSION

DEAN CONNELLEY: We, at last, have legislation. We make it compulsory for every child in the state of Pennsylvania to become "safety first." We hope to get that much from Dr. Payne and his book. But, do not be discouraged if your school board does not approve. I will say that half of the people representing the constituents in the United States are not fit. That I know. I do not say it despairingly. We had to start at the top in order to come down. In our technical schools of

the country, much has been done. In the college work, it is just as easy for you to have a Safety-first Committee in the curriculum as a committee on advanced studies, degrees, or any other thing. It is just as easy because we did it and for five years we have had a standing committee on safety. I sincerely hope that if we in Pennsylvania can help you, you will please write Harrisburg, to the Department of Labor and Industry, and we will try to do what we can for you.

SAFETY POSTERS MADE BY CHILDREN

MR. H. J. HOBSON (East St. Louis, Ill.): I have in all of my schools, bulletin boards. The National Council formerly furnished bulletins for these boards, but have discontinued. We are now attempting to make our own bulletins. I would like to ask Dr. Payne what he thinks of that.

DR. PAYNE: I think it is a much better plan to make your own bulletins if you can. That is what we anticipate. Take the slogans of the Cleveland school children—you can't beat that work by any sort of posters you get, and I have found that where one child will look at a poster from the outside, fifty will look at one by the school children. When you put those posters by the children up in the hall, you can't get to them for children. There is the intensest interest in them.

I think it is infinitely better for the school to make the posters, although they may not be so artistic. The children look at them because they are the work of one of their fellows. In that way you get a lot of interest, discussion, criticism, and enthusiasm.

MR. SIMLEY (University of Kansas): I should like to ask Dr. Payne this: For a number of years in this safety work I have had considerable hard sledding. I have used the Council bulletins, put them up and taught safety until I have made myself disliked at times. Isn't there some suggestion that can be given us as to how we can make safety-first practical in the technical school?

SAFETY SCHOLARSHIPS

I have this suggestion: Would it be possible for the National Safety Council to provide a scholarship for men in colleges who are interested in doing something for safety first and who will put across a good bulletin or essay or who will work throughout a considerable part of the year on a thesis on this subject? Unless it is possible to get some money consideration, something practical that the boys can get hold of, I fear we shall not get a good backing.

DEAN CONNELLEY: I trust you won't go back with that kind of propaganda. Try to put enough pep into your instructors to put it across. In Pennsylvania we spend twelve million dollars every year on compensation. Now, think of that! It cost us over nine hundred thousand dollars to run our department. We have over a million injuries a year. It isn't the money, it is the human side that should be brought out! I never knew a student who sought an education who couldn't get it even though he didn't have a dollar.

CHAIRMAN WHITNEY: This is the field day for the public and parochial

schools, and I would like to ask that we confine ourselves to that problem today.

HOW TO PUT SAFETY INTO THE SCHOOLS

MR. LINTON (Mingo Junction, Ohio): Down at Mingo Junction, a steel town, we have been pioneering along this line. While we do not have safety in our curriculum, we have intended to have it. I intend to go back and put these books in the schools, and we are going to do some things!

MR. C. W. PRICE: May I ask a question? If I were talking to a school superintendent, trying to introduce safety education into a school, and he said, "That is fine from the standpoint of accident prevention; we are interested in that. But, we are interested in the educational standpoint." Strictly, what answer would you make?

DR. PAYNE: I think that the school people are more ready to accept the answer that I am going to give than business men realize. They are seeking a way. I think school people are coming to see that we have to teach health. We have to teach accident prevention not because of the practical necessity but we have to tie instruction up in order to teach it at all and make it stick.

In the matter of teaching English: we are losing so much in not using these other objectives such as health, accident prevention, thrift, etc. The war taught us that in a wonderful way. During the war thousands of outside tasks were thrown upon us. One superintendent said in the beginning that he wasn't teaching school any more, he was doing war work. I think you might take the consensus of opinion of the superintendents that they never did as much English, geography, arithmetic, and history in all their lives as during the war, and they engaged in Red Cross work, knitting for the soldiers, gathering waste paper, and all the other things.

MR. PRICE: I remember the day I visited your school I was most impressed with the enthusiasm. Do you recall any material you used that got that kind of enthusiasm I saw there?

DR. PAYNE: The discussion of health problems and practical civic problems such as I mentioned a while ago. If we are teaching civics, we are teaching live civics and not textbooks. We are letting them know what takes place in the city. We are going to have in our school a child of ten years who knows more about the actual working of the city than his father. Isn't that just as valuable as teaching something you don't know about? We are all agreed that you can't learn by memorizing something you don't understand. The difficulty of the school curriculum now, with the great variety of things is that the whole thing must be tied up to the life of the child. That is what we do whenever we bring accident prevention, health, thrift, and all these other things into the schools.

Take an adult; how many of you would sit down and work out something because somebody told you it was good for your soul? We must start with the child and with the interest of the child. He must be interested. He must do it because he wants to obtain some objective in doing

it. He is just like an adult. It is going to affect his mind and life, and if it is, it must be related to his interest and purpose. I very often say to my teachers, "If the child don't want to do what you assign him, then you are wrong and not the child."

HOW THE POLICE MAY HELP

INSPECTOR MAY (Police Department, Cleveland, Ohio): How can the police help that work in the schools? (Much applause.)

DR. PAYNE: By doing just what they are doing in St. Louis. The children call upon the policeman. They go with him and they get more information from the policeman about the Police Department than in any other way. The policeman's duties are learned from the policeman by the children.

INSPECTOR MAY: What I am trying to arrive at is this: We know every school teacher is interested in the safety of her children. Just as soon as the policeman is not at the school, the principal will call up and want to know why. What I am getting at is this: last winter we had a policeman visit every school in the city of Cleveland and talk safety, telling the children what they should do when they left the school, telling them the way to proceed on the way home, picturing to them the things most likely to happen. But, I am wondering if there were some better or more forcible way of impressing it on their minds.

DR. PAYNE: I think that is a splendid thing providing the teacher doesn't think the duty is accomplished when the policeman finishes. If she does her work, and then brings in the policeman whenever she can, that is splendid.

As I said, the children themselves find out a great deal about the activities of the policeman.

MR. EUGENE ROESCH: I know of a chap, one of the traffic men in Cleveland, but part of his time he is stationed near a public school here. Now, this chap is really a big brother to the school boys and he puts the responsibility onto the school boys themselves for maintaining order and traffic and all that sort of thing. He has his coterie of chaps so that when he is not on the corner, perhaps called on a case, they will watch the traffic, take care of the little children, and report any disorder or infringement.

I think the policemen should, and I believe they do in New York City, chum with the big boys and also the little fellows of the school and say, "Now, here, you are my representative and I put this responsibility on you." If the policeman will do that, they will be teaching a lot of civics as well as helping these boys.

While we are on the subject of what the police can do, I want to bring this matter up. I am not going to mention any particular city. I have been at every meeting here and I haven't heard a thing about getting convictions and imprisonment. Let us put ourselves on record for convictions and get the judges to back up the police. This matter is a farce when a man gets five or ten dollars for speeding and endangering lives. I myself have been nearly run over several times, and on taking

the matter up with the police, they say that they are absolutely disgusted because, when they have a clear case and have witnesses, the thing is quashed.

COÖPERATION

MR. T. B. HAYES (Upson Nut Company, Cleveland, Ohio): I want to ask Dr. Payne if coöperation of the mothers' clubs wouldn't be of good advantage with the teachers in working on this safety movement. The children, of course, are the primary object of teaching, and working through the mothers' clubs and teachers would make a good feature.

DR. PAYNE: I think you can't help but get that coöperation when you begin to teach this. Just the Friday night before I left they had a meeting with fifteen hundred present at the school, a patron's meeting in a district where they are doing this kind of work. All you will have to do is to give them an opportunity and they will do it.

MR. F. S. CRUM (Prudential Life Insurance Co.): I mark three or four papers every day as I read them, mark all sorts of accidents which we classify and file, and I pay my boy of eleven years to cut them out. That boy knows more about the daily accidents as reported in the morning and evening papers than I do. He stops and reads, while I only glance at the headlines. You couldn't hire that boy to be a jay-walker.

That just illustrates that when this matter is brought home to them daily, there is nothing to it—it is absolutely automatic.

UNIQUE EDUCATIONAL PLAN

MR. MCCLAIN (National Safety Council, Cincinnati, Ohio): I wonder if these folks would be interested to hear of our unique educational plan in Cincinnati.

I am the Secretary of the local chapter at Cincinnati and at the same time I am a member of the faculty of the University of Cincinnati. It comes about in this way: the University of Cincinnati is a municipal institution. The trustees of that University are the business men, the industry men of the city. Those men have tried to interpret the responsibilities of an education of that type to the community. In view of that, in the last eight months, they have organized in connection with the University a department known as the Department of Industrial Medicine and Public Health. That department is connected with the Medical College.

The scope of the department is this: the director of the department is Major McCord who had charge of the Base Hospital at Camp Sherman. Captain Walker, a very able man, had charge of the nitro plant in West Virginia. We have a woman, Miss Laura Sanders, who has demonstrated her worth as a woman at the University. She has been at the Teachers' College, Columbia, and the Wright Airplane Company. She used to work among the women in industry.

We are employing a man to take charge of employment relations who will go into the industrial field and develop among the manufacturers themselves, and show them the necessity and advantages of that. In

connection with that department they have a safety man. We are all members of the faculty. Besides our field work among the industries in the city, we have regular teaching jobs. This department I have mentioned takes graduates and gives them a sort of apprenticeship in these things I have enumerated.

A student will be with me a few months. I will give him the best I have in the field in industry. He will be with Dr. Walker a few months. When we get through, he is industrially trained, equipped to go into an industry of two or three hundred employees, where they can't afford to hire a safety man, or a doctor, and he will be able to meet the situation.

Here is an advantage that comes to me as a safety man being connected with the University. We have about eight hundred engineering students. I have arranged to give them a definite course in safety—we will call it lessons. If it were outside of the University, it would be called lectures—anticipating that the men will hold responsible positions later. In the Teachers' College, I have been accorded the privilege of giving them a course preparatory to teaching safety in the schools. I took my plans to the Board of Education to organize a class of teachers in the schools in the city, at least one from each building. It is hard to get them all together, but we are going to get one from each building. I am going to teach them and train them along the lines of safety as Dr. Payne has outlined. I intend to go to the schools myself to give lectures and exhibit moving pictures to give a background. We will encourage little playlets.

We have been offered the use of an already-organized club, as it is called, affiliated clubs. Each school has a little active organization that we have used for selling liberty bonds and thrift stamps. These clubs have been offered me for use in the safety work. So far as I know, and I believe I am right, I am the first man in the world (that is, taking in a lot of territory, I know) to be Secretary of a safety organization and at the same time a regular professor in a university. I thought you might be interested in that.

CHAIRMAN WHITNEY: Are there any other questions or observations? If not, we are adjourned.

Banquet

October 3, 1919

STEPHEN W. TENER, Chairman

President, Northeastern Ohio Division, National Safety Council.
Cleveland, Ohio

A. C. Brown, Toastmaster

President, Brown Hoisting Machinery Company, Cleveland, Ohio

THE CHAIRMAN: It is my pleasure, as President of the Local Council, to welcome you all to Cleveland, and to thank you for coming long distances; for coming as a multitude. I am glad to welcome you to this, the Fifth City of the United States—excluding Missouri and Alaska. (Laughter.) There seems to be a little objection to that statement. Inasmuch as I have never been in either Missouri or Alaska, perhaps I had better correct myself, so I will begin all over again and welcome you to the Fourth City of the United States, exclusive of Missouri, Massachusetts, and Alaska. (Laughter.)

THE LOCAL COUNCIL

I want to say a word for the Local and its activity. I have been extremely busy with other matters, due to labor troubles, and I confess I have not been able to attend the convention regularly, nor have I been able personally to do very much work in connection with the preparatory work of this convention, but I will paraphrase the inscription which Mr. Carnegie ordered placed on his tombstone—"Here stands a man who is able to pick men better than himself." The members of the Local Council have done their part; credit must go to the various committees, with their active chairmen, all splendid, enthusiastic workers in the cause, marshalled by that indefatigable, enthusiastic, and genial gentleman—Oscar McNab. (Applause.)

It occurred to me today, inasmuch as you were all engaged in taking part in the various activities of the convention, that very few of you have been able to visit our industries and see what is made in this city. We believe our city has made an enviable name for itself in the quality and quantity of its products all over the world. Our city is well known for the excellence of its pig iron and its peanut butter (laughter); for its automobiles and popcorn; for its wire and its wigs; for its oil and its carpet tacks; for its telescopes and its chewing gum. It is noted for its skirts and its shock absorbers (laughter and applause); for its cranes and its crackers; for its paint and its "two-and-three-quarters

per cent": for its sewing machines and its garbage cans; for its electric lamps and insect exterminators; for its grindstones and macaroni; for its brick and its mustard plasters; for its brushes and its sausages; for its chemicals and its candles; for its ships and its horse radish; and it is well known for its savings banks and its sand banks. It is well known as the home of a Rockefeller, but of no fellers who are rocky. (Laughter.) I hope I have impressed you with this, and you have put these statistics beyond the vestibule of the memory portion of your brain.

WOMEN RECOGNIZED BY THE NATIONAL SAFETY COUNCIL

Fortunately, in my position as Chairman in opening the meeting, it does not devolve upon me to address you at any length. An announcement has been handed to me which I am asked to let you have. We men are going to have a boss—the women have been recognized by the National Safety Council. Miss Tracy Copp has been made Chairman of the Women's Section. This brings her automatically to membership of the Executive Committee, which as you know is the governing board. (Applause.) Miss Kathryne Hunt, in recognition and appreciation of her work in the Chicago office, has been elected Treasurer. (Applause.)

Among those in this city who have given a tremendous lot of time to the Safety Movement is Mr. Alexander C. Brown, Toastmaster of the evening, and him I now introduce to you and take a back seat myself.

THE TOASTMASTER (Greeted with applause): *Mr. Chairman, Ladies and Gentlemen:* Perhaps some of you may know the temper and patience of a college audience in chapel on Sunday morning, and when one of the speakers of the evening asked me how long he could speak I was reminded of the remarks that the president of my college always made when the visiting clergymen asked him that question Sunday mornings before chapel. He said, "There is no limitation fixed on the length of your address, but no souls are saved after twenty minutes." (Laughter.)

PROBLEMS FACING INDUSTRY TODAY

One of the large employers of this country has said, "The personal relation in industry entered into in the right spirit gives the greatest promise of bridging the yawning chasm which has opened up between employer and employee." I think in these days of so much frenzied thinking, when we can all share thoughts with each other, it pays in the National Safety Council to give a little thought for a moment to where we stand in some of the problems that are particularly facing industry today.

The first thing we ought to have clear in our minds, as I see it, is: What is the end toward which we are striving? That sounds like a big contract, but if we will accept two premises which I think are necessary, it will be helpful to acknowledge first that the labor problem after all is nothing but one of human relations; secondly, that for any helpful solution it is necessary to approach the problem in the right spirit.

The end, therefore, it seems to me, is one of equitable human relations

based on mutual confidence; and one of the means to that end is any system or plan which will lead in that direction, entered into in the right spirit.

It seems to me the reason why so much of the thinking along these lines has been frenzied during these times of stress is the confusion as to which is the means and which is the end. We hear a great deal about many plans, programs, and systems: we hear a great deal about industrial democracy. It is difficult to give a definition of them; but where these plans of various kinds have failed, it seems to me, is primarily in the attitude of mind which has accepted them as the end and not as one of the means.

The problem is too big for any one means to be the only means of solving it. There are too many human instincts that must be administered to and must be reckoned with. And, furthermore, the very unrest that exists is not confined to any one class. We all of us share it. We all of us are dissatisfied.

I think a little article in one of the papers, which I hope not all of you at least have read when it came out, brings out the fact that the employers and the business men are by no means satisfied in their own minds. This was given as a prescription for morning exercise for the tired business man:

MORNING EXERCISES FOR THE TIRED BUSINESS MAN

"Rise at 7 A. M. Stand in the middle of the room. Raise arms slowly overhead; take deep breath and say, 'Damn the government,' lowering arms in attitude of despair ten times. Extend body flat on the floor. Cover eyes with hands; kick heels; think of the railroads and weep till dry. Kneel, wring hands, meditate upon the labor unions and groan a hundred fifty times.

"Assume sitting position, hands on hips. Sway gently to and fro. Concentrate on Mr. Burleson until a general frothing at the mouth sets in, until exhausted. Collapse on floor; grovel vigorously; think of the income tax and gnash teeth in anger.

"Observe this simple regime every morning before breakfast and you will reach the office with most of the cares and troubles of the day already out of your system." (Laughter.)

A few of these things have to be reckoned with and met in any system that is adopted; such as the instinct of monetary gain, the instinct of pride in workmanship, the instinct of leadership, of individual right, of individual obligations, which has not been emphasized nearly as much as the one of individual right—and they are equal, they should be equally emphasized. Then the instinct of family welfare, of personal improvement and comfort, and of self-preservation.

These last three instincts, it seems to me, are the point of contact which is peculiarly suitable for the work of the Safety Council—the instincts of family welfare, of personal improvement and comfort, and of self-preservation.

While safety work is performing its normal functions, it is appealing

to those instincts and forming a point of contact, between the employer and the employee, so that all the time it is doing its normal good work it is also performing a peculiar kind of team work for all other phases of work that are helpful and constructive in our labor situation. It is paving the way for all the other methods and humanitarian schemes and plans that have a tendency toward humanizing industry. That, it seems to me, is one of the big things that the Safety Council is doing for team work in this problem.

Now, speaking of the part that safety plays in team-work, we want to have emphasized the part that team-work plays in safety: and our next speaker, who is a New York banker—and we hope safety plays a part in his business—is peculiarly suited to talk on this question of team-work. He is the treasurer of the Safety Institute of America. He has been personally responsible for what the city of New York gave to him and to the organization which he has built up—a building which will be a Museum of Safety for the United States. Through an interlocking board of directors of his organization and the Safety Council, team-work has been carried on to a very great degree, and we will all be glad, I know, to hear Mr. James Speyer on "Teamwork in Safety." (Applause.)

TEAMWORK IN SAFETY

JAMES SPEYER, TREASURER, SAFETY INSTITUTE OF AMERICA

You have all heard of Charles Darwin and his celebrated book, "The Origin of Species," but I wonder how many of you have heard of the story that is told of this great man, who loved to be surrounded by his children and friends of his children. One day, these young people thought they would like to play a practical joke on the famous naturalist. They took a dead June-bug and carefully glued on the wings of a butterfly. Then they put it on a plate and brought it to the great and kindly man and asked him, "Sir, what kind of a bug is this?" He looked at it for a moment, and then said, "My young friends, this is a humbug." (Laughter.)

Ladies and Gentlemen of the National Safety Council, I do not want you to say the same thing about me, and therefore, I tell you right now, that I know very little about the technical side of the safety work, and hesitate very much to speak before such well-informed men and women, as are here to-night.

You are all experts in your field, and in these times of catch-phrases and loose talk about "uplift" and "social betterment", it is a real pleasure to meet practical men who do not try to achieve—much less promise—the impossible. You are doing a man's work, and your judgment and advice are based on personal experience, scientific study, and actual contact with your fellow-men. The fact, in itself, that the work of the National Safety Council is in the hands of practical and experienced men, and not in the hands of theorists and amateurs, however well-

meaning, should secure for it the support of everyone, whether employer or employee.

I do not want to trouble you with statistics, but it is a remarkable fact that, out of a total of 3,208,000 men called under the draft and physically examined between December 15, 1917, and September 11, 1918, there were about 950,000, or nearly 30 per cent found to be disqualified partly or totally, at that time.

Now much of this disability was due to insufficient care and under-nourishment, when these men were children; how much to insanitary conditions in the homes, or unhealthy conditions in factories; how much to accidents, sustained on the highways or in the workshops; and how much to carelessness of the workers themselves, I do not know; but that much of all this could have been prevented and should be prevented, is evident. Not only is man-power of very great importance in time of war, but the conservation of man, and woman power, also, is equally important, economically, for works of peace.

It is not necessary for me before an audience such as this, to speak of the purely humanitarian side of your efforts. Every one here wants to see all of his fellow-beings contented, as far as possible. No one can afford to forget in these days that, if human beings become physically unable to support themselves, those so handicapped are not only a financial burden to the community, but easily become dissatisfied with the existing order of things and their dissatisfaction breeds discontent and worse. It is therefore "good business" in more ways than one, to prevent sickness and accidents to men and women and children.

SAFETY WORK PROMOTES COÖPERATION

There is another weighty reason why the work that you are doing should appeal to every one, and that is, because it tends—like nothing else—to bring labor and capital together, to assure coöperation in a practical, natural way. The easiest way to do this is for employer and employee to consider together non-controversial matters—matters that are clearly to their mutual interest; and what can be more so than the health and physical well-being of the workers? The workers naturally are interested in it, and so must the employer be. There is no twilight in this zone and, when men once find that they agree on certain aims and measures, it does not take very long to have them discuss other more difficult points, like hours of work and wages, and to recognize one another's legitimate aspirations, their rights and mutual obligations.

In our own country, blessed like none other with natural resources, we have seen, during the last fifty years, a marvelous development of industries. American energy, American inventive genius, and American capital and brains have been devoted very largely to producing, at low cost and in great quantities, those things which the people need in their daily life; all of which has resulted in very substantial benefits to all. But in this tremendous effort, made in competition with other nations, it would seem that the welfare of the men and women and children engaged in producing these very things, has perhaps not always

received sufficient attention, at least up to the last ten or twenty years. The Peace Treaty, as you know, has one special article establishing international organizations for the purpose of improving labor conditions. The next twenty-five years will see the efforts which your association—in coöperation with the workers themselves—is making for their well-being crowned with growing success.

Each century has had its distinctive feature of progress,—sometimes only discerned by subsequent generations. But one thing is apparent even to-day: Never since the world came into existence, were there so many men and women who, realizing their obligations, are devoting their time and thought unselfishly to the betterment of living conditions of their fellow-beings. I believe that the result of such pioneer teamwork of coöperation will be more satisfying for all concerned, than any benefits that may come through enforced rules and legislation. But in any legislation dealing with these matters of public health, accident prevention and liability, the advice of the National Safety Council should be sought and heeded, both by State and Federal authorities.

Ladies and Gentlemen, we are living in serious times, but let us be careful not to lose our sense of proportion, as to events in which we take part. One is apt to overrate the immediate difficulties that confront one, not remembering similar dangers of the past successfully overcome, and to be startled at any novel way that may be proposed for their solution.

Will you forgive me one moment if I remind you of the program of the Populists in 1892-93 only about twenty-six years ago? The platform of this "People's Party" proposed certain changes, which frightened many of our people and seemed to them absolutely revolutionary and fraught with danger. The distress and financial stringency then existing made the "People's Party" call for "free and unlimited coinage of silver and gold" at a fixed ratio, for an "increase in the circulating medium", and a "national currency, safe, sound and flexible."

You all know, Ladies and Gentlemen, they are wrong as to the "free and unlimited coinage of silver", and the majority of our people decided, at the subsequent election, that they were wrong in that remedy; but the "national currency, safe, sound and flexible" we have since got, through the Federal Reserve Bank Act, worked out by experts who knew better how this aim could be attained.

Another thing the Populists demanded in 1892 was "a graduated income tax". Well, we got that. They also demanded that "postal savings banks" be established by the Government: These are here. Another thing they asked for was the election of United States Senators by direct vote of the people: The Constitution has been amended to that effect. They also asked for "rigid enforcement of the existing eight-hour law on Government work", and "sympathized with the efforts of organized workmen to shorten their hours of labor". You know what great progress has been made in that direction.

There are certain other things that the Populists advocated, namely that the "Government should own and operate the railroads in the interest of the people", and also "that the telegraph and telephones like

the Post-office, should be so owned and operated." I do not know exactly what they meant by the words, "in the interest of the people." We have lately had a little experience with such Government operation and, in spite of able management, it has not proved satisfactory to our people. On the other hand, the people who own railroad securities are well aware that the policy pursued by Federal and State authorities during the last half-dozen years or so towards the railroads, has not been "in their interest", nor in that of the country as a whole—to put it mildly.

At that election in 1892, out of about twelve million votes, the Populist Party received approximately one million. There was one other party that received less, about two hundred sixty thousand votes, and that was the Prohibition Party; nevertheless, prohibition has since been written into our fundamental law. While some of us do not like this amendment very much, it will doubtless be a substantial factor in preventing accidents.

There is one other measure which it is expected will soon become a National law, and which was not even in the platform of any party then: that is Woman Suffrage and that also should help your work.

I mention all these to remind you that what to many seems revolutionary at a given moment, gradually may come to be accepted and regarded as justified, and that all these progressive changes under our well-tried form of Government, have been brought about in an orderly manner and by peaceful means, as becomes a free, self-governing people.

PERIOD OF UNREST

To-day, the whole world is still under a nervous strain and the situation is certainly fraught with danger. In order to win the war, each Government had to keep its own people keyed up to a high pitch. Many vague and specific promises for a better state of affairs to come were made; but, alas, many a hope thus awakened is doomed to disappointment. At the same time, the destruction of property and human lives had, at least, to be condoned. While some of the present unrest is due to these general conditions, it may be caused also, in part, by the natural desire of some employees to secure a more equitable share of the large profits which their employers made, or are supposed to have made, during the war. Many men, not only among the working people, are dissatisfied and are trying to better themselves, the more ignorant ones not being too careful as to the means to that end.

There always have been, and there always will be, others who will use such dissatisfaction and unrest for their own purpose, just as there always will be some who remain blind to the signs of the times in which they live, and fail to recognize changing conditions. It must, however, be clear to anybody who stops to think, that the high cost of living can surely not be overcome by the curtailment of production, be it through strikes or through shortening the hours of work. This is the wrong remedy and must bring the opposite result. It would indeed be a misfortune for the workers themselves and for our country, if the radical

element were to prevail now, even if only for a short time. But, I do not believe it will. Whatever may happen in other countries, it will not happen here! I have too much faith in the common sense of the American people.

OUR PROBLEMS AND OUR OBLIGATIONS AS A NATION

After a while, when our nerves have calmed down, we will surely continue to make sane progress, as we have in the past, in the solution of the differences between capital and labor in an orderly manner, after considering and deciding what is really best to be done not for any one class, but for the welfare of the people as a whole.

Whether we shall insist on laws for compulsory arbitration, for forbidding strikes, in the transportation industry or by those in the employ of the Commonwealth; whether we shall insist that combinations of labor, (which are as legitimate as combinations of capital) shall be subjected to the same laws and restrictions, and that the leaders of both shall be punished for any abuse of trust; whether we shall insist that labor should share more directly, not only in the profits, but also in the management of large enterprises; whether any or all of these proposals are to be embodied in the law of the land, nobody can tell at present.

But this we all know: The relations between labor and capital cannot be adjusted by the suppression of the right of free speech on the one side, or by the destruction of property on the other, and I also believe that the American people will insist that every one shall be free to work where and as he chooses, and that the savings and property of every citizen, large or small, shall be protected against attack from whatever source.

Ladies and Gentlemen, one word more and I am through: Thanks to our fighting men on land and sea, and competent leaders, and to the work in the factory and on the farm, to the efforts of a united nation, our country has won this war, and, with enhanced prestige, is now the great creditor nation of the world. Whether there be a League of Nations or not, whether we are in it or not, our advice will be sought, and our voice will be heard in the large international questions which the future will solve. But it is not enough that today the United States is the richest and perhaps the most powerful nation. If we want to have real weight and use our full influence for Peace and Humanity in the future, we must show to the other nations of the world, first of all, that we will not tolerate mob law here, and that we are able to make orderly progress ourselves. The coöperative work that you of the National Safety Council are doing is one of the most practical and patriotic steps to that end. We have to give a living example of the real spirit and discipline of a true democracy. If we want to help maintain order and peace abroad, we must show the rest of the world that we can maintain order and peace at home.

THE TOASTMASTER: I am sure the Congress will wish me to thank Mr. Speyer for his courtesy in coming to us, and to assure him that

when New York grows large enough for the Congress, we shall be glad to meet there. (Applause.)

I think you all know Mr. Beyer very well. Well, Mrs. Beyer is as enthusiastic in safety work as "Dave" Beyer is. She has, however, done us one discourtesy, which she is going to endeavor to make up tonight. Her debut was made in New York City in the Metropolitan Opera House—her debut to America; but her debut to the Safety Council, and only the start of many pleasures which we hope she will give us in the future, will be given tonight. Mrs. David Beyer. (Applause.)

"SAFETY LAST"

By MRS. D. S. BEYER

(MARIA CONDE)

Is your engine unprotected?

Safety last!

Are the plans for guards rejected?

Safety last!

Pat it gently on the gear,

By the middle of next year

You will likely not be here!

Safety Last!

Never label stairways "Danger,"

Safety last!

Do not warn the passing stranger,

Safety last!

If you tumble down the stair,

Break your leg or muss your hair,

It's a fine excuse to swear!

Safety Last!

Is your emery wheel a menace?

Safety last!

Has it blinded Mike or Dennis?

Safety last!

Never worry, never weep,

Do not groan when you're asleep,

Compensation bills are cheap,

Safety Last!

Song by Mrs. Beyer. (Prolonged Applause.)

THE TOASTMASTER: Mrs. Beyer, the National Safety Council hopes you will continue not only with your verses of "Safety Last", but in other ways to make Safety First last. (Applause.)

In connection with safety work, there is a great deal being done, in good ways and other ways, as welfare work; but the other day I noticed

for the first time that welfare work had extended to the farm, and like welfare work in industry, it was carried out on behalf of the producers. It was called to my attention in this clipping. The headline is: "Milk cows to music. Increased amounts obtained by this method at the Electrical Exposition prove that music has power to induce a cow to yield extra amounts of milk."

"A test was made here at the Electrical Exposition. Cows which were milked to the accompaniment of phonograph music were said to have given from ten to twelve per cent more than their average yield. (Laughter.) Classical music seemed to be most appreciated by the cows. (Laughter.) One of the Holsteins under the influence of the compositions of Mozart and Beethoven gave forty-five quarts of milk in twenty-four hours."

That is welfare work that pays. (Laughter.) That also makes clear what some critics of welfare work mean when they say that insincere welfare work is simply a dodge for milking the producers. (Applause.) Safety work, fortunately, has never been so criticized. It started with nothing but the inspiration, the vision, and the determination of its pioneers. It had no figures to prove that its inspirations were correct.

The next speaker, who is one of our pioneers, has become now, after his many years of constructive service, the President of the National Safety Council.

(The audience immediately rose to their feet with cheering and shouting, and sang "For He's a Jolly Good Fellow".)

THE TOASTMASTER: He was elected. I think, because from the start he would not accept the statement "It can't be done." His confident belief that it could be done leads me to read to you a few lines by Edgar A. Guest on the subject "It Couldn't be Done" because of their appropriateness to our new and beloved President:

IT COULDN'T BE DONE

Somebody said it couldn't be done,
But he, with a chuckle, replied;
That "maybe it couldn't" but he would be one
Who wouldn't say so till he tried.
So he buckled right in with a trace of a grin
On his face. If he worried he hid it
He started to sing as he tackled the thing
That couldn't be done—and he did it.

Somebody scoffed—"Oh, you'll never do that.
At least, no one ever has done it."
But he took off his coat, and he took off his hat,
And the first thing they knew he'd begun it.
With a lift of his chin, and a bit of a grin,
With never a thought that he'd rue it,
He started to sing as he tackled the thing
That couldn't be done—and went to it.

There are thousands to tell you it cannot be done,
 There are thousands to prophesy failure.
 There are thousands to point out to you, one by one,
 The dangers that wait to assail you.
 But just buckle in with a bit of a grin,
 Then take off your coat and go to it,—
 Just start in to sing as you tackle the thing
 That cannot be done—and you'll do it!

The Safety Movement no longer has to depend upon the inspiration and vision of its pioneers. It now has figures, facts, and statistics to prove that that vision was correct. And when I say statistics I do not allude to the definition some one gave to the group which may be divided into plain lies, damn lies, and statistics. (Laughter.) I think Mr. Price's statistics are beyond that criticism.

The determination of our new President, this determination that has won him the success he has so richly deserved in all these years of service, reminds me of a story that is told by Mr. Charles Schwab.

He tells of a young colored soldier in a training camp outside of New York City, during the war, who had been working very hard for many months without any rest or recreation. When he finally secured a furlough he quickly spruced up and started out of camp. He was stopped by the sentry, who asked him for the pass word. "Pass word? Pass word, corp'ral? I ain't got no pass word." "Well, you can't get out of here without the pass word." "Well, I'se got a furlough." "A furlough won't let you out of here. You've got to have a pass word to get out of here. And, furthermore, you can't get back without one if you did get out."

"Well, corp'ral, I'se got a furlough. I'se got an old mother up in heaven. I'se got an old father in hell, and I'se got a sweetheart in Hoboken. And, pass word or no pass word, I'se goin' to see one of them three before this day's out." (Laughter.)

I was told that whatever I might say about Ralph Richards, the wheel horse of safety, the Abraham Lincoln of the Safety Movement, could not possibly do him justice. I will ask him to speak without further introduction, as soon as we can get sufficient quiet from this audience who will greet him when he rises, so he may be heard. Mr. Richards.

(Greeted with prolonged applause and cheers.)

THE COUNCIL—PAST AND FUTURE

R. C. RICHARDS, PRESIDENT, NATIONAL SAFETY COUNCIL, CHAIRMAN, CENTRAL SAFETY COMMITTEE, CHICAGO & NORTHWESTERN RAILROAD

Mr. Toastmaster, Ladies, and Gentlemen: I should be less than human if I did not feel deeply the very kind reception that you have given me tonight, and the approval you have given to the action of your Executive Committee in electing me to the highest office in the gift of the National

Safety Council. The Council has twice signally honored me much beyond my deserts. Three or four years ago, very much to my surprise and astonishment, when I was attending one of these dinners, the toastmaster announced that I had been made an honorary member of the Council. I thought then, as I do now, that there is no honor that could come to a safety man that he should appreciate more than being elected an honorary member of this great Council which has done so much for the conservation of human life.

Tonight, when I am again honored by the Council, my heart is too full to tell you how much I appreciate it; but if giving to you my best efforts in the splendid, wonderful work the Council is organized to do, will make you understand how much I do appreciate what you have done for me, you can depend upon it that that work will be performed. They say that the only prayer that is ever answered is the prayer of labor. I will give you the best I have.

You have all discovered by reading the program tonight that it was intended that some one else—my eloquent friend Bob Campbell—should speak, and that I am simply here as a filler-in. Nobody will regret more than this audience that I was drafted to take his place. I feel a good deal like a friend of mine who was called upon unexpectedly on an occasion like this, to act as I have been asked to act, and on the way home he met one of his friends who knew what he was going to do. The friend asked if he had his audience with him. "Yes, for three blocks." (Laughter.) "But owing to my early training as a sprinter, I distanced them after the three blocks." (Laughter.) I hope my effort won't meet with the same kind of reception that his did.

REVIEWING THE PAST

Seven or eight years ago, my friends, the National Safety Council started on a journey. I think some great educator said, "All the world stands aside for the man who knows whither he is going." The National Safety Council knows whither it is going. It is destined to a place, a station, on the great road we are following, known as conservation of human life. We started with a party of thirty-seven, in charge of Bob Campbell and Billy Cameron, and as we moved along year by year, instead of people standing aside and getting out of our way, they have dropped into our ranks: and with Morey and Palmer, and Van Shaack, and Price, the party has grown in six or seven years from thirty-seven to thirty-seven hundred or more. And every year, with your enthusiastic cooperation and assistance (and you know every great movement in the annals of the world was a triumph of enthusiasm) that party will grow until it numbers tens of thousands, and no place will be large enough to accommodate our Congress, until we ourselves build such a place.

And can't you visualize what that place will be when our party grows to the right number? I surely can! And I believe you can. The Safety Movement is bound to grow; is bound to succeed because it is right, and anything that is right must necessarily succeed.

When "Safety First" was first heard of as a phrase, we people who

welcomed it enthusiastically were dubbed as dreamers and fanatics by the wise and hard-headed men of our country. But like many things that have been mentioned in Mr. Speyer's paper this evening, it has come true. We want to remember, ladies and gentlemen, that this thing didn't just happen; it didn't just befall; it wasn't done in a day, or a month, or a year—but in a flight of years. And ten or fifteen years from now we shall look back and count the achievements that have been accomplished in conserving that one priceless thing that no man or woman has ever been known to sell—men sell most anything else, sometimes for money, sometimes for glory, sometimes for ambition—but no man or woman has ever been known to sell his life or limb. And because we are striving to save that priceless thing, the greatest asset that our great nation has—the lives and limbs of its people—we are bound to be successful. We are bound to meet with the approval not only of our own hearts and consciences, but of the hearts and consciences of all the people of these United States.

TWO OBJECTS IN VIEW

The National Safety Council has two objects in view, in addition to saving life and limb, and that is to furnish service that will aid everybody in doing what we are trying to do. Nothing that has ever been published by the National Safety Council has been copyrighted. Everybody is privileged to use our ideas and our information, no matter who or where he is.

The next great thing that we have to do, Ladies and Gentlemen, is to educate the people. We commenced by educating the men in industries, because that was where an awful waste of human life was going on. It isn't necessary for me to tell you how much of it there has been in the past, but we all know that since the organization of this great movement and this wonderful Council that we have been making rapid steps toward the reduction of that great waste of life and limb—that this country was suffering every year. And now, in the Educational Section that was organized today, we are commencing where some people thought we ought to have commenced in the first place, but the time was not ripe for it. We had to demonstrate, first, that we could do something in order to get the support and assistance that was necessary.

That wonderful book which Dr. Payne has written tells us that every year, in the parts of this country where they have registration of accidents, and that is only 70 per cent of the country, over 10,000 children under ten years of age lose their lives in an accidental way; and that 250,000 of them under ten years of age are maimed or permanently crippled. And so, because that illuminating book has forced us all to realize how much and how necessary it is that something should be done to educate the children and the public in general, this Council has determined it will take up that work.

The other great work we want to do this year is the work of in-

creasing public safety—on our highways, our streets, in our theaters, and everywhere the public goes.

Those two things, Ladies and Gentlemen, will be the two things, as far as I am concerned, that we will devote our best efforts to in order to bring about a satisfactory remedy. This Council tonight has representatives from nearly every state in the union—from thousands of communities. There are over two thousand people registered, which does not include our wives our sweethearts and our sisters. And if every one of you men and you women—God bless you!—will make it your individual job when you go home to see the superintendent of your schools, to confer with your board of education, and take with you a copy of this book written by Dr. Payne, and explain to them some of the things that are contained in that book, and show them the necessity of doing something to put a stop to this waste of child life, this maiming of children, the result will be wonderful. I want all that hear me tonight to pledge themselves that they will do something along that line. Don't leave it to "George" or to the General Manager, or to his able assistant, or to myself—but do it yourselves! And then see how much happiness, content, and pride it will bring to you to know that you have succeeded in doing something that has saved some child in your community.

Ladies and Gentlemen, if you could see what I have seen during the last thirty-five or forty years in the investigation and settlement of accident claims—that regiment of widows that have passed through my office, some of them with three or four children tugging at their skirts, that regiment of old, gray-haired fathers and mothers who have lost an only son on whom they were dependent, and that vast army of maimed and crippled people—you would realize as I do how necessary it is for each and every one of us to do something individually to help the safety cause. Our friend Whitney, who has devoted countless hours to starting this idea, and Dr. Payne have blazed the way. It is up to us now, my friends, to follow in their footsteps, take advantage of what they have shown us, and do something for the benefit of the child life of the nation.

I just want to say one thing more. The Toastmaster has told us that no soul was saved after twenty minutes and the church has been telling us for centuries that the most important work in the world is the saving of souls. If it is, certainly the next most important work is the saving of life and that is our work.

During that great war, which happily for us ended victoriously, there was one little poem written that has always appealed to me—more, I think, than anything else I have ever read. It was written by Colonel McCrae of the Canadian forces, whose body now lies in Flanders fields:

IN FLANDERS' FIELDS

In Flanders' fields the poppies blow
Between the crosses, row on row,
That mark our place; and in the sky
The larks still bravely singing fly,
Scarce heard amidst the guns below.

Local Council Officers' Session

October 3 and 4, 1919

C. W. PRICE, Chairman

General Manager, National Safety Council

FRIDAY MORNING SESSION

CHAIRMAN PRICE: Every time I think of the work of the local councils and all that it involves, I think of what my friend, Raymond Robins, said when he returned from a trip in the Men and Religion Forward movement. He was all flushed as he came off the train, and he stood up on a chair and began speaking: This is what he said: "Friends, these are great days. Things are certainly coming to pass." That describes exactly the way I feel.

Looking back over this past year, we see it has certainly been a great year. Looking forward to this coming year and considering the possibilities in this local council movement, I think every man in the room is keenly aware of the fact that it is growing more and more every day. We can literally say, Gentlemen, that these are great days, and that great things are not only coming to pass, but have already come to pass.

Rochester and Pittsburgh and then St. Louis made a greater contribution to the safety movement than they dreamed of. Little did the people who helped to organize those three movements dream how the demonstration of what can be done in a community would really grip that community and get every man, woman, and child interested. Little did any of us dream that that could be done. We wouldn't have believed it a year and a half ago, and yet the demonstrations that have been made in those three cities, and now in Cleveland and now in Cincinnati and then in Portland and in Kansas City—those demonstrations are bringing to our minds the thought, as we have never had it before, that it can be done. Unbelievable things have been demonstrated to be possible.

I want to speak of the organization of two local councils, because we don't want to forget the smaller cities that have been organized with a permanent secretary, one of which is in Delaware with headquarters at Wilmington with the du Pont Company as sponsors and backers, with Mr. Reed as the Secretary and Mr. DeBlois as being one of the prime movers. Mr. DeBlois is a member of our Executive Committee and one

of our influential men in Council affairs. Then there is the council at Bellingham, Washington, which is the fifth local council to be organized in that state. We hope that, possibly during the coming year, with the backing of the new safety board which is represented at this Congress by Dr. Kloeber, there will be a permanent secretary at Seattle, and that that permanent secretary may take care of the other local councils and get even better work out of them than they have been able to perform during the past year.

I have almost said what I was going to say at another point, that at the last Congress we had three cities, Rochester, Pittsburgh, and St. Louis, with permanent secretaries, and this year we have added Portland, Kansas City, Cincinnati, and Cleveland. We must not forget Cleveland. From present indications we are practically certain of Chicago. Mr. Harold McCormick has agreed to call together about thirty millionaires as soon as they get back from their vacations and raise \$30,000, and if he does we are going to have a local council in Chicago that will be a model, we hope.

The Executive Committee is considering—and I think it is going to be realized—a plan by which there will be a joint arrangement between the Safety Institute of America and the National Safety Council, so that a local council will be organized in New York City with headquarters at the Safety Institute and with the Safety Institute acting as the agents of the Council, to take care of Yonkers, Northern New Jersey, and Long Island. This will probably constitute the biggest and most important local council that will be organized. I think I can say with confidence that that will come to pass. The action of the Executive Committee last night leads me to believe that it is now only a question of detail. I think that is going to be the biggest thing we will do this coming year.

Duluth is very promising. Mr. McDonegal, who is the President of the Duluth & Iron Range Railroad, a powerful and influential man in Duluth and interested in many things, has promised to call together a group of men as soon as the labor difficulty is over, and if he does we are sure of getting the money. So I feel pretty sure of Duluth. We have been flirting with Buffalo, and I have been down there. The Chamber of Commerce seems to be taking the matter seriously and has appointed a special committee for the purpose of considering ways and means of raising \$10,000 and engaging a permanent Secretary. I think the examples of Rochester and Cleveland are getting to be a little irritating to Buffalo.

That brings me to a point where I can say, Gentlemen, that every city that organizes makes it easier for the next city, and I can say to you truthfully that this thing is developing just as fast as we can possibly take care of it with our present field force. Looking forward to the next year, we practically have at hand now all of the work that we possibly can do during the next twelve months in organizing these big centers that we have spoken of.

There is Mr. Smyth over there. Mr. Smyth was a newspaper man

and he helped Uncle Sam clean up that little bunch over in Europe. Mr. Smyth has done some of the best organizing work in Kansas City. And there is Mr. Coffin of Portland. And there is Lintz. The demonstration here in Cleveland is sufficient evidence of what Lintz can do. I don't want to miss an opportunity of speaking of our neighbors across the line, the border cities, represented by Captain Robbins over there. He was mixed up in that quarrel, too, about four years. If I were to characterize Captain Robbins I can only use one expression which perfectly describes him, and I would have to use the expression we used in the old McCormick works, "He has the guts," and he is putting it across. After only three months, and after hobnobbing with secretaries like Lintz and Fellmer, he went back and had the nerve at the very outset to organize a Safety Week in the five cities. I happened to be invited to go up there, and do you know they didn't have a single accidental death during that week in the five cities? That shows what it is possible to do, Gentlemen, when you have got the guts and the backbone to take hold of it and say, "We are going to do it and do it just the same as we said, 'We are not going to take a year to get going in this war, but we are going to do it in thirty days.'" In this movement we want to get the guts and the courage, because we have the big idea, and if we believe in it we are going to go to it and do it. Captain Robbins believed in it and he went back and did it. It was one of the most wonderful demonstrations I have ever seen, with so little preparation, so little time to develop a community spirit.

HIGH SPOTS OF THIS YEAR'S EXPERIENCE

Now I want to line up the high spots of this year's experience, because nobody else will. It seems to me the outstanding things in this last year's experience that were really significant to us were looking forward to the future. There was the school for Safety Supervisors conducted in the four cities, a school including fifteen lessons with some of our very best men, men like Oartel of Pittsburgh, for instance, as the speakers or teachers. There were fifteen lessons which covered the fundamentals of safety. They were carefully prepared by our Engineering Department. I don't think our Engineering Department has ever done anything so well as the preparation of those lessons. They were very brief, written in popular newspaper English, but including the very essence of the whole proposition, the meat of the cocoanut. The pupils were furnished copies of those lessons. At the end of the course a banquet was given with proper speeches, and engraved diplomas, each one with a little blue ribbon around it, were presented.

One of the interesting things about this school was that, immediately after writing a letter to the plant manager outlining the purpose of the school, the character of the lessons—that this school was prepared really to train a man for the position of safety inspector and give him the fundamentals—the manager became thoroughly interested. Nothing else that we have ever done brought a response from the general managers so promptly and heartily as the proposal to establish these schools.

Before Mr. Lintz came on the job, I went out before here in Cleveland. A splendid school was conducted here and it had the largest percentage of attendance. The students were one of the finest groups of men that we had. This school was started even before the local council was well organized. The idea of offering a course which is complete, which covers the fundamentals, which will prepare a man for the work, is a very popular plan, and I think I can say that in all the history of the National Safety Council we have never rendered to our members a service so definite, direct, and tangible, as that rendered by these schools. I don't think there is any qualification to that statement at all.

Now so successful were these schools that we have conceived the idea of turning our foremen's meetings into foremen's schools.

We are now preparing ten lessons out of the fifteen, carefully selected with regard to the work of the foremen. Those lessons will be written in very simple style, but they will give every foreman all that a foreman needs to know about safety in such a way that the foreman will believe it. He will have a complete set of lessons. He will have a diploma that he can hang in his office. I believe, Gentlemen, that the foremen's schools will be equally popular with the managers, and I believe they will render equally definite and tangible service to the foremen. I think all of you are aware, as I am aware, that we are never going to get anywhere in this efficiency movement, this industrial relations movement, until we have better educated and better trained foremen, because the attitude of the workmen depends on the attitude of the foremen. We are all waking up to the fact that the foreman is the keyman absolutely. I think we who have been in the game for a long time, and who have met thousands of foremen, are impressed and depressed, as I have been, many times. I suppose I have spoken to a thousand meetings of foremen, and always I have been impressed with their low average of intelligence—good men but with very limited education, very limited outlook, and practically no contact with the outside. I believe that this service to foremen is going to be an important development in the local councils.

The big thing in the future local council is going to be not industrial safety, but public safety. I can see it every day. Industrial safety is taking its place in the regular organization as a part of production, and there will be less and less need for propaganda work such as we have had to do during these years, because it is recognized as a matter of profits. Just as fast as we can convince the manager that it makes money and is good business, he is going to give it the place which the companies with which we are so familiar are giving it, and we don't need any further propaganda.

But public safety, school safety—those are the things that will call for a continuous campaign just the same as we are continuously campaigning for better morals and better health and so on: and it means the education of the rising generation.

I don't think any one who has not been close to the work can appreciate the opportunity for the permanent secretary. I know it has been a revelation to me. The demand for a man who can devote all of his time

to the service of the members has been well beyond the possibilities of these splendid men to serve our members, and there is simply unlimited opportunity to go into plants, incident and meet the superintendent and those who are interested in safety and at home with them and help them work out their own extermination and stay with them in the right road. There are unlimited opportunities to go to the members' meetings and in this way to keep up interest, because the interest many times wanes when they have to live on their own initiative. Our members welcome the inspiration that comes from their secretaries. There is wonderful opportunity to go into the plants as our secretaries have done, and with a portable motion picture machine have moving picture meetings at noon time.

Now I am almost through. I don't know whether I should say it or not, but I am going to, because it is in my heart. I can't tell you how much I appreciate personally the splendid service of our three field secretaries. I have often said to their faces and behind their backs, that I never expect to have better men as long as I am manager of the National Safety Council. They are men who have been pioneers in safety work, who have been pioneers in this large movement which has come during the last few years, and I want them to know, and I want you to know, how much the officers of the Council appreciate their service, and what splendid possibilities there are in that service as we develop these things. They go into a city and spend a month to help work out the organization and then work with the secretary, until they acquaint him with the experience of all the other cities. These field secretaries meet with the permanent secretaries every three months in conferences and give the permanent secretaries the benefit of their experience. In this pioneer movement we are doing just what we have done in the National Safety Council; we are pooling our experiences. Then there is the exchange of letters and reports, going the rounds of these permanent secretaries, so that one man knows what all the others are doing. We are gradually working out standards so that we can go into a city with a program—one of these field secretaries can—which promises definite results. It isn't a theory, but it is a fact that has been tried out in other cities and can be recommended.

Now I have talked longer than I thought I was going to talk, but it is because I feel so keenly the possibility of this thing. It is beyond our strength or our time or our ability. We are going to have more opportunity, and it is coming now. We don't have to go out and do any more missionary work. If we take care of the things that are coming to us, that are thrust-upon us—if we meet those, we are going to do mighty well. I think that will be true of every local council. I know that Fellmer will back me in this, that if you meet the things that are right before you, you will have more than you can do. This thing is so full of possibility, and this demonstration in Cleveland—which I am sure is a convincing evidence of what can be done in a community which was not very radical on safety six months ago—is really remarkable. This was a good, solid, conservative sort of community, not very radical on safety.

but look at it now. It is a wonderful demonstration which has come here.

THE EXPERIENCE OF A LARGE CITY IN LOCAL COUNCIL WORK

CARL L. SMITH, PUBLIC SAFETY FIELD SECRETARY,
NATIONAL SAFETY COUNCIL

My contribution, I am told, is to give you the experience of a large city in directing a local council, and to visualize to you those things which have been found to be successful in instilling Safety into the community life. We are fortunate indeed, and I am particularly fortunate, in having the experiments of a number of large cities that have accomplished effective Safety work the past year from which to draw the experiences to present to you.

PERSONNEL OF THE EXECUTIVE COMMITTEE IMPORTANT

In starting the organization of a local council, too much care cannot be exercised in selecting the men who are to compose the Executive Committee. Men should be selected to fill these positions, especially the offices,—such as the president, vice presidents, chairman of the finance committee, and treasurer,—from among men who are prominent in the community. I have found in my personal experience, and in my observation of the work in other cities, that success comes easier when the men who comprise this committee are men of prominence. Personally, I believe that the president of a local council should be some manufacturing head, or a prominent representative of a large public utility company, such as the president or general manager of a prominent company in the district. There are many reasons to confirm this theory. If the head of the local organization is a man well known and occupying a high position in the manufacturing world, he naturally commands great respect, and it is very easy for him to get the cooperation of other industrial presidents and managers. Especially is this so in the beginning, when a city is just starting its work.

In every city that I have gone into the past year I have found there are one or two, or sometimes three men who, when they endorse a proposition, speak for practically all industrial plants of the community. It is our problem to interest these men. Our experience has proved that when we do reach these men we have a better and more substantial organization, and it has been found, I might say, comparatively easy to get their interest. We have made enough demonstrations, as shown by the development the past year in our Local Councils' work in large cities, to be able to lay before the big men the picture of just what can be accomplished by organized safety work in a community.

CHAIRMAN PRICE: That is a very important subject. It really determines the success of your local council.

MR. G. E. MORGAN (Employers' Mutual Insurance Co.): I want to as-

whether the men who were selected as the heads of your organization down there were the large contributors, or were they the men who interested the large contributors to start your plan for the first year?

MR. CARL SMITH: In a great many cases they were both the large contributor and the man who was interested in the work. If he is the head of a large manufacturing plant, he is naturally in position to make a large contribution. In most cases the man at the head made a substantial contribution. He was big enough to do that to set the pace.

SAFETY ENGINEERS PLAY AN IMPORTANT PART

By saying that big men should comprise the Executive Committee, I do not mean to slight in any way the executive ability and efficiency of our safety engineers in the community, for they are a deciding factor in the success of the work; but as the old saying goes, and which we have been following out in industry—that we should not place square pegs in round holes—so it is in this regard. Safety engineers are qualified to do a certain specific work in community safety. They are especially valuable as chairmen of our districts, and a certain number should be included on the Executive Committee. This is the system that is now being followed out in Pittsburgh, St. Louis, Rochester, Cleveland, Cincinnati, Kansas City, San Francisco, Portland, Windsor, and other cities that are organizing local councils with paid secretaries.

CHAIRMAN PRICE: May I add this word to that? One difficulty has been that the executive committees have been made up almost wholly of the men just under the general manager. I believe every one of the local councils knows that it has meant a great deal to them to get some really influential men in it. I have had it in my field experience over and over again. There would be splendid young men, splendid working material, the very backbone of a working organization, but lacking just that backing, that influence which puts it across in a big way. That is a very important point.

PAID SECRETARY A NECESSITY

MR. CARL SMITH: The experience of the cities that I have just named has proved beyond question that a paid secretary to handle the details of the work and direct the activities is so important and so far ahead of the old plan of a voluntary secretary, that it is hardly necessary for me to take your time by offering any further reasons why this should be done. Suffice it to say that the results obtained in these communities speak for themselves.

In St. Louis, the first year of their organization, accidents and fatalities in industries were decreased 57 per cent. Industrial, public, and home accidents as a whole were decreased 16 per cent in 1918; and the report of the Coroner of St. Louis shows a reduction of 18.5 per cent for the first eight months of 1919 over 1918. In Pittsburgh, according to the report of the State Department of Labor, accidents and deaths in

Allegheny County, the first year of the organization, were decreased 33.1 per cent. Prominent men, such as the Coroner of St. Louis and the Commissioner of the Department of Labor of the State of Pennsylvania, have gone on record to the effect that the safety work, as conducted by the National Safety Council, with the paid secretary in these communities, was largely responsible for results.

CHAIRMAN PRICE: It might be well to answer questions in regard to the type of men who make good secretaries. It makes or breaks, you know. Will you outline your ideal of a secretary, the kind of a man whom you would get for \$3,600 or \$4,000, or \$5,000 in some of the big cities?

MR. CARL SMITH: In the first place I think that a secretary of a local council must have initiative to put over his ideas. He is a secretary, is in the background, and is not presumed to be in the limelight. Nevertheless, the secretary is quietly directing the work of the whole organization. If he is that kind of a man, he is going to be able to get his Executive Committee to work with him. He should give them all the glory. He should be humble when it is wise to be humble, and he ought to be there with the punch when it is proper to be there with the punch. The ideal that we have is so inviting to big men that you just have a mighty easy job. They will be delighted to do the work for you because they want to do something for the community.

HELPFUL TO HAVE BACKING OF CHAMBER OF COMMERCE

It is very helpful to have the support of the Chamber of Commerce in conducting community safety work. In St. Louis the Chamber of Commerce contributes the office space, the salary of a stenographer, furniture, lights, telephone, and other incidental expenses. They have found that the Safety Department is one of their liveliest activities. It secured for them more publicity than any two or three other departments. It also gives direct service to their members as every man, woman, and child is interested in safety and the welfare of the city. Presidents, past presidents, and chairmen of membership committees of Chambers of Commerce have told me that in soliciting membership for their organization, the subject of safety was one of their most appealing talking points. By having the endorsement of the Chamber of Commerce, they are really sponsoring your work to the industries of the community.

There is a lot of argument on that point: whether we should be affiliated with the Chamber of Commerce or whether we should be independent.

MR. P. S. CASE (Niagara Falls): We find in Niagara Falls—and I presume it is common to a good many other cities—that the Chamber of Commerce is regarded as an organization of capital and their benefits are largely benefits to the capitalistic members.

MR. CARL SMITH: It all depends upon your local Chamber. Chicago has a real Chamber; the Advertising Club is affiliating with it. St. Louis has a real Chamber of Commerce. I think there is one in Rochester. It depends on local conditions. If the Chamber of Commerce is a

big organization in your community, get into it; if it hasn't the standing it should have, then stay away from it.

CHAIRMAN PRICE: Am I right in assuming that in practically all cases the Chambers of Commerce are known among the labor leaders as a sort of neutral body and not against labor as the Employers' Associations are?

MR. E. P. ROBERTS (Manager of the Engineering Society of Akron): I have a good many dealings with the men in the ranks both in Akron and Cleveland, and I think the average man on the street has the impression that the Chamber of Commerce is against labor.

CHAIRMAN PRICE: Then you want to keep away from it.

MR. ROBERTS: I believe in the Chamber of Commerce thoroughly, but the man on the street does not.

MR. CARL SMITH: You understand that regardless of what Chamber of Commerce you are allied with, you maintain your independence. It simply helps you along with the overhead expense. The direction of your department is entirely up to you and to your committee in every case.

MEETINGS OF EXECUTIVE COMMITTEE OFTEN—OTHERWISE NO ENTHUSIASM

I am fully convinced, after my experience in St. Louis, especially in arranging for the Congress, as well as my observation of the workings of executive committees in other cities, that it is vital to the success of the work that executive committees meet weekly. It enables them to keep in touch with the movement and to take an active part in doing some of the work. After all, success depends on getting the Executive Committee-men to really do some of the work. The secretary is employed to attend to the details, but he must have the expression of his committee in order for him to be sure that he is on the right track. It is great encouragement to a secretary to have twenty-five or thirty members of the Executive Committee get together once a week. In the average community it is very easy for men to get together at noon-day luncheons. They have to eat, and as one man said a short time ago: "I attend a great many noon-day luncheons, but I know of no meeting that I get more genuine pleasure in attending than the meetings of our Local Council Executive Committee." Why this statement? Because, after all, he realized that this cause was representing an ideal that is to be found in but few organizations. The members of the Executive Committee become intelligently interested just in proportion to the active work they do.

MR. L. J. SMYTH (Kansas City Council): In starting a movement, how are you going to get the kind of men you want on the Executive Committee to go to the weekly luncheons? I find, for instance, that the men we want for an executive committee usually has three or four luncheon engagements almost every day in the week, and it is hard for them to decide which one to fill. I haven't yet been able to find a day in the week when I can reach all of the members of my committee, and I have a comparatively small committee.

MR. CARL SMITH: After you have gone along for three or four months,

that won't be the case, because when your committeemen meet, they will attend it in preference to any other luncheon engagement. If you get forty per cent of your committeemen to attend your weekly luncheons, you are doing well. Of course, the attendance will fluctuate—you won't have the same men each week. But they keep in touch with you by the minutes, and you get what you want: that is, you get action on matters which you present to the committee.

MR. M. L. FELLNER (St. Louis Council): There is one point which the speaker brought out which I find quite important, and that is to provide copies of your minutes for those who do not attend your meetings. I have had more favorable comment on that than anything else which happened in the Executive Meetings.

MR. G. H. MCCLAIN (Cincinnati Council): I want to know how you get these temporary committees into existence at the start of things?

MR. CARL SMITH: You know when you go out to purchase a house or purchase anything, you look it over carefully, and you usually select the best you can find. That is the way we do with these men here. We select them with regard to their abilities along particular lines. Then we go to see them and sell them the idea. We sell them on the thought that they are the one person in Kansas City or Cincinnati who can turn the trick. It takes some persuasion, perhaps, but eventually they come along because they see that this is an unselfish work, and everybody is in it for the good of the city; the civic idea grips them and they accept. That is the way you get them.

MR. MCCLAIN: Are those appointments or selections verified by the organization later?

MR. CARL SMITH: Yes.

MR. MCCLAIN: You pick the men and get the committee into existence.

MR. CARL SMITH: Yes, it is obvious that the secretary is going to be the "goat." It is up to him to see that he surrounds himself with the proper people in order to put the job over. The secretary is really the one who selects these men in the beginning.

MR. L. S. BRAINERD (L. T. Block & Co., St. Louis): I think another good thought in picking this Executive Committee is to have as much of a diversified group of men as possible. That is, from diversified interests, diversified employments. Have some from public utilities, some from iron and steel and some from wood working, etc.

ACTIVITIES

MR. CARL SMITH: There are two classes of activities that should be conducted by a local council—some activities for the fall and winter months and some for the summer months. The reason for this is obvious. There are things that will appeal to superintendents, foremen, safety engineers, and workmen in winter that will not appeal to them in summer; and there are activities in the summer that will not appeal to them in winter. The one thing we all, of course, try to do is to have something new all the time to keep the interest aroused in a community. Here I want to say that in planning these activities we often make the mistake of

planning too much—more than we can possibly do. *Do a few things well.* This spells success. There are just a few things that one can do, and if they are done well, they will get results and enough results to satisfy any manager that he is getting dollar for dollar for the membership dues paid.

The mistake has been made in believing that a lot of activities should be launched at one time in order to let the people know that you are doing something, and the result has been that they usually have resulted in failure. It is much better to do one or two things and have them done in a big way, than it is to do a half-dozen things in a small way.

Fall and Winter Activities.—The most successful activity we have held the past year in any of our large centers has been the School for Safety Supervisors. This experiment was tried in St. Louis, Pittsburgh, Rochester, and Cleveland. Four hundred and sixty-four men were graduated from these schools and were given certificates. The schools were attended by plant managers, superintendents, safety inspectors, foremen, and members of the shop safety committees. The course consisted of fifteen lectures.

In most of these cities a chairman was appointed to take charge of the school, and let me say that this is one of the secrets of the success of the schools. In St. Louis a general manager of some big plant was designated to act as chairman. Experience has taught us that it is necessary to have a man with plenty of "pep and punch"—our chairman had the "pep." When the men attending the school see that they have such a leader, they are very responsive. The secretary should keep in the background. He is only there to see that the details are taken care of. Committees were appointed by the men themselves to help handle arrangements in conjunction with the chairman. They took care of such matters as providing entertainment—sometimes a quartette, sometimes a pianist, sometimes a vocal solo. In other words the men realized that this was their school. After the close of the course in all the cities in which it was given, alumni societies were formed, and monthly meetings were held.

As to some of the results accomplished—the General Superintendent of the St. Louis Transfer Company, P. J. Kelleher, stated that as a result of the lecture on Plant Lighting, given by Mr. C. W. Price, General Manager of the National Safety Council, he had made an inspection of all his garages and barns and had installed a new and up-to-date lighting system. As a result of the lecture on Resuscitation, given in St. Louis, there were several cases reported where lives had been saved because a man who had taken this lecture had been near and offered assistance. One case, I recall, was in Cleveland, and the man was employed by the American Steel and Wire Company.

In St. Louis, the secretary kept in touch with every student by writing a letter each week to those who were present and also to those who were absent. In this way personal touch was maintained with the men, and I assure you it was appreciated by them.

MR. M. L. FELLNER (St. Louis Council): Mr. Smith fails to mention that at these schools we distributed registration cards, and that was the

reason he had such close check-up on these fellows. He would write them, "You missed that splendid lecture last night," and it would make the fellow keen to come the next time.

CHAIRMAN PRICE: Did you write a letter to the manager about the attendance of his men?

MR. CARL SMITH: Yes. It is well to do that as a news-letter of service to members. Suppose that Mr. DeBlois would come to speak on some definite subject, and a big crowd was there. We would send out a news-letter to the manager like this, "Five hundred attended supervisors' school last evening." As a matter of fact that was done. The Secretary of the Chamber of Commerce wanted to know if that was true, because it hit him right between the eyes. The presidents and general managers of the plants will want to know it also, because if the school has grown to that extent they will want to learn more about it.

Foremen's Meetings. Next to the Supervisors' Schools the most important activity is monthly meetings for foremen. A chairman should be chosen for this work just as a chairman should be chosen for the Supervisors' School. The superintendent of a plant who is well known and a favorite among the foremen would be preferable. It St. Louis last year, in a series of foremen's meetings held in a large hall of the Street Railways Company, with a seating capacity of 2,000 people, they drew an average attendance of 1,800 superintendents and foremen. You ask how this was accomplished? I can state positively that it was caused by three things:

1. There were 550 men enrolled in the Supervisors' School. Most of these men were executives in charge of other men. They were appealed to and were pledged to see that the foremen in their plants attended the meeting.

2. An effective letter was sent to the manager each month, containing tickets patterned after the ordinary theatre ticket, for the manager to distribute to the foremen. On the back of each ticket, was a program of the entertainment to be given in conjunction with the speaker's name and the subject on which he was to talk.

3. The chairman of the foremen's meetings was a man who could tell a few good jokes and make the men feel that they were all of one large family and that they were coming together once each month for a great purpose, and at the same time they were receiving information that would tend to make them more efficient and give them greater opportunity for service to themselves and to their fellow-men.

Splendid results in obtaining attendance have been accomplished in Pittsburgh, Rochester, Cleveland, and other cities.

That is a valuable point. You should have a chairman who can get up and arouse the enthusiasm of the men.

MR. L. J. SMYTH (Kansas City Council): Can those foremen's meetings be made a combination of school and round-table? Is there time enough in one evening in a comparative short session to crowd it all in?

MR. CARL SMITH: Oh, yes. And another thing that struck me as very interesting last year: a great many of the supervisors who attended the

weekly meetings insisted upon attending the foremen's meetings too. In the first place, they wanted to see how many of the foremen of their own plants attended. In the second place, they wanted to enjoy the entertainment and the big program just as well as any one else. So there was plenty of time for discussion, as you say, and it made a very interesting evening.

CHAIRMAN PRICE: Would you say that at least half of the time in a foremen's meeting should be reserved for round-table discussion?

MR. CARL SMITH: I wouldn't say half of the time. I would say the better plan is to have a definite time to start and a definite time to finish; a definite time for the lecture and a definite time for discussion. In the supervisors' school we allowed thirty minutes, no more. The men soon get to know that they have only thirty minutes for discussion, and that they have to speak up and start it. It made no difference how hot the discussion was; when the time came for closing, we closed.

Managers' Meetings. It has been found advisable to hold about four meetings in the form of a noon-day luncheon for managers and plant executives. The speakers at these meetings should be men who will be able to talk on subjects in which managers are interested,—such as "Health and Efficiency of Employees," "Employees' Representation," "Labor Turnover," "Employment of Men," etc.

It has been said that managers would not attend noon-day luncheon. In St. Louis an average attendance of 275 was obtained. In Rochester, Cleveland, and Pittsburgh good results were had. Some have thought it impossible to induce the managers to attend these meetings. This is not true. If you have a good speaker and if the meeting is properly advertised the managers will respond. All notices of such meetings should be addressed to the manager, and the invitation should include his plant executives. A policy that proved very effective was to mail an invitation to the manager, enclosing a post card, asking him to state how many places he wanted reserved, and then the day before the meeting check up these cards against the list of invitations mailed. Those who had not replied were called on the phone and personally asked to attend, stating the importance of the meetings. It is not necessary for the secretary to do this detail work. He can turn it over to his stenographer or any other help in his office. I remember one instance in getting out a crowd for a managers' dinner the young lady, in one hour's work calling over the phone those who had not replied, received requests for 67 plates. As the manager is the man who must O. K. the membership bill each year, you naturally want to reach him in some way and tell him the fact that you are doing something worth while for the welfare of the community. In order to make a local council successful the manager must be educated in safety as well as the foremen.

MR. POLLARD (International Harvester Co.): What has been done with reference to getting superintendents' meetings?

MR. CARL SMITH: They attend the supervisors' school.

Motion Picture Service. One of the activities that is appreciated by the manager, safety engineer, and workmen of the plants is the service

of a motion picture machine and films for noon-day and evening shows. Most of the districts are now supplied with a portable motion picture machine and some motion-picture films. Letters are sent out from time to time to the managers in the district, stating that this service is available to them and that the secretary will be glad to arrange for the showing of a film that will be in his office for thirty days. Experience has shown that after these letters are mailed, in a very few days enough bookings come in to keep the motion picture-machine in use for three or four weeks at a time.

Secretary's Service. The paid secretary can find himself a very busy man in giving individual service to plants,—such as inspections, talks to foremen and workmen, assisting safety engineers, in organizing the plant and many other calls for his services too numerous to mention.—if he will but send out a letter from time to time to each manager comprising his membership.

Summer Activities. Experience has taught us that it is well to discontinue all meetings for managers, safety engineers, and foremen during the months of June, July, and August. The reason for this is that we find early in the spring every one is interested in getting in the garden, or putting the eggs under the old hen, going fishing, playing tennis, or what not, and the appeal to attend meetings in the evening is lost. Summer time is here and they want to enjoy it as much as they can, so they turn their minds into other channels.

Boat Excursion. However, there are a few things that will appeal to them in which they will be glad to take an active part. In St. Louis, this summer, they conducted a very successful boat excursion for superintendents, foremen, and safety engineers. In fact a great many managers attended. Posters were distributed in all the factories, and tickets were sent to the managers. Many concerns bought tickets and distributed them gratis to their men. In other words, they held a community safety boat excursion.—nearly 2,000 went on the excursion.

Picnic. In Pittsburgh, the Carnegie Steel Company held a picnic with a barbecue, games, band, shows, and safety speakers. Mr. Phil G. Fenlan, Safety Engineer of the Duquesne plant of the Carnegie Steel Company, told me there were 15,000 men, women, and children in attendance.

Open Air Shows. The Park Department in every city, my experience has proven, welcomes the coöperation of the Local Council in giving open air shows to the children of the community. Usually the shows are given on the playgrounds or in the parks. The city authorities are always willing to provide seats and assist in the preparations. There are always people in every city who will be glad to help in the way of entertainment. Community song leaders are delighted to assist. The months of June, July, and August are, of course, preferable months for this entertainment as the schools are closed and the children are free to be amused and instructed. Posters and tickets distributed through the plants are good ways to advertise these shows.

PUBLIC SAFETY

Personnel of Committee. In beginning public safety work in a community, the personnel of the committee is very important. There are men in every community who, because of the position they occupy in public life, should play an active part in the work of public safety. It would be sheer folly to attempt to organize a committee without such men as the Director of Public Safety, Director of Streets and Sewers, Chief of Police, Judges of the Courts, Circuit Attorney, Director of Parks and Public Buildings, representatives of prominent manufacturing plants, automobile clubs, team-owners' associations, transfer and taxicab companies, etc. Many individual men in public life have attempted to organize public safety work and have failed because it was purely an individual idea. To have community safety, every organization in the city which is obviously interested in safety, should have certain specific work to do. The safety committees as conducted in St. Louis, Pittsburgh, and Cleveland are made up of men who are representing such organizations and such work is assigned to them as they are especially qualified to do because of the organizations they represent.

Essentials in Industrial Safety and Public Safety. In industrial safety we have found that there are five essentials that are really the governing factors in the success of safety work in industrial plants, namely: manager, foreman, safety engineer, shop safety committees, and the bulletin boards. We also know that to have successful safety work in industrial plants, the manager must put the safety idea on the map, and so it is with public safety. There are five essential things that must be done.

1. The Mayor of the city must believe in safety and that it is a good thing, and be willing to request, over his signature if necessary, the prominent men of the community to serve on the Public Safety Committee.

2. The policeman is to the neighborhood which he patrols the same as the foreman is to his men. He is responsible for the protection of the citizens on his "beat," and just as we have had to educate the foreman to his responsibility, so shall we have to educate the policeman. We are hoping to do this by having schools for policemen, where each will receive ten lectures on Safety Work as applied to his job.

3. The secretary of the Safety Council in the community is to the community what the safety engineer is to the shop. He must keep in touch with the needs of the community and his Public Safety Committee, and wisely pilot the ship.

4. A Vigilance Committee, composed of prominent men of the community, takes the place in Public Safety of the workmen's committee in the shop. These committees are organized by first having five men appointed on the committee. These five men meet and adopt a pledge card which every one signs before becoming a member. They are then each given a number and thereafter known by that number. Each is supplied with a number of report cards on which he reports careless practices occurring on the streets. These cards, after being filled out, are

sent to the Secretary of the Complaint Board of the City, or Chief of Police, who then takes the matter up, either personally or by letter, with the person concerned. The complaint card is filed by license number of the car. Should a second offense be reported, more severe measures are taken. Each one of the five men agrees to name five more men and be responsible for their instruction, thus making a total of twenty-five men. These twenty-five men sign the pledge, and after a little experience, each names five more men, making a total of 150, and so on. The number of men involved are as many as it may be deemed necessary to select.

5. *Bulletin Boards.* After all is said as to the success of the safety work in Industry, we all know that the bulletin boards in the various departments still play an important part in the prevention of accidents. The pictures and stories that are put on these boards from time to time visualize to the workmen the part they themselves must play to reduce accidents, and are a great factor in selling the men the safety idea.

If we are to reduce accidents on the streets and curb the speed maniacs it will be by visualizing to them the pictures and stories of the 60,000 lives that are lost each year in public accidents, so that the fifth essential in Public Safety is bulletin boards in garages, service and gasoline stations. In Pittsburgh, St. Louis and Cleveland the plan is to have these bulletins posted on the boards at least monthly by the policeman on the "beat", the board to be electrically lighted, with glass front the same as used in industry, and to be marked the property of the city. Attached to the board it is planned to have a tin box with the words "Traffic Rules and Regulations. Take One"; these boxes to be kept full with the little booklet of the traffic rules and regulations of the city. This will insure a permanent distribution of the law so that the old excuse of the driver not having an opportunity to get a copy of the traffic law will be done away with. It will surprise you to know that in St. Louis for instance, although there are 35,000 automobiles running around the streets of the city, that only 5,000 copies of the traffic law had been printed for distribution in the last five years. We know that bulletin boards in garages and gasoline stations will get results, and I might cite as an example the experience in East St. Louis where Mr. D. E. Parson, General Manager of the East St. Louis and Suburban Railway Company, posted bulletins on Public Safety in the public garages and gasoline stations promiscuously without any attempt to make it a dignified presentation, and as a result of his efforts collisions between automobiles and street cars were decreased 50 per cent.

I have here a copy of the Pittsburgh and Cleveland plans for Public Safety, giving the personnel of their committees and the work assigned to each committee, which is patterned after the work laid out by the Public Safety Committee in St. Louis. Copies of these plans can be secured from Mr. G. E. Clarkson, Secretary of the Western Pennsylvania Division of the National Safety Council, 704 Frick Building, Pittsburgh, and Mr. A. H. Lintz, Secretary of the Northeastern Ohio Division of the National Safety Council, 310 Chamber of Commerce Building, Cleveland.

SCHOOL SAFETY

"School Safety," as many managers of plants are expressing it today, "is the very essence of safety work in a community. When you start to teach the children you begin to get at the fundamental basis of accident prevention work." We are indebted to Dr. E. George Payne, Principal of the Harris Teachers' College of St. Louis, for the first book written on this subject, which will show a teacher how to include safety instruction to the child in the present school curriculum without adding a new study. The school people in the communities that I have visited are very anxious to get this work started, and it is one of the things that our Secretary in our Local Council can offer the managers of the plants in his district in the way of service that will be appreciated by them.

FINANCING A LOCAL COUNCIL

You are perhaps familiar with the way in which these local councils are being financed. If not, it will be interesting to you for, after all, money is needed to carry on these activities and the more money the community has, the more successful it is going to be in safety work, just as the more money a plant spends in perfecting its safety organization, the more efficient its organization is. In St. Louis the plan of assessment is based on the number of employees. An assessment of 10 cents per employee is made for the first thousand and 7 cents for the excess. This has been found an equitable plan and sufficient to finance the work. In Pittsburgh the local work is financed by a double due assessment. In Rochester it is taken care of by the Chamber of Commerce through a Community War Chest. In Cleveland, Cincinnati, San Francisco, Portland, Kansas City, and Windsor the work for the first year is being financed by contributions made by the big men of the city in order to make a demonstration as to what can be done in community safety, and after the first year the method to be used is to follow the assessment plan on the pro rata system, as used in St. Louis.

In making plans for a paid secretary to undertake the work in a community, let me just say there is nothing so discouraging to the secretary and every one else as to be handicapped by finances. The time to get the necessary money is at the start. In making the estimate of the cost, and preparing your budget, make it high enough so that you are sure it will cover the cost of the work of the year without slighting the service.

CHAIRMAN PRICE: I am glad to see my good friend Morley sitting over there looking pious—he is here from Canada. Mr. Morley is the General Manager of the Ontario Safety League and the Canadian National Safety League. We are very glad to have you come over here and tell us what you think of this man Smith and what he said.

MR. R. A. MORLEY: There are certain points that Mr. Smith has brought out that might possibly be worth while for the members present to have some of our experience on, because our experience now spreads over nearly seven years.

EXPERIENCES OF ONTARIO SAFETY LEAGUE

Mr. Smith brought out the importance of the Executive Committee, and I think that perhaps we have been more particularly lucky in the Ontario Safety League—we have been very lucky in the type of men we have had. We have gone in strongly for presidents of concerns, not forgetting, of course, the labor organizations, the automobile associations, etc.

So far as the labor end of it goes, Gentlemen, I want to say that you cannot lay too much stress on getting results out of your labor men. The labor men are tickled to death to come to your Executive Committee meetings and meet with the men who are presidents of concerns, etc. They get their point of view and it is the old, old story about safety work being the greatest ground that there is for carrying on proper and satisfactory industrial relations.

Now as to the Executive Committee meeting once a week: I don't agree with Mr. Smith. I think that once a week is too often, and in our experience once a month is plenty; that is, after you get working. Of course, at the outset you may have to have meetings seven days a week, but after you get things going, the Executive Committee has laid down certain policies and has become acquainted with the man who is doing the work—that hard-hearted Secretary who is so very essential—after they become acquainted with him and his methods, I think that you get your best results out of having your meetings once a month, not once a week. I say that after several years' experience on the job, but I think that you ought to have a definite date. For instance, ours is the first Monday of every month, absolutely regardless of anything else being pulled off—except a public holiday. We have a meeting on that day, and as I say, you get results.

I don't suppose there is any need to elaborate on that need of a paid secretary. You have to have a man whose daily bread is, to a certain extent, dependent on what he is doing. He is going to take a darned sight more interest in the thing than if he were simply putting in an hour or two a day for what he considered the good of the cause.

Mr. Smith also mentioned the question of the secretary having the necessary punch. I remember on one occasion the president of the organization making a statement to our secretary and the secretary looked over at him and said, "Dr. Hughes, that is not so." Dr. Hughes said, "Oh, I thought it was." He took it very nicely, too.

You brought out, sir, the question of the importance of public safety work, and I think your public safety work must be made the basis of your big appeal to the community at large. You are going to get your results from the community at large, through your public safety work; and the most important part of the public safety work in our experience is the school work; it is the keystone of your whole proposition. You carry on your school work, and you may not get results for ten years or you may get results tomorrow.

In that connection I would like to tell you a story of Mr. Cushing, who came into our office about three years ago from Thorold, a compara-

tively small place near St. Catharines. He said, "I understand you issue school bulletins. Can we get them at Thorold?" I told him that they could. He said, "What do they cost?" I named some small figure. He said, "I am not a member of the school board, but I want to get them." I asked him where his interest came in. He said, "I am interested because my company is one of the comparatively big employers of labor in our small town, and we feel that, if the children in the schools to-day are taught school safety, street safety, safety in the homes, and various other types of safety, when we get them in our plant they are going to be safe operators, and it is going to be simple to teach them industrial safety."

That is one of the big points of your school work. You can't lay too much emphasis on it. We have carried on our school safety in a various number of ways. We use motion pictures. We have school bulletins which we put in the class rooms every week, and once a year we distribute a letter to parents. Those are all things that have been done time and time again by somebody else, but when you get a combination you are going to get results.

In connection with that school bulletin, I want to put this thought into the heads of some of you. Your school board is going to pay a great deal more attention to your school bulletins and to the work that you are doing in the schools, provided they have some financial interest in it. We have been very lucky in regard to our school work. For instance, the Board of Education in Toronto this year allows us to spend up to \$600 on school bulletins and on that annual letter to parents. Once a quarter or once every half year, whenever we need the money we send them a bill and say, "Gentlemen, up to date we have spent so much money." At one of our meetings not long ago in Hamilton, the Chairman of the Toronto Board said that they were allowing us \$600 and that they were going to double it next year. We get \$200 a year from the Halifax, Nova Scotia, Board for the bulletins.

That feature of paying for the bulletins has two excellent points to my mind. In the first place, as I said before, you get more effect from stuff like that when it is paid for, and in the second place you get the money.

I want to finish up with a remark about the question of finances. With some of the local councils the question of finances may not matter, but it seems to me, as Mr. Smith brought out, it is a thing to which they must at some time or another devote a considerable amount of attention. In our campaign, at least in Canada, we have two features with our finances. In the first place, we have got to get the money. In the second place, we have got to spend that money to prevent accidents. Those are the two features of the financial end of a safety campaign, to my mind, and you can't get away from either one of them. I laid down a policy years ago when I took hold there that we wouldn't buy a damned thing unless we could pay for it. Lots of things we went without simply because we did not have the money to get them with. But our credit is good, Gentlemen, we can get anything we want now in the city of Toronto.

As a wind-up, I want to tell you two or three incidents. We have a peddler in Toronto who, every year, for six years, has sent us his little \$5 check. He is a man who is listed in the city directory as a "peddler." Because of the work we are doing he thinks we are worth \$5 a year from him. We have had contributions from all types and all classes of people. As I explained to you, we have had money from the Board of Education. We have had, in the six years that we have been at work, a total of \$10,000 from the city of Toronto.

The last thing I want to leave with you, Gentlemen, as the climax is that this year the province of Ontario, in view of the work we have done and the work the people hoped we would do, has made us a grant, without any strings of any description, of \$10,000, and that is more than patting one on the back.

CHAIRMAN PRICE: Mr. Morley has a right to speak with authority on school safety, because that has been emphasized during the last few years in the work in his city.

I remember during the first year of my service as field secretary, that one of the very bright spots in that experience was a four day visit I made at Niagara Falls. I remember that they had twelve members of the National Safety Council when I went there, and we found, on investigation that there were twelve other companies that were worth mentioning that were not members of the National Safety Council. We set a goal of having every company in Niagara a member, and we started out every morning with pep and ginger and determined not to fall down. Inside of three days we had the other twelve and that was one hundred per cent.

One of the men who was most active in that little drive and in organizing that local council, who is now and has been ever since, one of the men who has made it one of the most successful small councils, is Mr. P. S. Case of the Union Carbide Company. Mr. Case, we are glad to have you here. Come up and tell us how you did it.

THE EXPERIENCE OF A SMALL CITY IN LOCAL COUNCIL WORK

P. S. CASE, UNION CARBIDE COMPANY, NIAGARA FALLS, N. Y., SECRETARY-TREASURER, NIAGARA FRONTIER LOCAL COUNCIL, N. S. C.

The experience of a small city in Local Council work should, I believe, have a value from the standpoint of determining the policies of other councils which materially outweighs its historical interest. Our experiences in Niagara Falls Safety Council, though novel and intensely interesting to ourselves, were, I assume, a repetition of those of most locals. With this idea in mind, I am limiting the intimate details of our experience at the Niagara Frontier Safety Council to those which will best serve to "point a moral rather than adorn a tale."

A Local Council is or should be essentially a service organization. By this, I mean, an organization which justifies its existence by virtue of the

services it renders to its members. My experience in Local Council work has led me to believe that the most vital requisite of a Local Council's success is that it devote a considerable if not the major portion of its energies to rendering special service to its members.

There is at all times, and more particularly at the inception of a Local's activities, a necessity for a number of routine activities which are valuable to the members collectively. The Local Council, however, never becomes indispensable until it ascertains what the individual members consider their personal problem in safety work and effectively helps them to meet that problem.

Niagara Frontier Safety Council was organized under rather unique and favorable circumstances.

ORGANIZATION OF A LOCAL COUNCIL

In October, 1916, I attended the National Safety Council Convention in Detroit. There were, at the same time, several other representatives of Niagara Falls industries on hand. One day somebody mentioned that the representatives of the Buffalo plants proposed forming a Local Council in our district to embrace both Buffalo and Niagara Falls. At once we began to discuss the proposition of Niagara having its own Local, for we did not feel that Buffalo was conversant with the peculiar problems in our Electro-chemical Industries. In other words, there seemed no chance of an organization in Buffalo securing the intimate knowledge of our personal problems, which we have already mentioned is essential to a Local Council becoming a true service organization. We then bespoke Mr. Cameron and Mr. Price and arranged tentatively for a Local Council at Niagara.

It became evident, on returning and canvassing the plants in town to see who were already council members, that only a small portion were receiving the benefits of belonging to the parent organization. This being the case, Mr. Price devoted a considerable portion of his time at Niagara to securing new memberships and we have more than once congratulated ourselves that we did not fail in a single instance of "selling our service."

After organizing our Local and helping us conduct our first foremen's meeting, Mr. Price of necessity left us to our own devices and thereby hangs a tale.

Pursuing our original idea, stated at the outset of this paper, the effectiveness of a Local Council's efforts depends on the quality of its service. The mere fact that it has a service to offer, be it foremen's meetings, or school for safety supervisors or what not, is of no significance unless this service is of intrinsic worth to the members. In other words, the Local must effectively meet the member's personal problems.

Almost without exception the Foremen's meetings have a function to perform for every industry. Executives' meetings have their place also as do schools for safety supervisors and workmen's mass meetings, etc. These are collective functions that can best be performed for a group of plants by a central organization. There are, however, a vast number of special problems which come up in the individual experience of every

plant which are, in the main, more vital to the success of its safety work than some of the general considerations just mentioned.

The Council's organization in Chicago has long recognized this fact: witness the Sectional Bulletin Service, the Sectional meetings of this Congress, the Safe Practices leaflets on special hazards, the Information Bureau, etc. A Local Council to be successful must duplicate this type of service if it is to have a genuine value to the members.

Our early experience after Mr. Price assisted us to organize was highly successful. We had several foremen's meetings during the winter of 1917 and 1918 which were well attended and favorably commented upon.

A BUDGET AND A POLICY

Buffalo had at the same time, organized a Local there and on comparing notes, we found that our progress was favorable as compared with theirs. There were two things, however, which we had failed adequately to provide for—namely, a budget and a policy. The former we successfully solved after considerable deliberation on a five cents per employee per year basis; but the latter involved principles of service which I have already outlined and was the main reason for our re-organization which I will detail later.

Our early activities involved the expenditure of considerable money which was advanced to the organization by two large member plants in town. As our organization began to take form, we got together and decided on an assessment of so much per employee per year on the various members as a fair system of raising funds. We were able, moreover, at five cents per man to raise more than enough funds for a year's activities together with a fund to retire the loans which had been advanced us during our early organization. We were, however, without a definite policy which included special service to our individual members and this together with our inability to maintain an effective voluntary organization, particularly during the recent war, contributed to the necessity for re-organization.

In order to render the high class of special service to individual members on which the existence of a Local Council depends, it is necessary to maintain a paid organization at least in part. There is, of course, a certain amount of routine stenographic and clerical work which under a voluntary organization is divided among the various officers. Such an arrangement will function, after a fashion, but has the permanent disadvantage of no centralized filing and record system. When, however, we attempt the personal relations which involve visits to member plants, conferences, follow-ups on meeting notices, membership drives, etc., it is altogether beyond the possibilities of a voluntary organization to accomplish. Unfortunately my knowledge of Local Council work does not extend to a personal acquaintance with a permanent secretary's work. Aside from the functions of a Local Council which are obviously impossible to perform in any other way, there is of necessity a mass of other problems with which a permanent secretary would deal. These are present in any Local Council problem and are peculiar to the group of industries concerned.

I am, therefore, not in a position to state just what we have left undone at Niagara which we ought to have done with a paid secretary, but there is no doubt in my mind as to the fact. With this in mind, that in order to render a high class of special service, a Local Council must maintain in part at least a paid organization, Niagara's experience was typical.

During the winter of 1917 and 1918 we again held foremen's meetings which though excellent in quality were not properly attended and we began to cast about for a reason for this falling off in interest. In the first place, owing to our lack of a paid secretary, we were not in a position to follow up properly our notices of meetings. Then too, we were not making any additions to our membership which might have contributed to maintaining a keener interest in our foremen's meetings. This condition was unavoidable for the same reason although the field was very promising. I might state at this point, that Niagara's industries were almost without exception on 100 per cent war work and the labor and production problems were absorbing all of the time of our voluntary organization. In addition, we were entirely out of touch with one another's personal problems, largely because we were too busy with our own and all of these factors militated against the formation of the necessary constructive policy.

By the fall of 1918, we had reached the limit of our capabilities under our original organization. It was obvious that a re-organization had to take place in order to build something that could render real service and it was equally obvious that this had to be a paid proposition at least in part. So in the fall of 1918, we turned our attention to the successful experience of the Rochester Local and began to study their methods of doing business.

REORGANIZATION AND BROADENING OF ACTIVITIES

There had, in the meantime, been a Chamber of Commerce organized in Niagara Falls and we decided to duplicate, so far as possible, Rochester's relation between the Local Council and the Chamber of Commerce. The details of this arrangement, of course, took some time and not until the spring of this year did Niagara Falls Safety Council become part of the Niagara Falls Chamber of Commerce.

It is axiomatic that even an organization which renders a very distinct and valuable brand of special service to its members must broaden its activities to enlarge its organization in size and effectiveness, if it is to continue to exist. I notice in a recent executive service bulletin from the Chicago office a fine collection of valuable data on Employees' Representation which is evidence of the recognition of this fact by the central organization.

The idea of Safety work is so intimately connected with employees' relations in general, that without losing its identity as safety work, it may well include a working knowledge and supply of information in these other directions. I suggest that all Local Councils seriously consider the possibilities of service to their members which lie in the inclusion of a moderate amount of attention to employment, hygiene, employees' repre-

sentation, and recreation problems in a Local Council's program of activities.

Niagara Falls Chamber of Commerce is seriously considering this phase of industrial needs in the form of what will be known as an industrial council. This council will be in charge of a paid secretary who is part of the Chamber's regular staff and together with safety work will give his attention to some of the other problems mentioned above. As this involves a considerably greater financial outlay than Local Council work alone the plans are taking some time and will not be operative until later in the year.

Having heard our experience such as it is, I hope you are convinced as I am that a Local Council is primarily a service organization the effectiveness of whose efforts depends on the quality of its services. That it must render a progressively efficient and genuine service to justify its existence which in turn is only possible through a paid rather than a voluntary organization. That the work of a Local Council must be progressive in its nature and extend in the direction which the needs of its members demand, presumably to those other branches of employees' relations which are daily becoming more and more important.

DISCUSSION

CHAIRMAN PRICE: I am particularly anxious to occupy the next hour in a discussion of the problems of the small local council. I would like to discuss first the problem of the local council that will probably not be able to employ a permanent secretary.

I think the lame spot in the program of our local councils' sessions last year was that we allowed the consideration of the larger local councils to overshadow everything. We know how to solve the big city problems, and we don't know how to solve the other. Thus far in these sessions, we have not added very much to this problem. I have selected Mr. Case deliberately believing that he is as competent to answer those questions as any one. We haven't all the light, but we have a little, so let us see if we can get at anything that will really be of help to us in solving this problem.

Niagara Falls has done better than most other small cities and Mr. Case is very frank about its failures. He hasn't been nearly so frank about its successes.

MR. DEBLOIS (Wilmington): I would like to propound a question at once. What place in the inauguration of a small local council would you give to publicity? I don't mean simply newspaper articles, sporadically, but a general knowledge in the community of the existence of a local council, what its purposes are, etc.

PUBLICITY

MR. CASE: I don't think there is any question that publicity is the finest thing that you can have. There is no question that you should have one hundred per cent interest in a small town by all concerned,

both manufacturers and the general public. In a small community you have got to get everybody or you are not going to get along. You need the influence and you need the money. The more publicity you can get, the better it will be. Safety is essentially an advertising and selling proposition. I think publicity is the word every time.

MR. DEBLOIS: Let me continue that, if I may. In starting the thing, would you start with publicity, concentrate on that before you undertook actual work?

MR. CASE: My personal knowledge or feeling in that matter and I don't pretend to speak from great experience—is that in almost any activity results speak almost louder than anything else you can bring forth. A moderate result to back up your publicity is an excellent thing. I wouldn't get the cart too far before the horse.

MR. DEBLOIS: We have just been going about six or eight months in the Delaware Council. We have Mr. Case's problem of a small community. There are three or four very large concerns having central headquarters, the du Pont Company, for instance. There are no large manufacturing interests. We have concentrated sixty per cent on the publicity. We started with perhaps six members of the National. We haven't really gone out to sell a membership. The Membership Committee hasn't called more than one meeting and hasn't got to work yet. We have let publicity sell memberships. It has done it because we sold newspapers first. We can get anything we want in the paper now. That means not only two or three columns, but the front page, if necessary, and editorials. They are hungry for the stuff. We have sold it to the editors personally. The labor paper has given us as much as two whole pages in one of its weekly issues. We can feed it anything. That has sold us to date about thirty-five memberships, active memberships, and it is going to keep right on selling them.

The point has now arrived where they are asking for a little something for their money. We have given three good meetings, one with Forster, one with Price and one with Carl Smith. But we must give them a little more, and we are going to feed that to them now. But meanwhile in our opinion, that publicity work has got to be kept up one hundred per cent, and because we are a state council and not a city council, we have got to sell the state papers, such as they are, down to the last little local town with a weekly news sheet, just as much as we sold the city papers. That is the reason I wanted to bring that out.

CHAIRMAN PRICE: That is a good point, but you admit that you have to deliver?

MR. DEBLOIS: We have to deliver something.

MR. LINTZ: Speaking of publicity, I am always interested to learn just how you brought the council before the people with respect to getting these members? Did you advertise the council itself and what it does in a direct way?

MR. DEBLOIS: I really have misled you that publicity sold these memberships. In launching the thing, we had to select the only non-partisan organization as a sponsor. That was the Chamber of Commerce. The

only other organization professedly non-partisan, was the Manufacturers' Association, which was regarded by the labor interests as anti-union.

The Chamber of Commerce really hasn't taken any active part in the work. When we sold the idea to the Manufacturers' Association through the Chamber of Commerce, they promised one hundred per cent membership. Actually they got about twenty-five. But they didn't get it through the efforts of their secretary, but entirely through our newspaper publicity.

That is the way we started the thing, through the Chamber of Commerce as a sponsor at a luncheon, which brought the matter to the attention of the Manufacturers' Association at one of their regular meetings, to the Compensation Board, which took but passing interest in it, and to the labor unions, Central Labor Union, and the Labor Herald, which are with us one hundred per cent strong.

CHAIRMAN PRICE: Mr. DeBlois, do you think that you can carry on the program that will include a foremen's school instead of a safety supervisor's school, and a real effective public safety campaign, for instance, a week's drive, including the city officials and also this publicity that you have spoken of, without a paid secretary?

— PART-TIME PAID SECRETARY —

MR. DEBLOIS: I wouldn't say that we didn't have a paid secretary. We are dodging the issue. One of my assistants, Mr. Read, who unfortunately was called back to Wilmington, is giving sixty per cent of his time. He is experienced in safety work, is an experienced organizer, and had something to do with the sporadic safety drive that was organized by one of his ex-assistants in the city of Nashville. His time is paid entirely by the du Pont Company. He really is a part time secretary and I arrange his duties so that he can devote a portion of his work to that.

CHAIRMAN PRICE: Do you think that is a practical plan? I had in mind bringing that up, the possibility in Niagara of securing a man like Mr. Case whose company is interested, whose time could be spared, possibly paying him a salary for that time and in that way overcome the weakness of the plan?

MR. DEBLOIS: Here is the proposition. I think it is a perfectly workable one in other communities. We have these three large powder companies which have their main offices in Wilmington. They derive very definite advantages from the local council, both to the men in the organization and to the status of the organization in the community. There was a little feeling in the community against these big fellows, and the big fellows don't want that. It is not hostility but it is just a little aloofness. The big fellows want to be mixed right in with the community and they welcome anything that will strengthen the community relations. Every time it was necessary to raise pay or salaries the other fellows around the town said. "Oh, well, these big fellows are hogging all the market and spoiling all our wage schedules." Therefore, the activities of a local were welcomed.

Now, then, when you come to assess those large companies for dues, you cannot assess them on the payroll basis, because they have very few payroll employees there, practically none. So we went to them with this proposition (there are two small ones and one large one): "Now you two small ones give us \$100 annually which we will consider straight dues to the local. It is not a donation, but it is the value of the services that you will derive for your employees, and your own position in the community. Mr. Large One, we will also take \$100 dues from you, but we will also take the services of one of your men." That went over without any trouble at all. They saw that they were going to get more in service than could be paid on any normal dues schedule.

CHAIRMAN PRICE: Is there any such possibility in Niagara? Is there one company sufficiently large to spare the time of one man?

MR. CASE: I think that it is possible. I must say, in all frankness, that I think it is fundamentally wrong, because there was a certain wise man who said a long time ago that a man "cannot serve two masters," but at the same time it is a very good makeshift, and provided we have the whole-hearted enthusiasm of the concern to which this part time man belongs, I think it could be accomplished. However, I do not believe we would come to the point of accomplishing what we could with a full time paid secretary.

CHAIRMAN PRICE: About how many employees, roughly, have you in Niagara Falls.

MR. CASE: Probably 25,000.

CHAIRMAN PRICE: Do you think that Niagara in the next two or three years, is large enough to warrant the employing of a man at \$3,000 or \$4,000? You have got to have just as good a man there as anywhere? What do you think is the practical solution of the Niagara problem?

PERMANENT PAID SECRETARY

MR. CASE: Personally, whether it is good judgment or not, I am sold on the idea of a permanent paid secretary. I think, and I have the opinion of the Chamber of Commerce to back me, that by including certain other functions in relation to the spreading of general information on employee relations, the overhead could be borne properly. In other words, members could take out their service in other things besides safety, but whether that agrees with the policy of the Council or not, I am not in position to say.

CHAIRMAN PRICE: Don't you think, Mr. Case, that with the very rapid development of public safety which I think is bound to come in the next two or three years, because of the large increase of street accidents and because of this school safety that is coming now—don't you think that all of the citizens, including the industrial managers, will appreciate that there is a big community problem that is bigger than the service that might be rendered to the individual plants? Even in a community of your size there is a big job for a good man. It is a bigger job than we had thought when we considered this only as possibly a service to these industrial concerns.

MR. CASE: I think that is very true. It is a very pleasing development that public safety is becoming so large a part of the local council's work. I thoroughly agree with Mr. Price's former statement that industrial safety is becoming such a part of the regular routine of affairs that it naturally develops that we take more interest in public safety, and I believe thoroughly that in Niagara there is a possibility for such a man.

CHAIRMAN PRICE: Mr. Smith, what is your thought in this matter.

MR. CARL SMITH: My thought is that the failures have been due to the fact that no one man has had sufficient time to give the necessary attention to the work.

There are four or five problems in the small cities: a definite program, school for supervisors, school for foremen, school safety, and, perhaps, public safety.

CHAIRMAN PRICE: Would you say that Niagara should have a school for supervisors or a school for foremen?

MR. CARL SMITH: It ought to have both. You have just mentioned twenty-five thousand employees. That would bring you a revenue of \$1,250, and if that were increased to ten cents per employee, it would give you a revenue of \$2,500 a year. I would say it could be easily raised. If you had as secretary a man who was interested enough in the idea to see that the program was carried out, I believe that you could find a very good woman, a high grade stenographer, who could tend to the office details at a salary of \$90 a month and carry on the program for you with your assistance. That would develop, perhaps, into a paid secretary at \$3,000 a year. But your problem is to put over some direct activities in your community this fall.

Start with \$2,500 as your budget. Get your high grade woman who will do the bulk of the work in the office, and she can handle the details for you with you as the secretary to guide her. In all of our small cities the problem has been the sending out of the notices to the foremen, to the managers, checking up and seeing that they attended the meetings. She would take care of all those details. You would simply have the responsibility of carrying out the idea. I think that is what we are going to have to decide upon. Certainly we must have a program. Publicity is all right, but we must have down on paper definite services to give these men.

CHAIRMAN PRICE: I think that Smith has said something there. I think I said something, too, when I spoke of the enlarging field in even a small community. It is big: it is much bigger than we have thought it in the last two years. A year hence, aren't we going to see it big enough and aren't the people going to see it big enough so that there is ample room for a paid secretary in a small community, even smaller than Niagara, Mr. Case? What do you think of that, Smith?

MR. CARL SMITH: Yes, it will come.

MR. DEBLOIS: I absolutely foresee, when we take up public safety work this spring that this man who is now part-time paid secretary will have to devote his entire time to safety work. But part of his salary will be deducted from the fund which we are looking forward to raising

for public safety work. We have about 125,000 population, but with public safety work it means a full time paid secretary with a stenographer and office assistants.

CHAIRMAN PRICE: I want to get your reaction on this. I remember when I attended a meeting of some eighty business men in Cincinnati where we were launching the financial campaign, that the chairman, Mr. Geier, who is one of the outstanding young general managers there, made this point: that we want right now to get under one organization all of these things that are going to make for industrial peace and betterment—safety, health, industrial relations, the housing problem. Let's not split it up. Let's get a good man. Isn't that what we are going to come to in a small community? We want peace; we want right industrial relations; we want safety on our streets; we want safety instruction in our schools; and we want the active coöperation of our civic organizations.

As this thing grows, and it is growing by leaps and bounds, this problem of bringing about good conditions, this meeting of the crisis that we are in the midst of now—aren't we beginning to see that even in a smaller community than Niagara Falls there is a great big job for a big, broad, strong man? There is a job for such a man to work out an organization that will not only take in this narrower field that we have been talking about, but that will also take in this whole field.

MR. MORLEY: I think the majority of those present don't appreciate the value of public safety work as a money-getter. We have lots of men in Toronto, perhaps one hundred, who don't get anything at all out of the contribution they make every year to our work. A few days ago I was accused of doing too much direct advertising for the Ontario Safety League, but what I said in rebuttal, so to speak, was that we had to do a certain amount of that in order to hold the interest of these people who would not give up their good money unless they knew that we were doing good work, and that we had to advertise what we were doing.

Gentlemen, public safety work gives you a chance to get money from the average banker who may not directly care about industries or anything else. He may have no interest in school safety; he may have no children, but for a community proposition he will give his money.

CHAIRMAN PRICE: I am interested in getting Dr. Payne's reaction. He has been active on the Executive Committee down in St. Louis. I think, Doctor, your thought on this idea of the larger problem, including not only safety and sanitation but the whole question of community welfare, would be helpful.

DR. PAYNE: I came in during the midst of this discussion and hardly know what you have said. Take our own local council. There are a lot of us who are very glad to do a lot of things. We have all sorts of points of contact, but we haven't the time to initiate activity and carry it out in so far as the details are concerned. For instance, I am Chairman of the Committee for the Speakers' Bureau, and there is a great deal that I can do there, if we have somebody who really does the work, but otherwise I couldn't do it at all. Therefore, in a town of 50,000 a man

would have his hands full taking care of this work. And if you had such a man as Smith or Fellmer, I think he would get the funds to carry it on with.

CHAIRMAN PRICE: This is the point I want to really get at now: in a small community of say 25,000, don't you think that in addition to the industrial problem, let us say, that there are a dozen plants, that the community problem, the school safety matter, and getting the cooperation of all the civic organizations and the city officials and all, is big enough even in that community to warrant the hiring of a good \$3,000 or \$4,000 man to take care of the situation?

DR. PAYNE: Absolutely. And I think that when once hired he would demonstrate his worth, if he is that type of man, to the community. Take the problem of school safety alone—I mean teaching it in the schools. I am thoroughly committed to the feeling and to the view that the only fundamental way to handle this is to take children and develop them in ideals and habits of safety. Whenever you once do that you have cared for the problem.

Take an instance that the public is hardly conscious of. This whole prohibition movement is due almost wholly to the fact that the Women's Christian Temperance Union about thirty years ago got into the schools the teaching of temperance. Most of it is unscientific—they call it "scientific temperance." Its effect in a few years, although very poorly taught, was that you got a body of people in the United States large enough, just as soon as these children came into the period of voting, to abolish the liquor traffic. It wasn't what they thought about it or what they knew about it, but it was what they felt about it. And the way they felt about it was what they said and talked about as children.

You have the problem of teaching safety, as I said in the committee this morning. There are only a limited number of situations in which accidents occur and those situations are very definitely known. The way that accidents are prevented is by persons being careful. Carefulness with reference to each of these situations is just a matter of habit, and those habits are formed, not when we are adults, but when we are children.

Our habits are practically formed by the time we are twenty. We form no habits, practically, after we are twenty; and that is why this problem of safety is such a difficult problem—because our lives, so far as habit and skill is concerned, are formed before that time. Therefore, the school proposition alone would take up much of one's time. If he worked it out in the way that it has to be worked out. The teamsters must get the notion of safety. They are just like a body of teachers were yesterday; they had no idea that there were more people killed by accident in the United States during the period of the war than were killed on the battlefields of France. They were absolutely amazed and appalled at that situation. So you must get that notion over to them.

CHAIRMAN PRICE: I think every man in this room appreciates the enormous value of school safety as a part of this community effort.

Now I want to get Ward on his feet over there. Ward is from Yonkers.

I don't know when I have met a fellow like Ward in a community. He is a combination of a Tammany ward heeler, a Methodist preacher, a business man, and a born leader. He is an Irishman. Now supposing, Mr. Ward, you weren't hitched up with New York and that you were isolated so that you would have to handle Yonkers alone, do you think that Yonkers could afford a good paid secretary at \$3,000 or \$4,000 a year, who would take care of the whole safety and sanitation work, industrial relations, community betterment, and similar activities?

MR. FRANK WARD (Yonkers, N. Y.): There was a thought which ran through my mind when Mr. Smith was talking. In Yonkers we have a Commissioner of Public Safety. In other words, we have a department there which is responsible for the safety of the city of Yonkers. I was wondering whether it would be well to submit a proposition to the council or mayor there to have the city defray a portion of that expense, and make it less burdensome on the industries and the other institutions around there or the people who would be likely to contribute to such a fund.

However, I do believe that with the number of manufacturing industries we have there it would be possible to gather from them and some of the other people who are interested in this particular subject a sufficient amount of money to overcome the secretary's expense. I have listened with a great deal of pleasure to the remarks that have been made here about that particular thing. I firmly believe that a high-grade man is absolutely necessary. I remember very well, Mr. Price, the time you visited Yonkers. In order to save a lot of time and to make a more congenial affair of it, I invited all the managers of all the industries in Yonkers to our plant. We had a lunch room there. Mr. Price talked to them practically while they were eating. They were there four or five hours before they got through, although they came with the understanding that they would only be there thirty or forty minutes. I have noticed during Liberty Loan campaigns when I had visited the various plants that every one of them is practising safety to the fullest extent, and they are proud of it, and they will tell you about it. They all have records of their accidents, and I believe, with the interest that was displayed by those various industries, that it will be possible to gather a very liberal contribution for the furthering of that particular subject.

I was very glad to hear Dr. Payne speak the way he did about the school part of it. I had never really appreciated that there was so much good to be done. I have thought along those lines somewhat and I can see it is positively true that you must start with the child. He doesn't start after he is twenty years of age to formulate the principles that you try to pound into him before he reaches that age.

We have been handling the matter this way in the New York Council, and I believe it has been a very crude way. We have depended upon the people who have attended the meetings to advertise it. In other words, New York Council is peculiarly located. It isn't like any one of the individual cities such as Rochester, Cleveland, or St. Louis. We

cater to a radius of twenty-five miles over in Jersey and down Staten Island, up in Westchester County, and in the past winter, owing to the courtesy of the Safety Institute, we have been able to have a meeting every thirty days. We have had six meetings during the winter and special speakers at each one of those meetings. They have resolved themselves into round-table discussions which have been very interesting. The attendance at these meetings has been very good. One meeting was devoted entirely to the ship-building organizations in that section. But up to this time we have been dependent upon the people who attended the meetings to go out and preach the propaganda and gather the new ones in.

MR. DEBLOIS: I was wondering whether in the smaller communities the liability insurance companies could be of more value than they are in promoting the local safety council work from the industrial side. In our state they have a great big hold on the state, and while they are active in the organization, and one of their engineers is vice-president of the Council today, still I feel that either in the financial end or in the securing of memberships through their own insured, that they ought to be of very material help. I think there is a field for development.

CHAIRMAN PRICE: Don't you think, Mr. DeBlois, that very soon now public safety is going to become so recognized that we will be able to get a contribution from the city and possibly, also from the Chamber of Commerce?

MR. DEBLOIS: I think we have got to get it in Delaware.

MR. G. E. CLARKSON (Secretary, Western Pennsylvania Division, Pittsburgh): We have had already three meetings of our public safety committee. Our first meeting was a very large one. We considered it very large. We have about eighty-five men, interested in all affairs of life, nearly. At the next we had about forty. That was during the summer months. The next one was held just a few weeks ago. At our last meeting we were able to get two members of the City Council and also one or two of the Executive Board of the Chamber of Commerce. We carried our program out according to schedule, and asked our committees to report. About half of the seventeen committees reported. Then we called upon one member of the Council and one from the Chamber of Commerce. The member of the Council was a man who is quite influential in the Council. He has been connected with it for a good long time, and he is otherwise a public spirited man and influential in the civic and political life in Pittsburgh. He said, "To my mind, this thing is more worthy than a half dozen other things that we are spending a whole lot of money for, and I will say to you that if you will bring the matter properly before the Council, I, for one, will vote for it." Certainly we were very much encouraged by the moral support, at least, that we got from the Council. That was followed by General Logan, Chairman of one of the important committees of the Chamber of Commerce. He, by the way, is a member of the Executive Committee, and he said in effect that this organization should become one of the regular activities of the Chamber of Commerce.

As yet we have not followed out these suggestions. We are waiting for the psychological time. There is one reason why we are waiting. Another reason why we are waiting is because we haven't had the time. We in Pittsburgh are just as much too large as you in Niagara are too small. We ought to have at least three or four local councils around in our Pittsburgh district as large as your council at Niagara Falls.

But the reaction out of this public safety work is this: when we get started and get sufficient momentum, get to doing things you know, I think the others will follow. These smaller communities will follow right in line, and just simply ask and demand that they have a paid secretary. I believe that we ought to be willing to give it to them.

CHAIRMAN PRICE: Capt. Robbins, you look as if the spirit were moving you and you were just waiting for a chance to talk.

CAPT. JACK ROBBINS (Windsor, Ont.): I think that what I have to say will interest the gentleman from Niagara. In my little place—

CHAIRMAN PRICE: How many folks are there in those five cities of yours, Captain?

CAPT. ROBBINS: There are about 65,000. It is comprised of five little cities. I want to show you the interest the mayors of these towns took in this matter. I went to one mayor, the second mayor I visited. I said, "We want you on our Safety Committee." He said, "No." I said, "What? Don't you men believe in safety?" He said, "Yes, but I want to be in the first place," and it was true of every one of them. We couldn't put the fourth man on at all until we convinced him that it was for the benefit of the community at large. He wanted to be first. That was our trouble.

I think that we have met in our four cities nearly every question that Mr. Price put this morning. Take, for instance, the Chamber of Commerce. I believe the Chamber of Commerce has done more work for our local council than any other organization.

CHAIRMAN PRICE: I believe you are right.

CAPT. ROBBINS: We are going to stick with them.

The next point is the Executive Committee. We got the big men interested. We sold them the idea. The public were rather indifferent. They would say "We believe in it," but they wouldn't get up out of their seats and do anything. I started them going, and when they saw that there was a man there who meant to put it over, why they got out and did everything they could to put it over. Mr. Price knows it. The Executive Committee is in my brain right now. Why? Because I waited until safety week to see who worked and those who didn't work I didn't want, and I have got the workers and the big men. They comprise my Executive Committee.

Next was the foremen's school. Already we have 32 plants asking why the devil we don't start the foremen's school, because we had promised it a long time ago. I couldn't do it until safety week. There are 32 plants that have promised, and that have each guaranteed five men. We shall have an audience anyhow.

Mr. Price, Mr. Morley and Mr. Little came to our city and spoke.

What was the result? The next morning, without making an assessment or anything, \$2,000 came in my mail. It was exactly \$1,900. We didn't spend a lot of money in publicity. We talked to them first and got them interested. Then we gave them the publicity and we got the results.

You know with us there is traffic coming from Detroit, which is the second biggest city in regard to automobiles. They drive over on the ferries and, of course, in each of the cities there are different rules and regulations. We made the big record of no deaths and no serious accidents. The only accident that we had was to a young lady. One of the big steamers loaded with steel pulled away from its anchor and hit a ferry boat. The lady fell and broke her leg. That was the only accident we had in that week.

On Monday of the next week a little child who attended my picture show on Saturday was killed. The mother said, "That little girl is a safety girl and knows all about safety," but she got killed. She was walking on the right side of the road, but a man who hadn't taken the interest in safety, who hadn't been taught safety, was on the wrong side of the road and killed her.

In so far as the police are concerned, already we have had twenty-eight convictions. They were twenty-eight cases where the maximum fine was assessed. We are following the example set by St. Louis. We are going to get them if they don't pay attention to the driving laws, and make the city safe. They are going to get it, and they know they are going to get it, and the police are behind us. It is so all through Canada, and not only in my place.

We made 50,000 small two-minute talks. We give them to the retail merchants. They put them in each package. Each home which bought groceries or anything had one of those talks. We thought 50,000 would be enough. Before I came away, the retail merchants asked for 200,000. They will pay for them and give them out all the year.

The paid secretary is the only thing. We have had a certain amount of money promised us by the Manufacturers' Section of the Chamber of Commerce, but as a man said to me in a plant, "What is the use of taking care of me inside the plant when you would have me go outside and get killed by a machine?" He is right. We have to have public safety. You know each little town has its own council. They were composed of different nationalities and they were all indifferent. I spoke to all of them, and before I came away the mayor of the biggest of those towns came to me and said, "Put your proposition up to us as a body for public safety."

CHAIRMAN PRICE: In all my experience in field work I have never had any instance that came anywhere near illustrating so well what could be done in a small community as this, because this is small and all divided up. But when you have a real man there at the head of the thing with the time, you can put it across.

This thought came to me as I have been sitting here: The trouble with all of us who have been worrying about this small town proposition is that we haven't seen this thing big enough. Isn't that the secret?

We haven't grasped the bigness of this thing, even in a small town. There is a real place for a real man in every community. Now, if we are so slow, how can we blame citizens for being so slow?

The thing that I am carrying out of this meeting this morning is the need to convince myself of the bigness of this thing, to make myself believe that even in a small community we must have a paid man. We are going to put this across in the small community just the same as in the large city, and we are not going to sit here helpless and hopeless wondering how we are going to solve the problem.

MR. E. E. BACH (Director of Americanization for the State of Pennsylvania): All of this discussion has been very interesting to me, and I want to give you this one suggestion: that you can still fortify yourselves further along the line of public safety by tying up closer with the State departments of each State. We are just about to tie up with the great public school systems of Pennsylvania along the line of first aid, with a course in first aid. Now why not get busy with your program on public safety and take it up with the superintendent of schools? It can link up very nicely in that way and it will be put over with power back of it.

Speaking of the other extreme—the small town with the single industry and with that industry owning the entire town, property and all and controlling every activity in that town—

CHAIRMAN PRICE: That was your problem?

MR. E. E. BACH: Yes, but it seems to me your point of attack there will be with the head of that particular industry, and you can quite easily carry out every feature of the most generous plan that you can possibly conceive if you once have interested the head of that particular industry.

MR. FELLNER (St. Louis): There is one thing that we always have to do. We will have to get the authorities of the civic activities, as well as our industrial activities, to realize that after all, the greatest number of accidents happen in public life, not in industrial life. That is quite natural. The exposure is larger, the number of hazards is larger, and once you sift that down and draw it out in heavy lines it is very easily shown.

FRIDAY MORNING SESSION

HOW TO CONDUCT A SCHOOL FOR SAFETY SUPERVISORS AND FOREMEN

THOMAS STANION, MANAGER, SAFETY AND SANITATION, THE ALUMINUM CASTINGS COMPANY, CLEVELAND, OHIO

It has taken the average farmer many years of experience to appreciate the true meaning of these lines written by an Indiana young man who had left his father's farm:

I left my dad, his farm, his plough,
 Because my calf became his cow;
 I left my dad—'twas wrong, of course—
 Because my colt became his horse.
 I left my dad to sow and reap,
 Because my lamb became his sheep;
 I dropped my hoe and stuck my fork
 Because my pig became his pork;
 The garden truck that I made grow
 Was his to sell, and mine to hoe.

Too often the daughter or son labored hard with things apparently their own only to have them sold by the father and the money added to the family purse. Just as state schools have been one means of demonstrating to the father what the boy or girl can accomplish when given an interest aside from work on the farm, so the schools for safety supervisors and foremen have helped industrial managers to realize what they, the safety supervisors and foremen, can accomplish along accident prevention lines when given the proper place in the work of the plant.

Important as is this effort, there are but few places where schools have been conducted as a city or community affair. These few were primarily for safety supervisors but foremen were usually welcome. Little effort has been designed especially to reach the foremen. Not a few companies have had classes or clubs for the instruction of foremen but these were usually for production affairs with safety instruction as a part of the course. Schools conducted for a community must obviously be of a different character from those held by a company for here there is no semblance of the company authority to inspire attendance. They are on a purely voluntary basis and must of themselves create and hold the interest. The doctrine of Safety First is no new preachment. It was born with the animal kingdom and since the earliest days of the human race, we have been taught by experience and precept that self preservation is the first law of man. Experience has been an expensive teacher and those gaining her lesson have not always seemed to profit thereby. The precepts have been true to best practice but their presentation more or less haphazard with this result—we have today a generation of adults who do not know how valuable an asset Safety First can be in their lives and how simple its application to the every day and ordinary rules of life. Fortunately for succeeding generations our public schools are grasping the opportunity of service by inculcating the Safety First idea in the minds of little children in a way and at a time when it will make the lasting impression.

PROBLEM OF TEACHING ADULTS

The problem then of the school for supervisors and foremen is complicated by the need of presenting to adults the same fundamentals that are now being given to children in the lower grades;

to adults who largely have not had extensive education. Obviously, these adults must have the lessons set forth in practical form and any theory so clothed in daily usages that its value will not be ignored. The training given in the school for safety supervisors and foremen should be so correlated to that in the public schoolroom that the father can encourage his son and the son awaken the interest of the father.

The subject of this paper might be interpreted as a combined school for safety supervisors and foremen. Yet there is a fundamental difference in the approach that should be made to these two classes of men for, theoretically, the foreman functions as an executive while the safety supervisor assists and encourages by ferreting out the accident hazard and recommending the proper course for its removal, and keeping alive generally the practice of Safety First principles. While these differences exist and they can well be recognized in presenting the lessons, yet the guiding principles for the work as a whole are the same. What is said about the school in general can apply to one as well as to the other. It is the same sort of interest to be aroused and maintained and like methods can be used.

Taking as a premise that accident prevention work is the best entering wedge into that limitless field of employees' industrial relations with the management, what better could be chosen than this as the first subject for treatment in special classes for practical industrial men. Realizing, too, that safety supervisors are largely drawn from the ranks of foremen and further, that as a class they, the foremen, have been neglected in an organized effort for general advancement, it is fitting that this initial effort to spread safety knowledge should be primarily for them. There are organizations for engineers of various sorts; for managers; for agents of every description; but remarkably few associations for foremen intended for their advancement and better mutual acquaintance. The safe way is always the right way to do a job and if this group of men are given a comprehensive training in the safe way, a general improvement in their work is sure to result.

SUBJECTS AND SPEAKERS

The primary reason for these schools is to present in comprehensive and interesting ways the fundamentals of accident prevention work, with a secondary and almost equal reason to afford the student a broader viewpoint. To give a course of lectures which might well be a part of any technical school curriculum and yet couched in terms of and intermingled with practical affairs such as will maintain the continued interest of shop men. The subjects chosen should in themselves be worth while—each a vital stone in the Safety First foundation. The speakers should not only be skilled in their respective subjects but able to hold the attention of their hearers with their delivery as well as the wealth of experience out of which they speak. These classes are quick to detect the imitation from the real in the presentation of the subject. Anything that can be used to illustrate the lectures,—either pictures, models, or

samples,—is of value. A little color makes an impression and helps to carry the message. The lessons should be real. They should show careful preparation and be conducted in a dignified and orderly manner. It should be realized that the school as a whole will get only what is put in and that the members of the class will soon catch the enthusiasm of the leaders. On a basis of drawing out the thought of the class, more will be accomplished than by handing information to them. Interesting items, data, and other facts, briefly stated, are valuable as suggesting means of tackling similar problems in their own plants or factories. All that can be done to encourage the safety supervisor or foreman toward solving his own problem strengthens him accordingly and will put his safety work on a firmer foundation. After all—to guide the thought and action of the pupil in self expression is not only the function of the school but the highest goal of the teacher.

Following the discussion of the lesson as a whole or the treatment of each major part of the subject, there should be an opportunity for questions from the class. Too much importance cannot be attached to this phase of the work. There will doubtless be a hesitancy at first in putting forth these questions, but under a genial atmosphere this will pass away and the members of the class take advantage of the expert knowledge available. Even though their questions may seem simple they should be answered with all the information at hand. Besides the questions, value is derived from a recital of experiences by members of the class even though some of the results had not been so successful as desired. Good always follows from a frank discussion by men who are handling a common problem.

THE CHAIRMAN

Assuming that this school or class is conducted by a Local Safety Council, the chairman of the meetings might well be some other than the executive secretary of the Council. His time is too valuable for this detail. Some one interested in the community safety work, with experience in handling meetings, who will set aside the evening regularly for the class, would be more desirable; preferably a man who has had active experience as a shop executive or safety supervisor and can thus appreciate the shop viewpoint. His interest in the class should be such that he will feel responsibility in its success and will be diligent in his efforts to conduct the class in an interesting manner. Much enthusiasm can be aroused and maintained and the social side of the meetings encouraged. The meetings should start at an appointed time and last not more than one hour and a half. Once a week has proven successful as the frequency of the meetings and on any night that will not conflict with some special local affair. If the classes are held in a community where certain nights have, through long established custom, been used for lodge meetings, such nights should be avoided. So far as possible, the attention of the class should center on the subject for that evening although announcements will have to be made. In this, the secretary can assist as well as in obtaining the record of attendance, distributing the lesson

outlines, and such things,—all of which help him to get acquainted with the various members and be better able to push the community safety work as a whole.

When the time seems right, the class can be encouraged to organize by electing officers. This will tend to arouse interest, afford a medium for transacting business for the class to act as a unit. Then, too, this class can be a power in carrying through other activities of the Local Council such as executive luncheon meetings; superintendents' and foremen's district meetings; and workmen's rallies by backing them up in their respective plants and arousing the interest of the proper people. In fact, such work will bring beneficial results to the class as a whole because of the additional interest the members will find through these efforts.

Although there are some limitations in selecting speakers, the field is so broad and the general interest in safety work so keen that the proper ones can always be secured. It hardly need be mentioned that one poor evening leaves an impression that requires several splendid programs to overcome. Some of the subjects that go to make up a well-rounded course may seem in themselves uninteresting because the beginner cannot appreciate their value. One is Accident Statistics, their Compilation and Use. It requires some experience to appreciate the value of carefully recorded facts surrounding each accident. All of us are too prone to minimize the importance of the thing in hand and it is not until some little time has elapsed that we see its value. By special attention color can be given this meeting and interesting side lights thrown out to show how great is the subject and how real the value of carefully prepared records, both to show as time goes on in which direction progress is being made and to present an accurate statement of how accidents occur in the particular plant.

PRINTED OUTLINES OF SUBJECTS

Printed outlines giving a general resumé of the subject are supplied for distribution to the class as a service of the National Safety Council. These can best be given out at the close of the meeting and, added to the notes a man has taken will make a good reference for the subject. The outlines are arranged for filing in a loose leaf folder. Few samples or specimens have been used for general distribution in these classes although this offers a field that might be developed to good advantage.

The location of the meeting place merits careful consideration. Some years ago one of our industrial centers started a class in English-for-foreigners. A fine room in a good building was secured, located not far from the center of the district where the prospective scholars lived. But only a very few attended. After no little investigation it was learned that the meetings were not held in a place frequented by these people. Another room was secured—this time on a street that was one of their direct paths of daily travel. The class was a success at once for they found it easy to "drop in." Although not to so marked a degree, yet

the principle involved applies to this class as well. A building that is used for other meetings or gatherings that these men attend would be the best selection.

Thus far the course has been covered by fifteen lessons substantially as follows:

1. The Importance of the Manager's Cooperation in Promoting Safety
2. Plant Conditions—Arrangement, Order, Lighting
3. Design and Construction of Safeguards
4. What the Foremen Can Do to Promote Safety
5. Bulletin Boards, and Other Ways of Reaching the Workmen
6. Workmen's Inspection Committees and Meetings
7. Electrical Hazards
8. Eye Protection and Safe Clothing
9. First Aid
10. Labor Management and Safety—Physical Examinations—Instruction of New Men—Labor Turnover
11. Plant Sanitation
12. Accident Records, How to Compile and Use Them
13. Fire Prevention in Relation to Safety
14. Qualifications of a Safety Engineer, His Duties and Opportunities
15. General Review and Experiences

The field which they cover can, like the whole safety program, be divided into the two major parts, viz.: Mechanical and Educational Safety. True to the program for other safety work, the order in which these subjects are usually taken up shows the two groups intermingled—not following through the entire educational group before any mechanical subjects are introduced or vice versa. The reason for this is obvious; both classes of the work must be undertaken at the same time and run concurrently if real progress is to be made. Nor can either lag behind the other any more than one can be emphasized to the exclusion of the other and have a successful campaign. A works manager once asked of his assistant who was somewhat familiar with safety work this question: "Is it true that 80 per cent of the preventable accidents can be eliminated by care on the part of the worker and that only the other 20 per cent can be stopped through mechanical guards?" Upon being told that such was true, he replied that the effort of his plant had better be directed solely toward the 80 per cent item *first* and then at a later date go after the 20 per cent. No comment need be made on the inherent fallacy of such a plan. Safety is a thing of mutual benefit to worker and company to be secured by the joint cooperative effort of the two. The management must take the lead by giving visible evidence of the sincerity of its intentions. Such can only be expressed through mechanical guards or engineering revision. Just so far as the company takes this lead will the workers be encouraged to follow. It is indeed quite proper that the two main themes in the course should be developed hand in hand. They cannot be separated and are mutually dependent. Though the results expected from each part are not on the same scale, yet they are of equal importance.

GENERAL REVIEW AND EXPERIENCES

The value of the last lesson—General Review and Experiences—cannot be overestimated. By the time this subject is reached, the members will have had opportunity to put to practical tests the points they have gained from the course. A chance to tell how they have succeeded or failed will be timely. There will be eyes saved from the proper use of goggles and protectors; burns avoided; fingers uninjured because of effective guarding; shop lighting revised; resuscitations; and in fact, almost every phase of the work will come up for discussion. In the arrangement of this meeting, too, careful planning will bring its reward.

It has been aptly said that the business of a school is to "bring the knowledge of the past into the service of the present." This expresses concretely the aim of a school for safety supervisors and foremen. To avoid pioneering. What would not the early leaders in the Safety First realm have given for such instruction as is now included in any one of the lessons? How much searching and experimenting, and how many failures would have been avoided? Yet such information was not to be had. Our technical schools had not sensed the need nor had any college developed its courses along these lines. The University of Hard Knocks solved the problem and perhaps it is well that such is the case. Those who first were concerned with its solution were practical men who needed the ideas expressed in shop terms. In fact, although the members of these classes may not have college degrees, they are hard-headed business men and will appreciate this training in so far as it gives them points and ideas which they can readily adopt or adapt to their definite needs. No silver-tongued orator who can ascend to filmy heights of theoretical methods need come before them. His schemes might not stand the acid test of adaption to the average shop. That these men may have the inspiration of the practical experience of successful men and the enthusiasm that comes from a class learning things together, is the real aim for the instruction. Of value, too, for the safety man are the pointers that can be thrown out on side lines—the ideas that will start his thought along another line and assist him in some problems not definitely a part of his safety work.

Were there not definite results to be had from these classes, their existence would not be justified. First of all such a class is one of the best services a local council can render its community. No other organization is so able to conduct such a school. Its value will be felt in the safety work of the district as a whole as well as in the plants and factories directly represented in the class. Recently one of our local councils was soliciting funds for its year's budget. A certain company had not been inclined to cooperate but some of its supervisors had joined the safety class. Later on this fact was made known to the management and their attitude changed. Here was a definite service from the Local Council and a goodly check was forwarded at once. Next, the lessons on the part the management has in the work do get home to the proper officials with the result that the company realizes the true relations of

affairs; that is—first of all, a careful management before careful men can be expected. Lastly, the definite accomplishment through explicit knowledge gained in class. Instances of lives saved after the class had been given the demonstration on the simple method of resuscitation are not uncommon. Who knows what suffering has been saved because an effective guard or protector was used after the safety man had carried back a lesson from the class? The benefits are far reaching. No one can measure all of them and yet there are enough visible to justify all the effort. Incidentally, there is a general broadening for all who attend.

DIPLOMAS AWARDED

To dignify the course and that the members of the class may have something to show for their efforts, the National Safety Council awards a diploma to each one who satisfactorily completes the series of lessons. This usually means attendance at 75 per cent of the lessons and a statement that the outlines for those not attended have been read. The diplomas are greatly prized and the graduation thus afforded has been found to be a valuable affair, giving an opportunity for a special social evening with its attendant benefit of better acquaintances.

The future of these schools is indeed bright. The science of safety is stretching into broader fields, affording the safety supervisors better means for developing their work. This they are following with diligence and enthusiasm. With the foremen undertaking definite instruction in safety and grasping the opportunity of a closer working relation with their men, which this work affords, they are not only boosting accident prevention but are entering the day of a better understanding with their men through the best possible approach. The spirit in which these activities are being undertaken insures their success.

DISCUSSION

After reading, "These classes are quick to detect the imitation from the real in the presentation of the subject," which occurs on page 235, the following discussion took place:

CHAIRMAN PRICE: One of the secrets of success of your school here was the character of men who addressed it, wasn't it?

MR. STANION: Yes.

Following the reading of the sentence, "Good always follows from a frank discussion by men who are handling a common problem," on page 236 the following discussion took place:

CHAIRMAN PRICE: I believe you start about a quarter past eight and close at ten. About how much time would the presentation take and then how much is left for the round-table discussion?

MR. STANION: The presentation required about three-quarters of an hour, and from a half to one hour was reserved for discussion as the meeting desired.

CHAIRMAN PRICE: I remember the night on which I gave a little talk on shop lighting at the school. It was a very simple thing. I think there

were seventy-five or eighty-five questions during the hour and a quarter. They kept me on the floor steadily, and at ten o'clock they were still going strong. Every question that was asked me by those men was a question of a practical nature, such a question as a practical man would ask who wants to go home and put in a lighting system.

I gave it in four schools and the questions were very much the same. It is wonderful how it brought out the discussion. For instance, a man wanted to know how to light an overhead crane. They were all practical questions. One of the things that I would suggest, if you conduct a school, is that the speaker stop at the end of each little section of his talk. For instance, I would cover the subject of reflectors, showing the fundamental principles of the design of a reflector, and the difference between inefficiently designed reflectors and efficiently designed reflectors. Then I would stop and the students would ask questions.

MR. STANION: That is a mighty good point: that the speaker must know his subject. He may think, because he is talking to a group of men from a shop or plant who have not been trained in school, that they are not going to follow him as closely as another audience might, but don't you believe it. They do. You would be surprised at the comments following the meetings. If a speaker isn't right up to snuff the men know it and they say so.

ENTHUSIASM CAN BE AROUSED AND MAINTAINED

Following the reading of the sentence, "Much enthusiasm can be aroused and maintained and the social side of the meetings encouraged," on page 236 the following discussion took place:

CHAIRMAN PRICE: Don't you think, Mr. Townsend, that one of the important factors in the St. Louis success was Mr. Stremmel?

MR. TOWNSEND: The personality and enthusiasm of Mr. Stremmel was certainly a wonderful factor, and when we came down to the last meeting in the course and he stood there and showed such a perfect grasp of every one of those subjects, as he held a sort of examination of the whole thing, it was a revelation to me.

CHAIRMAN PRICE: Mr. Townsend has a little diploma hung up in his office somewhere, showing that he graduated from that school. He is with the International Shoe Company. It is wonderful—the spirit and enthusiasm that the students got in that thing.

Following the reading of the sentence, "It hardly need be mentioned that one poor evening leaves an impression that requires several splendid programs to overcome," page 237, the following discussion took place:

CHAIRMAN PRICE: I wish you would emphasize, if you will, the point that you have some money available to bring in outside speakers. I think that is important. You don't depend on local speakers, do you?

MR. STANION: The program in Cleveland was made up with eighty per cent of the speakers from the outside, and when it was necessary to pay the expenses of those speakers, the local council had funds available for that. In most cases, however, the speakers come at their own expense.

CHAIRMAN PRICE: I wanted them to see the type of men who addressed your classes.

MR. STANION: We had Mr. Oartel from the Carnegie Steel Company. His subject was, "The Duties and Opportunities of a Safety Engineer." Then we had Frank Morris, Mr. Rasmussen, Mr. Smith and Mr. Price, all of the National Safety Council. Mr. Rice, of the Pittsburgh Railway, was there and Mr. Scott of Chicago.

MR. H. L. ROBINSON (Worcester County Council): I would like to ask Mr. Stanion if there is any preparation required by the members, home work, etc., that would be objectionable to the average foreman?

MR. STANION: Our course required nothing of that sort. The outlines were distributed after the lesson had been given and he was expected to go over that at home, but there was no check made to see whether he did or not.

MR. H. L. ROBINSON (Worcester County Council): Is the topic for the evening the same subject as covered in that outline or paper that the National Safety Council sends out?

CHAIRMAN PRICE: Oh, yes. He must be assigned to that particular subject. Not only that, but the speaker is selected because he is strong on that subject.

MR. H. L. ROBINSON: Will the National Safety Council furnish a list of speakers on whom we can draw?

CHAIRMAN PRICE: Oh, yes. We try to persuade them to do it; we make it our business to help every school get speakers.

I think, Stanion, you might give your own thought about handing out the lessons before or at the lecture. There is a point there that ought to be brought out. Why didn't you give the lessons the week before?

MR. STANION: Our point in giving out the lessons or pamphlet after the speaker had finished was that if a man had it in his hand sometime before he would be less likely to pay attention to what was being said by the speaker. He knew he was going to have an outline at the end, and he was free during the meeting to pay attention to the speaker.

CHAIRMAN PRICE: I think Smith or Rasmussen told me at St. Louis they found there was an inclination (when the men had the outlines in advance) to say, "Oh, well, I know all the speaker is going to say, and I guess I won't go." There was not very much of that, but just enough to make it wise not to give out the lessons in advance. Let them take the lessons home as a sort of review of the important points. The Council furnishes the lessons. There are ten lessons in the foremen's course, and fourteen lessons for the supervisors' schools.

Following the reading of the sentence, "Of value, too, for the safety man are the pointers that can be thrown out on side lines—the ideas that will start his thought along another line and assist him in some problem not definitely a part of his Safety work," page 239, the ensuing discussion took place:

MR. STANION: Right there, Gentlemen, a great deal of benefit has been derived in shops where the safety engineer has shown himself interested in something beside safety. For instance, one of our leading safety men found a type of hammer, the head of which was set in rubber. The

rubber setting took up the shock as the man used it. He thought immediately that that would be of benefit to the production people. It would help them, though not especially from the safety standpoint. He took it to them and they liked it, and he rose in their estimation because he could bring something around beside safety.

Mr. Stanion then read the remainder of his paper.

VALUE OF POPULAR SONGS

MR. RASMUSSEN: Would you mind telling these gentlemen what the singing of that safety song did for the school?

MR. STANION: Yes, with apologies to St. Louis. (I wouldn't dare say that we started the song.) We would sing that song, which is a parody on "Hail, Hail, The Gang's All Here," every evening. It gave an enthusiasm to the meeting to start it in good shape.

MR. FELLMER: Did you ever make them whistle?

MR. STANION: We had them whistle one night.

CHAIRMAN PRICE: If somebody had told me two or three years ago that you ought to have singing at a school of this sort I would have said, "No, no, that is out of place." Those St. Louis fellows strike the thing that catches the middle-class fellow right here (indicating the heart). Maybe it is a Southern trait, the Southern atmosphere—what is it down there that you fellows seem to get?

MR. FELLMER: We are real folks.

MR. RASMUSSEN: I had some doubts in my own mind as to the value of that singing while we were conducting that school here, and one evening Mr. Stanion was out of town and he asked me if I would take charge of the school. There was an opportunity to demonstrate whether my idea was any good. So I purposely omitted the singing. The whole lesson went through very nicely, but just before the close one man got up and said, "We didn't have our song."

CHAIRMAN PRICE: That song puts the pep into you. Going out in membership campaigns is one of the toughest jobs that you have. It takes the heart out of you, and every morning in St. Louis when we would jump into the automobile we would say, "Are we downhearted? Hell No," and we put it over one hundred per cent, didn't we, Fellmer?

MR. FELLMER: Yes.

CHAIRMAN PRICE: I think I agree with what Herbert Spencer said. Some one has called him the "Giant Intellect." He said, "We are very largely controlled in our lives by the emotions and only in a very small degree by our intellect." I think some of us are just a little highbrow, we are not quite human enough; we don't hit that other fellow where he lives. Those Southerners down there seem to get that chord and we Northerners will have to copy it.

We have plenty of time for discussion and this is a very valuable presentation of what I consider the essentials, and I wish you would ask questions of Stanion. There isn't anything that is on the program that is more important than this because the foremen's meetings and the safety supervisors' meetings are the backbone, absolutely, of your local

council work which is going to appeal to your manager and get his support.

MR. H. L. ROBINSON (Worcester County Council): Is there any maximum or minimum whereby the class will be most successful? That is, you wouldn't want a class smaller than fifteen? If you have too small a class you won't accomplish very much, and on the other hand can you get too large a crowd?

MR. STANION: I would say that that would be a problem to meet as the conditions justify. If you had only fifteen you could arrange a course for fifteen. If you had fifteen hundred you could arrange a course for fifteen hundred.

MR. RASMUSSEN: In a condition such as you have, couldn't you invite some of the plant superintendents?

COMBINE FOREMEN'S AND SUPERVISORS' CLASSES

MR. H. L. ROBINSON: I think that we couldn't limit it to supervisors because in most of the plants there aren't more than a dozen all told who have safety engineers or supervisors. We would have to combine the foremen's class with the supervisors' class.

CHAIRMAN PRICE: I am very glad that you mentioned that. If you don't agree with me please say so. I was in Grand Rapids and Flint and I have recommended that they have only one school,—foremen and safety supervisors—with the idea that there is a small group of men who are going to be safety inspectors and they could be handled in a class supplementing the course.

MR. STANION: I wonder whether any one got the impression that the school in Cleveland was only for safety inspectors and supervisors. Such was not the case. One of the most enthusiastic members we had was the president of an automobile company.

CHAIRMAN PRICE: Would you say that seventy-five per cent of those men will not devote themselves exclusively to inspection?

MR. STANION: Sixty or seventy-five per cent.

CHAIRMAN PRICE: I think that has been the case in St. Louis.

MR. BROWN (Brown Hoisting Machinery Co., Cleveland): One of the directors in my company attended and missed only one meeting. My particular point of view was the value of having the superintendents and the assistant superintendents attend the schools as well as the safety man, because the school, by its nature, to a certain extent is elementary. It can't carry any subject through in all its branches, and the safety engineer can study out the details by himself later. Your safety engineer will not get proper coöperation unless the superintendents have somewhat more than just the elementary teaching that you would give to the foreman. For this purpose, however, the superintendents will not need the post-graduate course required of the safety engineer.

CHAIRMAN PRICE: Then too, Mr. Brown, in the part which is devoted to your safety engineer and to the superintendent, too, you are talking to him about what he can do with the foreman, which is a very important problem, of course.

Mr. Brown, have you more confidence in this idea that we are talking about as a result of your experience here than you had at first? I know you were very optimistic, but has your experience confirmed the valuation you placed on this thing?

MR. BROWN: There isn't any question about it. As you say, it pays every day of the year.

CHAIRMAN PRICE: This movement is twelve years old and the experience of each of these Congresses is a revelation to all of us. There is a wonderful volume of experience that is locked up in the heads and lives of all of us fellows who have been in the game. What a wonderful thing it is, and what an intensely practical thing it is to put all that splendid experience into this simple form, boil it down and in fifteen lessons put it across to these key men—not twenty-five things that you ought to know, but six things that you ought to know. That is literally what the school does. It takes the experience of twelve years and puts it into simple form so that those men, without going through our experience and struggle, can get the essentials at once, without all that experimentation that Mr. Stanion has told about. When I think about it in that way, then the value of this school idea comes to me. I don't think we have ever done anything that compares to it in practicability and in service, direct service to the industry. Aren't there some more questions?

MR. TOWNSEND: I would like to emphasize two or three things. Of the five hundred who were in attendance at our classes (although so many didn't graduate) I don't believe more than ten per cent of them were safety engineers or supervisors or men who expected to devote their whole attention to such work. They consisted of foremen, superintendents, and mechanical engineers from different plants, and I feel that there was a great value in having these men in attendance.

CHAIRMAN PRICE: I think that is a splendid point. I am thinking, Rasmussen, that we ought to change the name of that school and call it a school for safety supervisors and superintendents.

MR. TOWNSEND: It is so essential that you have the mechanical engineer interested along these lines because he has to cooperate absolutely with the safety engineer.

I want to speak of another thing in reference to these topics. In general, the men who presented those topics in the St. Louis School held pretty closely to the outlines that had been provided, but a few of them didn't; and I know as I sat there trying to get all that I could out of the lecture and listening to those presentations, on one or two occasions I felt when a man was through that he had not given us very much, but before we were through with the discussion and the questions, the whole thing had been thoroughly brought out, so that we felt that we had the full benefit of the subject.

I want to ask Mr. Stanion this question. Did you lay any emphasis on the entertainment features of the evening to attract the people and give them something outside of the subject itself?

MR. STANION: We had nothing of that sort. The fellows came to the meeting on Monday night. We sang the song, got down to business,

and when we had finished with the discussion, there was a little chatting around and then we went home.

CHAIRMAN PRICE: What do you think of that entertainment feature?

MR. TOWNSEND: Sometimes we would have a solo or instrumental music or a quartet, besides our song which was led by Mr. Stremmel. Sometimes we had a moving picture, a safety film—something of that kind.

CHAIRMAN PRICE: That would occupy just a few minutes.

MR. TOWNSEND: It would probably take twenty minutes or half an hour at the most. I felt that this was a really important feature in winning some fellows who perhaps weren't so much interested in the safety proposition or the school lesson, but who would come for the entertainment feature and remain for the other also.

CAPT. ROBBINS: I would like to have you tell me whether our idea is wrong. You know we have just started. We have sent notices to the managers asking that they be present. We also have gone on the theory that a man has guts enough to think that he is going to be the manager or foreman sometime. We are not limiting it to foremen or safety supervisors at all. Anybody who wants to come in and thinks it is going to benefit him is more than welcome at our meetings.

CHAIRMAN PRICE: I think you are on the right track, Captain. You are always right, Captain.

MEN HIGHER UP SHOULD SET EXAMPLE

MR. E. P. ROBERTS (Manager of the Engineering Society of Akron): I want to emphasize the importance of the men higher up setting the example. In the case of Mr. Brown here, whom I happen to know, he sets the example to his men, and they in turn set the example to the men under them. But that doesn't always happen. For instance, in a plant I have recently been connected with, I have seen some of our higher men set very bad examples on safety. There are lots of automobiles going out at closing time over the sidewalk. They ought to have a watchman there. Those men high up don't set the proper example in driving out. I think it is very important that they should set that example.

Also in connection with hospital work: the men higher up should set the example in going to the doctor or the nurse for slight scratches. We are continually preaching that to the men, even with a slight scratch. If the men see some man higher up having a slight scratch attended to, it is an example to them which is very important.

MR. J. H. HANSON (Rochester Safety Council): With reference to the idea of entertainment at the safety schools: it seems to be pretty general throughout the north here that fellows want to get down to business. We took a vote in our school and they voted against any sort of entertainment. With the foremen it is entirely different: they want it. It may be due to the hospitality of the South that they heed that little entertainment in St. Louis to put the thing across.

CHAIRMAN PRICE: Mr. Stanion spoke of the tangible results, reported

in writing or verbally. of what those pupils actually did in their own plants. That is one of the most encouraging things in this whole business. Seventy-five per cent of the pupils who graduated have gone home and done something substantial.

TESTIMONY AND REPORTS

As an example of what I mean: I was going up to the speakers' table there at St. Louis and three men stopped me and said, "Mr. Price, you will be glad to know what happened after your lecture on lighting. We have torn out all the old lighting in our plant and equipped it with new lighting." That made me feel good. I felt as though that trip was worth while. I know that Swift and Company organized Workmen's Committees and reduced their lost time accidents 50 per cent before the school closed. Did you not have a night of testimony in one of the schools?

MR. FELLNER: We didn't have a night of testimony in the supervisors' school, but we sent out a circular letter and asked for the reports, and about one hundred letters were received in reply. They contained some of the most wonderful things that you have ever heard. At one of the plants they operated a good many punch presses and they had fifty-seven varieties. It was one of these plants that had grown up from time to time as an auxiliary to another business and had never been organized. One of the young men in that plant turned himself loose. They placed a great value upon what he had learned about good housekeeping in the first place. He had all the windows cleaned, established dead lines for aisle space, and got the other foremen into the game. He found a couple of carloads of rubbish in that plant.

His firm was thinking of building a new structure: when the president came through and found out what had been done he cancelled the idea of having a new plant. The accident reduction in that plant was forty-five per cent. After S. J. Williams' lecture on fire prevention, I was present when they conducted a test of the extinguishers and we found Mr. Williams' statement that forty per cent of them were inoperative was correct. Under the head of good housekeeping we discovered that most of the extinguishers were hung where a fellow couldn't get at them unless he had an airship. We planned that differently.

The most wonderful thing that was done was when this young safety supervisor came in and asked me what I would advise him to do about his stairway, which was about four stories high. I could have told him the solution right off, but I didn't. I just threw out a hint or two and then let him go to it. I found the stairway whitewashed from top to bottom, with a large light at the top and one at the bottom, so that there was always daylight on the stairway.

There is one thing that never can be emphasized too much, and that is that a man must know whereof he speaks when he goes to address a school, or when he goes to address the safety supervisors' or inspectors' committee. I met one of these committees in the American Steel Foundries Company in Granite City, and it was the most wonderful

experience that I have had in all my safety work. There were seventy-five men: Of course, they had the able leadership of Mr. Stremmel to pilot them along. You should have seen the fellow feeling, the idea that they were all just folks and not workmen or foremen or manager or secretary of the local council—there was no ceremony there, every one was in his shirt sleeves—why they even addressed the negro as Mr. Brown. The questions which were fired at the speaker and at Mr. Stremmel and myself kept us jumping, but when we got through we all voted it was the most wonderful thing that ever happened.

Just to give you an idea of it: they had a smokestack used for carrying off gases, and this stack had to be reconstructed. They reconstructed it on a concrete base and put a steel stack on top, thinking that while they were about it they might make it possible to carry off as many of the gases as possible and preventing the gases from getting into the plant. One of the ordinary workmen on the committee got up and said, "I stopped the taking down of the scaffold on that stack before I came into this meeting." The construction boss was in the meeting. He said, "Yes, he stopped me and said he would bring it up at this meeting." This workman said, "We surely can place twenty to twenty-five feet more concrete on that foundation and carry the gases over the roof of that building. Six men whom I know of are in Colorado now getting their lungs treated, and the doctor tells me that their lungs are in the same condition as the lungs of a soldier who has been gassed over in Europe." He was just a common workmen, Gentlemen.

MR. COFFIN (Portland, Oregon): In the largest cities, in the East especially, there are any number of public buildings and large buildings many stories high, and they are managed as a rule by a chief engineer. Now those engineers control the lives of a great number of employees, and there are a great many hazards that are pertinent to a building of that kind. Could they not be included?

CHAIRMAN PRICE: Yes. Usually the local council has adopted the plan of making the attendance upon the school a privilege of membership in the council. I don't mean to say that that is the rule that you have to follow, but I think we will agree that that is advisable, so that if the owners of this building were members of the council, they would get an invitation to this school.

MR. SANFORD (General Electric Co., Lynn, Mass.): I wish to emphasize what in my opinion is the need of the foreman getting a good, strong, safety education. We had for some time safety inspectors who were covering the entire plant. They were inspecting the individual machine equipment in the various foremen's departments, but we found that a man might report that his machine wasn't just right and the foreman would say, "Oh, well, the safety inspector will get that; keep on using it until he tells you to shut it down." That has been changed as far as the foreman is concerned. Each department foreman is made absolutely responsible for conditions in his department. He can work that out in his own way, either by appointing an inspector or by requiring the assistants and gang bosses to share the responsibility.

We still have the inspection service. We have, for instance, two men who spend all their time on the 100 or 150 cranes throughout the plant. They are not responsible to the foremen as the crane repairs are handled by the maintenance department. Everything in the plant which is handled by the maintenance department, such as cranes or elevators, is reported to the maintenance department for attention.

CHAIRMAN PRICE: I would like to ask you one question. Do you think that there would be a place in Lynn for a school where the foremen from all of the plants would meet?

MR. SANFORD: Lynn is just about evenly divided—General Electric Company and the boot and shoe industry. These two different industries would probably have specific problems which would be widely different.

CHAIRMAN PRICE: Those lessons have to do with the fundamentals. Don't you think there is a value in getting foremen away from their own plant and meeting other foremen under entirely different conditions and in an entirely different atmosphere? You can't get this in any kind of an inside foremen's meeting.

MR. SANFORD: I think that might possibly be worked out.

CHAIRMAN PRICE: That is the point that we are discussing here. It doesn't make any difference how good their foremen's meetings are. There is a value in getting the foremen away from their own plants and getting them to meet other foremen. It is surprising how few foremen visit other plants.

MR. FORTUIN (Lehigh Valley Council No. 5): We have had no school, although our council has been very active in other respects. Yesterday I attended a meeting of the Cement Section. Mr. Josse, another St. Louis man, stated at that meeting that he and some of his men attended the school at St. Louis. A man was injured in their plant through electric shock and due to the lessons they received at this school they saved his life. That brought home to us the importance of starting a school down our way. I can say to you now that we are going to do it.

CHAIRMAN PRICE: That makes me think of the thrill I had when a fine young man about as tall as Mr. Brown and as good looking as he is walked up to the table at the Cleveland school and received his diploma. Someone pointed him out to me and said, "That man saved the life of a man which would have cost the company \$5,000." I said, "If we have done nothing else in Cleveland but that, it is worth while."

MR. JUDD (Omaha Council): We haven't yet done anything toward giving the lessons that you have spoken of here. It is our intention to start a school just as quickly as we can get the papers. Our intention is to get out among people who are not members of the council, see if we can't get some of their foremen or superintendents to attend these meetings, and in that way win the membership of the company. We have called on several of them and they are undecided whether they want to go or not. We reasoned that if we can go and get these men and show them the value of these lessons that we will win the support of the man who is at the head of the company. That is the way we intend to go at it. I am going to try to see if I can't start a school of this kind in my

own plant. We have in the neighborhood of fifty or fifty-five foremen. We are new: we have never tried out anything at all and the information we are getting here is certainly valuable.

CHAIRMAN PRICE: Mr. Rasmussen says that Omaha is coming and coming strong.

AN ALUMNI ASSOCIATION

There are a few things that I want to summarize. In all these schools I think we have formed what might be called an alumni association in order to hold the class together. The graduates appoint their permanent chairman and secretary. They meet once a month for two purposes. In the first place they are going back to their plants to try these things out and naturally they get into difficulties. Once a month they have the opportunity to come together and with a leader like Stanion or Stremmel, they can ask him questions about their own problems and then go back to their plants and take a new grip. That is an invaluable thing. Then there is a great deal in having the feeling that you are not alone. There is nothing so discouraging to a safety engineer who is just starting. I remember when I started with the Harvester Company I was absolutely alone. To have a feeling that other people are standing with you and you can lean on them for experience is a tremendous help to a new man. To have a speaker who will supplement or enlarge some industrial relations subject makes a very interesting program. I think that is a very important thing. It holds your group together.

Then the third point—and this is very important—we are literally developing new timber out of these men, timber with which to build a local council organization. They are men who have been isolated to some extent, but they are the best kind of men and they have this fresh interest and this vital contact with the thing itself. If we can hold these men together in these schools and keep them interested in the local council we have some real workers. I remember that in St. Louis they increased the attendance wonderfully just through the efforts of these people. That is worth while, I think.

Next year I am going to bring up this same subject. It is certainly by far the most important thing, the most important development in our local council work. There is no question about it at all, and one of the things that has wonderfully encouraged me is this: it is what we put into a letter to a manager that a school is to be started, that a series of fifteen lessons is to be given, covering all of the essential things that a superintendent or a safety engineer needs to know in order to do the work, a school in which there will be passed along the experience of other companies by these good teachers and that quickly, in fifteen weeks, and that this man will be given a diploma. It appeals to them. There is something thoroughgoing and systematic about it. It covers the whole ground. It isn't just a hit and miss meeting of foremen, and it has been successful in every town where it was conducted. I believe we have struck an idea absolutely. It is the opinion of fifty men, with whom I have talked, that the foremen's school will be popular because it is more thorough.

FINANCING A LOCAL COUNCIL.

Mr. Pardee was not here to discuss the financing of a local council. Mr. Brown, who has been the chairman of the committee to raise the finances for Cleveland is especially interested in that subject, and I know that the rest of you are. I don't know whether I could lead off with just a few ideas that are in my own mind in regard to financing, but I want to express one thought in regard to financing a new city. For instance, we are going up to Duluth. There is a great, big new territory, practically untouched. Mr. McDonegal up there is going to call together a few influential men and they are going to raise \$10,000. We have found from experience that we must get a little money to bridge the first eight months or year in order to make a demonstration. I never appreciated that so much as I did after the Congress in St. Louis. It happened to be my pleasure to go with Smith and visit all but three members of our council, meeting the managers and telling them what our new plan was and that we were going to increase their dues double and sometimes threefold, to cover the local expenses. Smith and I used to joke and say that we didn't sell more than six of them. We didn't have to. Simply the story of what we were going to do, and the fact that we had made a demonstration, that wonderful demonstration of safety week, was all that was necessary.

Now I have such faith in this idea, and I feel that the need is so great, and I feel that the industrial managers are so keenly aware of the fact that the whole industrial relations movement hinges on the education and development of their foremen, that I believe you can in any town get the money to have a six months' demonstration on this school idea and other things. You can then go to the business men and work out permanent financial support such as they have in St. Louis.

In a word that is my central idea. Mr. Brown, I would like to have you talk and ask questions and start this thing going.

MR. BROWN: I can do only the second part.

Assuming that you have financed the first eight months through contributions, isn't it desirable to remove the council entirely from any necessity of soliciting contributions in the future?

CHAIRMAN PRICE: Absolutely. You haven't put it on a permanent basis until you do that, and that means, Mr. Brown, that you must have the influence of some big man who knows the general managers. We did that in St. Louis. We took the time to sit down and tell them what we were going to do. That can't be done in a wholesale way very well. We found that going to the man personally was the thing we had to do.

MR. BROWN: The thought occurs to me that now the local councils are spreading so rapidly throughout the country, and there are more and more cities all the time who are having permanent paid secretaries, that it would be desirable to have the dues made universal throughout the country, based on the number of employees regardless of whether they had a local council or not, a local secretary or not. In other words, raise the dues to the National in order that a rebate may be sent from the National to those cities where there is a local council. The cities

that are doing the intensive work are those which have a paid secretary, and a great deal of that work is building up a fund for the National Council—in other words, securing members that the National Council doesn't have to solicit at all, thereby increasing its revenues. That increased revenue can be used by the National Council in its intensive work to get members in other localities where there is not a permanent paid secretary. It seems to me that instead of burdening the localities that have a permanent secretary with the national dues and an additional amount for their local, no matter how you put it, whether it is all in one or in two sums, if it is a larger amount than members pay in cities which have not a local council, it would be more equitable to charge the same dues of all and then rebate a certain amount to the secretarial cities.

CHAIRMAN PRICE: Let us assume then that there are five hundred industrial centers in which we would hope local councils would develop with paid secretaries, and we would estimate that in each one of those we would want \$10,000.

MR. BROWN: I am talking about the second year.

CHAIRMAN PRICE: Yes, I say the second year, and your thought would be to raise our dues sufficiently to raise that amount which, if pro-rated around, would support a secretary?

MR. BROWN: It is based on the success of the Red Cross Plan.

CHAIRMAN PRICE: That is an entirely new thought. I am thinking of this, Mr. Brown, that the dues of the council were raised fifty per cent not long ago, and, of course, it is a very radical thing to raise dues very much in an organization like ours. In the first place you would have to make a very substantial raise. You would have, roughly speaking, to double the dues to accomplish what you have in mind. Supposing you did that. We will say that I am a man down in Texas and you have deducted from my dues. You must explain why, and you say it is to support these local councils. I reply that I am not anywhere near a place where I can get help from a local council, and that I don't believe I can help support a local council in Cleveland.

MR. BROWN: The St. Louis plan has proved that you would not have to double the dues.

CHAIRMAN PRICE: The dues were more than doubled in St. Louis.

MR. J. H. HANSON (Rochester Safety Council): We had to treble the dues.

MR. BROWN: Of course the National Council wouldn't have to do anything as large as that even if it did require doubling the dues for the local, because it would have the dues to draw from somewhat more broadly than from any one town. You would not only get those increased dues from the town where the council employed a secretary, but from all the other districts also.

MR. RASMUSSEN: Wouldn't the communities which have no permanent organization—for instance, Duluth—complain about helping to pay for a local service that was rendered the people of Cleveland?

CHAIRMAN PRICE: I can't tell off-hand the spread of our membership, but we have a large number of members who are isolated in little towns

and small centers where there isn't much probability of developing a local council.

MR. BROWN: I have talked with Tom Stanion about it and he has practically convinced me that the present method of financing the local council is the proper method, but there are others I want to talk with. I am not bringing this out necessarily as my own point of view.

If that is not the proper plan, would you think a suitable coöperation from the national organization might be this: that, for every new member secured, a certain proportion of his dues for the first year be rebated to the local which has a paid secretary, on the theory that all of that expense has been assumed by the local in securing that member and has thereby relieved the national of that expense? The theory is that the local should be paid in that measure for securing that member whose dues for all the years in the future will go one hundred per cent to the national. It would also stimulate the securing of new members by the local council because of the particular benefit they would get from the new members, rather than from increasing their funds by contributions from the present members.

CHAIRMAN PRICE: We have done substantially that, only in different form. For the first year we give them twenty per cent of all dues, old members and new alike. Whether that would amount to as much as your plan of simply confining it to the new, I can't say.

MR. BROWN: Will you repeat that?

CHAIRMAN PRICE: If you had two hundred members in Cleveland, say, when you started, you would be entitled during the next twelve months to twenty per cent of all the old members and the new. If you have had a local council here and had that twenty per cent that is another matter, but to-day in Duluth when a local is started it will get twenty per cent of all the dues of all the members we have had up there for years.

I would like to make two points there. In the first place I never did anything easier than to go to those 125 managers and ask them to make such a marked increase in their dues. I never in my experience have had anything sell so easily as that. Why? Because there has been such a tremendous demonstration. Now, I believe, after this week, Mr. Brown, that if Mr. Lintz will select men like yourself, who know the managers on whom you want to call, and if both of you will go to see those managers, you will put it across just as easily as we did in St. Louis, because you have had a demonstration here that will convince anybody who is open-minded. I never did anything easier than to raise that money in St. Louis.

There is something in the people of a city supporting its own local activity. You know we take more interest in a thing that we give directly to. It is our baby, you see, and I am a manager, maybe, and I am giving a couple of hundred to this local council in Cleveland and I therefore have an interest in it. It is a very direct contribution toward a specific thing.

MR. BROWN: I was only bringing out that where that is done, the local

is performing certain services that are no longer required from the national. Therefore, could not the amount of the contribution that went directly to the national be reduced?

CHAIRMAN PRICE: I forgot to say that in addition to this twenty per cent that we are giving, we are also sending our field secretary to spend a month with your local secretary. This is our contribution to your local council. It doesn't cost you a cent. We are glad to make that contribution.

Then the third point that I want to make is that we have a surplus of \$45,000 and we don't want to increase it. We have brought it up to a point where it is comfortable; it will bridge us over three months, and we have now brought our budget up to our income. We are giving all the service that we can out of \$153,000, and therefore we couldn't subsidize the locals without cutting out some of our present service.

However, Mr. Brown, I am very optimistic about the other plan. I believe it is easily possible for you to go to the members of the council here after your splendid demonstration and get the money. I believe that managers are so alive to the need of doing something, and as one man said to me after one of the meetings in a city where I spoke before some rich men to raise some money—he said, "Price, all you have got to do is to go tell the story of what St. Louis, Cleveland, and Pittsburgh have done. Just that story of actual accomplishment is enough to convince any business man who is at all progressive." I believe in this thing; I believe it has such intrinsic worth, it is so practical, that we ought to be able to sell it. Lintz, it is up to you.

Mr. LINTZ: Nobody knows it better than I do.

CHAIRMAN PRICE: Let's hear from some others.

Mr. J. H. HANSON (Rochester Safety Council): We had a special committee appointed to look into this thing and thrash it out because we had this problem come before us last fall. This committee brought in a decision that a budget should be made up which would include both the cost of the public safety campaign and the regular industrial work. They found that it took seventy per cent of that budget to conduct public safety work, and it was the conclusion of the committee that the cost of the industrial work should be borne by the industries.

CHAIRMAN PRICE: You mean the public safety work?

Mr. HANSON: No, the industrial—that should be borne by the industries, by an assessment of say seven to ten cents per man, and that the public safety work should be borne by the city, the Chamber of Commerce and the Automobile Club. It was proposed to go to the Chamber of Commerce, to the Automobile Club, and to the city authorities, to ask a certain amount which would cover this budget. We are financed at the present time in an entirely different way—we draw from the community chest.

CHAIRMAN PRICE: I want to add a chapter that Hanson didn't put in there. I want you to get this, Mr. Brown. The council financed the experiment in Rochester during the first six months, putting up \$5,000. I spent two weeks with Harvey just at the close of the six

months. We went to the industrial people—now mind you—to raise enough money to finance the local during another six months' period, and it was very easily raised because of the demonstration.

MR. BROWN: I think that that statement by Rochester brings out a very important question that is likely to be asked by industrial managers. "How much of my contribution is simply public service work, and how much of it is real industrial work?" The answer is that thirty per cent of what he gives us is used for the part that he is most interested in, according to that statement.

CHAIRMAN PRICE: My experience is that industrial managers—I won't say they are equally interested—but they certainly are very much interested in public safety.

MR. BROWN: I don't mind that myself, but I think it brings out the necessity of going to others than simply the industries for help. You have a good argument that the community must take the responsibility in the support of the movement.

CHAIRMAN PRICE: I still insist that the backbone of the financial support of your local council, both public and industrial safety, is going to be in your big industries. The big bulk of your money is going to come from those people.

MR. MCCLAIN (Cincinnati Local Council): In conducting a public safety campaign such as they have here in Cleveland this week, this idea occurs to me: suppose we made a lot of little lapel tags or banners and the school children sold those on the streets for ten cents apiece—is that a good idea or is it not?

MR. STANION: That would cheapen the whole thing.

MR. LINTZ: I wanted to inject a thought there: Mr. Hanson made me think how enthusiastic the automobile clubs are. I have had the pleasure of associating with Mr. Caley, our local secretary, and I have had several very interesting conversations with him. He told me, "Lintz, I am with you. I know it is a good thing. If it is five hundred or one thousand remember that the Automobile Club is with you." I think that enthusiasm can be made to grow.

Fortunately the Cleveland Automobile Club has adopted its own insurance department. We have a better chance of getting support than we otherwise would have.

MR. FELLNER: There are two absolutely definite activities. One is the industrial activity; the other is the public safety activity. You must finance them in two budgets and that is what we are going to do in St. Louis. We are not going to disturb our industrial budget at all. The public budget will be secured by calling together those most interested: department stores, transfer companies, the city authorities, and groups of that kind. It is going to be put on a permanent basis, not on a contribution or charity basis.

CHAIRMAN PRICE: Do you mean to tell me that you are not going to take any money out of the fund that is secured from your seven and ten cent assessments?

MR. FELLNER: We can't afford to.

MR. LINTZ: Have you given any thought to a basis of establishing dues for public safety work?

MR. FELLMER: Not yet, but we have been figuring on establishing a regular basis of dues.

THE PITTSBURGH PLAN

MR. CLARKSON: The Pittsburgh plan of financing industrial safety work is to double the dues to the National Safety Council, but when we formed our Public Safety Committee, we insisted upon keeping the Public Safety budget absolutely separate from the industrial budget. The plan is this: to raise \$15,000 for public safety work. We have assurance of financial support from the city, from the county, from the Chamber of Commerce, and from several other sources, such as the Board of Fire Underwriters, and the Street Railway Co. Of course, the Street Railway Co. is an industry and it belongs to the industrial class.

CHAIRMAN PRICE: Sometimes the street railway companies are more interested in public safety work.

MR. CLARKSON: I am going to classify them later.

We are going to the street railways and the public utilities and the large corporations, because they, as large corporations, are interested in public safety, very much interested, and, as a matter of fact, we believe over there that the large industries are not paying enough dues. They are public institutions. Take for instance the Carnegie Steel Company, the Jones & Loughlin Company and other similar companies. They are public institutions; there is no getting around that. They owe a duty to the public; hence we are going to pass those corporations for contributions. That is the way we expect to get our finances for the public safety work. That is, the city is going to give so much, the county is to give so much, and the Chamber of Commerce so much; such organizations as the Board of Fire Underwriters and the fire insurance companies are especially interested. Then we are going to the industries, the large industries, and ask them for a contribution to take care of our first year's work. That is the way we plan to raise our finances to carry on both of these functions.

But, in connection with our industrial work, we can't raise our dues again for we feel that would be suicide; we have got to concentrate on getting new members.

CHAIRMAN PRICE: Mr. Brown, I am going to use you as a barometer to indicate to me whether we are getting anywhere. Have you had your questions answered? Have you a clear idea of how you ought to finance the council here? Aren't there some doubts still in your mind?

MR. BROWN: Yes, but I don't think that any one in this room will say that they have it solved. I think, however, that it is concealing the issue when you say that the money that you spend for public safety is

CONTRIBUTIONS OR DUES

not derived from contributions but is derived from dues. You get those dues from those who are particularly interested in public safety rather

than in industrial safety, like the bankers and the professional men and the rest of them. You call them dues.

CHAIRMAN PRICE: No.

MR. BROWN: St. Louis calls them dues, but they still are contributions, because dues are only those funds that come back with the direct benefit to the employees of the companies that pay the dues. And when you call them dues for a banker, that proportion of his dues that applies to thirty or forty or one hundred that he may have in his bank, that part is dues, but the rest is contribution.

If a lawyer, who has no employees, pays \$100 for membership in the local council, you call it dues, but it is a contribution. There is no use trying to cover that up. I don't mean that that isn't wise and proper, but I think it is better to show that it is a direct contribution for the public safety work.

MR. EUGENE J. ROESCH (New York City): I think I can offer something which may be helpful to us here.

CHAIRMAN PRICE: What is your connection, Mr. Roesch?

MR. ROESCH: I have been organizing the printers of the country, and I have some experience along this line. In my connection in Europe and South America, I have always been very interested in safety, and in New York City, preparing for the war emergency, I organized perhaps the largest classes in this country in accident prevention.

We are interested now in the salesmanship of our proposition, and we should take this as a real salesman and study our problems properly. In the first place, wherever you have a direct benefit you want to call it dues, and I would suggest that you have some means of pro-rating it.

CHAIRMAN PRICE: We have that.

MR. ROESCH: Where people have indirect benefits, they have also just as great moral obligations and they should do their share, but do not call it a contribution. If you do that, you are going to set up a wall immediately. Call it subscriptions, and have a definite basis for those subscriptions. We have gotten a budget of about a million and a half—printers who formerly paid \$20 or \$30 a year for their work are now paying \$2,000 and \$3,000, and they are doing it gladly, because they see their benefits, and the allied industries are never allowed to think of making a contribution at all. They make a subscription and they really see some indirect benefit. I think you should keep away from that word "contribution". I feel you will get much better results if you call it a subscription.

DISTINCTION BETWEEN PUBLIC AND INDUSTRIAL SAFETY BRANCHES

MR. TOWNSEND: I would like to say a word that would make a little clearer in the minds of some the distinction between the public and industrial safety branches of local council activities and why in St. Louis we feel that it is the proper thing to raise a separate fund for the public safety work. We are offering there in the public safety work a definite service, which is distinct from that which we offer to the industries in the industrial section. The chauffeurs' school is going to be largely

patronized, and it is awakening a great deal of interest. The school for patrolmen is going to be of a great deal of interest. The bulletin service at the filling stations for automobiles, the bulletin service in the public schools, and various other things of this type will advance public safety. These things have got to be financed, and it is going to take a definite budget to finance all of them. We feel that it would not be just to attempt to draw from the budget for industrial safety. But instead of going to these manufacturers, as we have in the past, we will go to them, of course, but also to these other groups, the transfer companies, the department stores and these people who have many automobile trucks on the streets, and we will ask them for their contributions—and I think we will call it, not a contribution, but a subscription.

We feel that we are going to put it over with a lot of enthusiasm in the future and the people will see the justice of its being a separate fund.

MR. COFFIN (Portland, Oregon): I believe that I can speak from experience as far as public safety is concerned—

CHAIRMAN PRICE: Mr. Coffin used to be the head of the Public Safety Commission in Portland.

PUBLIC SAFETY COMMISSION OF PORTLAND

MR. COFFIN: That was an organization of prominent citizens officially appointed by the mayor. We were financed by the city council, as well as by the Chamber of Commerce and public utilities. We started in our work about five years ago, and every one knows the work that the Commission has done in Portland. It has become national in its scope. We raised \$4,000 a year in that work when we first started. With the large increase in automobiles we still cut down the accident record. Our deaths from street accidents decreased from an average of 29 or 30 a year—we cut it down the first year—to five a year. In our fire prevention work, as you all know, we cut the losses from two million to two hundred thousand. That is on record. So that in starting now in industrial safety, it seems to me that that should be kept entirely separate from the public safety function, because the city, the city officials, and the public utilities are vitally interested in public safety. Of course, it will work in conjunction with and be under the management of the National Council, but the two will be kept separate.

CHAIRMAN PRICE: The time is approaching when we must turn McClain loose or we will have trouble.

We could go on here for an hour discussing the form of this thing, how we could work it out. That is a very important detail. We might get somewhere, but the two things that I think are important for us to carry out of this meeting are: First, that this work we are doing is absolutely practical, it meets in a successful and effective way a crying need in our streets and in our homes, as well as the industries, a need that every thinking citizen is rapidly coming to realize. Secondly, we have a plan here which has been tried out. We have worked out definite lines of service such as this school that we are talking about and this public safety that was outlined yesterday by Mr. Smith, and which has

been so splendidly demonstrated here. If we are going out to get this money we must have faith in the thing that we are trying to sell. That is fundamental to every salesman. I used to be a salesman. I sold shoes. I couldn't have sold shoes if I didn't believe in them.

I personally am obsessed with the value of this thing, and when I go out to sell a membership I go into a manager's office with faith sticking out in my eye. I don't believe I could sell a membership at all if that were not the case. If I have had any success in cracking hard nuts—and they always take me to the hard ones—it is because I profoundly believe in the value of this thing. It is growing every day. There are wonderful possibilities that are locked up in these activities which we have discussed this morning, foremen's and superintendents' meetings, possibilities that we haven't caught a glimpse of in this public safety. It is coming by leaps and bounds.

Think of the story that Capt. Robbins told yesterday. That is a new chapter and there will be a new chapter next month. If we have the faith in this thing we are going to go out and sell it. I think it is very important that we should know how to put it before these people whom we are going to approach. For instance, one of the things which we did in Pittsburgh was to get out a little folder outlining the whole plan and activities, so that in convenient and brief form it can be put into the hands of all these men you are approaching and they will get the story. Give newspaper publicity constantly to the school and the other things that we are doing, so that these men whom you are going to approach will be fully informed in regard to the activities of the council and the value of it.

Another point I want to emphasize is that when you go to those men, go to them personally and go to them with some one who knows them personally. We went to twenty people and we got twenty subscriptions. Why? Because the man whom I was with knew every one of those men. If you, Mr. Lintz, will take Mr. Brown to see Mr. Mather of Pickands & Mather, you are going to come away with the bacon, I tell you.

I think that we can properly go on to the next subject, although personally I would like to spend more time on this. The thing is so new that we are practically engaged in pioneer work. It is growing by leaps and bounds. It is a wonderful experience that has come to us in the last year. I feel as if I had just started in safety work. This thing is opening up so fast. The next year we are going to come back with stories of wonderful accomplishment.

At every one of our sessions we always like to exhibit one of our new babies. One of our newest babies is Cincinnati. In that city, there is in operation a very unique plan of connecting the local council with an industrial medicine department newly organized in the University of Cincinnati. It opens up an entirely new experiment and the more I get into it the more I am impressed with the possibilities of it, I am inclined to think that Cincinnati has added a new chapter. You have gone St. Louis one better, and Pittsburgh, too. Now McClain, get up and see if you can prove it to them.

THE CINCINNATI LOCAL PLAN

G. H. McCLAIN, SECRETARY, CINCINNATI LOCAL SAFETY COUNCIL

A good deal has been said in all these meetings about the educational side of safety. The educational side of safety, to my mind, is *the* side. Of course the thing develops into ramifications that nobody can see the end of when we go to talking about the educational side of it.

We have a condition in Cincinnati that is unique, as Mr. Price has said. In view of the fact that it was somewhat radical and unique, I will go into details. I may spend some time on things that aren't very interesting to you, but if they get tiresome just raise the flag and I will stop.

Last winter in February, Mr. Victor T. Noonan, who has cut a wide swath in safety work in this State, held a get-together meeting in Cincinnati at the Sinton Hotel. Considerable enthusiasm was demonstrated there, which, perhaps, is a little out of the ordinary for Cincinnati. Cincinnati has been a dark spot in safety work for some time. At the conclusion of the meeting there was a very decided demand for some sort of safety organization. The leaders in that town had been aroused and demonstrations had been given them that it would pay them to be interested, so this demand came for a local organization. There were two schools, as it were. Some people wanted just a local safety league. At that meeting were Frank Morris, Dr. Otto Geier, Mr. Lew Palmer and some others who were directly interested in the National Safety Council. These men whom I have named were on the Board of Directors. They foresaw the advantage of organizing a chapter to be affiliated with the National Safety Council. In other words, a regular local chapter. That much was decided on, after this meeting was over.

JOINING SAFETY WORK TO INDUSTRIAL MEDICINE AND PUBLIC HEALTH

About the same time another activity of somewhat similar nature was developing in the city. There are some very fine public-spirited people in Cincinnati. Among the professions there were some men who were dreaming of the organizing of a department that would be known as the Department of Industrial Medicine and Public Health. This was the dream of Dr. Holmes, Dr. Fred Lander, Dr. Otto Geier. Dr. Geier conceived the idea of linking up this safety work with this department which was then being organized.

About that time, I believe, we called in Mr. Price. Mr. Price came and after going through the thing pretty thoroughly he said, "Well, it looks interesting as an experiment." He has signified that I am an experiment, or that I typified this experiment in Cincinnati.

It was decided finally that the local safety secretary should be a member of this new organization. I believe I shall explain the details of this organization inasmuch as it is new and is being looked at from every angle all over the United States.

Dr. McCord, who was Major McCord in the medical corps of the base hospital at Chillicothe, was asked to take charge of this new department. Dr. McCord had, to use the common term, made a name for himself over

there and had attracted considerable attention. He took charge of the department and aided in the organization. I must say that Dr. McCord brought with him every army rule and tradition there is and he certainly can lay out things on a military basis. He is my boss and I know.

Another factor in this work was the industrial physician. We finally succeeded in getting Captain Watkins who had charge of all sanitation, hygiene, and medical work at Nitro, West Virginia, where he had about twenty doctors and seventy-five or eighty nurses under his jurisdiction. He is a man who, I believe, knows all that is known in industrial medicine and public health work. This man was for nine years in the Public Health Service of the United States. He has taken over this work of industrial medicine. One of his chief functions will be to render a service in that field to the industries of the city. I must say that in Cincinnati we have some places that need a half dozen such men right now.

Another division of this department is the service that we are giving to women in industry. We have secured the services of Miss Laura Sanford. It may be that some of you people know of Miss Sanford, who was for a long time with Columbia University and later with the Wright-Martin Company. She will spend her time on problems relating to women in industry, bringing to the attention of the management conditions as she finds them.

We have Captain Walker, who was a very active bacteriologist at Camp Sherman, and in Europe too, to take charge of the bacteriological work. We are to have the coöperative service of a dentist in oral hygiene. We are taking on an expert in employment management. We are going to attempt to educate a lot of these men, these industries in Cincinnati, to the advantages of modern methods, because we are woefully lax in that regard. I might say right here that we have a rather peculiar condition. The city of Cincinnati, a city of perhaps a half million people, has only three or four factories which employ more than two thousand people. There is a great list of factories employing from fifty to two hundred and three hundred men. So we have a real problem there, and a good many of these fellows are old timers; a good many of them have taken the business from their fathers, and it is pretty hard to show them the light.

SAFETY A REGULAR DEPARTMENT OF THE UNIVERSITY

Last—and I don't know whether to say least or not—is the Safety Department. This department has been recognized as one of the regular departments of the University of Cincinnati. I have the distinction of being the first local secretary who is also a professor in a university. Gentlemen, I am the only specimen alive in the world to-day. But after all, is it an experiment?

CHAIRMAN PRICE: You are, a little later on, going to tell what McClain is going to do in the university?

MR. MCCLAIN: I am saving the best for the last.

Cincinnati University is a municipal university, maintained by the regular educational fees of the taxpayers. The trustees of Cincinnati

University are business men and the industrial leaders of the city. These men are forward-looking and public spirited enough to reach up into the clouds, as it were, and interpret the responsibilities a municipal university should have to the community.

Now I will try to answer the question you have asked. Where does the safety man come in and what is he going to do?

Here are the advantages, as I see them, in this connection. We have about 800 engineering students in the university of Cincinnati. A large number of those students are what we call coöperative students. I think Cincinnati University is a pioneer in what we call coöperative education. A large number of those boys go out and work in the factories in Cincinnati and in the immediate vicinity, Dayton, Hamilton, Middletown, and Springfield, for two weeks. Then they spend the next two weeks in the University. I have the opportunity and the plans made to teach these young men safety. These men who will be in a few years the foremen, the superintendents, the managers in that city and community will have this thing in their skins so deep that they will never lose it. And that is my responsibility.

Now you all know that a man has a very high regard for the things that he learns in his particular college. He thinks his college is just a little bit better than any place else, and that is perfectly all right. Now if I am able to go before these young engineers and say, "Men I want you to know that you are the first college men who are being trained by a member of the faculty who is a regular safety man," I believe that it will make an impression on those men which they will never forget. I am going to teach them along the lines of these foremen's meetings. I am going to utilize those lectures to a certain extent and blend them with college experiences, and I think they will be very valuable.

CHAIRMAN PRICE: How many students are there in the engineering school this year?

MR. McCLAIN: About eight hundred all together.

I want to introduce, as far as I can in the technical side of their training, safety in machine design and things of that kind.

TEACHING SAFETY TO TEACHERS

Here is another advantage that I think that I have. There is a college of education or a teachers' college connected with Cincinnati University that trains from eight hundred to a thousand teachers. I have arranged with the dean of that college to give a series of eighteen lectures, a credit course of eighteen lectures or lessons—I call them lessons down there, which, of course, is more appropriate in the school—on this question of safety, which is based in a general way on Dr. Payne's experiment in St. Louis. I go just a little bit farther. I intend to do a little field work. I want to take some of these teachers out on the street and I want them to see with their eyes what the hazards of the street are. I want to take them through industries. (This is the latter part of the course, after they have become thoroughly interested in safety.) I want them to get it from the big, broad, viewpoint. Then I want to give

them one or two lessons in the mechanics of safety. I want to emphasize such things as railroad signals, elevator protection, railroad gates, bells and signals, stop and go signs, everything that has to do with the mechanical side, and the rules that go with them.

So much for the teachers. Here is another important thing. In my connection with the university—

CHAIRMAN PRICE: You forgot to speak of the school teachers who are coming, one from each building.

MR. MCCLAIN: I am going to speak of that. I went to the Board of Education with a plan for public school teaching based on Dr. Payne's experiment. I almost hesitate to call it an experiment now, because it is no longer an experiment, it is a proven fact. I went to the Superintendent of Schools. I said, "Dr. Condon, I want to call together one teacher from the various buildings of the schools." Then I told him about creating a class for professional credit, and giving them a course so that they can apply the teachings of Payne's book. Immediately it met with his approval. I said, "I want your permission to make the rounds of the schools to talk to the students en masse for ten or fifteen minutes, to give a background to the teaching of this question of safety in the schools. It will dignify and emphasize the local teachers' work." It instantly met with his approval—no objection whatever. Furthermore, they placed at my disposal childrens' committees and things of that nature which were already organized in the school to be used as vehicles of safety.

It is my intention, men, to emphasize this question of school safety in the school. I spent five years as a teacher. Sometimes they say, "pedagogue" but I just like to be known as a teacher. I enjoyed it immensely. I can live a half dozen lives if I can get around to the young people. I think that I can go into those schools with my little moving picture machine occasionally and give a little lecture to back up the teaching of the local teachers, to emphasize that, and I believe that we are going to get way yonder in our results.

That, in a way, outlines my program. You men have the advantage of me because you can come here and stand up and say, "We did this and we did that and we did the other thing. We had so many men in our classes, etc." All I can do is to stand here and swell up my chest and boast about what I am going to do. I really believe that I am going to do it, because I never undertook any other proposition in my life where everybody has so whole-heartedly handed me the right hand of fellowship and said, "McClain, we are with you; you are all right; go to it; is there anything we can do to help you?"

CHAIRMAN PRICE: That means a lot.

MR. MCCLAIN: Just to illustrate: in the city of Cincinnati there is a very fine social service organization. The citizens will soon go into a campaign to raise a little over one million dollars to carry on social work in the city. We went to the federation of these social agencies and we carefully cultivated their support, and they give us anything that we ask.

The other day the man who has charge of the Better Housing League called me up and he said, "McClain, can you come down some day and give a little talk to my visiting housekeepers? This question of home safety, as you have emphasized it, has impressed me very much and I believe that if you will instruct these visiting housekeepers a little bit, their activities will be a little broader." You know I am not going to overlook a chance like that. That illustrates just how we are being treated.

So much for our connection with the university. On top of that we have our regular industrial service which you men have already been working on and have proved successful. We are laying our plans now for our supervisors' schools. I expect also to have the foremen's schools. I got on the job in August. I was very anxious to try my strength. I was so interested that I couldn't hold still much longer, so I decided to have a big foremen's meeting to let them know we were in town. I am a little chesty about this too. I knew but few of the industries in the city. I made no personal calls. We sat down and wrote letters, attached a little blank at the bottom, requesting so many tickets to this foremen's meeting, and we had some 1250 odd men out in Emery Hall, the biggest hall in the city. Then I thought, "Well, you are off now and you have got to keep it up." That gave me a little encouragement.

FINANCED BY BUSINESS MEN

The thing that will interest you is how this thing is financed. This whole department (we speak of it as a unit because in making up our budget for this department we included about \$7,500 for safety activities) will spend, I imagine about \$35,000 a year. A group of business men accepted the responsibility of financing it. In other words, they said, "You fellows go ahead and do your job, and you don't need to worry about the finances. We will take care of them."

Well, these men simply guaranteed our existence and told us to get on the job. They have raised practically all the money, or will have done so shortly. They are going to all the industries of the city and are getting subscriptions. I emphasize that word "subscriptions" in the light of what has been said. They say to a man, "We will have a man for you who will teach you employment relations; we will have a man for you who will come in here and help you improve conditions for your women; we will have a man come in here who is an expert in safety; we will have a man come in here who is an expert in industrial medicine. Put down your \$200, and if you don't get all this service it will be because you don't ask for it. It is there for you."

Our finances really aren't worrying us very much. This period of financing is to cover five years. When a man puts his little old \$200 down for this year, it means that he has got to come across the next year and the next year. Later, if the department has demonstrated itself of true worth to the community, the university will make some plans of financing it through the regular channels.

The money that was raised was taken to the trustees of the university and given to them to administer.

Have I left out anything?

CHAIRMAN PRICE: I want you to emphasize one point, that practically all of these boys who are working two weeks on and two weeks off in the shops—two of them hold one job—are absorbed into the industries and occupy important places.

MR. McCLAIN: I don't know whether any of you men are directly in contact with this coöperative system of education. It is working out to be a huge success to the young man who can't advance money for his education. He works two weeks and goes to school for two weeks. We have found it to be a wonderful thing in Cincinnati. These men, as you readily see, are going out into the industries and are going to carry this microbe of safety with them, because I am going to put it into their heads so tight that they will tell their foremen about it; they will tell the men around it. It will be one of their hobbies. To me, that looks like a mighty big field for spreading this gospel of safety. It looks to me like throwing a stone out into the center of a pond. The waves go out and out and out until they reach the shore on all sides.

(Mr. G. E. Clarkson, Pittsburg, took the chair.)

CHAIRMAN CLARKSON: All right, gentlemen, you can now shoot questions at Mr. McClain.

DISCUSSION

A MEMBER: I would like to ask whether you have included in your program a little publicity work whereby other universities in this country will be kept in touch with the work which you are doing. I had the pleasure some time ago of making a safety inspection of one of our largest universities. I was astonished at the lack of consideration that was given to safety in their laboratories and in their methods of teaching.

MR. McCLAIN: I might say that I understand the Council will make some effort in the next few months to spread propaganda to all the active universities of the country on this question of teaching safety. It is going to start a campaign to educate the universities. That may be a little far-fetched, but the fact is that they should start right there.

MR. L. J. SMYTH: How much of your program can be carried out in a state university? For instance the University of Kansas is close to our council in Kansas City, and it has offered coöperation through Prof. Sibley, the head of the Mechanical Engineering Department. In what way could a university coöperate with a local organization where the university is forty or fifty miles out of town, but draws on the city for a great many of its students?

MR. McCLAIN: How close are the relations between the university and the city?

MR. L. J. SMYTH: Very close. Although the university is in Kansas it is very close to Kansas City, Missouri, and the relation is a very close one. We want to get their coöperation but don't know just how to go about it.

MR. McCLAIN: I think one of the things that is coming very shortly is this: Universities are going to give credit for a certain safety engineering subject. I believe this will come first in the mechanical engineering schools. It strikes me that the first thing to do is to put in a course in safety engineering, and in that course not only stay close to the technical side of it, but also go into the various phases of it, how it relates to the employee and to the employer and to the problems of the foremen, because these men are all going to be executives—I wouldn't exactly say all of them, but the executives of industry will come from them.

CHAIRMAN CLARKSON: In Pittsburgh we have the Carnegie Institute and Pittsburgh University, both of which are connected with industry. Their directors are the large managers and officers of the large industries, and I have no doubt that if we would just start out in Pittsburgh as you have started in Cincinnati, we could affiliate with either of those universities. Of course, Carnegie Institute of Technology is one of the largest technical institutions in the country, and Pittsburgh University is somewhat like the Cincinnati University—it is one of those coöperating schools.

MR. COFFIN (Portland, Oregon): Has anything been done toward putting in a course of safety engineering in the curriculum of these technical schools?

MR. McCLAIN: Not to my knowledge.

MR. H. L. ROBINSON (Worcester County Council): I think the Massachusetts Institute of Technology has made a little start along that line. I am not able to state just how far they have gone, but I have received circulars from which I infer that they intend to go into safety engineering, perhaps in connection with their mechanics course.

MR. McCLAIN: It seems we are right on the edge of the universities taking this thing up. Our mail every morning brings in inquiries from the whole United States on our method of procedure. This is particularly true of the fact that the entire department of Industrial Medicine and Public Health is attracting nation-wide attention. It is new and an experiment, and people are anxious to learn how the plan is organized, what we are going to do, and what our relations with the university are.

MR. FELLNER (St. Louis Council): Let me suggest, from the experience of Mr. McClain and the other gentlemen, an idea which I have in my mind? Why not have the local secretaries in communities where there is a university, and where the local council is conducting a safety supervisors' school, offer to the engineering department of the university the use of that school to its students, and in that way get the safety idea implanted in the heads of these prospective executives?

MR. McCLAIN: That is a very good idea indeed.

Adjournment.

LOCAL COUNCIL REPORTS

BOSTON SAFETY COUNCIL

W. C. SWIFT, PRESIDENT

Works Manager, Standard Woven Fabric Co., Walpole, Mass.

E. M. COFFIN, SECRETARY-TREASURER

Staff Engineer, Associated Industries of Massachusetts,
1034 Kimball Building, Boston, Mass.

The New England Safety Council at a meeting early in the year, decided that its activities were, in a measure, duplicating those of local councils already established at Worcester and Springfield, and therefore, at a very spirited meeting decided to disband with the understanding that the Boston Safety Council would conduct the activities carried on in Massachusetts east of Worcester County.

The carrying out of this program led to the organization meeting of the Boston Safety Council, June 12, 1919. Forty-eight delegates representing industrial and other organizations were present. Mr. W. L. Robinson, secretary of the Worcester local, outlined very clearly the activities started in the center of the state, and Field Secretary Rasmussen of the National Council was present and gave much valuable advice and assistance. The Compensation Rating and Inspection Bureau was represented by Mr. Magoun, General Manager, who gave a very pointed talk on the value of safety work in reducing compensation premiums through the Massachusetts Experience Rating Plan.

Our second meeting was held, June 27, with an attendance of thirty-nine. Mr. Victor T. Noonan, who comes to Massachusetts from Ohio, where he was director of industrial safety, gave us a very fine talk on "Indifference, the Great Ally of Accidents". The following discussion was led by Edwin Mulready, Commissioner of Labor in Massachusetts, with very general participation.

At the meetings of the Executive Committee it was deemed best to defer further activities until the end of the vacation season, when general membership meetings will commence and community gatherings for foremen and employees, with speakers and moving pictures, will be facilitated.

CENTRAL MISSISSIPPI VALLEY DIVISION

C. B. HARDIN, PRESIDENT

United Railways Company

M. L. FELLNER, SECRETARY

St. Louis, Mo., September 15, 1919.—Following the adjournment of the Congress of 1918. Mr. Carl L. Smith as Permanent Secretary of the Cen-

tral Mississippi Valley Division of the National Safety Council began the practical organization of the Division's work. A permanent organization was effected and the following officers and committees installed:

President: C. B. Hardin, United Railways Co.; Vice-Presidents: George Aurien, Mississippi Glass Co.; D. E. Parsons, East St. Louis & Suburban Railway Co.; Philip Stremmel, National Enameling & Stamping Co. Plants; Secretary: Carl L. Smith, St. Louis Chamber of Commerce; Treasurer: Herman Spöehrer, Union Electric Light and Power Co.

Committee Chairmen—Boy Scouts: Major H. H. Simmons, Scout Director; Complaint Bureau: E. G. Marsh, Secretary Complaint Board; Educational and Schools: Geo. P. Knox, Assistant Superintendent of Instruction Public Schools; Finance: Arthur T. Morey, General Manager, Commonwealth Steel Co.; Fire Hazards: Wm. G. Panzer, Chief of Fire Department; Industrial: J. C. Josse, Continental Portland Cement Co.; Legal: Hugh K. Wagner, Attorney and Counselor at Law, 503 Fullerton Buildings; Liability Insurance: Walter D. Thompson, United States Casualty Co.; Membership: Paul F. Gutmann, Mississippi Glass Co.; Parks and Public Recreation: Nelson Cunliff, Park Commissioner; Police and Traffic: Barney Verheyen, Assistant to Chief of Police; Program: Walter S. Gemmer, Scullin Steel Co.; Publicity: W. B. Weisenberger, St. Louis Chamber of Commerce; Public Safety: Charles M. Talbert, Commissioner of Streets and Sewers; Public Utilities: C. Howard Stewart, Assistant to Secretary and Treasurer Laclede Gas Light Co.; Sanitation: Dr. G. A. Jordan, Assistant Health Commissioner; Speakers Bureau: Dr. E. Geo. Payne, Principal, Harris Teachers' College; Statistics: Dr. R. S. Vitt, Coroner, St. Louis.

District Chairmen: L. S. Brainard, Utilities Indemnity Exchange, St. Louis, Mo.; J. W. Costley, Granite City Steel Works Granite City, Ill.; H. C. Davis, Wagner Electric Company, St. Louis, Mo.; Homer J. Hodson, East St. Louis & Suburban Ry. Co., East St. Louis, Ill.; Edward C. Friedewald, Kolb Coal Company, St. Louis, Mo.; H. F. Hecker, Monsanto Chemical Co., St. Louis, Mo.; Dr. Heber Robarts, Belleville, Ill.; E. A. Robertson, Laclede Steel Company, St. Louis, Mo.; Duncan C. Smith, Aluminum Ore Company, East St. Louis, Ill.; J. C. Townsend, International Shoe Company, St. Louis, Mo.

SCHOOL FOR SAFETY SUPERVISORS

The first activity undertaken was the institution of a school for safety supervisors and a course of fourteen lectures on the following subjects:

1. Safety and The Manager: The Importance of His Support and How to Get It—W. E. Worth, Superintendent, Chicago Tunnel Co., Chicago.
2. Design and Construction of Safeguards—R. J. Young, Manager Department of Safety and Relief, Illinois Steel Co., Chicago.
3. Plant Conditions; Arrangement, Order, Lighting—C. W. Price, General Manager, National Safety Council, Chicago.
4. What the Foreman Can Do to Promote Safety—Frank E. Morris, Safety Engineer, American Rolling Mill, Middletown, Ohio (Present, Regional Field Secretary, National Safety Council).

5. Bulletin Boards, and Other Ways of Reaching the Workmen—W. R. Rasmussen, Secretary Western Pennsylvania Division N. S. C. Pittsburgh (Present, Regional Field Secretary, National Safety Council).
6. Workmen's Inspection Committee and Meetings—M. L. Fellmer, Commonwealth Insurance Company, St. Louis.
7. Electrical Hazards—F. H. Reid, Bureau of Safety, Chicago.
8. Labor Management and Safety; Physical Examinations, Instruction of New Men, Labor Turnover—A. H. Young, International Harvester Company, Chicago.
9. First Aid—Dr. R. S. Vitt, Coroner, St. Louis.
10. Eye Protection and Safe Clothing—Fred M. Rosseland, Safety Engineer, National Safety Council, Chicago.
11. Plant Sanitation—Dr. G. A. Jordan, Assistant Health Commissioner, St. Louis.
12. Accident Records, How to Compile and Use Them—Frederick M. Crum, Assistant Statistician, Prudential Life Insurance Co., Newark, N. J.
13. Fire Prevention in Relation to Safety—Sidney J. Williams, Secretary and Chief Engineer, National Safety Council, Chicago.
14. Qualifications of a Safety Engineer, His Duties and Opportunities—J. A. Oartel, Carnegie Steel Co., Pittsburgh.

were given to a class which had an enrollment of over four hundred and an attendance of over three hundred on the average. These fourteen lectures were followed by a general Review and Experience Meeting and the course closed with appropriate graduating exercises, May 22, in the form of an informal dinner at the Planters Hotel at which occasion General Manager Price distributed diplomas to two hundred and twenty-five graduates (graduates being such students as had attended at least 75 per cent of the lectures). The first lecture was given in the Directors' Room of the Chamber of Commerce with an attendance of one hundred and twenty students. After the first lecture it was found necessary to secure larger quarters, and through the cooperation of the Union Electric and Power Company the subsequent lectures were held in the splendid auditorium of that company on Twelfth and Locust Streets, and this auditorium was filled to capacity (450) on several occasions. This course of instruction has been productive of a great stimulus for safety in the industrial plants of St. Louis and wonderful results have been noticed in some plants that had never before paid much attention to organized, systematic safety work. The classes were in charge of Mr. Philip Stremmel General Superintendent of the National Enameling and Stamping Company's Plants, whose enthusiastic methods and strong personality were one of the most potent causes for the wonderful spirit prevailing among the members of the class. The members were composed of young men in minor executive positions, such as traffic men, employment men, shipping clerks, etc., through the ranks of superintendents and work engineers into the ranks of executives and managers. After the close of the school two meetings were held; one in the form of a dinner lecture on the newly passed Work-

men's Compensation Law at which Mr. H. C. Davis, Assistant Treasurer of the Wagner Electric Company, and one of the members of the class, delivered a very comprehensive lecture on "Workmen's Compensation". The other meeting was in the form of a get-together social, at which the Ford film "The Only Way" was shown and a beautiful class pin adopted and plans were made for the participation of the class in a boat excursion to be given by the Superintendents' and Foremen's Organization.

SUPERINTENDENTS' AND FOREMEN'S MEETINGS

Four meetings of superintendents and foremen were held on the following dates:

January 30, 1919. Mr. Rasmussen's experience in reducing accidents at the plants of the American Smelting & Refining Co., Omaha—W. R. Rasmussen, Secretary, Western Pennsylvania Div. N. S. C., Pittsburgh.

March 4, 1919. Opportunity—Victor T. J. Gannon, United States Department of Labor, Washington

March 31, 1919. Playing The Game—J. C. Townsend, Safety Engineer, International Shoe Co., St. Louis.

May 12, 1919.—Key Men—Philip Stremmel, General Superintendent, National Enameling & Stamping Co., Granite City, Ill.

A musical and entertainment program was given in addition to these splendid lectures. These meetings were attended by an average of eighteen hundred superintendents and foremen and their wives and were very enthusiastically and interestingly arranged. Mr. J. C. Josse of the Continental Portland Cement Company was in charge of this feature of the work. Under the auspices of the Superintendents' and Foremen's Organization the Council arranged for a Boat Excursion on the Steamer St. Paul which took place on Saturday, August 23, and proved very successful. A total of over fourteen hundred participated in this outing and the afternoon and evening was spent in a great get-together family-style excursion.

MANAGERS' MEETINGS

The following Managers' Meetings were held with enthusiastic attendance of executives and managers from all the industries of our district:

February 21. Labor Turnover in Relation to Safety—A. H. Young, International Harvester Co., Chicago.

April 10. H. C. Davis, Assistant Treasurer of Wagner Electric Co. and Dr. R. S. Vitt, Coroner, substituted for Mr. R. M. Little, Director of the Safety Institute of America, New York City, who did not arrive in time to deliver his lecture on "Conservation of Man Power."

May 22. The Missouri Workmen's Compensation Act and Its Application—H. C. Davis, Assistant Treasurer, Wagner Electric Co., St. Louis.

MOTION PICTURES

The Council purchased a moving picture machine and the film "The Outlaw". It has been shown in plants of members all over the district and has proven of material value in the work.

SPEAKERS BUREAU

The Division maintains a bureau of speakers in charge of Dr. E. George Payne, Superintendent of the Harris Teachers College which furnishes speakers for clubs and organizations. A good many addresses were delivered by this bureau to organizations, especially before Parents' and Teachers' Associations. The service of the secretary was also freely rendered for addresses on safety topics before assemblies of workmen and superintendents as well as other bodies.

PUBLIC SAFETY

At the beginning of March a systematic campaign was begun toward the furtherance of Public Safety, under the chairmanship of Mr. A. T. Morey and with the following Sub-Committees: Vigilance; Street Cars; Statistics; Complaints; Playgrounds; Automobile and Legislation; Schools; Bulletins and Publicity; Police.

The Public Safety Committee inaugurated regular monthly meetings in the form of a dinner at which questions pertaining to Public Safety are taken up successfully. These assemblies have assumed the character of a civic institution of St. Louis and are attended by not only the members of the Central Mississippi Valley Division interested in safety, but by the heads of financial, mercantile, transportation, and civic interests of our city. We have had present at these meetings members of the Board of Police Commissioners, heads of our educational institutions, Chief of Police and his staff, the judges of our courts, prosecuting and circuit attorneys, etc. Under the cooperation of this committee the laws and regulations affecting traffic and other phases of public safety have been promoted, and great results have been obtained. The enforcement of a one-hour parking ordinance in our city which reduced the number of automobiles parked in the congested district by over 50 per cent and thereby facilitated traffic very materially, while reducing the chance of accident, is directly traceable to the work of this committee, as is the establishment of the whistle signal system by the traffic police. The cooperation of the civic authorities of St. Louis is whole-hearted and we can safely say that these authorities have been made into safety enthusiasts. Astonishing results are being obtained by means of the Vigilance Committee which is composed of a number of the best business men of St. Louis and the purpose of which is to report violators of traffic rules to the City Bureau of Complaints which diplomatically calls the alleged offenses to the attention of the offenders and is very successful in getting offenders to promise more careful handling of vehicles in the future, while at the same time establishing a record which could be used in proving to automobile drivers repeating previous offenses that it is inadvertent carelessness on their part which makes them transgressors. So far there has been no occasion to use this record in court. One of the judges of our city courts stated that since his tenure of office in April, he has only had one repeater brought before him.

The Daily Press of St. Louis has been tied into the work of the Public

Safety Committee in a very gratifying manner. All the papers giving a great deal of publicity to the work of the Division.

RESULTS

From figures obtained from the Coroner's Office the number of inquests held in the city of St. Louis for the first eight months of 1918 was 1140—For the same period of 1919 this number had decreased to 1010, a decrease of $11\frac{4}{10}$ per cent. For the same period the automobile deaths in 1918 were 61 and in 1919—51, a decrease in number of 10, and, in percentage of $16\frac{4}{10}$ per cent—This in spite of an increase in automobiles from 23,000 to 41,000, or 78 per cent. Industrial fatalities decreased from 110 for the year 1917 to 46 in the year of 1918, a decrease of 58 per cent. and according to the statement of the Coroner's Office present figures indicate a further decrease in the neighborhood of 20 per cent.

SCHOOL SAFETY

With the assistance of the Home Office, Dr. E. George Payne, Principal of the Harris Teachers College compiled a syllabus on safety to be taught in the curriculum of all the schools in St. Louis.

On June 15, Mr. Carl L. Smith assumed his new duties as Public Safety Field Secretary of the National Safety Council and Mr. M. L. Fellmer was appointed Secretary of the Central Mississippi Valley Division to succeed him.

PROJECTED ACTIVITIES FOR 1919-20

School for Safety Supervisors consisting of the following sixteen lectures, one General Review and Experience Meeting, and four Round-Table discussions:

November 28—Safety and the Manager, the Importance of His Support and How to Get It

December 5—Safeguards

December 12—Shop Lighting

December 19—Reaching the Foreman—What He Can Do to Promote Safety

January 2—Bulletin Board

January 9—Workmen's Inspection Committees

January 16—Head and Eye Protection

January 23—Plant Sanitation

January 30—Layout of Buildings and Machinery

February 6—Fire Protection in Relation to Safety

February 13—Electrical Hazards

February 20—First Aid

February 27—The Movement for Better Industrial Relations, Its Development and Significance

March 5—The New Employee—Instruction in Safety, Physical Examination, Continuity of Employment

March 12—The Foreign-born American

March 19—Qualifications of a Safety Engineer—His Duties and Opportunities

SCHOOL FOR SUPERINTENDENTS AND FOREMEN

In accordance with the plan of the National Safety Council there will be a School for Superintendents and Foremen consisting of ten lectures, as follows:

1. Handling Men (a general lecture on foremanship)
2. The Foreman's Place in Accident Prevention (including introductory statement of the safety movement as a whole)
3. Design and Construction of Safeguards
4. Plant Sanitation—Arrangement, Order, Lighting, Sanitation
5. Educating the Workmen (including bulletin boards and instruction of new employees)
6. Workmen's Inspection Committees
7. Eye Protection and Safe Clothing
8. Electrical Hazards
9. First Aid
10. General Review and Experience Meeting

MANAGERS' MEETINGS

We are projecting four or five meetings of the same high character as held during last year. The details of the subjects and speakers have not as yet been decided.

SCHOOL FOR CHAUFFEURS

Under the auspices of the Public Safety Committee, a School for Chauffeurs will be established, at which the following six lectures will be given by competent speakers:

1. Rules of the road—parking regulations and traffic rules
2. Mechanical hazards and efficient driving
3. Hazards of the streets
4. Accidents, statistics and reports
5. Safe operation of automobiles and trucks
6. Qualifications of a safe and competent chauffeur

The project is to give to members of the Chauffeur's Class a diploma similar to the one given to graduates of the Safety Supervisors Class of 1919.

STATISTICAL BUREAU

Plans are being perfected whereby all public accidents will be reported to the office of the Secretary and there statistically tabulated as to causes and circumstances. Industrial accidents, at least as far as they produce fatalities, will be treated in like manner.

BULLETIN BOARDS

The Public Safety Committee will endeavor to establish bulletin boards in all public garages and gasoline filling stations in the city and providing suitable bulletins through the National Safety Council.

Eighth Safety Congress

BUDGET

The activities planned call for a total budget of approximately \$14,000 for the year 1919-1920 to be equally divided between the Industrial and Public Safety sections.

CHICAGO SAFETY COUNCIL

HARVEY G. ELLERD, PRESIDENT
Armour & Company, Union Stock Yards
CHARLES H. DAVIS, SECRETARY
Commonwealth Edison Company

The program of meetings was delayed several weeks because of the "Flu" epidemic. All of the meetings except the first were joint safety dinner meetings with the Illinois Manufacturers' Association. The chairman for each meeting was appointed by the joint body. The Executive Committee held regular meetings, each member taking an active part.

The general meetings held during the year follow:

November 27, 1918. Meeting called to order by President Fred M. Rosseland. Report of Nominative Committee received and the following officers unanimously elected to serve until June, 1920:

President: H. G. Ellerd, Armour & Company; Vice President: H. L. Krum, International Harvester Co.; Secretary: C. H. Davis, Commonwealth Edison Co.; Treasurer: T. E. Barker, Miehle P. P. & Mfg. Co.; Executive Committee: the Officers and W. E. Worth, Chicago Tunnel Company; H. M. Webber, Chicago Telephone Company; F. M. Rosseland, National Safety Council. The meeting was then turned over to the chairman of the meeting, H. L. Krum, who introduced the speaker of the evening, F. A. Carlisle, Manager, Friedlander Brady Knitting Mills. Mr. Carlisle gave a very interesting talk on the important subject "Women in Industry." A detailed discussion followed the address, during which Mr. Carlisle answered many questions.

January 29, 1919. "Reconstruction Plans Based on War Time Experience," Chairman William Beye. "From the Standpoint of the Employee," by John Walker, President, Illinois Federation of Labor. "From the Standpoint of the Employer," by H. F. Perkins, Division Manager, International Harvester Company.

February 26, 1919. "State Fund Insurance," Chairman, President H. G. Ellerd. "Objections and Defects of State Insurance," by R. T. Caldwell, of Dysard and Caldwell, Attorneys, Ashland, Ky. "Destructive Tendencies in America Today," by M. T. McKee, Secretary, National Council of Insurance Federations, Detroit, Michigan. The discussion of this subject was exceedingly interesting. Mr. Caldwell's address was printed in pamphlet form and Mr. McKee's speech was printed in "Manufacturers' News."

March 26, 1919. "Working Condition Service, U. S. Department of Labor," Chairman, A. H. Young. "The Scope, Function, and Purpose of this New Governmental Agency," by Grant Hamilton, Director General. "Division of Labor Administration," by W. M. Leiserson, Ph. D., Chief of Divisions. Mr. Leiserson made a big hit with his straight-forward statement of the fundamental truths of Industrial Relations.

April 15, 1919. "Industrial Surgery," Chairman, Doctor L. P. Kuhn. "Fifteen Functions of Industrial Surgery," by Dr. Loyal Shoudy, Chief Surgeon, Bethlehem Steel Company. "The Present Deficiency of Surgical Treatments and After Treatments of Accidents," by Dr. P. B. Magnusson, Medical Director, Industrial Commission of Illinois.

May 7, 1919. "A Get Together Dinner Meeting," Chairman W. E. Worth. "Entertainment During the Dinner," by Daw and Russell, Entertainers, and Quartette of the Commonwealth Edison Choral Society. "What Is Our Job?" by R. C. Richards, Chairman Central Safety Committee, Chicago & Northwestern Railroad. Motion Pictures: "The Outlaw" (Courtesy, Liberty Mutual Insurance Company); "Fit to Fight" (Courtesy, U. S. Public Health Service); "Careless America," (Courtesy, Universal Film Mfg. Company); "Experience Meetings," 4:30 P. M. "Advertising Safety to Your Men," Chairman, H. L. Krum. "Proper Treatment of Advertising Matter," P. A. Power, Advertising Manager, Benjamin Electric Company. Mr. Power pointed out the advantages of placing stress on treating subjects from the positive, rather than the negative viewpoint, because of the psychological effect obtained. General discussion followed.

The attendance at each meeting averaging about 300 (attendance at one meeting was 700), clearly indicated that the subjects considered were timely and important. During the Spring efforts were started to bring about a better financial condition which would enable the Council to employ a paid safety engineer secretary. Progress was necessarily slow, but it is believed that financial arrangements will be completed this fall.

Tentative plans were made by the Executive Committee to hold a series of district safety meetings but labor conditions seemed to render such meetings impracticable and they were postponed until a later date.

Much of the success of the work during the year was due to the personal work of Executive Committeeman, W. E. Worth (who is also Chairman of the Industrial Relations Committee of the Illinois Manufacturers' Association), and of the Chairman of our Program Committee, A. H. Young.

The Safety Banner, inaugurated by the Chicago Safety Council in 1917, was continued throughout the year. It is acknowledged to be a valuable means of informing members of safety dinner meetings, items of local interest, and as a desirable medium of communication between the Executive Committee and the Membership.

DETROIT SAFETY COUNCIL

J. H. GOLDIE, PRESIDENT

Cadillac Motor Car Company

H. T. BARNES, SECRETARY-TREASURER

Lincoln Motor Car Company

The Detroit Local Council held but one meeting during the Fall of 1918, due largely to the influenza epidemic. The subject discussed was

We are the dead. Short days ago
We lived, felt dawn, saw sunset glow,
Loved and were loved, and now we lie
In Flanders' fields.

Take up our quarrel with the foe.
To you from failing hands we throw
The torch; be yours to hold it high.
If ye break faith with us who die
We shall not sleep, though poppies grow
In Flanders' fields.

There is an old hymn, that wonderful hymn of ours—The Battle Hymn of the Republic. The last line of that hymn "As He died to make men holy, let us die to make men free," I want to paraphrase for the benefit of this little talk that I am trying to make to you: Let us remember that as our men fought and died across the seas to insure the liberty and freedom the founders of our government established, let us live to make their children and their children's children safe. (Prolonged Applause.)

THE TOASTMASTER: Mr. Richards, in thus closing the formal part of the program for this evening, I am sure that all of these ladies and gentlemen desire me to tell you that we not only know, as you have said, that we have a principle that is right, but that we have leadership which is right, and we will follow you every step of the way. (Prolonged Applause.)

"Coöperative Accident Prevention." A most interesting talk was made by Mr. John A. Oartel of the Carnegie Steel Company.

At the annual meeting, January 15, 1919, the following officers were elected: President, J. H. Goldie, Cadillac Motor Car Company; Vice-President, J. M. Eaton, Lincoln Motor Company; Vice-President, C. G. Axtmann, Detroit Insurance Agency; Secretary-Treasurer, H. T. Barnes, Lincoln Motor Company; Program Committee, R. A. Shaw, Ford Motor Company; Membership Committee, E. F. Lingemann, Hudson Motor Car Company.

The February meeting was the best attended dinner meeting ever held by the Council, 228 persons being present. The subject was "Dangerous Practices" and Mr. R. M. Little of the American Museum of Safety was the principal speaker.

The subject of the March meeting was "The Value of Uniform Accident Records," and the Employment Managers' Club was invited to attend. It was suggested that a joint committee be appointed to investigate the value of including an employee's accident record with his employment record. After due consideration the committee felt that such a plan was not advisable at this time.

No meeting was held in April, but on May 16, a meeting was called to discuss plans for assisting in the Public Safety Campaign which the Detroit Police Department and the Detroit Automobile Club were to hold during the month beginning May 20. Much credit is due Mr. George Walters, Secretary of the Police Department, Mr. Charles T. Bush of the Detroit Automobile Club, and Mr. F. E. Morris, Field Secretary of the National Safety Council for their untiring efforts in behalf of the campaign. There is no question as to the success of the campaign but it is felt that an even greater result would have been obtained had the campaign been held to one or two weeks rather than a month.

Plans for securing a permanent secretary for the Detroit Safety Council were discussed during the campaign and it is hoped that definite action may be taken this Fall.

EAST CHICAGO SAFETY COUNCIL

J. C. SMITH, PRESIDENT
Inland Steel Company, Indiana Harbor, Ind.

E. O. M. REDDIN, SECRETARY
Hubbard Steel Foundry Company, East Chicago, Ind.

November 7, 1918. Safety Engineers' meeting. Mr. W. F. Grebe spoke on "Accident Prevention." Attendance, 10.

December 12, 1918. Workmen's meeting. Mr. S. J. Williams spoke on "Accident Prevention." Moving pictures were shown. Attendance, 95.

February 6, 1919. Workmen's meeting. Mr. Arthur H. Young spoke on "Workmen and the Safety Movement." Moving pictures were shown. Mr. James Johnston, Scotch comedian, in monologue, songs, and dances, and music by the East Chicago High School Orchestra.

EAST ST. LOUIS SAFETY COUNCIL

D. E. PARSONS, PRESIDENT

D. C. SMITH, SECRETARY

Safety Engineer, Aluminum Ore Co.

Things accomplished by the Council during the past year, for the city of East St. Louis, are as follows: Fifteen plant men have been attending the Safety Council in St. Louis during the past winter; coöperation has been effected with the executive committee of St. Louis, financially and otherwise; we have placed in the public schools of this city books on Safety, and have secured the coöperation of all principals in the teaching of Safety to the children, much along the lines followed by Dr. Payne in St. Louis; attractive bulletin boards have been maintained in all schools and public garages, filling stations, etc.; a selection of bulletins has been sent to the various places; considerable work has been done along fire prevention lines through posters and through work in the various plants; monthly meetings have been held, where various plant problems have been discussed, and, at our last meeting on Friday, September 26, a special committee was appointed to meet with some of the city executives for the purpose of interesting the public in this work.

We were late in getting started this year, on account of the activities in St. Louis, and most of our finances and individual work went to that side of the river. Much that takes place in St. Louis along the Safety line is naturally carried to the East side of the river.

ERIE SAFETY COUNCIL

O. G. HITCHCOCK, PRESIDENT

Hayes Mfg. Co., Erie, Pa.

M. C. GOODSPEED, SECRETARY-TREASURER

General Electric Co., Erie, Pa.

The work of the Erie Local Council for the past year has been in the main a following up of the work done in previous years. Practically no new work of any kind was attempted. Meetings were held each month during the winter season which were fairly well attended. Two of these meetings took the form of inspection trips in local plants with a very much increased attendance. The discussion and program, however, at these meetings had to be very limited.

One public meeting was arranged, the speaker of the evening being Mr. R. M. Little, of New York.

The Executive Committee is trying to hold a rally directly following the annual meeting of the National Safety Council, at which time reports of the Cleveland meeting will be given and an attempt made to line up the membership for better work during the coming year.

Eighth Safety Congress

LEHIGH VALLEY SAFETY COUNCIL

MORRIS FORTUIN, PRESIDENT
 Pennsylvania Cement Co.

J. R. MULLIGAN, SECRETARY-TREASURER
 Bethlehem Steel Co.

The fiscal year ending June 30, 1919, was the most successful experienced by Lehigh Valley Local Council since its inception five years ago. Despite the fact that monthly meetings were discontinued during the fore part of the fiscal year due to war productional activities on the part of the membership, the resumption of the monthly meetings beginning with the Annual Public Meeting in December and continuing through the six month period ending in May, showed the membership enthusiastic and intensely interested in the work.

Lehigh Valley Local Council has banded together in its membership over sixty industries in the Lehigh Valley, represented by 103 individual memberships. The attendance at our monthly meetings during the latter half of the fiscal year was never below 90 per cent of our membership, which showed a lively interest in the subjects discussed.

December, 1918—Bethlehem, Pa.. "Rehabilitation of Injured Men."

January, 1919—Easton, Pa.. "Accident Prevention."

February, 1919—Allentown, Pa.. "Importance of Uniform Accident Statistics."

March, 1919—Bethlehem, Pa.. "Importance of Safety Committees in Accident Prevention Work."

April, 1919—Nazareth, Pa.. "Provisions of the Revised Compensation Law."

May, 1919—Easton, Pa., "Industrial Morale."

NORTHEASTERN OHIO SAFETY COUNCIL

S. W. TENER, PRESIDENT
 American Steel and Wire Company, Cleveland, Ohio

A. H. LINTZ, SECRETARY
 Cleveland Chamber of Commerce

The activities of the Northeastern Ohio Division have been somewhat limited since the report rendered last year until the appointment of the permanent secretary the latter part of April, this year. The inactivity of the members last year, naturally, was due to so many important officers being called to the assistance of our Government during the great War. During 1918 new officers were elected to further the work in view of securing the services of a permanent secretary.

The permanent secretary took up his duties on April 23, 1919, at which time he immediately assisted in formulating a complete new executive committee. The committees elected on May 16 to handle new local

matters were as follows: Annual Congress, Oscar McNab; Boy Scouts, John K. Doan; Churches, Rev. E. R. Wright; Clubs and Organizations, Fred H. Caley; Districts, C. E. Pettibone; Education and Schools, G. A. Green; Entertainment, L. B. Bacon; Finance, A. C. Brown; Fire Hazards, M. R. Marshall; Industrial Relations, E. L. Brady; Inspection, Safety Codes and Safeguards, H. L. Weeks; Membership, B. W. Nutt; Plant Organizations, O. J. Lewis; Program, Thomas Stanion; Public Utilities, W. F. Weh; Public Safety, F. E. Waite; Publicity, R. M. Wheeler; Safety Week, T. B. Howe; Sanitation and Health, Dr. H. L. Davis; Speakers' Bureau, W. R. Carson; Workmen's Compensation, A. L. McKee.

Active work on the Annual Congress and Safety Week was started about July, 1919. From this time on, the time of the secretary and the executive committee was occupied in making ready the latter preparations.

A School for Safety Supervisors, comprising fifteen lessons, was conducted, starting on March 31, with one lesson a week. There were 137 students who completed this course and were graduated on July 7. The entire program for the graduation exercises was unique in that the arrangements for the evening were all taken care of by a committee which was elected by the class. The main address of the evening was delivered by Mr. C. W. Price on "The New Ethics of Business." The enthusiasm displayed at the graduation exercises, which were held in the form of a banquet, can well be appreciated when you learn that there were 125 present, notwithstanding that there was a street car strike on in Cleveland at the time.

The class has since been called together by the class officers to be told of the plans for the Annual Congress and Safety Week, and the same enthusiasm was prevalent at this meeting, and many volunteered to serve on the Local Reception Committee during the Congress.

The secretary, in conjunction with Mr. Thomas Stanion, Chairman of the Program Committee, and the district committees, conducted three very successful foremen's rallies, with an excellent program, uniquely arranged, and had very good crowds at each.

The Local Council held two monthly meetings for plant executives during May and June. The first of these meetings was addressed by Mr. R. M. Little, Director of Safety Institute of America, New York City, on "Forethought vs. Afterthought in Safety." The other was addressed by Mr. C. B. Auel, Director of Processes and Standards, Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa., on "Safety and Industrial Relations." A very large attendance was present at both of these meetings and proved to us that our prospects for meetings of this nature in the future are good, and it is evident we will have good crowds. We hope to proceed with these meetings on the average of one every two or three months during the winter.

The secretary has also given moving picture Safety shows and talks to foremen and safety committeemen at about fifteen plants.

It being necessary to start work in connection with the Annual Congress and Safety Week about the last of July, all other local activities were set aside with the exception of this work.

The Public Safety organization for the City of Cleveland has been completed, and the Mayor of the City has personally named and written to various influential men to serve on the respective Safety Committees.

OMAHA SAFETY COUNCIL

H. A. JOHNSON, PRESIDENT
Omaha Gas Company

E. E. JUDD, SECRETARY-TREASURER
American Smelting and Refining Company

The Council has had one Foremen's Banquet, has held four meetings at various places throughout the city, and has taken in 13 new members.

PHILADELPHIA SAFETY COUNCIL

H. B. HARMER, PRESIDENT
JOHN P. MUDD, SECRETARY-TREASURER

The Local Section opened its program for the year of 1918-19 with a very successful meeting at its headquarters, the Engineers' Club, in Philadelphia.

Dr. Francis D. Patterson, Chief, Division of Hygiene, Department of Labor and Industry, who is well known in both National and Local Council circles, addressed the November meeting on the subject of "Reconstruction and Rehabilitation." A great deal of the text of Dr. Patterson's paper has since been published in magazines, newspapers, and publications of the state of Pennsylvania.

The second meeting was held in December. The subject for discussion was "The Woman in Industry." Introduction was made by Mr. J. J. Coffey, Supervising Inspector, Department of Labor and Industry. A very interesting discussion followed, in which representatives from very nearly all the large manufacturing concerns of Philadelphia participated. In general, the discussion was topical in form and considered the following phases of the subject:

1. Laws governing her employment
2. Moral protection
3. Physical comfort
4. Safety

Prior to each meeting of the Safety Council, an informal dinner is held in the dining room of the Engineers' Club. Through the courtesy of various members of the Local Council, music is furnished. The societies affiliated with the Engineers' Club have purchased a piano, which is used on these occasions. Needless to say, a splendid spirit of good fellowship prevails at these informal dinners and many subjects other than safety enter into the discussion. Sometimes near the close of the dinner, the strictly routine business of the Council is gone over and finished so as to give the entire evening to the paper and discussion.

Mr. J. F. Conner, of the United Gas Improvement Company, gave an excellent lecture, entitled "Dangerous Practice," at the February meeting. His talk was profusely illustrated with lantern slides. At this same meeting, Capt. Matthew J. Shields, Field Representative of the American Red Cross, talked on "First Aid and Sanitation."

At the March meeting, Mr. Harry A. Mackey, Chairman of the Interstate Compensation Board for Pennsylvania, presented a paper, entitled, "Three Years' Administration of the Pennsylvania Workmen's Compensation Act." As the manufacturers at large were interested in a revision of the current act, Mr. Mackey's talk proved to be of the most vital interest.

Mr. Arthur Sellers, Chief Deputy of the Coroner's office in Philadelphia, at one of the meetings gave an informal talk on "Industrial Accidents in Philadelphia".

A special feature of the meeting in the Spring was the demonstration of the various safety devices. Such articles as goggles, protective face masks, leggings, and machinery guards have been shown at the meetings.

Mr. L. A. DeBlois, Safety Engineer, E. I. du Pont de Nemours & Company, Wilmington, Del., spoke at one of the meetings on general safety matters. The very large attendance which marked this and several previous meetings showed the increasing appreciation of the Local Section by the manufacturers of Philadelphia.

"Accident Reporting and Recording" was the title of a paper given by F. S. Crum, Assistant Statistician of the Prudential Insurance Company of America. This meeting concluded the activities for 1918-19.

SEATTLE SAFETY COUNCIL

B. W. SAWYER, PRESIDENT, AND CHAIRMAN PUBLICITY COMMITTEE
Brace and Hergert Mill Company

T. H. BOYD, SECRETARY, AND CHAIRMAN MEMBERSHIP COMMITTEE
Safety Engineer, 948 Henry Building.

Since our last annual report, the Seattle Safety Council has continued to conduct a vigorous Safety Campaign in the establishment of its members. Active safety committee work and lectures to the employees have been constantly maintained in each plant, periodical safety meetings and banquets have been provided, with a large attendance from each firm, with the result that our activities in the direction of accident prevention have been kept alive and constantly before both employer and employee.

We now have enrolled, a membership representing approximately 5,000 employees in the lumber, shingle, sash, door, box, and metal trades industries in Seattle and immediate vicinity with a bright prospect of a very material increase at an early date.

The Seattle Safety Council was created by a group of local employers in January, 1918, following which, application for charter was made to and favorably acted upon by the National Safety Council.

The Executive Committee selected Mr. T. H. Boyd, Chief Claim Adjuster and Investigator of the State Industrial Insurance Commission of Wash-

ington, as its Safety Engineer, to organize and operate the same. Immediately an intensive Accident Prevention Campaign was inaugurated and since the above mentioned date, we have devised and installed 1,564 safeguards of various designs, all of which was in addition to the requirements of the State Factory Inspection, to which each of our plants was subject. As a result, accidents in our member establishments were actually reduced 50 per cent plus during the first year's operation, while our statistics for the current year indicate a most gratifying condition and a still further reduction. This statement is endorsed by the State Industrial Insurance Commission of Washington.

The safety engineers of the various chartered Safety Councils in this State, realizing the necessity for a movement sufficiently broad in scope and with proper police power to cover all industries in the State included in the forty-eight different classifications of industry and coming within the purview of the Workmen's Compensation Act, and having in mind the particular need of a carefully drawn and equitable merit and demerit rating system, more than a year prior to the convening of the last session of the legislature, drew up the fundamental principles and framework and had drafted into legal form for presentation to the Legislature, a bill which resulted in the present state safety law, creating the State Safety Board. This is considered one of the most finished and up-to-date pieces of industrial legislation ever placed upon the statute books of any state and wonderful results are predicted from its application and enforcement.

Subjoined are the present officers of this Council:

President. B. W. Sawyer. Brace & Hergert Mill Co.; Vice-President, H. C. Hilke, Seattle Cedar Lbr. Mfg. Co.; Treasurer, E. T. Verd, Bryant Lumber Co.; Secretary, T. H. Boyd, Seattle Safety Council; Executive Committee: Alvin Schwager, Schwager & Nettleton Lbr. Co.; Wm. A. Whitman, West Waterway Lumber Co.; F. F. Hopkins, Seattle Boiler Works; Chairman Program and Education Committee, A. D. Cross, O. B. Williams Co.; Chairman Public Safety Committee, W. A. Steigleder, Bolcom-Canal Lbr. Co.; Safety Engineer, T. H. Boyd, Seattle Safety Council.

WATERBURY SAFETY COUNCIL

R. S. SPERRY, PRESIDENT
Scovill Manufacturing Company

B. J. HINE, SECRETARY-TREASURER
Scovill Manufacturing Company

The activities of the Waterbury Safety Council may be briefly summarized for the year ending July 31, 1919, as follows:

A business meeting for members was held December 20, 1918, at which the following officers were elected:

President, Roger S. Sperry; Vice-President Ex-officio, W. H. Sandland, Mayor; Vice-President, Whitman W. Bowers; Secretary-Treasurer, Burton J. Hine.

A complete executive committee as well as chairmen of the various committees were also elected:

Plans for the work to be carried out were discussed and arrangements for financing the Local Council made by voting to add 10 per cent assessment to the membership dues of all members.

A meeting for superintendents and foremen was held January 30, 1919, with an attendance of about one thousand. A program consisting of speaking, moving pictures, and singing proved very successful.

A general public safety meeting was held February 27, 1919, at which about one hundred and fifty were present. An excellent program of speaking, lantern slides, and singing was carried out.

A meeting for all employees, including foremen, was held April 24, 1919, about 250 attending. Two subjects, "The Neglect of Slight Accidents in Factories" and "Goggles and Their Uses in Safeguarding the Workman" were covered by the speakers, illustrated with photographs. Music was furnished, and moving pictures shown.

An open air meeting for the general public was held May 23, 1919, in the evening, about eighteen hundred attending. Two good speakers covered the subject of "General Public Safety" after which moving pictures were shown. Music was furnished by the Chase Companies Band.

Exhibits included a lineman receiving a shock, simulated by flashlight powder, at the top of a pole, and being lowered down, afterwards receiving first-aid treatment. Also, of a man being struck by a trolley car, who was also carried to the platform for first-aid treatment.

Interest in the Local Council has been stimulated during the year through the efforts of the Chairman of our Publicity Committee in connection with the various meetings, and with the increasing of our publicity work we are expecting to increase our membership. During the year, an important membership, that of the City of Waterbury, has been secured.

Great credit is due to those who have served on the committees during the year in making the meetings so successful. Our council having been in existence but a short time, the work of the committees demands considerable time and effort which have been cheerfully given.

WORCESTER COUNTY SAFETY COUNCIL

J. F. TINSLEY, PRESIDENT

Vice-Pres. & Gen'l Mgr. Crompton and Knowles Loom Works.
Worcester, Mass.

H. L. ROBINSON, SECRETARY-TREASURER

Manager Employment Service Department.
Crompton & Knowles Loom Works, Worcester, Mass.

Our regular Fall meetings were resumed in October, 1918, at which meeting we had Mr. John Higgins, at that time President of the New England Safety Council, in which he spoke of the necessity for each local

Council working out its own plans under the supervision of the National Safety Council the same way the local draft boards handle their work under the Provost Marshal Organization.

Since then, regular monthly luncheon meetings have been held on the first Monday of each month, at one of the local hotels, and these meetings have averaged between twenty-five and thirty members at each meeting.

One of our general meetings was held at Fitchburg, following which a trip was taken through the plant of the Simonds Manufacturing Company, where many interesting things were observed in the manufacture of saws.

The last meeting of the season was held on a lake at Webster, where we had a shore dinner and general good time. Previous to the meeting, a trip was taken to the plant of the S. Slater & Sons, Inc.

It was planned to have such trips during each year, in order that the members may become better acquainted and to lighten up the serious sides of accident prevention.

In order that every one could get the most good out of the local Council, we organized a round-table group to make a study of definite types of hazards. Each group has a chairman and hold meetings once a month, reporting the results of these meetings at the general meetings. The groups are divided as follows:

1. Eye and Safe Clothing Section
2. Machine Tool Section
3. Wood-working Section
4. Power Transmission and Electrical Hazards
5. Foundry Section.
6. Construction Section

By having these various sections, we get away from generalities and each member can attend the groups in which he is interested.

We have also formed the Consulting Engineers' Committee, who may be called on by any interested concern in Worcester County for advice of any kind on safety, and who are prepared to make an inspection for any concern and recommend guards wherever necessary.

Several of our members have had evening safety meetings for their own employees, with very satisfactory results, the attendance of some of them having been as large as five hundred.

The Local Council itself, held a Foremen's Safety meeting during the Winter, at which Mr. R. M. Little gave a very interesting address.

Our plans for the coming season are to collect accident data from each of the concerns every month and to compile this data, returning to them a comparison of their own lost time accidents with the average for the whole county. We consider that this will enable us to have some definite figures to show prospective members, and will also cause a little competition among our members to decrease their accidents below the average.

On the whole, the activities of the Worcester County Local are well on the way toward making an alive Council and a benefit to all the members and to the community.

Safety Bulletin Luncheon

ROUND-TABLE DISCUSSION

Friday, October 3, 1919

FRED M. ROSSELAND, Chairman
Safety Engineer, National Safety Council, Chicago

THIS luncheon round-table meeting was arranged for the purpose of discussing some of the essential features of a good safety bulletin, and suggesting improvements in the bulletin service of the National Safety Council. About 100 delegates attended. The discussion was spirited and interesting, and was limited in its extent only by the necessity of adjourning to avoid conflict with the general session in the afternoon.

SIZE OF BULLETINS

The Chairman described the Council's present practice of issuing, in the general series, one large bulletin (17 by 22 inches) every alternate week, and on the other weeks three small bulletins (8½ by 11 inches), with an occasional double-size bulletin (11 by 17 inches) where necessary. The sectional bulletins are practically all of the small size.

In the discussion which followed, it was generally agreed that bulletins of different sizes are desirable because they help to prevent the bulletin board from looking always the same. When a vote was taken, it appeared that two of the men present were limited to small bulletin boards which would take only the small-size bulletin. One other expressed his dissatisfaction with receiving a large bulletin every two weeks. All the others present indicated their approval of the present policy.

TEXT VS. ILLUSTRATIONS

This, the Chairman stated, is a never-ending question. The Council endeavors to use illustrations as much as possible, but a certain amount of text seems to be necessary, and in some cases quite a little text is needed to make the bulletin intelligible. It is very seldom that the Council issues a bulletin consisting entirely of text, and in such cases the number of words is as few as possible.

In the discussion of this matter, several speakers remarked that, in spite of what the Chairman had said, they thought many of the Coun-

cil's bulletins still contained too much text. Such a bulletin does not command attention unless it is signed by the company. It is all right for a company to issue typewritten or printed bulletins consisting largely or entirely of text, over its own name; but National Safety Council bulletins, which cannot be signed by the company, must consist almost entirely of illustrations in order to hold the attention of the workmen. A series of pictures is better than an explanation in words.

The Health bulletins in particular should be illustrated wherever possible, rather than consisting entirely of text, as they now do in most cases.

The meeting voted almost unanimously that the amount of text on National Safety Council bulletins should be still further decreased below the present practice.

GREWSOME BULLETINS

The Chairman stated that every little while the Council receives a criticism from some member on the grewsome bulletins which are issued occasionally. To such a criticism the Council always replies that while such bulletins are admitted to be unsuitable for posting in a department where there is no great hazard and where only women are employed, and perhaps likewise in some other departments, most of our membership find an occasional bulletin of this sort very helpful and we therefore continue to issue them.

One member present stated that he had made a special effort to ascertain the opinion of the workmen themselves, on this matter. In 126 shops which he visited he received an unfavorable comment in only thirteen cases.

Other speakers agreed that bulletins of this type, if properly prepared and issued not too often, are a powerful means of attracting the attention of workmen who are not moved by any other sort of appeal. The meeting expressed its agreement with this view of the matter.

HUMOROUS OR CARTOON BULLETINS

The Council has received some criticism, the Chairman said, because of the occasional humorous or cartoon bulletins that have been issued recently. It is said that Safety is a serious subject which should be treated in a serious manner.

In this discussion it appeared that some of those present agreed with the criticism just mentioned. Others, however, emphasized the fact that the average man will look at a cartoon where he will not look at anything else: bulletins of this type attract attention and add variety to the bulletin board. When a vote was taken, a large majority of those present favored a continuation of the Council's present practice of issuing occasionally—not too often—a bulletin of this type, provided always that the bulletin is so designed that it will not appear to ridicule or make light of the Safety idea.

A, B, C Session

October 2, 1919

PHILIP STREMMEL, Chairman

Superintendent, Hot Mills, National Enameling and Stamping Company,
Granite City, Ill.

CHAIRMAN STREMMEL: I attribute largely our success of the school for Safety Supervisors in St. Louis last year (which you all know was the largest class in the United States) to the fact that we started promptly at the stated time and finished, irrespective of how interesting the meeting was, at the closing time. We never permitted ourselves to go a minute over the time. What was the result? The men knew what to expect. The men knew that we would start on time and they were there, and they knew they would get out on time, and therefore we never permitted our meetings to drag, and they were full of life.

As you know, this is an A, B, C session, and it is primarily for safety engineers and safety supervisors. To my mind the safety engineer and the safety inspector are the two vital men for safety in the plant. And so I am glad to see this splendid representation of men here this morning who have come to listen to men who have had experience along these various lines. It now gives me pleasure to introduce to you Mr. C. B. Hayward.

MR. HAYWARD: In taking up this subject I want to have you note particularly that it is the essentials of the safety organization and not the details that this talk is going to cover.

THE ESSENTIALS OF A SAFETY ORGANIZATION

C. B. HAYWARD, DISTRICT SAFETY MANAGER, LIBERTY MUTUAL INSURANCE
COMPANY, PHILADELPHIA, PA.

When it comes to laying out and putting into action for practical operation, an organization the purpose of which is the reduction of accidents through the elimination of existing hazards, and the bettering of working conditions, in a plant, the problem involves executive, adminis-

trative, and practical ability, not different from that shown in other productive channels. The development of this work and the efforts called forth in this specific phase of Industrial Relations, provide an interest and an outlet for the energies of every man following this branch of engineering science. It is taken for granted that he has had the proper training for understanding the possibilities of this industrial necessity.

INITIATIVE, TRAINING, AND GOOD JUDGMENT REQUIRED

The same quality of initiative, training, and good sense or judgment are required in the handling of a Safety Organization as in any of the various other departments of a plant. The directing of safety activities, making it a result-getter, is no soft job. The fruits of your labor are absolutely what you make them, and hard work only will bring you success. Safety Engineering is most important to the industry that employs you, and calls for the best in man if the best results are to be obtained.

Hence, in presenting this subject before you, let me have your attention to this one fact: Safety work is a man-sized job and the essentials mean much or little according to whether or not you intend to carry the activity to a successful finish. Know your work—keep your fingers on the details—keep in touch with what others are doing in other plants—watch the opportunities and make use of them to keep the work interesting and impressive.

THREE ELEMENTS

There are three elements in the essentials of a safety organization which are distinctive in that they are simple and basic in their scope. They form the very foundation of our plan and are not only necessary in the commencement but are still more important in the continuation of its existence. They are elements of support, analysis, and action.

THE ELEMENT OF SUPPORT

The successful operation of safety work in any sized plant hinges upon its director or keeper. I repeat for your benefit this last statement: The proper functioning of safety engineering activities centers around the man who is its responsible head. You who are here today are, to all intents and purposes, the men whom fate has ordained to carry out this work, making it an asset in your respective plants, and the element of support, the faith and backing you require, may mean more than you realize. Let us, therefore, analyze what the safety engineer needs in the way of support before we go into the details of carrying on the organization.

Official Recognition. First, there should be no doubt about which side of the fence the general manager or head of the plant is playing. He should feel the responsibility of its success and be an absolute believer in and follower of safe practices. Furthermore it must be known throughout the factory that the highest official supports the new movement in all sincerity.

Foremen. Second, the foremen or men in charge of men should be let known by their words and actions that safety is considered by them as

part of their duty to the employees as well as to the employer. The support in this game against chance is of vital importance to the outcome of the issue.

Employers. Third, the support of the employees must be obtained and maintained through practical and common-sense methods. They will not lean to scientific, theoretical, dreaming practices put to them in a complex manner. Sound judgment with simplicity will reach and keep them.

The first item of these three is most essential to safety organization and must be secured by the one who is to do the organizing before the work is started. The other two can and should be obtained soon afterward. I once heard one of the foremost safety men in the country state that once a plant had the first two of these elements of support within its walls, it had its safety organization. Experience has proven that there is a completed truth in this statement and it will be vouchsafed for by any safety engineer who has been through the mill and won his spurs.

THE ELEMENT OF ANALYSIS

Taking up the next step in the development of this general plan the element of analysis should be in sequence of importance. The details of the work resulting from an analysis of the efforts to be applied in various lines, make it simple to understand where the energies of the organization are expended. In other words, this answers the question. Of what shall our work consist? It might be said in a general visualizing statement it covers three fundamental and vitally important phases of activity: Supervision, plant inspection, and safety education. These three subdivisions are in reality the product of our safety department and are applicable to any size of plant whether there be 50 employees or 5,000 employees within its jurisdiction.

Supervision. The first item mentioned, that of supervision, may be carried on by a general committee comprised of only a few persons in positions of authority and meeting once a month, or may be superintended by a safety engineer and a corps of assistants who work under the guidance of a general committee. The personnel of this supervisory board and the time given to the work at hand should be determined by the size of the industry, the hazard of the operations and the number of employees. Comparison with industries of similar size and commodity for the market, which have had some experience with safe practices, is also a deciding factor in making this activity of economic value to your company.

Plant Inspection. Considering the second subdivision, inspection of the plant, and referring to supervision methods just mentioned, it is not difficult to see that the same range of operation is also possible under inspection. From weekly or periodical inspection in the smallest industry, the work may be broadened to daily and constant scrutinizing of working conditions by a full time safety engineering department in the larger plants. It is necessary in either case to make a study of accidents that have happened, learn their causes and locations, assist in

construction of guards, etc. These are the details that proportionately require a greater amount of time as the size of the plant increases.

Safety Education. In taking up item number three of the analysis, the safety education of employees, it should be understood that in the actual work done by the safety organization this item is the most important of the activities. Because most accidents are due to carelessness, the great problem rests with the instruction of employees in safe practices. The details of this work should be regulated to the size of the industry as in supervision and inspection. I might take the time to go over all these details but it is not necessary. The main thing to remember is that this safety education is an important essential in the organization.

THE ELEMENT OF ACTION

The element of action is the third and final essential of my outline on the requirements of a successful safety organization. It might be called sincerity of operation. It might be described as carrying out the details to a finish. If you intend to put a safety organization into action, make it a real part of the plant's existence. This element has that bearing upon the whole plan of making it a live activity or a dead issue. The vim, pep, or whatever you wish to call energy, that is shown by the general manager, the safety committee, and the safety engineer must be of such stable quality that interest never lags and the work never gets stale. The incentive to make your plant an ideal one in which to work and one where accidents are not known, should exist ten years from now as well as at the present moment.

CONCLUSION

In conclusion, the main fact I wish to emphasize for your attention is that this presentation of the subject before you is simple in its fundamentals and inclusive in its outline. The essentials are what you need and what you at this time should understand. It is unnecessary to enter into details for you can cover these through reference to safe practice standards in use throughout the country. You can get much of this information from other discussions at this very congress. The object of this discourse is to present to you facts that deal with the building up of a successful safety organization—facts that are self evident and clearly defined. Support you must have; analysis is the basis of engineering; and action is red blooded American determination.

CHAIRMAN STREMMER: I think we all agree with the speaker in the closing words of his paper. I will now call upon the second speaker on the program. Mr. Fellmer, the Secretary of the Mississippi Valley Division of the National Safety Council, who will speak to us on "The Foreman—The Determining Factor." I am very sorry to say that Mr. Morris is ill and cannot be with us. He wrote me a letter a week ago and said "I am looking forward to my trip to Cleveland when we shall see each other eye to eye." We have had Mr. Morris at our plant on a number of occasions to speak to our foremen and to our safety committee.

THE FOREMAN—THE DETERMINING FACTOR

M. L. FELLNER, SECRETARY, CENTRAL MISSISSIPPI VALLEY DIVISION,
NATIONAL SAFETY COUNCIL, ST. LOUIS

The foreman is the keystone of the arch of safety in an industrial plant.

Let's first see what a foreman is. A foreman has been placed in his position because he knows the work to be done in his department, from the practical side. That is one requirement. The second one is that he has been placed in this position because a superior officer in the organization of the plant realizes that he is a man who can teach others to do the particular work to be done in that department. In olden times a foreman was a man who was running around—the old English term is an "over-seer". That term implies a man who watches the other man perform his duties—a sort of a prodder, to keep them going. And also in the times of an abundant labor supply the foreman was given a great deal of leeway in the manner of handling the men, and he very often handled them very much more forcibly than elegantly. He very often handled them by kicking them around and kicking them out at his own sweet pleasure. These times have fortunately passed and the foreman is now an entirely different rock in the structure of safety. The best term that I have heard applied to the job of foreman was applied by the United States Shipping Board during the war. They called their foremen "leaders", and that is what a foreman really ought to be. He ought to be the leader of his department. He ought to lead his men, not drive them. That brings us to the point of a foreman being the making or unmaking of a safety campaign.

In one of our Round-tables in the Central Mississippi Valley Division in St. Louis, a young foreman got up, after it had been impressed upon the foremen present just how necessary it was for the foreman to instruct new men in his department in the specific dangers of their occupation—the young man got up and stated that he had not done so in the case of a supposedly experienced operator of a certain machine. He had put him to work because the man claimed that he was experienced on that intricate machine, and when the foreman returned to look after the new man he found him with his hand practically severed, by reason of a hazard which was peculiar to that machine and with which this otherwise experienced workman was not familiar. This foreman then declared that thereafter he would never be too busy to instruct a new man in the particular dangers of his job.

FOREMAN MUST WATCH NEW EMPLOYEES

If you were to see a graphic analysis of the accidents of any large concern, as to causes, places in the plant, hours of the day, and term of service of the men involved, you would find that your line representing men in the employ of the company during the first month is the longest of all. This is quite reasonable. When a man comes into a plant, he

isn't always of the highest mentality and he is more or less bewildered. He is over-timid, and the first thing he knows he gets hurt.

Then my studies of the frequency of accidents in plants prove that after the first month you will find a downward curve in the number of injuries happening to new employees, until the first effect of the hurt gets worn off. Then a fellow becomes familiar with his surroundings, familiar with his work, and by about the twelfth or thirteenth month of his employment the curve gradually begins to increase again. It is a strange thing, but in several analyses that I have made of the accident records of large concerns, I find just that to be a fact.

That increase of the curve is strictly attributable to the foreman. It is strictly a lack of supervision on the part of the foreman that brings this about. The foreman has a thousand and one reasons to be continually supervising his men in the execution of their duties, but the one reason that very seldom is brought out to the foreman is a rather selfish reason. The foreman, as far as the department and its output are concerned, is the employer of laborers under him. They are directly amenable to his direction. The efficiency of a foreman and his gang is gauged by the cost of production in that department, and the cost of production is affected by the cost of accidents. So, from a selfish standpoint, if the foreman keeps down the cost of accidents in his department, he naturally proves to his employer that he is an efficient man because his cost of production is correspondingly low.

A foreman who does not pay attention to safety is simply standing in his own light. When a foreman employs a man, or a man is sent to the foreman for employment, no matter how experienced the man is in the work for which he is employed, he has to be taught to do the work of that particular plant in the particular way of that plant in a manner profitable to that plant. Only then is he a valued employee. Then it devolves upon the foreman to take every new man and break him in to do his work in his way in a manner profitable to the plant or department. If he omits safety in the primary education of that man, and the man is hurt, he has to go through the same proceeding again and break in another man. This increases the cost of production.

SAFETY AND EFFICIENCY

Now there is another thing: If a foreman does pay due attention to the safety work, the men very soon will think that he is really concerned about their physical welfare while at work, and they will feel free to come to him and offer their suggestions as to the betterment of conditions in the department, and it will bring about a better feeling of understanding and confidence between the foreman and his direct charges; and by and by when safety begins to permeate that little subdivision of the plant, the foreman will find that these men will caution each other against dangers and will produce a very favorable record of accidents. And again, the foreman having brought about that state of affairs in his department, will be free to devote more time to the actual production of his department, thereby further increasing his efficiency

and putting himself into line of promotion. So those are the selfish reasons for the foreman to put his shoulder to the wheel and make safety an actuality in his department.

Unless a foreman does just these few things, unless he is able to command the respect and the confidence of his men toward the safety organization, you may have the biggest prizes, you may have anything that you can schedule, and your safety organization is going to be a fluke. The foreman, as our esteemed Chairman has said, is the "keyman" of the situation. He is the man about whom the entire organization of any plant revolves, though his position in the organization may be a subordinate one. By reason of his direct contact with the men and his position as a transmitter of the wishes of the men to the management, he stands right at the keystone of the arch. He is the keyman. If you take him out of any organization, your organization is bound to fall in efficiency and in safety.

CHAIRMAN STREMMEL: There is no doubt about it, gentlemen, the foreman is the determining factor. The foreman today fills the most important position in the plant. Why? Because he is the personal representative of the management. He is the salesman who is selling the ideas of the institution to the men. The men have a conception of the institution to the extent that the foreman imparts the knowledge of the same to them, and therefore there is no question but that the foreman is the determining factor in any manufacturing establishment. It gives me great pleasure to introduce the next speaker, a man who was one of our lecturers last year in our school of Safety Supervisors in St. Louis, a man who gave us a very interesting message, Mr. W. R. Rasmussen.

METHODS OF PROMOTING SAFETY EDUCATION IN A PLANT

W. R. RASMUSSEN, REGIONAL FIELD SECRETARY, NATIONAL SAFETY COUNCIL

During the year and two months I was in the Pittsburgh District and in the six months that I have been out as Regional Field Secretary for the National Safety Council, I have visited approximately 1,500 plants, and the most surprising thing to me during that year and eight months has been to see how few organizations really get the maximum results from bulletin boards. Why do we put up bulletins? I would ask you this question: Why does a commercial house advertise? I think we have it right there.

You know that practically every large concern, whether large or small, spends a great deal of money for advertising. We can't pick up a daily newspaper, a magazine, or a periodical of any kind but we see some very high class advertising. I attended a meeting of advertising men a short time ago at which one gentleman stated that there were more brains put into the advertising game than any other profession known.

Now if it is good business for the commercial man to advertise—and I think it has been proven that it is—why isn't it good business for the

safety engineer to advertise? You have something to sell. You can't lay your merchandise on the table as the commercial man can, but you can lay your idea on the table—and how are you going to get them across with the great mass? Simply through advertising, and your advertising medium is your bulletin board.

KEEP BULLETIN BOARDS ATTRACTIVE

If you were a commercial man and you expected to derive real benefits from your advertising you wouldn't write a half page advertisement, hand it over to the newspaper, and let them run it indefinitely. You are paying big money for that space and you would want to utilize it and get as many messages across as you possibly could. You would be very careful as to the location of that advertisement. You wouldn't want it in some place where nobody would see it. Why does not the same thing apply in advertising safety in our plant? I met a young man about two weeks ago on the Pacific Coast, and as I walked into his plant I noticed an old dirty wall, full of smoke and grease. There were a lot of old dirty bulletins on the wall. Some of them were torn, and it looked to me as though they had been up there for a year. I said to him, "Why don't you get some real bulletin boards, something that will attract the people?" He replied, "They don't read them anyhow; they don't pay any attention to them. Anyway I am only trying to reach workmen." That was amusing. Could you expect any self-respecting man to go up and read an old, dirty, torn bulletin? When he said that he was only trying to reach the workmen, I wondered whom these high priced advertisements are trying to reach. We are trying to reach the same men.

What is the best method of using bulletin boards? I should say to have a really active bulletin board, something that will appeal to the men. Usually the best color for a bulletin board is our safety color. I would have it painted green on the outside. I would have it glass covered. I would have a light at the top so that it would shine down and the bulletins would stand out. I would have the inside of the board in white, and I would have a removable back so that I could have different material on each bulletin board, which I could take from one to the other and keep on down the line until I had changed them all.

How often should these be changed? I should say at least once a week; oftener if you can, but at least once a week. The reason men don't read bulletins in plants is because they become an old story. There is nothing there that is interesting to them. They have probably read them once, but that is all. The boards have gotten dirty, and the men are used to seeing the same old thing there and hardly know that it is there.

WHAT TO PUT ON BULLETIN BOARDS

What shall we put in the bulletin boards? Of course we all get the National Safety Council bulletins. We want to put them in, but that is not enough. You have got to have something local, something about your own plant interesting to your men—for instance, bad tools that you find. Put them in the bulletin board, and tell the story about where

you found them and what was liable to happen if their use had been continued. Very often you have broken goggles. Put them in the bulletin board and tell the story. Tell whose eye was saved by that pair of goggles.

A short time ago I was in a plant and saw an old, run-down wheelbarrow—as dangerous as anything could be. It was standing underneath the bulletin board and the story was pasted inside of it, where it had been found and all about it. That was the first time I ever saw a wheelbarrow used as a bulletin, but it was mighty good material.

Very often you find an article in the newspapers describing some accident that has occurred in a neighboring plant, or perhaps a plant at some distance, but something that might occur in *your* plant. Paste it on a large sheet of paper and draw an arrow pointing to it and let the men go up and read it.

This kind of bulletin boards is not the only kind. I have found that a great deal of good can be derived from blackboards and chalk. These also must be kept very much alive. You can tell stories of different things that happen in the plant, not only safety but other things that you would like to have the men know. For instance, if a man is sick, ask somebody in that department to go to see him, put his name and address on the board. Put on the board the number of accidents you had the same week a year ago and try to beat the record. If you can't find anything else, there are a lot of safety slogans. Use them—they are good.

WHERE SHOULD THEY BE PLACED?

Where should bulletin boards be placed? There is another thing that a great many organizations get away from. I have seen more bulletin boards at the front gate than anywhere else. They put them there, and when a man is going out or coming in he is usually in a hurry to get to his work or to get home, consequently he never sees what is on that bulletin board, unless it is something that can be seen at a glance. I would say, place the bulletin board right where he is working. True, he does not read it every time he passes there, but every time he looks up it is a reminder. These men don't get hurt on purpose. They get hurt because they forget, and if you have that bulletin where, whenever they look up, they will see it, it will remind them to be careful.

I find an honor roll a very good thing. Start the first of the year and put up the names of all the departments in the plant with a sign something like this, "These departments have gone so far this year without an accident." When they have an accident draw a black line through the name of that department, not heavy enough so that you can't tell what department it is, to show that it is a disgrace, that they have had an accident. You will be surprised how hard those men will work to keep their department on the honor roll.

In getting men to wear goggles I have found this a good illustration to them. Take two glass eyes and put them on a small bulletin board, with a pair of goggles, and this slogan, "Which would you rather wear—these or these?"

THE "DIRTIEST PLACE" SIGN

Every organization has more or less trouble in keeping the plant clean. I believe the best method that has been tried is a sign about twelve feet long, about one foot wide, stood up on two horses with these words on it, "This is the dirtiest place in the plant." Whenever you find a dirty place, have the sign put there, but it isn't the safety engineer's job to put it there. (Laughter.) Have a committee, which will be appointed through one of your Safety Committees, and call it the "Dirty Plant Committee," or some similar name. You can occasionally go around and tell them about some dirty place that you saw, but let them place the sign because you don't want to get in bad.

The whole proposition of bulletin boards is to keep up the men's interest. It isn't only the bulletins that you put on the bulletin board, but it is various ideas that you can get hold of that will get enthusiasm into the men. For instance, I saw this used, hung right over the front gate as the men went into the plant, "We have gone so many days without an accident." The number of days was changed each morning. If they forgot to change the number of days there would be somebody in the Safety Office asking them what had happened.

Another thing is a big target at the front gate, with rings around, each ring representing an accident. A block of wood painted red is a good color because that designates danger. If you have one accident put it in ring No. 1. If you have two, put it in ring No. 2 so that the men can see that somebody got hurt. The men want to know all about it, and the secret of your success is to get the men talking about it.

In getting out a bulletin to the foremen this has been a good method. Take all the foremen in your plant and make a list of them, then the number of men each foreman has, the number of hours those men have worked, the number of accidents each one has had, the number of days' loss each one has had and the percentage of lost time. Put the best man on top and the poorest man down at the bottom. Hand one of those to the foreman every month. Let him see where he stands and you will be surprised to see how the man at the bottom will get up to the top next month. That shows whether the foreman can prevent accidents or not.

I think you have an idea of bulletin boards—that it is advertising, advertising safety in your plants. Get the best methods that you can possibly think of, put it on the basis of advertising, and I am sure you will get it across.

CHAIRMAN STREMMEL: The statement made by our speaker that more brains are put into advertising than any other line of business was a remarkable statement to me, and it proves to me that we are living in an age when education is the foreword, and we realize more and more as we go along the value of education. Those who are leading the forces of unrest today have realized that for some time and they have used it to a great advantage in the form of propaganda, education, and that is what the safety movement has to be largely a matter of education, a matter of advertising.

It again gives me great pleasure to introduce our next speaker who was also one of our lecturers before our school last winter at St. Louis. This speaker gave us the closing message of our school year, and it was agreed by all who attended our school that he was the speaker of the season. It gives me great pleasure to introduce to you Mr. John A. Oartel.

WORKMEN'S INSPECTION COMMITTEES

JOHN A. OARTEL, CHIEF, SAFETY BUREAU, CARNEGIE STEEL COMPANY,
PITTSBURGH, PA.

In discussing the subject of Workmen's Inspection Committees, I shall treat it under two heads—"The Man" and "The Job." We hear a great deal today about selecting the man for the job. Why not do so in our safety work, which surely ranks in importance with any work that is being carried on in the world today? What type of man should we have to serve on workmen's inspection committees?

THE MAN

Intelligent men. In using the words "intelligent men," I do not mean men with the training of the schools or anything of that nature. I mean men who are at least fairly familiar with the safety work, with the process or operation which they are called on to inspect, and with the hazards incident to that operation or process. A mistake that has been made in the past has been that we have not lined up men with the big idea of safety. I have known men in the mill in the old days—steel blowers, open hearth melters, and rollers—who absolutely refused to impart any information along their particular line to a beginner. They feared if they did so that after a time the beginner would learn all about the process and they themselves might be displaced. They were afraid of their jobs. If I were called upon to appoint workmen's inspection committees, the very first thing I should do would be to call the committee together in a meeting and impress upon them the bigness of their job. I should get the best safety enthusiasts I could, lined up to come and talk to them—men like C. W. Price, R. M. Little, and A. H. Young. I should have that speaker tell them that they are about to engage in a mighty big undertaking, no less a task than the saving of human life. The next thing I should do would be to instruct these committees thoroughly in all the hazards pertaining to the particular operations of their department. How do we go about it now, in most cases? A letter is sent from the office to the foreman appointing John Smith, Tom Jones, and Sam Brown, on the Workmen's Inspection Committee for the next six months. Is it any wonder that their work is slipshod and ineffectual?

Men of good common sense. Under this heading I want to include a number of qualities which I have not the time to discuss in detail. They should be men of tact and discernment and should understand human nature. They should have the courage of their convictions, as

they may sometimes be called upon to take issue with those in authority. They should be men of likable dispositions and broad sympathies, who have the power to draw out other men. They should also be of a mechanical turn of mind, if possible, as they may sometimes be called upon to devise safeguards where they are needed. In this short summary, you may think that I have perhaps set the ideal too high—that the type of man I have described does not exist in the ranks of Industry. If you should make that statement, it would be only partly true. As long as we do not set up high ideals that call for the best there is in a man, just so long will our work and attainments be mediocre and we shall fail to accomplish deep and lasting results.

THE JOB

The work of inspection committees, in my opinion, should follow two general lines, namely, inspection for mechanical hazards and for dangerous practices.

Mechanical hazards. The safety movement has already borne much fruit in the way of engineering revision, but perfection has not yet been attained, and a great many accidents are still caused by improper construction and lack of safeguards. We cannot hope to expect much suggestion in engineering improvement from the workmen's inspection committees, unless such glaring conditions exist that they should be apparent to everyone. We can, however, expect much from inspection committees in the way of correcting dangerous processes that do not require the services of a trained engineer. Some of the best safeguards that I have ever seen and that have by their installation protected certain very hazardous processes have been devised and developed by ordinary workmen. If we take our workmen entirely into our confidence they will surely come along with suggestions for safeguarding that will be beneficial alike to employer and employee.

Dangerous practices. We learn from our study of accident statistics that accidents occur to new men in the ratio of six to one. Here then is work for the inspection committees. I do not desire to intimate that the entire instruction of new employees in Safety should be left to the inspection committee. Not at all. That is the foreman's duty. The foreman who today does not take every new employee, or delegate the duty to someone else who is trustworthy—the foreman who fails to instruct every new employee in the hazards of his position, is no longer fit to be foreman. He may be good at getting out production, but unless he conserves the lives and limbs of his workmen he is a liability instead of an asset to his company. I think, however after the foreman has done his full duty to the new employee in the way of instruction, there still remains a great deal that can be done by the workmen's inspection committee. What more efficient work, what nobler work, can be done by the workmen's inspection committee, I ask you, than to prevent the accident? This can be done very effectively by the committee taking charge of the new man and "mothering" him for a certain length of time until he learns the job thoroughly and is familiar with every hazard and

dangerous practice. I would like to see a demonstration of this plan in a plant that has a high accident rate. In a plant of this nature, the committee would take charge and watch the new employee so closely that he could not make a false move of any kind. If this could be done, I am sure it would result in a reduction of accidents.

When we have done our duty to the new employee, our work is only partly done. There still remains the old timer, who because of his familiarity with the process, becomes careless and thoughtless. I have known men of this type who disregard all safety rules. They are a law unto themselves. They persist in taking a chance. They perform their work in a way that results in accidents to themselves and their fellow workmen. They generally do this in the absence of the foreman. He does not hear of it until an accident has occurred. There is a certain hesitancy on the part of all workmen in reporting practices of this nature to the foreman, but a practice like this if persisted in will undermine and wreck everything that has been done in safety education in that particular shop. Here is your proposition—whether to allow a man of this type to run wild and wreck your entire organization or to report him to headquarters as you would a man who is running wild on the streets shooting up the town. Workmen's inspection committees may solve some of these problems by reporting such men to the foreman or superintendent. By advice—by admonition—by even holding a man up to ridicule before his fellow workmen, a man who engages in dangerous practices may be made to see the error of his ways and turned from them.

I shall now outline briefly some of the ways in which some of the large companies carry on the work of their workmen's inspection committees.

CAMBERIA STEEL COMPANY

"In our plant we have nineteen safety committees composed of three men each, and their instructions are to make a thorough inspection of their department at least once a month and send us a written report. Their duties in addition to this consist of making an investigation of all serious accidents and spreading the safety spirit throughout their department all the time. After each committee makes its report we have an inspector go out from our office, look up the various items, and have orders placed at once to have them rectified. In some cases items found have already been ordered.

"These committees change every two months and consist of foremen and sub-foremen as a rule. Some of them do splendid work, but as you know, we cannot always pick just the kind of men we would like to have in this work. These men are chosen and appointed by their own superintendents who notify us of their appointments. At the close of this two months' period we award a \$10.00 prize to each committeeman whose department accident percentage shows improvement over the previous twelve months. The committee having the highest average improvement are awarded a grand prize of \$20.00 each. We find this cash award a great incentive for our men to carry on their safety work."

AMERICAN STEEL AND WIRE COMPANY

"The workmen's inspection committees that we have been using in our plants in the past are known as Mill Safety Committees, and are composed entirely of rank and file workmen. The committee generally consists of three members, who serve from one to three months, one man being kept on from the previous month to act as chairman of the committee. Members of these committees are chosen by their respective foremen, the Chairman of the Permanent Committee designating the foremen who are to appoint a member of the committee each month. These men are picked from the better class of workmen, those who are wide awake and familiar with the operations of the plant. The membership is not restricted to English speaking workmen, however, at least one foreign-speaking workman being placed on each committee.

"This committee makes an inspection of the plant once a week, and renders a report to the Chairman of the Permanent Safety Committee. These men are encouraged to observe and report any unsafe practices, as well as hazardous places and defective equipment.

"Each member of the Mill Committee is given a safety button when he is placed on the committee, which he is permitted to keep after he has been discharged from the active committee. This button indicates that he has served on the committee, and when he is discharged from the active committee, he is instructed to consider himself still a member of the safety committee and to do all in his power to promote safety in the mill.

"We have found these committees to be a very valuable asset in our safety work, and have received many useful suggestions from them.

"We are at the present time changing our organization and substituting departmental committees for the mill safety committee. There will be one of these committees to each department of the mill. The committee consists of the shop or department head as chairman, and from three to five workmen. The membership of this committee should represent, in so far as practicable, the various occupations in the department. The chairman should be permanent, but there should be a rotation of the remainder of the membership, the service of each member covering not more than three months.

"It is the chief duty of these committees to make safer and better working conditions for the employees in their department.

"They make a study of the general conditions, departmental and occupational hazards and practices, and endeavor to encourage the cooperation of other workmen in reporting promptly for correction any existing unsafe conditions, practices, or hazards through which personal injury may result.

"These committees meet at least monthly with their chairman, for the purpose of making a formal inspection of the department, or inter-department inspections, review accidents, suggest remedies, physical or operating, and they render a full report of the meeting with their recommendations to the Chairman of the General Safety Committee."

BETHLEHEM STEEL COMPANY

"The safety committee organization comprises four divisions or classes, three of these divisions being composed of qualified Safety Committeemen.

"1. *The Permanent Safety Committeeman*—One in each department, who has charge of all first aid and safety committee work there, and is responsible for first aid equipment, safety bulletin boards, and the distribution of safety literature throughout his department. He makes written reports of accident investigations in his shop. He is under the supervision of the Division Safety Inspector, and is compensated at the rate of \$5 per month, for the detailed attention he gives this work in addition to his regular shop duties.

"2. *The Departmental Teams*—Taking a course in First Aid and Accident Prevention, and who qualify for this work by completing the course with the Annual First Aid Meet.

"3. *The Active Safety Committeemen*—This group assumes their duties upon completion of the course, and serve for one year, or until the next First Aid Meet. In company with the permanent safety committeeman they make an inspection of the shop once a month.

"4. *The General Safety Committeemen* (Once a Committeeman, always a Committeeman)—Those who have served for one year as active committeemen. This group are the auxiliaries of the active committees, but do not make the monthly inspection of the departments.

"*Instruction of Safety Committeemen and Training in Accident Prevention*—You cannot qualify a man for Safety Committee work over night, safety committeemen are not born that way. A man may be naturally careful and prevent accidents to himself, but he must be trained in accident prevention if we expect him to look out for the other fellow. Neither can we expect long service in the shop to qualify a man for accident prevention work. Very often he has grown so familiar with the danger that he does not see it for himself, much less point it out to his fellow worker. Men must be trained to see the causes of accidents and near accidents in order to prevent them. Such training must come from a detailed study of the unsafe practices and hazards of a particular department. Safe practices covering the various operations are dwelt upon. Departmental accident statistics and accident investigation reports are used. Photographs and prints showing accident causes, help in the work. Current literature is quoted on the subject under discussion, and interchange of ideas encouraged. Much stress is placed upon the attitude and spirit of the committeemen in approaching a fellow worker on accident prevention work, realizing that accident prevention through education is a persuasive proposition rather than a command. A part of each first aid instruction period is devoted to this work.

"*Safety Committee Activities*—The safety committee organization is the natural agency for all human relations work in the plant, and the effectiveness of this organization can be largely measured by the degree to which it participates in plant human relation activities. The recent Liberty Loan Campaign in the Bethlehem plants, and in the subsidiary

plants of the Bethlehem Steel Corporation, was conducted by the Safety and Welfare Department. Twelve hundred of the fifteen hundred sellers at Bethlehem were members of the safety organization.

"Night school education, athletics, recreational centers, the injured, the sick, the unfortunate, all plant activities of the human element are within the realm of the safety organization. If the problem of the employer and employee is to be solved finally, the solution should naturally come through the medium of such a democratic organization trained to be considerate and helpful to the other.

"A study of the accident statistics at Bethlehem covering the last three years of the unorganized accident prevention period, 1911-12-13, as compared with results of organized work covering the period, 1914-15-16, shows an Accident reduction as follows:

Lost eyes	33.65 per cent
Amputations	41.5 per cent
Fatal	10 per cent
Average reduction for all causes.....	23.38 per cent

"This reduction despite the fact that accident causes were many times increased due to War productional activities."

CARNEGIE STEEL COMPANY

In our own company, we have inspection and safety committees composed of both foremen and workmen. At each plant there is a general or central safety committee, composed of department superintendents and assistant department superintendents. The superintendent of the plant, or his assistant, is chairman of this committee. In each department, there is a committee composed of the foremen of the departments. The department superintendent or his assistant, is chairman of this committee. In each section of the department, is a committee composed of workmen, with the foreman as chairman. The committees composed of superintendents and foremen are permanent; those of workmen serving for a period of six months. The duties of the workmen's committees are to have jurisdiction over the section in which they are employed. They are required to inspect for both mechanical hazards and dangerous practices. There is a very close connection and cooperation running through the entire membership of these organizations. The matters discussed by the general safety committee of the plant are handed down to and discussed by the department committees, and by them, to the workmen's committees. All recommendations from the workmen's committees are referred to the department committee, and if necessary, to the general safety committee of the plant for approval. We find that this system of safety organization gives good results. The superintendents and foremen form the backbone of the organization. They assume the responsibility, outline all policies, and direct the work. The workmen have their part in inspecting and looking after their own little corner.

How thoroughly should a plant be organized? Some statistics that I have gathered along this line may be interesting. I have found that a

comparison of eleven plants of the same company showed that the plant that had the most men on safety committees in proportion to the force, had the best accident record. The proportion ranged from one safety man to every thirteen employees, to one safety man to every one hundred seventy-three employees. The plant having one safety man to every thirteen employees has maintained the best safety record in the company for four years. The other plant is near the bottom of the list. You may draw your own conclusions. To sum it all up, the same things that bring success in any field of endeavor will bring success in accident prevention. These things are—organization, leadership, energy, tact and last but not least, good horse sense.

CHAIRMAN STREMMER: I want to say a word about the man who just read this most interesting paper. It shows what the safety game will do for a man when he once becomes interested in it. Mr. Oartel today is Director of Safety for the Carnegie Steel Company which employs something like 50,000 men. This man entered this plant, as I understand it, became interested in safety, and in order that he might know more about it and come in close contact with it, accepted a position at a reduced salary (he being a married man with a family) in order to get his start in the safety game, and today he is holding a very responsible position. It shows what the safety movement is doing for many, many men. I could tell you this morning a number of cases where young men have gone into safety work because they were interested and had a vision of the possibilities of it, and today have gone out holding responsible positions in various industries at splendid salaries.

For instance, one young man five years ago was a time-keeper in one of the steel plants working at \$65 a month. Today he is holding a responsible position in the safety field, receiving \$4,000 a year and traveling expenses. So there are any number of men whom I could tell you about, just like this one individual, who have had a vision of the possibilities of this safety work, who are giving it their time, thought, and attention, and are going into the work and are making a success of it.

Now it gives me pleasure to introduce the next speaker, who was also one of our lecturers in our school last year and gave us a most interesting message at that time.—Mr. Sidney J. Williams.

THE FUNDAMENTAL PRINCIPLES OF SAFEGUARDING

SIDNEY J. WILLIAMS, SECRETARY AND CHIEF ENGINEER, NATIONAL SAFETY COUNCIL, CHICAGO

The first half of our subject is—what shall I guard? The second half is—how shall I guard it?

If you want your plant to be 100 per cent safe, the answer to the first question is—guard every moving part, wherever located, on which a workman might be injured if he came in contact with it in any way or from any cause whatsoever. If the moving part is in a place "where nobody ever goes," remember that some one is likely to go there sooner or later, in connection with the repair or maintenance or alteration of the ma-

chinery itself or of the building, or for some other reason which you cannot anticipate. You probably have heard the classic story—a perfectly true story—of the man whose heel was cut off by an unguarded gear 14 inches below the ceiling. The man was standing on a scaffold, working on another shaft nearby; to brace himself he placed his foot against the shaft on which the unguarded gear was located, his foot slipped, and was caught in the gear. Many similar examples could be quoted of accidents occurring in out-of-the-way places. Recognizing this fact, the Illinois Steel Company rule book—to mention only one example—requires that all gears, wherever located, must be enclosed.

You may be puzzled by attempting to apply this principle to the guarding of overhead shafting and belts. Many shops contain miles of overhead shafting which it is almost a physical impossibility to guard. On the other hand, oilers and repairmen are frequently injured, sometimes fatally, on unguarded overhead shafting or belts. The only solution is, if the shafting positively cannot be guarded, to prohibit absolutely any work on such overhead transmission while it is in motion. Repair work, shortening of belts, etc., can be done during the noon hour or at night: oiling likewise—or better still, install automatic oilers, or oilers which can be filled from the floor by using a special oil can with a long spout. For details, see the National Safety Council's Safe Practices pamphlet on this subject.

A gear or belt or other dangerous moving part which happens to be located below a table, or in some other place where it is partially hidden, is not thereby made safe. Someone occasionally must reach under the table to sweep or repair the floor, or to oil or repair the machine. Someone may slip or stumble so that his arm comes in contact with a gear or belt which would be safe for the workman standing in his normal position. The immigrant totally ignorant of machinery—and it is hard for us to realize the completeness of the ignorance on this subject, on the part of foreigners brought up in farming districts—may deliberately put his hand or his finger into an opening that looks interesting, just to see what it is. If he finds that "it" is an unguarded gear, it is easy to say that the accident is his own fault—but that does not relieve our obligation to pay his compensation nor does it restore him to his vacant place in the gang.

What I have said of gears and belts applies equally well to any moving part on which a man might be injured—counterweights, cranks, reciprocating parts such as a planer bed, and so on; also, of course, to the operating point of machines.

CHARACTERISTICS OF AN EFFICIENT GUARD

The second half of the problem is—as already stated—"How shall I guard it?" Here are a few points to remember:

1—A safeguard should be so designed and constructed that it will prevent ALL accidents on the part guarded—not only accidents to the operator while at his regular work, but also to the operator or passers-by in case they slip or fall or carelessly touch the machine.

2—The guard should not interfere with production. If it does, it is liable to be taken off. In designing a guard it is generally wise to consult the man who will use it.

3—In general, the guard should be attached to the machine and not to the floor; if attached to the floor, use a connection which will interfere as little as possible with sweeping.

4—The guarded part must be easily accessible for oiling, inspection, and repair. The door or removable section provided for this purpose should be hinged or otherwise attached to the remainder of the guard, or to the machine. If not, it is likely to be left off permanently.

5—The guard should not interfere with cleaning and sweeping around the machine. It should, therefore, be kept generally about six inches above the floor.

6—The guard should be strong enough to resist injury and keep its shape. A light, flimsy guard soon becomes bent and is discarded. A substantial guard is cheaper in the end.

7—Incombustible guards are preferred. Wooden sockets, soaked in oil, may become a serious fire hazard. Metal guards are neater and wear much better. "Metal guards look as if you wanted to; wooden guards look as if you had to." Guards may be made of cast iron, sheet metal, wire mesh, expanded or perforated metal, or slats. Where subjected to acid or fumes, wooden guards may be necessary.

8—It is desirable to interlock the guard with the operating mechanism, where possible, so the machine cannot be operated unless the guard is in place.

9—A safeguard can often be so designed that it will also serve to prevent wear on the parts guarded—for example, a solid gear enclosure.

Let us consider the application of these suggestions to the design of gear guards. Cast iron guards are preferred because they may be made to fit more snugly, present a better appearance, and protect the gears from dust and injury. In shops having similar gears on several machines, the cost of patterns and cast iron guards will be no greater than the cost of "built-up" guards. A cast guard of one machine may be used as a pattern for making guards for similar machines.

Guards for a variety of machines, and in many sizes, may be more cheaply made of sheet metal. In large guards, an angle iron is used to make the joint between the flat sides and the curved part of the guard. In smaller guards this joint may be made by cutting projections (like saw teeth) on each side piece and bending these over to form a smooth curve. The joint may then be made either by spot welding or by riveting. Short pieces of angle iron may also be used to form the joint—about $\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$ -inch angles, one inch long, 3 inches or 4 inches apart.

Gears should be completely encased; or where this is impracticable, should have a band guard with side flanges extending inward beyond the root of the teeth. If there is a spoke hazard, the gear should be completely enclosed, or filled in between the spokes.

Belts, flywheels, shafting, and large gears are often guarded by an openwork, rather than a solid enclosure. Such guards should be so de-

the efficiency of the operator. The real safety engineer will, where necessary, study the operation of a machine until he understands it as well or better than the operator himself—as well as the foreman, the superintendent, the master mechanic; and then he will apply their brains and his own in working out either a guard, or a change in the machine, or a change in the operation, which will remove the underlying hazard and make the operation intrinsically safe.

DISCUSSION

CHAIRMAN STREMMEL: Now we have five minutes for discussion on each subject presented this morning. We will start with subject No. 1. "The Essentials of a Safety Organization."

RULE BOOKS

MR. ROBINSON (California & Hawaii Sugar Refining Co.): Is a book of rules desirable for every organization? We have about 1,500 employees. Probably about fifty per cent are foreign born. I would like to know if it is a good policy to try to introduce a book of rules for every employee, necessitating the printing of that book of rules in different languages?

MR. McDONALD (E. I. du Pont de Nemours & Co.): We cover that subject in this fashion, sir. We make a study of our particular department, find its particular hazard. We then go ahead and perfect what we term "House Rules," governing that house operation. That is done through our various plant operations and we have found it very successful. When a new man comes into our organization, he is instructed by the foreman in the hazards of his occupation along the lines mapped out in these safety rules.

MR. A. L. THOMPSON (E. I. du Pont de Nemours & Co.): I would like to add to what has been said about safety rules. It has been the practice of many concerns to get too many rules in the book. The fewer rules you have for house rules, the better it will be. A man never reads a long list, but if you will make those rules just as short and snappy and few as possible, you will get better results.

CHAIRMAN STREMMEL: Are there any companies represented here today who offer a reward of any sort to any employee who memorizes the book of rules on safety?

MR. THOMPSON: I don't know whether any of the Illinois Steel Company men are here or not, but they had a practice when I was with them some years ago that the men had to stand an examination on the safety rules, and after they stood the examination they were given a watch fob designating that they knew the rules.

CHAIRMAN STREMMEL: Does anyone present require the members of the Safety Committee to be thoroughly conversant with the book of rules before they are made a member of the Committee?

MR. THOMPSON: I think all of them do. I know the Du Pont Company

does. I wouldn't stand for a man on a Safety Committee who doesn't know the book of rules. As Mr. McDonald has said, we have house rules in the majority of our plants. Our general rules, of course, govern all plants. We specialize on particular house rules in the explosives department and those have to be memorized by the men before they are put on the Safety Committee, otherwise you wouldn't feel that a man was competent to serve on the Committee.

CHAIRMAN STREMMEL: I know many plants where the men do not know the rules. How many just simply ask your foremen to select men and have them appointed to the Safety Committee?

(The attitude of the audience indicated that none of them did this.)

CHAIRMAN STREMMEL: The five minutes are up.

THE FOREMAN—THE DETERMINING FACTOR

CHAIRMAN STREMMEL: Any questions or remarks on this subject? This, to my mind, is the most important subject that you have before you this morning. The foreman or the foreman's organization in any plant can make or break the safety organization to a large extent. Interest your foreman; get them vitally interested in safety, then you have the cooperation of your foremen with your safety committee. If the foremen have an indifferent spirit toward the safety cause, then your safety committee is handicapped in its work within the plant. I know foremen and you know foremen who have stated openly that safety is "all bull," and they haven't been interested in it at all. You know and I know that it has been a very difficult matter to interest the average foreman in safety because when we selected men for the position of foreman in days past we selected a type of man who possessed qualifications different from those which we require of them today. The type of man, whom we select today as a foreman is a different type of man from those we selected in days past. In days past we selected men who, if they could fire a lot of men, were considered good foremen. The more men he could hire and the more he could fire, the more valuable we thought he was to us as a foreman, but that has changed and today it is just the opposite. The foreman who can hire the least men and keep the most men within his plant, who can have the least turnover, is the man whom we want. He must be a leader of men. A leader of men must have certain qualifications, and therefore the standard of efficiency for foremen today is higher than it ever was, simply because he is the dominating factor in your plant. And the efficiency of your plant, the efficiency of your safety movement in your plant, depends largely upon the personnel of your foremen's organization. Therefore he is the determining factor in many respects, not only in safety but in efficiency and many other things. Therefore the question of selecting foremen is one of vital importance to any management today, especially due to the great unrest within our plants, and wise is the management who can select men who are leaders of men and who possess the necessary qualifications.

WHO SHOULD INSTRUCT NEW MEN?

MR. ERIC (Sparks-Withington Co.): In our plant we have a Methods Division and an Efficiency Department. I would like to know what part they should play in the instruction of operators. Our Methods Division studies the operations and efficiency of the machines. Is it advisable to have that department instruct the men as to safety and the use of guards, or to have the foreman do it?

MR. A. L. THOMPSON (E. I. du Pont de Nemours & Co.): I consider that instruction from the foreman is better than from the efficiency man, because the operator works directly under the foreman and not under the efficiency man. The operator does not feel that he is responsible to the efficiency man, where he does feel that he is responsible to the foreman. I have a couple of "areas" in my plant where a new man gets a general idea of his work before he is turned over to the house in which he is working. The foreman in the house where he is working is required to go over the rules with him and instruct him in his work, and a report comes in from the Safety Department that such and such a man has been instructed and by what foreman he has been instructed. We follow that up once in a while by going round and picking that man up and questioning him on the rules and asking him why he does so-and-so and his reasons for it. Then we see what kind of instruction he has received. I think you will find, at least I have found, that the instruction from the foreman is the best.

CHAIRMAN STREMMEL: There is another point: a man to be a foreman in deed and in truth must be well-informed about his job and if he is well-informed about his job and is able to instruct his men in any part of the operating of his department, if, when a man goes to him for any information whatsoever, he is well-informed about his job—it immediately creates confidence within the men who are under this foreman's leadership, and establishes a point of contact that is very valuable from the standpoint of efficiency in that department.

The time is now up and we will pass on to the next subject. "Methods of Promoting Safety Education in a Plant."

WELL PLANNED BULLETIN BOARDS BRING RESULTS

MR. MEACHAM (Goulds Mfg. Co.): It may be of interest to some of our friends here to know what we are doing along bulletin board work which I consider one of the most valuable means of education. When we started with our safety work we had six or eight bulletin boards, large clumsy affairs, strewn about over a great area and lots of the fellows didn't see them. They were too far away from them. About six months ago we had made up some small boards, about eighteen inches wide and two feet long, painted black. We had about twenty-five of them made and put them up in each department, where each man couldn't help but see them, and at the top of each board we put "KEEP YOUR EYES ON THIS BOARD." We kept that sign there for six months. At the end of six

months we put on this slogan, "ALWAYS BE CAREFUL—THE A, B, C OF SAFETY."

We put up in each department on these boards the bulletins that referred to the special hazards of that department. For example: a man in the pattern shop or a man in the shipping room is not particularly interested in a molten metal hazard, but he does want to know about the hazards of his department. Right there let me say that I think that good safety work consists more in telling men about the results of getting hurt rather than the hazards of their department, because nine times out of ten the man knows more about the hazards of his own occupation than you do.

Now with regard to department competition. I have had a little experience in that and it hasn't been altogether to my credit. We employ about eleven or twelve hundred men and we are divided into different departments. We have six plants and I conceived the very fine notion, as I thought, of pitting each department against the other in the matter of accident reduction. I found this, that while the accidents went down, the number of accidents reported decreased, they decreased because the fellows didn't want to report them for fear of spoiling the accident record of their department.

You have got to look out for that. So we immediately started a foremen's competition, based on the number of accidents that the foreman found necessary to send to a physician for treatment, and I think in the light of my present experience that that is about the best way to get at it. If you start this competition business, be careful.

MR. PERRY (Eastman Kodak Company): Another example of bulletin boards will be of interest to you, I feel, in an industry reaching about 11,000 people. Within the last two months our antiquated open bulletin boards of wood have been replaced with a series of steel, glass-faced bulletin boards, illuminated, having the standard removable back. The backs are changed in half of the board, the board being of double construction. The backs are changed every day in one half, and from once to twice a week in the other half. The usual bulletins can be roughly divided into those two classes, messages to put across every day, and messages which it is desired to repeat for two or three days.

These new bulletin boards are getting the messages to the people. Previously they were not reading the bulletins posted on the old boards, which were often torn. But these new boards have bulletins put up in a clear, bright-colored manner. Most of them are printed on a regular printing press. They are attractive and neat, and I think the general idea includes a lot of the brains that the advertising people are claiming. It may be that the safety engineer could utilize some of the advertising man's brains to a lot of advantage because these new bulletin boards are working.

CHAIRMAN STREMMEL: The time is up. We will have to pass on to the next, "Workmen's Inspection Committees." There, to my mind, is a very important subject, not only from the standpoint of safety, but also from the standpoint of efficiency.

MR. CHRISTY (International Harvester Co.): I would like to ask for a little information. Perhaps some of these brothers here can help us out. Do you use a regular form for the use of the Safety Committee?

MR. MEACHAM (Goulds Mfg. Co.): The merit rating board of the State of New York provides a special form to be used for that purpose. There is a form for the safety inspector, there is a form for the various safety committees, and there is a form for the foreman's Committee and the General Committee. Those forms are in use in our plant.

SPECIAL TRAINING FOR SAFETY COMMITTEEMEN

MR. MULLIGAN (Bethlehem Steel Co.): Just a word with reference to the special preparation for men for safety committee work: The Bethlehem Steel Company feels that men must be prepared for safety work, and for that reason has instituted a course which has been carried on now for the fifth year, a course of five months of two hours per week on company time, one hour with the instructor and another hour with rehearsal. The work given in this course is one-half first aid work and the other half accident prevention work. The accident prevention work is based upon at least a four year history of the department from which the particular Committee comes. As a result of this course the Bethlehem Steel Company have particularly trained for safety committee work over a five months' period, four thousand men during the last five years.

This last course just completed last Saturday culminated with the graduating exercises in the form of first aid meetings, with upwards of 1,000 men.

During the time of their preparation they are not regarded as safety committee men because we feel that they are not qualified for the work. After the course is finished they go on as active safety committee men for one year or until the next group is prepared. After serving one year they move over into the General Safety Committee. All of the safety committee men in the shop are led by one man known as the permanent safety committee man whose position does not change and who is paid, for the attention he gives to this work, a bonus of \$5 per month. With the safety committee in the different classes, the permanent committee man who has charge of the work in the shop, the active committee who serve for a period of one year and the general committee—we never lose sight of a man. We believe in the slogan, "Once a committee man, always a committee man."

CHAIRMAN STENMEL: The time is up, Gentlemen. The next subject is "Fundamental Principles of Safeguarding." Here is the opportunity for some of you men who are just starting out in safety engineering and safety inspectors' positions to ask some questions.

GUARDS INCREASE EFFICIENCY

MR. HUGHES (Pacific Gas Co.): I have hardly found a place where a guard reduced or interfered with the efficiency of the machine. With reference to railings, especially on a dam: we find the men cross that dam

much more quickly with a guard rail. They will always hug the rail going along.

MR. COFFIN (Public Safety Commission, Portland, Oregon): I believe that one fundamental, basic problem here in the safeguarding of machines is to commence at the fountain head. The laws of the various states vary in prescribing certain safeguards, but it seems to me that if these various accident and industrial commissions and those who are responsible for safeguarding the plants could get together in a congress and prescribe certain regulations, then they can go before the various manufacturers and safeguard these machines before they are sent out to the various plants throughout the country.

CHAIRMAN STREMMEL: That brings us to our time for closing. I am sure that you will all agree with me that this has been a very interesting session. I am sure that you and I will say that it was "good for us to have been here." I take it that the men who have been in this A, B, C session this morning are men who are safety engineers, safety inspectors, officials or foremen or superintendents in the plants—they are men who are striving to know more about the safety game.

OPPORTUNITIES OF THE SAFETY ENGINEER

I want to say to the safety engineer and the inspector especially this morning these few words: this presents to you the greatest opportunity that you have ever had in your life. If you will study the safety game, if you will enter into the work with enthusiasm, if you will have a vision of its possibilities, I will predict for you, if you will pay the price, that within two or three or four years you will be a bigger man, a better man, a stronger man within the plant where you are employed; you will be in a position to demand a greater remuneration; you will be in a position to fill a more responsible position than you are filling today.

Let me bring home this thought to you. What is the safety movement? It is simply answering in the affirmative the question, "Am I my brother's keeper?" We are our brother's keeper, and let us remember that.

And men, how can you be a friend to man? By putting forth an honest effort in your respective positions as safety engineers and operators, to see that at all times you have safety first, last, and always! The meeting is dismissed.

would require an appropriation on the part of the company you represent. Think this matter over and later on we may develop the idea during the year and correspondence will be forwarded to you on the subject. Your opinion will be asked then, and whether or not your company would be willing to appropriate a certain sum in addition to the dues for the purpose of supporting such an office.

I would also like to call your attention to the entirely new departure in accident prevention work established this year—that of teaching safety to children, and through them reaching the parents.

Gentlemen, I want you to use every effort in your home town to try to put that thing across. You can get a copy of Dr. Payne's book from the headquarters of the National Safety Council. It is something that is really a radical departure. It is well worth while, and if you will put it in towns where you have plants, the children will reach the parents, and the parents will finally get that safety idea, instead of scoffing at it, as some do at the present time.

I have attended a number of the meetings of the Executive Committee of the National Safety Council, of which I am a member by virtue of my chairmanship of this section. I want to take this occasion to advise you that never has a body of men worked together in such perfect harmony for a common cause. The men of the executive committee never once consider themselves or their individual interests in taking measures for the development of the great idea. Gentlemen, this Council will prosper—it must, because it is right!

(The report of the Chairman was accepted.)

CHAIRMAN LYNCH: Gentlemen, the next order of business is a paper by Mr. A. L. Kaems, Deputy Industrial Commission of Wisconsin, Madison, Wisconsin. I believe, is far ahead of a whole lot of our other states on the subject of safety and safeguarding. I am sure Mr. Kaems will have something very interesting for us.

MR. A. L. KAEMS (Industrial Commission of Wisconsin, Madison, Wis.): Mr. Chairman and fellows, I have been assigned the subject of punch presses, and I believe it is a real question, because we know in Wisconsin that punch presses have given the Safety Department of the Wisconsin Industrial Commission more trouble than any one machine in the metal trade, for the reason that the accidents are all serious.

DIE CONSTRUCTION—THE REAL SAFETY OF PUNCH PRESS WORK

AUGUST L. KAEMS, ASSISTANT TO SAFETY ENGINEER, INDUSTRIAL
COMMISSION OF WISCONSIN

Punch presses give the Safety Department of the Wisconsin Industrial Commission more trouble than any other machine in the metal trades, for the reason that the accidents are always serious.

In 1916, 27 per cent of all the accidents in the metal trades were caused

by punch presses, and 48 per cent of all the serious accidents resulting in permanent disability in the metal trades were on punch presses.

In 1915, there were 1,988 days lost in temporary disability and 18,900 days lost in permanent disability. In 1916 there were 4,037 days lost in temporary disability and 61,140 days lost in permanent disability. In 1917 there were 5,685 days lost in temporary disability and 77,680 days lost in permanent disability. In 1918, there were 5,229 days lost in temporary disability and 82,250 days lost in permanent disability. For the first six months of the present year there have already been 2,135 days lost in temporary disability and 47,850 days lost in permanent disability.

These figures show how dangerous the work on punch presses is. All accidents on these machines have increased from year to year. In 1915 there were 141 accidents; in 1916, there were 326; in 1917 there were 341; in 1918 there were 381; in the first six months of 1919 there were 187 accidents.

Various reasons were given for these accidents, such as carelessness, disobedience, inattention, sleeping, and so on. In only two cases, the firms admitted that the accident was due to the improper setting up of the machinery.

We admit that more machines are in use today than ever before and that more kinds of work are being done than ever before; but as we have worked on safeguarding these machines, we should have held our own if the mode of our guarding was correct, but the figures I just gave show the increasing seriousness of the punch press problem.

I can remember when the first gate guard was demonstrated to us, showing that if even a lead pencil was left under the gate on the bed of the table, the press could not be tripped. We thought that guard would eliminate accidents, but it didn't.

Then came the two hand trips. When that was demonstrated, we thought that surely would be the thing to stop accidents, but accidents occurred just the same. Then came the automatic sweep guard which we thought would eliminate accidents. Yet we see that accidents have increased from year to year. This is due to the fact that we are not guarding right. Manufacturers are doing their work in the same way and they are now trying to devise some mechanical way of stopping the accidents. This is wrong, and I can prove it.

WHY SO MANY ACCIDENTS HAPPEN

Why have we so many accidents on presses? The answer is simple enough. It is because the operator must put his hand underneath the dies either to place the material in on which he is working or take it out. This can be easily overcome if we work out ways to place material in the die without using the hand, and to take it out in the same way. This is not very difficult to do, and it is my purpose to show you how it can be done.

Where the work is done in the proper way, we have succeeded in stopping accidents. How did we do this? Why, by building safe tools to do the work with and forgot all about the mechanical guard, and we will

have to go a step farther and plan presses for certain jobs so they can be done in a safe way.

I have in mind a plant in which thirty fingers were lost during 1917; eight in one day. Yet by building safe tools, there has not been one finger taken off in 1918 nor in 1919 up to this time. This surely is a wonderful record and it has been accomplished by just building *safe tools*.

Let me demonstrate to you how this was done. For instance, in re-drawing cups, the operator had to place the material in the die. The right way was for the operator to take hold of the cup on the sides, but in working fast, he sometimes missed his hold and then placed the index finger of his hand inside the cup, when the ram came down it caught his finger. At other times, the little finger was left under the bottom of the cup, and in this way, the little finger was taken off. To overcome this, we just built a slide and all the operator does now is to place his cup on the slide and push it ahead. This is so simple that one wonders why it has not been done a long time ago. It has increased production and made the work absolutely safe.

At another plant, a boy lost all of his fingers and part of the left hand, in taking a piece out of the die. This work was of such nature that it was necessary for him to use all of his fingers to take out the work. We overcame this by cutting out part of the lower and top die so that he could use his thumb and index finger in taking out the work. In the former method the operator used all of his fingers and there was a great deal of hand strain. Now he uses only his thumb and index finger, and it makes no difference if the press repeats for he cannot be injured. A gate which is on slides has been placed in front of the machine. When the iron is pushed into the press, it is straight, and passes under the gate; as it is formed he withdraws it and the gate rises and falls into position of its own accord. To make this change did not cost ten dollars, and the operation is now fool-proof. The young man who lost his fingers was the superintendent's son.

THE PRESS REPEATED

At another plant, a young man who operated a press lost three fingers of his right hand when the press repeated. The young man claimed that the press had repeated; the superintendent said it was not possible as it was a new press. He took the boy to the doctor, and when he returned, said he was going to run the press himself and prove that it could not repeat. After working one hour, the superintendent had the same kind of accident as the young man had. I went to investigate this accident and it looked to me as though it was not a difficult matter to remedy, and so stated to the superintendent. He asked me how it could be done. I said I did not know what to do at the time, but took two pieces home with me and that evening solved the problem of overcoming this hazardous operation. I went to him and said "I have got it figured out how it can be done safely". He asked me how. I found the die they used was closed on one side and the front, so that when the material was placed in, these two places acted as a gauge. As these pieces were not always

of the same width and four holes had to be punched into the piece, it was necessary to have the pieces fit exactly in a certain place. I told him to cut out the front and place in the other side so that the piece could be punched in. He said he had figured that out but it would have to be up against the one side on account of the different sizes. We put springs in on one side and that overcame that trouble. Then he said the piece would have to go in just so far. I said we would put in a gauge pin in the back. He said he had thought of that and could put in a disappearing pin but when he wanted to push out the finished piece with the unfinished pin coming up from the bottom always displaced the piece so it always would be necessary to reach in after it or pull it out with a hook. I said I will push it out just the same. You have been thinking of this gauge pin one way and I in another way. You are thinking of the pin coming up from the bottom and I am going to have my pin coming down from the top. As this piece has a depression through the center when finished my pin will release the finished piece and it can be pushed out by the unfinished. He just jumped up and down when he saw the idea and said "You got it—You got it".

The only thing that was changed was that instead of having a gauge pin at the bottom I placed it from the top down, which cleared the work, and it could be pushed out instead of taken out. All they have to do now is to push out the finished piece with the next piece.

At another plant a boy lost all of his second finger, all the third finger and half of the index finger, and crushed the little finger and thumb. This accident had been looked up and it was reported that the young man had tampered with the guard on the machine. This was given as the reason for the accident. If this had been true, in our State the boy would have been penalized fifteen per cent of his compensation; but as he was to receive only \$320 for this accident, the Industrial Commission felt that they wanted to be sure that the boy had really and deliberately placed the guard in such a position that it was of no use before penalizing him. I investigated this accident and found that the press had repeated and that the guard which was on it would not have prevented the accident. And yet for less than \$5 we changed the work on this press and made it fool-proof. All we did was to put the press on an incline, slide the work in and have it kicked out automatically. We closed the front of the press and left an opening through which the material could slide.

At another plant which used punch presses, one of our men called and ordered guards for the presses. This was followed by a letter to inquire what progress was being made in guarding these presses. Finally the Commission received a strong letter from the firm, stating that it was impossible to place the guards as ordered. Let me read the letter to you.

Industrial Commission,

Madison, Wis.

Gentlemen:

"In reply to your favor of May 16, we have had several expert people, including the superintendent of the company which manufactures this press, endeavoring to devise some safety device, and we have also taken

it up with several other expert people, and when they see the work we do with the press, they state that nothing can be made, so far as they can see, that will enable us to secure output to permit us to use the press and at the same time have a safety device on that would be anywhere adequate for the use in question.

"Of course, if the State of Wisconsin will not permit us to use this press without a device thereon which doubles the cost of the work in question, we will simply dump press in the scrap heap and have our work done outside the State of Wisconsin."

I went down to this plant and as soon as I came in, the superintendent started to tell me his troubles and what impossible things we asked him to do. And yet after thirty minutes I had convinced him how this work could be done in a safe way, and you can believe me that he felt embarrassed to think he had written such a letter. I can assure you that this man was a fine mechanic, because he showed me a machine he had worked out and which could not make a mistake; yet as simple a thing as building a tool for a punch press seemed impossible, due to the fact that everybody he asked had something else in mind—thinking of mechanical guards.

AN ENGINEERING PROPOSITION

So in building dies the thing to think of is how to get the material into the press without using the hands, and taking it out in a similar way. The work is simply an engineering proposition and demands mechanical thought and ingenuity, and a device which will fit one case will not help another. Every job is a little different, but every one must be worked out and can be made safe. Heretofore every man who had a new guard had a cure-all, just as the patent medicine man claimed that a bottle of his preparation cured all ills to which a man is heir from chilblains to whooping cough.

The trouble starts when you go into a plant and talk to the man, telling him to build safe dies. He has big things in mind and the one big thing is that he is always afraid that the production will be decreased. I will agree that the production must be kept up, today more than ever. Men must produce more today than ever before. We will never see wages down to where they were at one time, and the thing we must keep in mind is production for no business can exist when production is hampered. But if we keep up production at the expense of jeopardizing hands, eyes, even lives, we must go under. No business, no city, no country can exist when it ceases to have regard for the lives and welfare of its people. One country has just tried this and had to go under as it deserved. So will every business go when it once loses interest in its men. We have had too much stop-watch production. We found out how much a man could do in five minutes and then figured out how much he could do in an hour and in a day. I believe that theory is absolutely wrong. Let us take for illustration the boy who lost his fingers in the press on which the dies were so easily changed. I made these changes because I found that the boy was doing two-thirds of the work, and the press only one-third. The change I made was that the press now does

two-thirds of the work and the boy only one-third. Instead of having the boy place the work into the press and being compelled to take it out, leaving only the forming of the metal for the press, we made the press form the work and kick it out, and all the boy does is to slide the work into the press. You can see what this did to production immediately, beside making the work safe.

This idea of increasing the work of the machine and decreasing the effort of the operator, can well be compared to an automobile. Suppose you had only one set of gears in an automobile, and that of course would have to be a low gear. If you were in a bad place, you could start; and then if you came to a smooth road and wished to go faster you would have to race your engine, and the faster you wanted to go, the faster you would have to race your engine. If you wanted to pick up some of the speed the speed-demons have, you would have to burn up your engine; it would be impossible to keep it cool. But we have three sets of gears, and simply shifting the clutch increases the speed of the car without increasing the efforts of the engine. The engine represents the average workman and the gears the ordinary punch press. The only trouble is that we have not been shifting the clutch properly; we have been burning up the men rather than using the punch press to its fullest capacity. We have been burning men up at the job, and I want to say right now that men are working faster than we can safely work them, and a great many accidents are directly traced to that speed. For that reason tools must be built so that no matter what men may do, they cannot place their hands in danger zones. Let this great safety organization shift the clutch so that machines will do the maximum work and the human element the lesser amount and do it safely at the same time.

INCREASED PRODUCTION AND ELIMINATED ACCIDENTS

Let me take this plant in which thirty fingers were taken off in 1917 and which has gone on from January, 1918, up to the present time without an accident; this has been accomplished by building safe tools. When I first went into the plant in 1917 and presented the idea of building safe dies, their master mechanic told me that he had been in this work all his life time and the things I talked about were impossible. After every accident I called on him again to try to make him see it my way. When I found that I could not get him interested in this, I had to try another way so I went through the plant to find some jobs on which I could increase the production. I found such a job, which happened to be the cover for a coffee pot. This work was done in an unsafe way. It was blanked and formed out of a sheet and the operator had to reach in to take it out. He was making 6,000 pieces a day, and six thousand times a day he had to lay his hand underneath the die. If by accident he would have tripped the press, or the press repeated, he would surely have lost his hand. They had had several accidents on this press and when I took the master mechanic to this job and told him that I could increase the output, he asked me how. He was immediately interested because he thought I did not know anything about building dies, but

thought I might know something about production, and if it could help him, he wanted to know about it. Again I made use of my idea of the automobile. I found here also that the man was doing two-thirds of the work and the press the other one-third, and we changed this, putting the press on an incline, putting on a kick-out, and all the man then had to do was to move his material. We put a basket guard around the press, and it made the job fool-proof. The work was increased from 6,000 pieces a day to 13,000, an increase of 117 per cent, besides doing the work in a safe way. When this machine was put into operation properly guarded, I asked the master mechanic what he thought of the safe die, and he immediately said "Is this what you mean by building safe dies?" and I said "Yes, that is one of the ways; don't you think it is a good way?" He said, "Yes, there is nothing to this." I agreed that it was simple; just a little horse sense was needed.

Then we took the second bad job on which a man had lost four fingers. In the report, the firm stated that the man had been out fishing during the day time, and while working at night he became sleepy and through carelessness lost four fingers at this job. We made that fool-proof by building a new die for the machine and now it is arranged so the material is slid in and kicked out and the front of the press is closed. This job is fool-proof and we don't care whether a man goes to sleep or not, he cannot be injured. This, of course, increased the output 100 per cent immediately in spite of the carelessness or lack of alertness of the operator.

It took some persuading to get this superintendent to adopt my plan of building safe dies and he was not convinced until after I had demonstrated the feasibility of my plan. After I showed him how to increase production and eliminate accidents, he became an ardent advocate of safe dies. Let me read you a letter which he wrote sometime after giving my scheme a thorough trial:

March 18, 1918.

Dear Mr. Kaems:

About a year ago when you came to this plant looking up punch-press accidents, you advocated the plan of making dies in such a way that it would be impossible for the operator to be injured, or in other words, making fool-proof dies.

I did not think a great deal of this and could hardly see how it would be possible to make dies according to your suggestion. But after each accident you called again and I will be frank to state that I did hate to see you come as I knew beforehand what you were going to talk on.

I was finally convinced that such dies could be built and have several in use now that I know have prevented accidents.

A short time ago, I instructed one of the machinists to make a die which I had carefully planned with reference to safety. After he had given this some consideration, he thought of a plan by which this die could be made much safer than I had thought of, which goes to show that all of our men are now interested in this matter and are anxious to plan with us so as to avoid accidents.

I am also pleased to say that our foremen come to me with ideas about making safe dies, and in some cases they have been very good.

I believe that with proper thought and care, most dies can be made so that at least a great many accidents will be prevented. It has also proven that, in each case in which a die was made safe, the production was increased, which is an indication that a safe die is also an efficient die.

I hope to see you at the next meeting.

Yours very truly,

Master Mechanic.

At another time the same master mechanic became interested in another difficulty. I will show you a piece:

This is the bottom of a coffee pot percolator and was always made in three separate operations; First it was blanked out, and formed; the next operation was punching the holes and the third was trimming or sizing it, and each one was a hazardous one because the operator had to take the piece from under the die. A combination die was built for this and it is now all done in one operation; blanking, forming and trimming; throwing out the finished piece and separating the piece and trimming by having them fall into a V-shaped slide, which is open at the bottom slightly, letting the trimming fall through and the finished pieces fall into a basket. All this is done by simply feeding a strip through the press, and increasing the output 300 per cent. What chance would your stop-watch man have against this? He could place four presses in a row and work his men to the limit until they "burned up" and they could not produce as much as this one man easily, working alone. He is doing his work in a safe way and they are doing their's in an unsafe way. The first thing this firm thinks of now when they are building a die is "How can this work be done in a safe way?" I came into their plant not very long ago, and found the superintendent, the master mechanic and the foremen from the different departments in which punch presses are used, in the master mechanic's room and I wondered what the trouble was. When I inquired I was told that they were planning a safe die. When you think back only a short time ago, how the master mechanic had said to me that this could not be done, you can imagine how I felt when I found them planning such a die. Now nothing was said about production, but they talked of a safe die because it has been proven that every time they built a safe die production was increased. He told me that every time they built a safe die production was increased from 15 to 300 per cent and they are now enjoying a 100 per cent increase in business and all this without an accident in 21 months. Let us think again. Only a year ago, every time an accident occurred in this plant, there was an excuse for the accident. Every time the injured man was to blame, and yet for a year and nine months it has not been necessary for them to write a single excuse. Do you believe that their men were better in 1918 than they were in 1917? I believe you all will agree with me that the help in 1917 was as good as in 1918, and if anything, it was better. The excuse so often made that accidents were due to change of help had nothing to do with it as I have proved. So I believe it is not hard to see where the difficulty has been.

The trouble has not been with the men, but it has been with those in charge of the work by not providing men with safe tools with which to work. This must be done, or sooner or later we must reap what we have sown.

THE FOREMAN A BIG FACTOR

Another big factor in this work is the foreman. As long as we must work with the tools as we have them now, he is the big safety factor in every plant. I don't care what your safety committees may do, but until your foreman has become a safety man nothing can be accomplished for the reason that he is in contact with the men all the time, while your Safety Committee meets once a week or less frequently. The Safety Committee may plan ever so well but it is the foreman who must carry out these plans, and if he is not converted to the idea of safety the plans are never fully carried out. It is surprising when a foreman once becomes "safe" how many dangers he can find in the work. I find in plants where the foreman has become "safe" he can show me more dangers and things he thinks should be remedied than any one can imagine. I have in mind one plant at which a large number of accidents had occurred, and after having several meetings with the foremen where I had advised them to insist upon the men doing their work in a safe way, a foreman told me one day that he had lost the best punch press man he had. I said "Well, you are still running, but how did you lose him?" He said he had told the man to do his work in a different way, and the man had replied that he could not do the work that way and make any money. The foreman told the man if he was to stay there, he had to do the work in a safe way, and the man refused. The foreman then told the man that he was the best punch press man they had, but that sooner or later something would go wrong with the machine over which they had no control, and he would be injured. He said they would have to break in a new man anyway and might just as well start in now as later; if this man wanted to lose fingers he could not lose them there, that he would have to go to some other plant to lose them; and the man quit. If this had happened a year ago the foreman would have been scared to death to think he was going to lose the best punch press man in the plant, but he was not afraid of it now because he had a platform of safety to stand on. He was not afraid to break in a new man because he knew he was going to have a safe man. What effect did it have? The other men working there said: "Well if he lets the best man go, what will he do to us?" And the men saw the foreman meant to have the work done in a safe way, and realized that he was working for their interests. Again a year ago this foreman would have said: "Well, if he wants to lose his fingers, let him; they are not my fingers." But now he said: "If you want to lose fingers you will have to go somewhere else; you can't lose them here." This foreman had become a safetyman. There is no further worry over this foreman because we know he is on the job and where he stands. It is interesting to note here that the man who quit because he feared he could not make money and work in a safe manner is now back at this same plant. He has come to realize that

while he had to work, it was better for him and his family that he work in a safe plant than in an unsafe one.

In a meeting sometime ago, I asked the foremen how many of them had explained to the new men the dangers on a press, and to hold up their hands if they did. Not a hand went up, and I will be frank to state that at least 90 per cent of all our accidents on punch presses happened to new men. So you can see how necessary it is that the new men be fully instructed in their work. The average foreman cannot see much danger in the punch press. He thinks that if a man will keep his hands from under the die the man cannot be injured. Not long ago, I investigated an accident where a man had lost a thumb. They had taken the work from the press on which the accident occurred and put it on another which they thought was properly guarded and when I watched the new man work I could see that it would only be a matter of time when he would lose not only a thumb, but both thumbs because of the way he was doing the work.

When I called the foreman's attention to this he said "My, my! I showed him twice how to do the work right." So you can see that while he had shown the man the correct method of work when he started, he then let him alone and the operator had formed the habit of doing the work in an unsafe way. Of course, this foreman was not a safety man, and accidents are bound to occur in such places.

SAFETY BEGINS AT THE TOP

But the big factor in all this is that safe tools and devices cannot be built unless the head of the firm is interested. If he is not interested, we cannot expect the superintendent to be interested, and if the superintendent is not interested, we cannot expect the foreman and the men to be. So it all begins at the top, and it is surprising how little has been done to sell the idea of safety to plant executives; the men who must determine the policies of this safety movement.

I went into a large plant not long ago, in which thirteen fingers had been lost during the first six months of the year. When I told the General Superintendent that they had lost 13 fingers inside of six months, he said, "The Hell, we have!" Now that shows he did not know a thing about what occurred. The man who took care of the accidents saw that the injured man got proper medical attendance and when it was all over, the compensation was paid; if he was not able to work, on a punch press, other work was given to him. It was not thought necessary to burden the general superintendent with little things like this. Let us suppose that instead of 13 fingers taken off, material had been spoiled amounting in dollars and cents to compensation paid for these 13 fingers what would have happened? Would they have been able to get by with it? Why, no. Requisitions would have to be made out for new material and in the end it would have been necessary to come to the attention of the general superintendent that five or six thousand dollars worth of material had been wasted and I am sure he would have been interested in knowing the cause for this waste of material.

I have in mind a plant where three hands were lost in 1918, and when the first hand was lost, I went to the plant and showed them how this work could be done in a safe way. I am sure it would not have cost more than \$50. to have done this, but the superintendent in the department absolutely declared the man was to blame for the loss of his hand; that he would make this change, but the responsibility was on the man just the same. Only a short time later another report came in of a hand lost, and I went again. The superintendent again claimed the man was to blame for this second accident, for not attending to his work; that if he had, the accident would not have occurred. But they promised to change the work at once, and yet before it was done, the third hand was lost. It was then done, and the same accident cannot occur again. The superintendent also informed me that it had not decreased the output by a single piece.

Now let us stop and think. Suppose this man at one drop of the ram had spoiled two thousand dollars worth of material, and this had been brought to the attention of the general superintendent. When he called in his assistant and the foreman of the department, and they both told him that the man was careless and he had been warned several times but had not heeded the warning, and for that reason had spoiled two thousand dollars worth of material, would he have shrugged his shoulders and have said "That is too bad!" Why no. And if a few weeks later this same machine had spoiled \$2,500. worth of material and again the superintendent and the foreman of the department had been called in and again informed the general superintendent that the man on the job was careless; that he had been warned to take care and that the man next to him had warned him to be careful or he'd spoil the material; but he had been careless, would the general superintendent have shrugged his shoulders and said "That is too bad!" If he did, he would soon ruin the firm. If a few weeks later this same machine had spoiled \$3000. worth of material, would he again have said, "Too bad!" Why no; there would have been a housecleaning long before that. All this material could have been replaced, but hands cannot be replaced because they are God-given.

I will tell you why some firms are not interested in fingers, hands, and even lives. Hands and fingers are figured in the overhead expense and do not cost the firm anything. The consumer pays this overhead expense. But material cannot be figured that way and for that reason, they are interested in material and not in fingers. The public that is paying for this has not grumbled over what it has cost but some day it will awaken and demand that this work that they are paying for be done in a safe way. Several states have passed laws which authorize inspectors to go into the plants and seal dangerous machines so they cannot be used until they are made safe, and all will agree that punch presses should come in for their share of such sealing. Are we going to wait until that overtakes us in all states, or are we going ahead and do the things we should do? I say again that the heads of the firms must become interested and must begin to think how it must feel for one to be injured. Unless they can put themselves into that place, they cannot know. I am showing you the picture of a young boy sixteen years of age who has lost his hand due to

the fact that he was not properly instructed by the foreman, or to the fact that the machine was not properly guarded. How would you feel if that was your boy brought home? Let me show you a picture of a man who has lost his arm due to the fact that he was not properly instructed in his work, or that the machine was not properly guarded, and suppose it was yourself brought home to your family. Now, we men often think that we are the ones who are carrying the big load, but that is not true. It is the little woman at home who is taking care of the family all day, who sits up at night and nurses them when sick, that carries the big load, and then to have the breadwinner brought home crippled for life. How would you feel? That is exactly how these poor unfortunates feel when they are injured and their loss of limb or life may be directly charged to men higher up who have not yet become exponents of safety. I was in a hospital the other day when the nurse told me of a man who came in to have a finger dressed. When she saw his other hand she noticed that it was terribly crippled and she wondered how a man with such a hand could get in. I told her as I had told many a man before who had a crippled hand to keep his hand in his pocket while he looked for work, that this man kept his hand in his pocket while he looked for work knowing no one would hire him if it were seen. Not long ago I held a meeting in a small town at which a superintendent related how only a short time before he had hired a man and when the man came to work next morning, he noticed how badly crippled one of his hands were. The superintendent did not know what to do. He took a chance and allowed the man to work and found him to be a good mechanic and satisfactory in every respect. The superintendent stated, however, that if he had seen the man's hand, he positively would not have hired him.

Just think how you would feel if your hand was crippled through no fault of your own, and it would have to be hidden when you went to look for a job. How do you suppose such a man feels toward the society in which he lives?

SAFETY WORK LIKE RELIGION

Safety work is like religion. I do not care a snap for the man who goes to church regularly and then tries to get the best of his fellowmen; that is not religion; nor do I care a snap for the man who talks safety and does nothing; that is not safety. Safety must be within you. If you follow out the few simple things that I have suggested, punch presses can be made just as safe as any machine in the metal trades.

DISCUSSION

CHAIRMAN LYNCH: Gentlemen, it is in order to ask questions of Mr. Kaems if you have anything you'd like to straighten out.

MR. FRED HAZEL (O. J. McQuiston Co., Detroit): I'd like to ask Mr. Kaems on what press most of the accidents happen?

MR. KAEMS: It is on the quick action press. If you went through our records in Wisconsin you would find that not 10 per cent of the accidents occur on the larger presses; a much larger percentage occur on the small, quick action presses.

MR. A. W. GARDEN (National Cash Register Company, Dayton, Ohio): We can make our dies safe, but I believe we ought to get more to the root of the matter.

We have developed a system of tripping our presses by operating two air valves. There are many tripping devices on the market, but almost without exception a man can operate the press with one hand and have the other perfectly free. This is absolutely impossible with the device we are using. We have it so arranged that a man operating a press that runs 125 strokes to the minute can't feed it faster than that. We have had our experts try to beat that and only one man succeeded. He beat it when nobody was there to witness.

There is just one place a press can break that will cause it to repeat, and that is in the springs. If you have a flywheel press you have three little short springs any one of which breaking will cause that press to repeat.

Right now we are going over all of our presses and replacing those springs. We have about 200 presses, 95 per cent of which are the small, fast-action presses used for blanking, forming, and piercing work. It costs money to replace those springs but it doesn't cost as much as the cutting off of fingers.

We have reduced our accidents over 95 per cent in a force of 200 men. When a man loses a finger there, I tell you, Gentlemen, the Safety Committee is due for a calling.

On our work we first blank and then we shave off a great deal of the metal. We do that to get away from milling. It is faster and a cheaper operation. Sometimes we have only one-thousandth of an inch to shave off, and the stock must be put into a nest that is tight, otherwise we will shave all on one side and not on the other.

A man must put his hands underneath there, and it is entirely due to this air trip that we are able to cut down our accidents. We are working on a scheme now that may work and it may not, but up to the present time we haven't been able to solve this problem completely.

MR. G. H. McCLAIN (Cincinnati Local Council): I was connected with a concern, before my present connection, using a large number of punch presses, and we were convinced that the duplex trip was the final word in protection and safety. We were resting on our oars until one day a lad lost two fingers and a half because the press repeated, and since then that firm has learned that they can't put absolute trust in a press with the duplex trip because it is a mechanical device that involves a good many springs, and if any one of those springs failed to work it is likely to mean the loss of a finger or hand. I'd like to ask Mr. Kaems' opinion on that.

MR. KAEMS: Absolutely true! Anything that is mechanical makes it necessary to deal with certain springs and other things which are bound to go wrong at some time. If you could once get a press that was absolutely non-repeating, you would have the solution of the problem, but we can't get that, and so we have to deal with so many different things in the press.

This firm I mentioned that cut off 30 fingers in a year has gone 22 months without cutting off a finger, without an injury. We did it all by

building safe tools. We had one job there that gave lots of trouble; the making of the little piece that belongs in the bottom of a percolator. It took three operations to make that piece—first, to blank and form it; then to pierce it; and then to trim it. Now it is all done in one operation—formed, pierced, and trimmed—the trimming falls down into one receptacle and the finished article falls into another.

All the operator has to do it to take a sheet and run it underneath. We do not care whether the press repeats or not; the operator does not have to place his hand or fingers in the way of the die.

One report we received told of four fingers that were lost on a new die. The report said the man had gone to sleep; but now we do not care if he does go to sleep, just as long as he does not fall off of the chair and crack a leg, because he cannot put his hands underneath the die.

MR. FRANK ELWELL (Delco Company, Dayton, Ohio): In using air trips, if the air pressure goes down due to leaks or some other reason, the press will repeat. I was wondering if anything could happen to the supply of current on electric trips to cause the press to repeat.

MR. SHAW (Ford Motor Co., Detroit): If the current isn't there, of course it will not pull down the plunger. If there is no current your press will not trip. On the top of our machine we have a switch so arranged that every time the press goes down it breaks the current; there is then no chance of the current being continuous.

MR. E. J. CLARKE (General Motors Corp., Detroit): In commenting on punch presses I notice that no one has mentioned the automatic press, the type of press about which Mr. Case can inform you from his experience in the New Departure. In that plant there is a press which has the die operating horizontally and as the parts are blanked and formed they drop out automatically. The press operates continuously and is fed automatically.

MR. E. ROTH (Cleveland Metal Products Co.): There are three distinct features we have to contend with on punch presses. In the first place, the dog is apt to block. If there is a key on the shaft, the key is liable to break.

We have devised a safeguard for our presses so arranged that even if all the springs break the press can be controlled.

MR. SHAW: If the spring breaks, the press will repeat. If anything breaks and your hand is under there, it is going to come off.

MR. C. T. BANKS (Michigan Mutual Liability Co., Detroit): Am I to understand that someone has solved the problem of guarding the punch press and making it fool-proof, if something doesn't break?

MR. ROTH: Yes, sir.

MR. BANKS: Well, let's take, for instance, a punch press that is on jobbing work, where you put a die on in the morning and run it up to noon, and in the course of the afternoon change it several times more. And in the courses of those changes you have different thicknesses of material. What kind of a guard do you recommend to be adaptable to all of the different kinds of material that go through that press?

MR. ROTH: We have devised a guard that will meet all conditions.

When we run a blanking job we have a guard that has a glass front and wire mesh sides. We permit just enough room to get the stock underneath. If anything, it increases the output. Our guard is so designed that it will guard any kind of a die and any sort of operation.

CHAIRMAN LYNCH: The time is up on this discussion. The next order of business is a paper by Mr. L. C. Kahle, Chief Engineer of the Independent Lamp Wire Company, New York City.

ELECTRICAL EQUIPMENT, ITS INSTALLATION AND GUARDING

L. C. KAHLE, CHIEF ENGINEER, INDEPENDENT LAMP WIRE COMPANY, INC.,
NEW YORK CITY

The importance of properly guarding electrical equipment is beginning to be generally recognized, and it has progressed considerably from the time when some electricians, who were pioneer Safety First exponents, hung a piece of cardboard marked "Danger" on a piece of electrical apparatus.

We must protect all electrical apparatus so that when Bill carelessly leans up against a switch he may finish his yarn in comfort and not in the hospital. Then again there is the electrician who thinks "Oh, I have been working around electricity all my life, and I never got hurt yet." I think the problem of guarding to protect the latter man is the harder, and anything which can be done to make it hard for him to get hurt is a step in the right direction.

The chief operator of a large railway power house told me that his greatest accident hazard was the human element, that his best men sometimes take a chance. "Familiarity breeds contempt" and it will take much thought and ingenuity in the matter of guarding to help counteract this human failing.

The manufacturers of electrical apparatus and accessories are constantly devising new ways of insuring absolute safety and in every case when they advertise a new product, its safety features are prominently mentioned.

I once knew an old engineer who had made several crude guards for switches, and he was trying to convince a fellow engineer in another plant of the value of his guards. "Huh" (this engineer said) "the only way to guard that stuff is to lock it up and throw the key away and then somebody might find the key."

I am glad to say that that sort of an argument is giving way before modern ways of guarding against electrical accidents.

Much has been written and discussed about what voltage should be considered dangerous, and it seems to be the opinion that anything above 440 volts is dangerous. However, much depends on the conditions obtaining, and I, personally, have had a very severe burn from 6 volts. I had a ring on my finger and was oiling the motor in my car. I had the oil can in my hand and my ring made contact with the live side of the starter switch. Instantly the ring became red hot and I had difficulty in removing

it from my finger. The finger had a blister $\frac{1}{4}$ inch high all around it. Later, infection set in and I had a pretty sore finger for a while, so hereafter I will consider that the voltage of any line I come near is of high tension.

I consider that all electrical apparatus should be 100 per cent safe regardless of voltage, because the fact that the voltage is low and not dangerous, makes the average person more careless.

Safety apparatus is inherently more difficult to inspect than open apparatus, but the manufacturers have made the parts more rugged and therefore more reliable so that the necessity of extra work due to failure of apparatus is lessened to a large degree. Safety apparatus naturally is of higher first cost than previous standard apparatus, but the accident liability clause of various states makes the employer liable for accidents to employees. So there is a financial justification for the use of safety apparatus in addition to the main reason, which is a humanitarian one.

In considering safety as applied to any industrial plant, the source of current, either from sub-station or private power plant, should be first considered.

In one of our plants the power is obtained from a sub-station at 13,200 volts and enters the plant transformer house about 5 feet from the property line where it is transformed to 4,400 volts with the power company's transformers. From the transformer house it is conducted to the plant sub-station where it is again transformed to 440 volts and carried to the bus bars of the switchboard.

There are disconnection switches on the 13,200 volt line coming into the transformer house and oil switches between transformers in transformer house and those in private sub-station. There are also oil switches between transformers and bus bars on switchboard so that both sides of transformer may be killed, making it safe to work on same. By having an oil switch operated from switchboard connecting bus bars to feeder, this section may be killed so that it is safe.

The oil switches are against the wall and about 10 feet from the back of the switchboard. This is a good feature for nothing is more conducive to an accident in back of the switchboard than lack of room to work properly. A platform covers the connecting levers from the switchboard.

The transformer vault is locked and no one not authorized can enter. The openings at the ends of the switchboard are closed with heavy wire partition and the door locked so that only an authorized person can enter here.

SAFETY FEATURE IN CONNECTION WITH SWITCHBOARDS

The latest safety feature in connection with switchboards consists of an enclosed standard unit removable panel switchboard, which may be built up to form a complete switchboard, as the bus compartment is arranged so that bus bars can be continued from unit to unit through openings in the side wall. These panels are made in the form of a truck, and should a breakdown occur, the entire panel can be moved out, as it is mounted on wheels. As soon as the panel is removed, the connections are automatically broken so that workmen have no live parts to handle. Barriers

prevent accidental contact should any one enter the compartment when the panel has been removed. It has an interlocking device making it impossible to either remove or replace the panel with the breaker closed. A padlock may also be used so that no unauthorized person can remove the panel if the breaker is open. These units come complete with instruments, oil circuit breakers, instrument transformers and other appliances which may be desired, and should a breakdown occur, a spare unit can be immediately placed in service without taking the power off the main bus. It is stated by the manufacturers that this change can be made in less than a minute.

ELECTRICALLY-HEATED ENAMELING OVENS

The method of control for the electrically-heated enameling ovens is interesting and makes for safety.

The switches for these ovens were originally on an open-faced panel in the enameling room and naturally under the right condition a spark from a switch might cause an explosion and fire. These ovens are now controlled from a central point called the control room which is situated at a distance from the ovens. This room is of concrete construction and has a switchboard on which are mounted the thermostatic relays which control the temperature of the ovens. This eliminates a very dangerous fire hazard and centralizes the control in connection with these ovens.

I would like to mention the fire-fighting apparatus in the ovens. There is a pipe drilled with holes running each side the length of the oven and in case of fire the steam is automatically turned on and the fire is smothered by the blanket of steam. It is also possible to use Foamite to extinguish the fire. All lighting fixtures through the enameling department are fume proof, the receptacle being of a fume-proof composition. The lamp is screwed into this and then is covered with a glass globe which screws on to the receptacle in such a way that if a spark should in any way occur in the interior of the globe, it could not reach the outside.

All panel boards controlling the lighting throughout the plant are of the safety type with push-button switches mounted on a slate frame. These switches are covered by a steel door provided with a catch. The fuse holders are mounted outside the safety frame and are covered with a steel door provided with a lock preventing unauthorized persons from gaining access to the fuse compartment.

The motors driving the pumps for the clarifiers are direct geared to the pumps doing away with the fire hazard due to static from driving belts.

NEW TYPE OF MOTOR-STARTING SWITCH

A new type of motor-starting switch, which is low in first cost but provides complete protection to both the operator and the motor, has just been placed on the market. It is designed for connecting single or poly-phase alternating current motors of from 1 to 10 horsepower, 250 and 550 volts, directly to the line without the use of auto-transformers or resistance.

All of the mechanism with the exception of the opening handle is enclosed with a steel box. Parts needing regular inspection are easily accessible on opening a door in the cover; but this door cannot be opened except when the switch is in the "off" position (nor can the switch be closed when the door is open) and all parts reachable are then dead.

Therefore, it is impossible to receive injury from contact with live parts when either operating or inspecting the switch or making ordinary adjustments and renewals. The upper part of the cover is held in place by screws and so can be removed without difficulty by authorized persons, thus exposing the entire mechanism to inspection.

No voltage protection to the motor is provided by a magnetic release which opens the switch automatically on a failure of voltage. Overload protection is provided by means of relays, resembling cartridge fuses in appearance, each of which contains a contact connected in series with the release magnet. Harmless momentary overloads have no effect on the relays, but as soon as the load on the motor becomes dangerous, the contacts open the magnet circuit and the switch automatically flies open. The contacts then automatically reset themselves. The switch is so arranged that it cannot be kept closed on an overload or no-voltage even if the handle is held in the "off" position.

Enclosed switches may be used wherever the ordinary knife switches may be applied. The switch parts are so mounted inside of the box that the door over the fuses is automatically locked when the switch is in the closed position. When the switch contacts are open, the door can be opened after turning the handle to the "off" position. With the door open, in which position it is held by means of a catch, the switch cannot be closed. When the switch is in the open position it is impossible to reach the hand in far enough to touch the live contacts. The switches are made with the fuse holders in such a position that the fuseholders are always "dead" when the switch door is open and fuses can be replaced, therefore, in perfect safety. The door of the safety switch may be locked shut by a padlock thus making it possible to be operated by inexperienced persons and only persons who have access to the key can replace a fuse. A padlock may also be used to lock the switch in the "off" position so that safety is provided to the workman in case the switch were accidentally closed.

Automatic starters for both direct and alternating current motors may be had, to operate which you simply press a button and the motor accelerates with scientific exactness preventing excessive starting current making it possible for any inexperienced hand to start a motor without injury. The starters are totally enclosed in sheet-iron cases which may be locked shut and the line switch may be locked open by inserting a padlock. This is a good safety feature for then no one but the person holding the key may operate the starter.

Quick stopping may be obtained with the direct current starter by the use of a drum reverse switch which provides dynamic braking in the "off" position and speed adjustments may be obtained by the use of a master switch and field rheostat combined. With this arrangement the handle

My idea is to put polarized receptacles in all places where we use extension cords. One side of all those polarized receptacles is the grounded side of the circuit. That part of the plug cap which goes into the polarized side of the receptacle is connected to the screw side of the socket. I believe that is going to make it safer.

CHAIRMAN LYNCH: I think this must conclude our discussion on this topic. I am sure you have all been waiting to hear Mr. Shaw on "Our Method of Safety Education."

ABSTRACT OF PAPER ON OUR METHOD OF SAFETY EDUCATION

R. A. SHAW, DEPARTMENT OF SAFETY AND FACTORY HYGIENE, FORD MOTOR COMPANY, DETROIT, MICH.

INTRODUCTORY

Gentlemen, I will give merely a synopsis of our work. Our system of Safety Education has proved successful because the number of accidents, have not only been checked, but have decreased. This is strikingly shown by a comparison of the months of October 1916 and May 1919, when there were 194 and 40 accidents respectively; a reduction of nearly 80 per cent in three years, while the number of employees increased 18 per cent.

Our fiscal year ending August 1, 1919, shows only 1 death among 50,000 employees, and no deaths for 11 consecutive months.

GUARDING

The first thing we do is, keep all machines, conveyors, and other necessary equipment in a safe condition with efficient safety guards or devices. This convinces the employee that the Ford Motor Company is willing to do its share; and creates a desire on his part to do likewise.

EDUCATIONAL REQUIREMENTS

Safety Education should be something possessing power to cause inspirations and develop the individual along the lines of safety. It must be the thing to encourage men to respect the safety laws, and love humanity to such an extent, as to endeavor persistently to prevent suffering by reducing accidents.

A certain amount of humor is necessary in this work. It develops cheerfulness, which produces a fertile mind for the reception of seed (new methods) and causes it more readily to take root and become (as it were) a tree with many branches spreading in all directions, comforting those in need.

MOVING PICTURES

The Safety Moving Picture is a vital and important phase of our work. It shows the less intelligent workman the safe and unsafe ways of doing things. The pictures are acted by their fellow employees and conse-

quently produce personal interest and enthusiasm. There was a 27 per cent reduction in accidents during the period these pictures were shown.

In conjunction with them we had different foremen talk before the men, to bring out more specifically the hazards encountered by the men in their respective departments.

SAFETY RULES

Safe working rules are not all put in one large volume as is the general custom. Rules for punch presses, saws, milling machines, cranes, elevators, etc. are printed separately on a booklet cut pocket size with detachable section on the bottom which is signed by the operator and kept by his foreman.

We feel that in this way they are read and the results gratifying.

BULLETINS

Bulletins are changed each week in our 100 bulletin boards. This serves to acquaint the employees with the different hazards. When placing them in the boards, we watch to see whether the foreman is anxious to look at the new bulletin; if so, one-half of our desired accomplishment is attained, because the men will soon follow.

INSPECTORS

Our minute-men, or as some term them, safety inspectors, patrol the buildings, and are ever ready to cooperate with the men or their foremen in any safety requirements.

INTERCHANGING OF IDEAS

Safety Suggestion boxes are placed at each entrance. No prizes are given because we believe that all of our men are interested in safety to such an extent that they will gladly give their ideas to prevent suffering to themselves and fellow employees. We also have the use of the "Ford Man" to advance the interchanging of safety ideas.

MONTHLY SAFETY STANDING

A Monthly Safety Standing is compiled and distributed to the different departments, to stimulate a race between them. A letter from the Managers and President, to departments free from accidents, also creates a desire to be free from accidents.

LINING UP AT STREET CARS

A crusade, to line up the men at the street cars, has been successful. It matters not how many thousands of workmen are waiting for the cars, you will find them lined up one behind the other. Our exhibit at booths 5 and 6 contain pictures of this system in operation.

CONCLUSION

Gentlemen, I do not wish to burden you with a lot of ideas which you no doubt have had experience with, but I do feel that if you are to be successful in educating the workmen in Safety First, you first must have ideas that will seem reasonable and practical to them, and make them see that safety is to their advantage.

Universally, you will find that men are reasonable and will cooperate in any movement that is beneficial to them, if they only understand it to be such.

This is why Safety Education is absolutely necessary. You will succeed in the same degree as you are successful in presenting your ideas to the men in a way readily understood by them.

Before we give a rule book to a workman and allow him to put it in his pocket, the foreman first reads over all the rules to the man. If the man understands these rules, is willing to live up to them, he signs his name and badge number on a detachable section which is torn off and filed at the foreman's desk.

The foreman will cooperate in safety, but he must have absolutely a fair and square deal. The men who cooperate in safety must also have a fair and square deal. For instance, if you have an accident, it is a disgrace for the company to allow that man to say, "The foreman has never told me anything about my particular job." On the other hand, the foreman can say, "I talked these things over with you; read the rules to you and you said you thoroughly understood them. You signed your name here, which implied that you would practice and live up to these rules."

It doesn't mean that you have anything on the man in a legal way by which you can take his compensation away, because I wouldn't dream of such a thing. It is just a backing to the foreman.

I have heard so much about saws. We have a few rules on saws; not many, but just a few that a fellow will read. They do not tell the size of the shaft and saw, or a lot of stuff like that, but they tell about saw guards and a few other things of importance.

Our largest rule book is labeled, "Safety on Cranes and Elevators." We have put in here the safe load for manila rope and the safe load for steel cables, for an operator should know what his cables will stand.

Another rule book is, "Safety Rules and Suggestions for Shipbuilders." When those shipbuilders got started and had twenty boats under construction it was like a sham battle, only they weren't using bullets. After six months of education we had a reduction of 75 per cent in accidents.

We also have a few rules for the crane operators, which are placed up on the frame in the cab, so there is no question about their not having seen the rules.

On every crib in the plant we have three styles of goggles. If a man goes on a job where there is light dust, he picks out the light goggles. Where there are heavier particles flying around in any operation, of course they choose the heavier goggles.

The rule book we got out on punch presses tells how to put the hands on the machine. It also gives other details, and it certainly hits the nail on the head.

I think that moving pictures are very effective. The men will see themselves in the picture, and if you make it just a little bit humorous, so they will poke their neighbor in the ribs and have a good laugh, it will have a more lasting effect. They go home and tell their wives about being regular actors, and you know how that stuff goes. The wife will have to come and see the picture too, just in order to see her husband on the screen.

And then you can supplement the pictures with a short, snappy talk, telling the men it is part of their work to make the safety plan a success. At each meeting drive some one point home. Do not try to give a bunch of thoughts in your talk, but make one point conclusively and let your pictures do the rest. Then the next night make another point, and so on.

CHAIRMAN LYNCH: Gentlemen, it is necessary to appoint a Committee to nominate your officers for the ensuing year. I will appoint on the nominating committee, Mr. Michael Barratt, of the Michigan Bolt and Nut Works, Detroit; Mr. F. X. Wells, of the Packard Motor Company, Detroit; and Mr. J. H. Goldie, of the Cadillac Motor Company, Detroit.

Adjournment.

FRIDAY MORNING SESSION

THE meeting convened at 9:45 A. M., Mr. James J. Lynch, of the Chevrolet Motor Company, New York, presiding.

CHAIRMAN LYNCH: The first number on the program is a paper on "Employment and Safety," Mr. E. F. Blank.

EMPLOYMENT AND SAFETY

E. F. BLANK, MANAGER OF EMPLOYMENT AND SAFETY, BUICK MOTOR CAR COMPANY, FLINT, MICH.

The subject has a number of different angles, but I am going to deal more particularly with the relation of the Employment to the Safety Department. Few safety men realize the accident prevention work that can be done through the Employment Department.

Safety work should start with the new employee when he is selected and assigned to his job. The qualifier should consider carefully the type and size of men he is dealing with, and whether they are mentally and physically equipped for the position.

PHYSICAL EXAMINATION NECESSARY FOR PLACEMENT

The man should then be given a thorough physical examination, and should any defects or deformities show up that could disqualify him for the position to which he has been assigned, he should return to the

qualifier for better placement or rejection. For instance, if you should have an applicant who was subject to epileptic fits, you wouldn't want that man operating a crane or some power driven vehicle where his own life and that of others would be in danger. Or if it should be discovered that he had the sight of only one eye, you wouldn't place him on a job where he would be liable to lose the sight of the other eye, or where he would be liable to injure or cause others to be injured through his inability to judge distances accurately.

These are merely some examples of what we encounter in placing the new employee on the right job. The new employee seldom realizes how much has been done for his own safety before he has reached the job on which he is to work.

I have a few figures which might be interesting to you. Out of 20,000 men examined at our plant in 1918 there were 17,839 defects recorded. This in itself, I believe, is convincing evidence of the necessity of physical examination. There were 631 rejections during this period, and 712 applicants put to work under observation of the Medical Department. The percentage of rejections was very small but when you stop to consider the conditions in 1918, when we were short of men due to war work, when we were practically hiring the lame, the halt, and the blind, you will wonder why we rejected as many as 631. The physical examination is absolutely a safety measure, and should not be overlooked. It is one of the most absolutely worth-while propositions in connection with employment and accident prevention.

Most industrial concerns give out books of rules and instructions to their employees. These books should really be given out by the Employment Department right at the time the man is hired. A few signs or slogans on a bulletin board well appointed in the Employment Department will have a good result. The first impressions are the most lasting.

INSTRUCT NEW EMPLOYEE IN SAFETY

The new employee should be impressed with the fact that he is entering a factory in which everything possible is being done for the safety of the men, and that his help is needed to make this factory a safe and healthful place in which to work. Statistics show greater accident rates from new employees than from old men, therefore particular care should be taken in the training and instruction of the new men. The employment manager as well as the safety engineer is interested in this because a large percentage of the labor turnover comes from men of less than a month's service. A great deal of this can be traced to inadequate means of training, instruction, or supervision right at the start.

Some of you have training schools for instruction, but most of us rely on the foremen to instruct our new employees properly. The foreman's position is a very important one in any organization; he must be human and patient; he must understand human nature, and possess that personal touch that will win the friendship and confidence of his men.

If your new man is entrusted to a job, be sure that he is qualified to do that job. He must realize the importance of proper training and his

INDUSTRIAL RELATIONS DEPARTMENT

responsibility in that position. Some foremen are better fitted than others to do this training work, and to them this should be assigned. It is very desirable to make a good safety man out of your job setter or assistant foreman because he is closer to the men and they feel that he is one of them. No matter who the instructor is, the job of training is a mighty important one, and it should not be slighted. It is your best chance to make the new employee a safe and steady worker for your organization.

Most plants have well defined safety organizations. The safety engineer or the safety director is expected to work out means of reducing accidents, just as the employment manager is expected to reduce the labor turnover. The problems of the safety engineer and the employment manager are identical, inasmuch as their greatest problem, I believe, is the gaining of the cooperation of the foremen. This is purely a matter of education.

You must win the foreman's confidence, in order that he shall know that your recommendations for a change of operation or the installation of a guard or device is for the best. He must be with you heart and soul in order to make the operation successful. You must sell yourself and your recommendation or suggestion to the foreman on the job.

And so it is with the employment manager. He must have the utmost cooperation and confidence of the foremen in order to be successful in his work. He must be close enough to the foremen so that the latter will help the employment manager, through proper training and instruction and supervision, to hold the employees on the job.

INDUSTRIAL RELATIONS DEPARTMENT

The Industrial Relations Department is a department of service. The success of this department depends entirely upon cooperation. Each sub-department, whether employment, safety, welfare, or what not, has a distinctive service to sell, and your job and mine is to sell that service. The method of selling depends a great deal upon the make-up of your organization, and the policies of the management.

Good results can be obtained through foremen's and superintendents' meetings. By calling the foremen together periodically their interest in safety work can be stimulated. And if the different departments are properly coordinated one with the other, the employment manager or welfare director can take advantage of these meetings to drive home the important points concerning his work.

Shop publications are an excellent means of getting your message before the employee. A good deal can also be done by maintaining personal contact with the employees and the foremen. You must be sales engineer as well as safety engineer, and if you are part of a well organized industrial relations department with a well defined sales policy, you will find no trouble in selling the service which you have to offer.

DISCUSSION

MR. A. H. BISSMEYER (Cincinnati Milling Machine Co.): Mr. Blank spoke of employing defectives. I would like to know the practice of the

Buick Motor Car Company—do they employ an applicant who has epileptic fits?

MR. BLANK: We have some epileptics in the plant. We are not making it the policy to hire them, but there are certain jobs where you can place such men, on bench inspection, etc., where they won't be in danger of injuring themselves any more than they would be on a farm or anywhere else.

My statement was really an exaggeration to bring out a point. We hire epileptics only in exceptional cases where a man is especially qualified for some particular line of work. Of course, if his spells are frequent we do not hire him. There are certain places we have such men at the present time, but they have to be well placed.

CHAIRMAN LYNCH: Do you have any method of taking care of men who are defective?

MR. BLANK: We have some in the shop who give us some trouble once in a while. We have a man running a lathe who has thrown a fit a couple of times. Now, it seems to me in the larger shops the man is confined more than in smaller ones, and in the latter case he can get around and he is liable to get into some trouble more than in the former instance.

MR. R. A. SHAW (Ford Motor Co., Detroit): This brings up a topic that is very human, and it is a thing I think all industries must take part in. If every firm would take in one new man who is subject to epileptic fits, it would be a fine thing, but if several reject them, then, some firm that has a big heart has to make a special job for those men.

MR. E. B. CASE (New Departure Mfg. Co., Bristol, Conn.): I would like to inquire of Mr. Blank what the percentage of turnover is under his system.

MR. BLANK: Our percentage for 1918, of course, ran pretty high, due to war work, but at the present it will run around 100 per cent. We keep a weekly tabulation and a monthly summary.

MR. WM. POWELL (International Harvester Company, Chicago): I'd like to ask Mr. Blank to describe the manner of introducing the new employee—that is, after he has been hired, up to the time he reaches his place of employment.

INTRODUCING THE NEW EMPLOYEE

MR. BLANK: The new employee comes into a waiting room and is interviewed by an outside interviewer. This man turns away any one he knows is not qualified to fill any positions that are open, and either a record is made of his qualifications, or he is told to return at a certain time. If he is found to be a man we can use at that time, he is passed on to the qualifier inside who assigns the man to his work. He then goes to the physical examiner. Should he be found by the doctor to be, through physical reasons, disqualified to go on the job, he is returned to the qualifier. This brings the doctor and the selectors close together. If the qualifier explains to the doctor the nature of the work (the doctor isn't supposed to know everything about the shop, but of course

they know more than a lot of other fellows in the organization) and the doctor thinks the applicant can do the work, he will pass him.

Then the man, if he is hired, is passed on to the write-up, where he is assigned his work and a record is made for the pay roll, etc. In our plant he is then delivered by automobile to the factory to which he has been assigned. We have thirty-nine factories and they are scattered over a good deal of ground—all in one bunch, but spread out over a plot one and an eighth miles long and six blocks wide.

So he is delivered by automobile to the head time checker of the factory in which he begins work, and is there entered on the roll and signs his clock card, and is delivered to the foreman on the job. Then our man from the employment department gets a receipt from the foreman or the departmental clerk. So he is passed along out to the foreman who meets him personally, and the man either goes to work immediately or comes in the next morning.

CHAIRMAN LYNCH: Do you give these men any safety instructions before they go to work?

MR. BLANK: Only our Rules and Regulations book is given them there. We do not give any general safety instructions at the employment department on account of the varied work to which the different men would be assigned. It could be done to good effect in a general way, however, and when the man reaches the job have the foreman explain the specific dangers of the operation he is to go on.

MR. E. B. CASE: I believe it is an important safety measure that when a man is employed he should be taken by the runner, or whoever takes him to the foreman, to the gate by which he is to enter the plant. From there he should be conducted to his place of employment by the most direct and safe route, and the possible dangers explained to him on the way. Then he should be formally introduced to his foreman.

Mr. Blank lays particular stress on selecting men who are qualified for the position. I'd like to ask to what extent he is able to select men who are qualified for certain positions in the factory.

MR. BLANK: Ordinarily by trade questions, cross examination, etc., the qualifier can pretty well tell whether the man is telling the truth. In fact, that is what he is there for—to read personality—and if the man is telling something that is untrue, why, he can usually catch him in some way. But there are cases that get by. I imagine practically every employment department has had instances where the man, when he got out on the job, got cold feet and admitted that he was not qualified for that position.

MR. GLENN BYERS (Corn Products Refining Co., Granite City, Ill.): I would like to ask Mr. Blank how much time is consumed in placing the man on the job under his system.

MR. BLANK: From the time the man is called in it does not take much over fifteen minutes. We have a stripped examination, of course, and that takes a little time for disrobing and dressing again.

MR. A. C. CLARK (Delco Company, Dayton, Ohio): I'd like to ask Mr. Blank what action his company takes in regard to defects that are

detected after the man becomes an employee of the company. Suppose, for instance, he develops a venereal disease—what do you do in that case?

MR. BLANK: Once in a while it comes back, and, of course, that man is referred to proper medical care.

MR. CLARK: Suppose he gets a disease while an employee of your company?

MR. BLANK: In that case I imagine the doctor would request that we lay him off until he is properly able to go to work again. We don't have a re-examination except in case of transfer, and of course it would be disclosed at that time. If it were, he would be sent home until such time as he would be able to function properly on his operation.

MR. CLARK: After a man is employed is there any follow-up as to whether he is satisfied with the job? Does any one from your office pay him a visit to see that he is acquainted with his fellow workmen and is getting along well on the job? That is the method we pursue. We have a man who does that in addition to his transfer work. He gets a list of the new employees and makes a visit throughout the factory, and he makes it his business to grab the new man by the hand and see that he is acquainted with the man next to him. He asks him whether he is perfectly satisfied with the job, and so on, and we find it a good scheme because then the fellow doesn't think as soon as he lights on the job he is forgotten, and in a great many cases we find that the man working next to him is a fellow with his ears pinned back who doesn't pay any attention to the new man. And so when the man from the employment department goes up to him and grabs him by the hand and wants to know how he is getting along he feels there is a warm spot down there and that he hasn't been forgotten.

CHAIRMAN LYNCH: That's a fine idea.

MR. BLANK: How many do you hire a day?

MR. CLARK: We average about fifty to seventy-five, and possibly over that.

MR. BLANK: He has quite a job.

MR. CLARK: Yes, but he gets away with it.

MR. G. H. HAWES (O. J. McQuiston, Inc., Detroit): Mr. Blank, I'd like to ask if the book of rules and regulations which you hand your new men are printed in any foreign languages.

MR. BLANK: No, sir. There is only one language in the United States, according to us.

MR. GLENN BYERS (Corn Products Refining Co., Granite City, Ill.): If you want to reach the foreigners it would be a good idea to get text books and have them attend school, but your safety literature should be printed in English only. That is the way we are doing it.

MR. F. A. FREDRICKSON (Industrial Commission of Wisconsin, Madison, Wis.): I'd like to ask Mr. Blank if there is a discrimination as to wages when you find some of these physical defects on the employee.

MR. BLANK: Not according to our system of assignment. If a man is assigned to a certain job, he is able to do that job with a hundred per cent efficiency, as far as physical fitness is concerned. If he wasn't, he

wouldn't be assigned to that job. He'd be assigned to some other, or else rejected.

MR. FRED HAZEL (O. J. McQuiston, Inc., Detroit): I'd like to ask Mr. Blank what form of records the medical department keeps on applicants for employment, and to what extent they are used after the man is put to work, and are they used for any future reference with regard to his safety qualifications for the purpose of replacing that man or promoting him to any other position?

MR. BLANK: That medical record has nothing to do with promotion except in case he should ask for a transfer, we would refer to his card and find out what his physical examination showed up. If there was some defect which might prohibit his transfer to that specific operation his card would show it. Of course, he'd probably be given a re-examination, and if it was deemed advisable to put him on light duty or outside work, why, we would transfer the man on the physical record.

SECRETARY HOWE: When a man is introduced to the work do you have instructors there to break the man in to the job?

MR. BLANK: There are certain men assigned to that work in each department, and they do that along with the other productive work. Usually, the man who introduces the new men to the jobs is the assistant foreman or what we call the "job setter".

SECRETARY HOWE: Does that assistant foreman train the man along safety lines while he is working on the job, or into the job? Is that a part of his duty?

MR. BLANK: Yes. He points out the way to the new man. And we get in contact with the foremen doing this work through the foremen's meetings, and by the safety engineer talking with these foremen at these meetings he can get over any message he wants on instruction and training.

The line of instruction isn't exactly the same in every case, because your job is different, but the man who is breaking the new one in, points out the specific dangers of the particular operation, whether it is a lathe, drill press, or some other machine, or even if it is in handling stock.

CHAIRMAN LYNCH: Gentlemen, I'd like to close this matter and take up the next talk. We sent a letter to each member of the Automotive Section asking them to send in their opinion on the standardization proposition, and as a result a great many letters were sent to Mr. Goldie. In fact, he wrote me and said that he had too many letters. Everybody seemed to be interested in the matter.

I want you to pay particular attention to this, and this is the matter I had in mind when I suggested the resolutions and the committees for following out the work. A resolution at the end of this paper, if you gentlemen see fit, or a motion to appoint a committee for the purpose of putting through a resolution I think will be in order after you have heard Mr. Goldie. Gentlemen, I take pleasure in introducing Mr. Goldie.

STANDARDIZATION OF GUARDS (EXPERIENCE OF THE
AUTOMOTIVE GROUP)

J. H. GOLDIE, CADILLAC MOTOR COMPANY, DETROIT, MICH.

The thing that Mr. Lynch and I were interested in on this particular question was the movement, as you know, to standardize by either federal or state statutes the building of guards, and the applying of guards to machinery. I have come in contact a good deal with state boards and with courts in the matter of accidents, their settlement, causes, and compensation laws, and I have been inclined to think that on the whole it would be impossible to make any standard reasonably applicable.

REASONS FOR NOT STANDARDIZING

There are two or three reasons for that. I think the biggest reason (with all due respect to the gentlemen who are sitting here from the Wisconsin Industrial Commission, and I understand there are some other state men here) is that we have often placed upon our state boards for factory inspection service men who are not qualified, because they are placed there purely from political connection. Just a few days ago a factory inspector came into my office and wanted to talk to me about guards. The man had never been in a factory in his life; knew nothing about mechanics, and the only job the man had ever had in his life was that of a carpet salesman for a wholesale carpet house. That man was on the job because his brother-in-law happened to be at the head of the factory inspection service of the state.

That is one of the biggest objections, men, to standardization—the fact that it is so absolutely impossible, due to our political machinery, to get fully qualified men on the job to interpret these statutes with reference to standard guards.

I think the second big objection would be the attitude of the employer. I know that I have felt, and I believe that a lot of you men have felt, that the employer is beginning to see he must do safeguarding because his pocket-book has been hit by the Compensation Act. I will grant that is true in a lot of cases. I do know, however, in a lot of cases the employer has gone ahead with safeguarding and humanitarian methods because he wanted to keep his men from being hurt. But if it is true that men are being compelled to guard because of the necessity to save money on compensation, those men are going to look for every possible loophole to get out of putting a guard on a machine.

I believe that most of you men who come in practical contact with the guarding proposition will agree with me when I say the biggest loophole they find is that the guard is impractical, that it can't be put on, that it is going to tie up production, or the physical circumstances are such that it can't be done.

Now, I am here to say that if you have a standard specification made by a federal or state statute, you are going to have one fine time to get the man to put it on unless the state or federal officials are around to

jump on his neck. I think that is where the biggest objection is going to come.

Now, if that same manufacturer can have the service of a trained safety department with men of mechanical ability, with men who can work with him, and even adjust, if necessary, a different system of production in the department, so that a guard can be put on the machine to make it safe in the opinion of the trained safety man, then I think the real object of safety work has been accomplished. The men who must work around that particular guard are protected, and I don't believe that there is any necessity in this case for any specified guard.

Perhaps this discussion arose largely from the recommendations that have been made in numerous instances by insurance companies and state officials and some long-haired men in safety work, that a guard on a vertical belt should be six feet high, or six feet six inches, or something of that sort. Mr. Shaw says it is just as reasonable to say ten. I have seen in my limited experience in observing these things, guards four feet from the floor that I can't help but believe were perfectly safe from the standpoint of hazard from the moving belt.

There are other guards that have been suggested on pulley and horizontal belts. Some years ago I had an argument with a certain manager in our plant with reference to the guard on horizontal belts. He couldn't see any sense to it anyway; it was all foolishness! Just about the time we were having our argument a first class man in our millwright department walked down the passageway between a row of machines, when one of the metal fastenings on the belt came apart and gouged an eye out. From that time we didn't have to argue metal guards on horizontal belts.

If somebody sat down and attempted to standardize the proposition, there would be absolutely no limit upon the number of operations upon which standards might be set, and no limit upon specifications that might be made. It would be absolutely unworkable in the ordinary plant. We in our own company are looking forward with a lot of hope to the day when we shall be in a new factory where we will have everything done to the last word in factory machinery, belting, and working conditions, but if any of you men would come over to see us at the Cadillac factory now, the small number of accidents would seem unbelievable when you consider our working conditions. We have men working where machines are so crowded that you wonder how they ever get by at all. If we didn't keep on the job at all hours with safety inspection and with the installation of guards, and all this with the backing every single minute of the plant management, we wouldn't be able to keep from killing men every day in the week. But if you are to say to your management today that they have to put on a certain guard because the state law says so—well, I know what we'd be up against.

OPPOSED TO STANDARDIZATION UNDER FEDERAL OR STATE STATUTE

I believe this group could well go on record as being opposed to standardization under federal or state statute. I do think, however, that with the movement on foot in the National Safety Council at the present time for the establishment of an Engineering Section, it may be possible for

our group to work with this new Section, to have adopted by the Council, if you desire, a standardized guard system as recommendations of the Council or of this group, or both, but not as a must-be-done proposition by any state or federal board.

I find that the insurance companies, on the whole, are very glad to follow the recommendations of the National Safety Council on guarding. And I think the average insurance company is willing to follow the recommendations of a good, safe, sane bunch of engineers, although some of the insurance companies are not giving credits on ratings in some states where there is a standardized guard statute at the present time, if the particular employer or manufacturer does not live up to the standard set by the state.

Most of you men who come in contact with the new machine that comes into your plant have discovered that sometimes a lot of them come guarded to a reasonable extent, but in a lot of cases the guards applied by the manufacturer of the machine are not the guards that your own safety organization would recommend. For that reason I say if we have a standard of guards set by the Federal Bureau of Standards and by the state boards, you will have to make it so general and so absolutely applicable in the case of every manufacturer of machinery as well as every user of machinery, that it seems to me absolutely unworkable, because if the manufacturer goes ahead and puts on a lot of guarding on his machinery and charges it to the purchaser, the purchaser is going to be up in the air about it when the machinery is delivered to the plant and he finds that the machine with guards attached is not suitable to the particular operation for which it was bought.

Mr. Lynch was kind enough to remind me of a statement I made about getting too many letters. I didn't get too many, although I told him I was swamped with the number of replies I got to the letter which he sent out with reference to the opinion of the members of the Automotive Section on standard guarding.

I am not going to attempt to take up all your time with reading all these letters, but I want to read extracts from letters that came in from fellows on the firing-line. I say that the only way to get this thing ironed out is to get a real idea of how it should be handled from the fellow who not only has to put the guards in, but who has to fight the management all the time, or argue with the management as to the merits of the guard and whether or not such guards can be purchased or applied.

OPINIONS OF MEMBERS OF AUTOMOTIVE SECTION ON STANDARD GUARDING

Here is a letter from an automobile parts company. I am not going to mention these names because some of you might be embarrassed:

"It is our recommendation that a committee be named representing the tool builders of the country, who will assist with a practical outline for guards that will be effective and that will conform with the general design of machine tools, rather than put on some makeshift guard which is usually ordered by the state board."

I don't quite agree with the makeshift proposition, but I do think that

the recommendation that the matter be passed upon by tool builders falls in line with the recommendation or the thought in the back of the heads of most of the fellows who have been thinking on the subject that the matter ought to be recommended by some men who are really qualified to make the recommendation, and that it ought to be a recommendation and not an order.

Here is a company that uses a lot of gear machines:

"Many of our machines, the Gleason gear cutting machines in particular, have a cast iron guard which closes the pulley vent, with slots at the top for allowing the drive belt to run through. We have the type of guard necessary where a machine has to be adjusted by hand, but the commission (New York) would not accept the guard as standard."

Another member writes, with reference to the United States Government standard for these guards:

"We sincerely hope that it will not only work in conjunction with the National Safety Council, but give the matter serious consideration with the idea of standards that are practical, so they will not work a hardship on either the operator or the manufacturer."

That is the idea of every man who comes in contact with this particular subject—to have the thing made reasonable, so that it will be workable. That is the big trouble that is likely to result if we have to leave it to some highbrows on standards, rather than practical men on engineering problems.

The works' manager of another large company, after discussing a lot of the guards which are not practical, makes this remark:

"It has been rather a hobby with the writer to be a step ahead of the game, and we are very proud of some of the remarks and decisions made by the Safety and Health Inspection, and also the Compensation Board of our state in regard to the conditions in our factory. But it is the writer's belief that standard guards cannot be made except as adapted to particular types or sizes of machines for guarding in the proper manner; that is, that while a cylinder grinding machine is used only in the front, the feed and pump mechanism in the back is free, and consequently presented to the aisle as a source of danger to passing operators, but the makers while guarding the wheel do not feel it is necessary to guard the back part of the machine.

"You will certainly have our hearty cooperation in any steps taken along the line we have indicated. We believe that considerable could be done in the education of inspectors by placing them upon merit, rather than political preference or reward."

That didn't happen in Michigan; nor in Wisconsin, either.

"The state factory inspectors do not visit on the average oftener than once in one and a half years, and from my past experience with them they are very lenient. They have not as yet required any guards installed prior to the adoption of the trade regulations to be changed to conform with present regulations."

That is to their credit. A very good letter was received from one of our members who evidently made an exhaustive study of the subject of

standardization. I am sorry the gentleman is not present. I understand he is in another section.

"My first criticism of standard guards is of the term itself, or the promiscuous application of that term to various parts or to individual sets of specifications. Guard specifications in general are subject to such frequent alterations and revisions that even at the present time the term "standard" in this connection is used in anything but its accepted sense. In consequence of the revisions an undue hardship is imposed on the well meaning and honest industries to comply with the unusual rigidity, and it makes it necessary to rebuild a disproportionate number of apparently adequate guards.

"At the same time, the inflexibility with which these specifications are applied by those administering them leads to a great waste of material and labor in constructing guards of disproportionate dimensions, merely for the sake of compliance, rather than for the fundamental reason of protection."

Now, men, there is the whole argument in a nutshell against standardized guards. Guards will be built merely for the sake of compliance rather than for the fundamental reason of protection. I think that the experience of the Automotive Section, and the experience of the National Safety Council as a whole in the work done by the members of the Council on accident prevention, is that the spirit rather than the law has been working on the matter of guarding. I think it has been done from the humanitarian standpoint as much as, if not more than, from the standpoint of the saving of dollars and cents. That man goes on to say:

"It seems to the writer that the matter of standardizing guards without reference to standardizing the equipment is a proposition, to a great extent, like putting the cart before the horse. In that even in the individual plants great variations of construction exist in different places of equipment designed to perform the same operation."

That is true in a lot of our plants where even the physical conditions are different in the same plant. I know in our own plant we have crowded machines into such positions and driven them in such a way we wouldn't even think of doing if we were operating under different physical conditions in the plant. He continues:

"With this in mind, the idea of attempting to disregard not only individual difference of construction, but plant differences as well, seems rather far fetched. It would seem that the installation of inflexible specifications by the state or insurance carriers was an attempt to place not only the burden but the expense of adoption on the industry rather than on the state or insurance companies. It also seems it is an attempt to place the industry at a permanent disadvantage in respect to compensation for injury by unguarded machinery, in that the state or insurance carrier has constant recourse to the technicalities of standard construction as a defense."

Another: "Our experience has been that a guard necessarily must be constructed to fit the situation in hand. So far as is practical we have aimed to standardize all the guards used."

I believe that is the experience of every man in the Automotive Section

—make the matter practical, and get it as nearly the standard as possible. I might speak of just a little experience in our own company. We have been attempting to design and work out some system of standard guards on grinding wheels and buffing wheels, and through the assistance of our friend Mr. Shaw and some of the ideas that we have been able to steal from some of the other fellows, together with the ability of our good safety engineer, we have worked a standard guard, and while it does cost a lot of money to build the first few guards, the company works' manager was very heartily in favor of using them.

This extract comes from a letter from the superintendent of the plant of the Sterling Motor Truck Company:

"We have not been hampered very much in making our guards to certain standards, either by the state or the insurance company. They only give us a few fundamental rules which any one considers in making an efficient guard, and I personally believe they should be made to suit individual needs."

I think that is a mighty fine tribute to the gentlemen from Wisconsin who are here today.

The assistant general manager of the General Motors Truck Company has this remark to make:

"To sum up the guarding of machinery, we find in our case it is necessary for us to study our requirements and arrive at what we believe to be the best each time a guard is moved."

There is the point again by a man who has had to deal with it in a great many instances.

Here is a paragraph from a letter received from the Underwriters Laboratories:

"It naturally follows that standardization should have consideration in connection with the production and use of any mechanical appliance; that development is but the outcome of natural economic laws and possibly the application of Darwin's theory of the survival of the fittest. Nevertheless, authorities in enforcing the use of devices should refrain from pursuing the course of bringing about actual standardization as to form and character of appliances used.

"We attribute much of our success in the past to a policy rigidly adhered to of a standard of performance rather than specifications as to design, material employed, etc. To pursue any other course results in throttling development, and while on the surface standardization appears to have become necessary, it is a fact that standardization in results is the primary object of interest to the users and to regulatory bodies."

I have just given some of the points developed in the letters received in reply to Mr. Lynch's circular. The whole object of my taking this subject and the whole object of talking as I have and reading the excerpts from the letters received is to start a discussion from the members of the Automotive Section. If we are going to make this an experience meeting, the only way is to have everybody shoot questions just as fast as we can so that we may have some new ideas on the subject, or ideas perhaps opposed to some of these I have attempted to bring out.

CHAIRMAN LYNCH: Gentlemen, Mr. Goldie has been extremely inter-

esting. I am sure you will all agree. There is one point that hasn't been brought out I wish you gentlemen would discuss. If any of you are from New York state and know of this experience, kindly bring it out. Sometime ago the standard guard in New York was 5 ft. 6 in. That was passed on by the Bureau of Labor. The rating board accepted that as a standard and gave a credit for it.

A year or two later they passed a new standard guard of six feet. When the inspector got on the job he looked in his book of standards for the rating schedule to compare with the standard guard that had been applied a year or two before. He saw that the old standard guard was not six feet; it was six inches short—not standard, no credit.

Gentlemen, discussion is in order.

DISCUSSION

MR. J. A. DICKINSON (Bureau of Standards, Washington, D. C.): There is no intention on the part of the Bureau of Standards, nor has there ever been, to put through any codes by legislation. In the first place, we don't believe it is a government function. We don't believe that using the club is the proper idea.

The Boiler Code Committee has shown the proper way to handle standardization, and that is to make it so good that the states will be forced to it. The A. S. M. E. Boiler Code is today undoubtedly the best boiler code ever published, with the possible exception of the Ontario Boiler Code, which is copied very largely after the former with a few added requirements.

About four years ago the Bureau of Standards started in coöperation with the electrical engineers and the underwriters and a dozen different associations to produce an electrical safety code. That code today has been revised twice and is just about ready for publication. In spite of the fact that it has never been officially published there are in the United States today no less than eight states that have made that a law. By making your other codes equally good you will force their adoption by popular demand for them.

There is one thing on which I believe Mr. Goldie will agree with me, as a good attorney, and that is the fallacy of attacking a standardization code, or law because its administration is poor. The code should not be forced upon the people in an ironclad, stereotyped form, but with good common sense, and it takes men of experience to administer it and make the necessary waivers and exceptions where the demands arise. No inflexible code can be made. It is a physical impossibility. But you can make a code that will apply in eighty or ninety per cent of the cases that will save thousands of dollars.

There are a couple of points Mr. Goldie brought up that I am might glad to see. One was the question of the manufacturers not building standard guards. How can they build a standard when there is no national law to build on? The manufacturer will build a guard that will take care of the hazard in a large percentage of the cases. Guard machines are coming. We have to do something to meet the competition.

of the other fellow. And we will put on some sort of guard that perhaps won't pass, so we will have to tear it out.

Mr. Goldie has pointed out that guards should be fitted by experience, and yet he goes right back on his own assertion, stating that in their new factory everything is going to be the last word in guarding.

I am speaking from eight years' experience in the safety field, as a practical safety man, and you will find that most of the men in the Bureau of Standards are men of that type. My contention is that until you have covered your obvious hazards and shown your workmen that you are really trying to take care of the mechanical hazards, you cannot get your educational work started.

CHAIRMAN LYNCH: These things I hold here are a tentative program you are getting out; recommendations that haven't been adopted yet. I think you show 6 ft. 6 in. on the belt guard.

MR. DICKINSON: That is a tentative draft that was drawn up last June. There has been no real work done on that machine guarding code yet.

CHAIRMAN LYNCH: Then will your committee consult the Automotive Section regarding their wishes?

MR. DICKINSON: We certainly will be glad to cooperate in every way.

EXPERIENCE OF BUICK MOTOR CAR COMPANY

MR. R. F. THALNER (Buick Motor Car Co., Flint): Regarding education and safety work, I believe, myself, that machines must be guarded before we can carry on our educational work, but I'd like to cite the instance of the Buick Motor Company in Flint. Some years ago a recommendation was made to have six-foot guards installed throughout the plant where the man who recommended them thought they were necessary. The result was the guards were made up and installed.

The installation of those guards created more discontent among the men and hindered the safety movement in general in that plant more than anything else that could have been done, because guards were put up that were impracticable. As you were going through the factory the men would say to you that the guards were a joke. Now, a guard that is built so high, past the point where there is no danger, will naturally be taken as a joke by the men in a movement of this sort.

The quicker we can get the men out in the plant to use our appliances, our guards, the better it is for us, and that is the only way we can get something that is practical. The trouble with these high guards is that when machines are moved they will not suit the new condition. I have found that to be true especially during this period of movement since the war work is over and machines can be put back into their old positions, where the large guards which formerly suited the purpose do not conform to the new conditions of the machine when set up again.

In my estimation, the only way to protect against that is to make a guard that is adjustable on the machine and does not have to come up to an ungodly height. In my mind, I think the issue at hand this morning is whether guards should be built a standard height—not the standardization of guards, but the standardization of height. We might stand-

ardize guards, but to standardize guards with respect to height, I think is something that is out of the question.

MR. C. D. BANKS (Michigan Mutual Liability, Detroit): Mr. Goldie's remarks which he dug out of that voluminous correspondence reflect our opinion (speaking for the insurance company I represent) that standardization on most guards is impossible. That has been our experience.

Perhaps some of you remember yesterday that I got up here and questioned somebody about a punch press proposition. Somebody here said that if a punch press broke down four things had to happen to it, and if any of those four things didn't happen to it, why, they couldn't be injured. I took exception to that, and he told me that "Seeing was believing." So I went out yesterday, and it was proven to me beyond any doubt that standardization of punch presses, anyhow on guards, would be impossible.

In their plant that man has about three hundred punch presses of every kind; some of them they made themselves; and when I tell you they are a hundred per cent guarded and they are not all guarded alike, and every one of them are fixed so they are foolproof, you can see how standardization of guards, at least on punch presses, would be impossible.

MR. H. KNOLLMAN (Maxwell Motor Co., Newcastle, Ind.): Have any of the men in the room any records of any men or percentage of men being hurt from a vertical belt that is four inches or under? We have been keeping records for six months at our plant and we haven't had a case of a man being hurt either on his hands or any part of his body from a vertical belt that is four inches or under.

It seems to me as though the guards on the Gleason gear cutting machine answer the purpose fairly well. I won't say that belts over four inches should not be guarded, due to the possibility of the larger belt hurting somebody, but vertical belts under that size I don't think need to be guarded, except at the pulley where the belt comes on.

ANALYZE THE ACCIDENTS

MR. E. J. CLARKE (General Motors Corporation, Detroit): We should analyze the accidents and apply our guards and our remedies according to what those accidents represent.

A state factory inspector came into one of our plants with nine hundred employees, and said, "You have to put up high six-foot guards." Sixty per cent of the employees were women and forty per cent men. I said, "Let us analyze this thing. Let us first find the necessity for changing all of those guards and putting up six-foot guards. Let's go down to the hospital where they have the records."

So we went down there, and found that in one year and three months (as far as we traced the records back) not a single belt accident had occurred among nine hundred employees in that plant. He said, "I didn't think such a thing was possible; that isn't the general rule." "Well," I said, "let us go into this thing along sane and sensible lines." So I took him to another plant where four thousand men were employed. In two years—the period for which we were able to trace the records—we found two belt accidents, both on overhead belts, on the counter shaft.

You can't go to the hard-headed factory manager and say to him, "Here, we want a contribution for six-foot guards around this plant." Time and again I have gone into the back yards of plants and seen truck-loads and carloads of six-foot guards. Why? Simply because the managers are antagonistic to it, and also you can't place a man on a machine to do piece work and then say to him, "You have to waste your time fiddling with that guard." He will steal that guard out from under your nose with the most adequate supervision. I have been in a plant where they have done it. In the Studebaker plant I have seen guards where the arms attached had been sawed off with a hacksaw, and there a man had plenty of time to saw them off despite all of their supervision.

What are you going to do with that kind of a thing? Can't you see that the managers eventually say, "Boys, this safety business is all bosh! We can't go on with it. It is cheaper to pay the losses." That is what you are confronting. What we want to do is to make this thing constructive and not destructive. There is a limit to everything. The extremest has no position in this field.

What brought forward this idea originally was the tendency on the part of the different states to run into the proposition of six-foot guards irrespective of the actual necessity for a guard.

MR. A. L. KAEMS (Industrial Commission of Wisconsin, Madison, Wis.): I believe the thing we should know first is: Where are our accidents?

In our state we don't insist upon the six-foot guard. We don't care anything about a six-, six-and-a-half-, or a seven-foot guard, as long as it takes care of the hazards.

MR. D. R. LIVINGSTONE (Reo Motor Car Co., Lansing, Mich.): Regarding the six-foot proposition, I feel a good bit like Mr. Clarke, and have worked along that line.

MR. G. H. HAWES (O. J. McQuiston, Inc., Detroit): I have a specific instance in mind that Mr. Clarke failed to recall which I think should be brought up, of a plant where we have so-called six-foot guards or unreasonable guarding going on throughout the plant. These guards ultimately reached the scrap yard and have been displaced with guards that are more sensible and more adaptable to the individual hazards of the different operations, and the actual cost in accidents in that plant per man employed has been reduced from 47 per cent to close to 4 per cent per man per month for accidents.

We feel that the reduction came not only through changing the guards, but through a greater sympathy on the part of the individual working man, and a greater sympathy on the part of the management and support, on account of the sensible, reasonable engineering principles applied to the individual hazardous conditions.

MR. GOLDIE: I feel today somewhat in the position of a boy who sticks a stick into a hornets' nest when he knew about what would happen before poking it in. I knew exactly what was going to happen when I made the remarks I did.

My friend from the Bureau of Standards got me wrong on some ideas. I am not at all opposing standardization. I am in favor of standardiza-

tion as far as it is reasonable, and as far as it is made as recommendations rather than made compulsory.

I would make this recommendation, and I think he will agree with me: That some of us fellows down on the firing line ought to be kept in touch with the work of the committee when standards are being worked out. The committee can get some pretty good ideas from some of the men who are right up against the real thing with the human element and with the mechanical element in the factory.

To start the ball rolling, I move you, Mr. Chairman, that a Committee on Resolutions be appointed by the Chair, to consist of three men (and I will put in that motion that I won't be on the committee) to draw resolutions giving the attitude of the Automotive Section with reference to the matter of standards, with the recommendations of this group both for and against the movement on standardization.

MR. DICKINSON: I would suggest that in addition to that, a coöperative committee be appointed. It is all right to outline your position on this movement. We are mighty glad to have it, but the fact is we want the actual active coöperation, because work on the code will probably be taken up fairly soon. Whether that will be sponsored by the A. S. M. E. or Bureau of Standards, I do not know. We are waiting until the formation of the Standards Association is put through to decide on the bodies best fitted to handle that. I rather imagine it will be the A. S. M. E., but in any event the coöperative group will be called together from all fields of industry. If you appoint a Coöperative Committee at this time I believe it will be worth while. I would suggest five men.

CHAIRMAN LYNCH: It is moved that a Resolutions Committee be appointed, as outlined by Mr. Goldie, to consist of five men, as amended by Mr. Dickinson.

(The motion was unanimously carried.)

EXPERIENCE AT NITRO

W. E. WILLIAMS,¹ SAFETY ENGINEER IN CHARGE, U. S. EXPLOSIVE PLANT "C,"
NITRO, W. VA.

When our Government decided to enter the war against Germany the providing of explosives was a subject that received considerable discussion and a lot of legislative action. As a result of the findings of the War Board it was decided to build a number of plants for the sole purpose of manufacturing various gases and explosives that would be required by OUR BOYS when they arrived over seas. Smokeless powder being essential to the elimination of the Hun, was one of the most needed of these explosives. As a result of this need our Government decided to build United States Explosives Plant "C" at Nitro, West Virginia.

The plant is located on the Kanawha River about fifteen miles below the State Capital, which is Charleston, and is surrounded by hills that

¹Mr. Williams was not present at the Session, but sent in his paper for printing in advance.

lend beauty to an otherwise, to some people, undesirable establishment. This plant was designed by the Graham, Anderson, Probst, and White Company of New York and the actual construction of the project was entrusted to the Thompson-Starrett Company of New York. These two companies, when operating on the ground, coöperated in the safe designing and building of this plant to the extent that accidents were mostly of a minor nature. The actual construction of this plant was begun when the engineers arrived at the site in December 1917 and the first building that was erected was the barracks for the housing of the workmen, completed January 1, 1919.

The conditions for building were not of the best. The ground was not in a fit condition to do much excavating, being subjected to the frequent attentions of Jupiter Pluvius who reigned supreme; and you can imagine what the men were up against when I tell you that this ground was mostly red clay. This clay was of such a consistency that for sticking to anything and everything it would make a celebrated glue look and act like so much water. The workmen wrote maudlin verse upon their working conditions and, if you will pardon me, I will attempt to give you a sample:

There is mud in your eyebrows,
There is mud in your nose,
There is mud in your hair,
There is mud in your clothes.
There is mud in your coffee,
There is mud—Gee, how it grows!
Where isn't there mud?—Nobody knows.

Yet—in spite of these conditions the workmen stuck to the job like true Americans.

Mr. Milo S. Ketchum, a noted Engineer whose works have been adopted as a standard by the engineering profession, received the appointment of Director of this plant and to him is due considerable credit for the safe manner in which the actual construction work was carried to completion. I wish to call to your attention the fact that the Safety Department was under the direct supervision of Mr. Ketchum and as a result of this arrangement, safety suggestions and devices were given the necessary authorization that would insure of their being carried out or installed whenever conditions warranted.

SAFETY ORGANIZATION

The Safety Department was designated by the United States Employees' Compensation Commission to administer the Federal Compensation law as applied to civilian employees and as a result of this arrangement a fairly large staff was necessary to handle all details in an efficient manner. The personnel of this department of Safety and Compensation was as follows: Safety engineer in charge, assistant safety engineer, three safety inspectors, one general inspector, chief clerk, two stenographers, one typist, two clerks; in all, twelve employees.

Safety Inspectors were provided with horses to enable them to cover the territory assigned them, which was about *two hundred acres each*, but even with this added facility they were kept busy from morning until night.

Inspection blanks were furnished to all inspectors and at the end of each day their reports were turned over to the assistant engineer who checked them for their practicability and later checked their installation. One suggestion only was allowed on each sheet, this sheet forming a complete record of the entire transaction, being dated with the day of the report, the date of the beginning of the work, and the date of its completion.

Each week a meeting was held in the safety engineer's office at which all the inspectors, the chief clerk, and a stenographer were present. The meeting was called to discuss the conditions and practices that required attention and also to give the Inspectors an opportunity to discuss any peculiar condition that existed in their respective territories.

Standard details were arranged and stairs, pits, wells, machinery, etc., were guarded according to the detailed plans that were designed for each building, the guarding being done *before* the building was turned over as complete. The proper place and time for the safe-guarding of all classes of machinery and buildings is when the plans and drawings for said machinery and buildings *is still on the drawing board*.

The buildings were checked for unsafe conditions before being turned over by the construction foreman, all safety recommendations being taken care of while the construction work was under way. One point that was very carefully gone into and that had a very beneficial effect upon the foreman was, that *we never made a suggestion until absolutely sure* that it would be practical and a material benefit. As a result of this method more than *ninety per cent* of recommendations made were carried to a successful conclusion.

RESULTS OF THE YEAR'S WORK

The final results of the year's work can be summarized in a few words as follows: The average number of employees for the entire year was 9,596. Of this number there was an average of 182 admitted to the hospital for treatment weekly with injuries such as wood splinters, scratches, contusions, abrasions, etc., instructions having been issued to the foremen to send all men to the hospital for treatment no matter how small an injury they received. The result was that only 414 infection cases were treated during the entire year. In other words we had only *eight* infections per week for a working force of *nine thousand* men or an average of *one per thousand*, roughly speaking.

The actual lost time days were 1,440 or an average of one-sixth of a day per employee for a period of one year, these figures based on an eight hour day.

METHODS OF SAFETY WORK EMPLOYED

The work of our safety inspectors was of a varied nature, in fact it ranged from the inspecting of water and sewer excavations to the inspecting of the erection of *two hundred and fifty foot* power house smoke

stacks. When the water works system was about to be started the inspectors were on the job to see that there were no unnecessary risks taken and due to their good work we are able to say that only one minor accident occurred and it involved no lost time. When the water intake was being built and the excavation had reached the stage where it was necessary to build caissons, the assistant engineer went with one of the inspectors to take a look at conditions. When I entered the air lock the foreman in charge, a genial Irishman by the name of Murphy, turned to me and said, "Hould yez nose and brathe tr-oo yez ears for if yez don't ye will be in the divil of a fix win yez get tr-oo." This was Murphy's way of saying "Safety first" and with his men he stood ace high and always got results.

The greatest contributor to the accident list was our old and familiar enemy *Nails Plus Carelessness*. In fact I might conservatively estimate that about 60 per cent of all accidents were nail injuries and our inspectors were ever on the job preaching the seriousness of the nail hazard.

Handling materials naturally was one of the contributing factors when you consider that there were more than four hundred buildings erected for the manufacture of smokeless powder. There were also erected 29 store buildings, 43 hospital buildings, and more than 1,250 bungalows for the workmen, in addition to which there were 90 residences erected for the executive officers making in all more than 1,800 buildings constructed in a period of nine months. This would average over six buildings a day.

Naturally you would expect to have a great number of deaths in an enterprise of this magnitude, and you will no doubt be surprised when you are told that there were only eleven deaths due to accidents during the entire year ending December, 1918. One method employed to educate the men in the safe way of doing their work was the use of some good bulletins. We had scattered around the plant some forty bulletin boards that were equipped with removable fillers, these fillers being made removable so that they could be prepared in the office and then the inspectors could take them to the bulletin board to which they were assigned. The system we used required the bulletins to be changed daily. We would start a bulletin in box No. 1 and the next day transfer it to box No. 2. From box No. 2 we would then transfer the same bulletin to box No. 3, and so on until that filler was returned to the office. We used National Safety Council bulletins and also others that we designed ourselves. The latter usually pertained to accidents which occurred on the plant, or to conditions which existed here, and these seemed to make a hit with the men as they were often personally familiar with the topic.

I had opportunities to speak to the men on several occasions, and during the summer of 1918 had the good fortune to be able to take a hand in getting a band together that could play fairly well. We would start for a certain point and play a march or two; when a goodly crowd had gathered I gave a heart to heart safety talk that never lasted more than ten minutes. Immediately after the talk a singer or an instrumentalist would entertain them after which I made it a point never to let the men get away before the question of making things safe had been put up to them in such a way that results would be forthcoming, and the record

that was made shows clearly that the workmen kept their promises.

Two deaths occurred when an ambulance that was out on a night run got mixed up in the signals of a train crew switching loaded cars of material in the plant about midnight. The ambulance driver and the doctor who accompanied him were killed almost instantly, and the automobile was made into the finest lot of junk that I have ever seen.

One of the most remarkable things from the accident prevention standpoint happened during the building of the power plant. This power plant covers an area of 240,000 square feet. This includes boiler room, power house proper, and coal bunkers. The coal bunkers have a capacity of 50,000 tons and the daily consumption is 2,500 tons every 24 hours. Coal is handled by traveling cranes using clam shell buckets. There are 34 horizontal boilers generating 1034 horse power each or a total of 35,156 horse power per day of 24 hours. When running full capacity there are pumped each 24 hours 40,000,000 gallons of water, this amount being necessary to supply all needs of manufacturing purposes as well as the supplying of all employees' bungalows. To safeguard the health of the workmen this water is tested daily for colon bacteria. Not a single case of typhoid fever has occurred since the filtration plant was put into operation so you can readily see the water supply is of the best. *Not a single death or permanent disability accident occurred while this project was under way.*

The electrical hazard was also a very serious one, the plant being wired with high voltage cables, the trunk lines carrying 6,600 volts. This voltage is then stepped down to 4,400 and then down to 220, this being the average voltage used throughout the reservation.

There are 11 miles of narrow gauge track and 46 miles of standard gauge, the narrow gauge track being used for the electric storage battery motors and powder cars, and the standard gauge track for the moving of all standard rolling stock handling materials to and from the plant. Railroads were responsible for the deaths of four men and the permanent disability of one.

When the actual manufacturing of powder was under way there was need for the men to exercise more precaution than during the construction period and the one thing that the inspectors preached was carefulness. A clean house reduces the fire hazard and as a fire would have disastrous results every precaution was taken to insure the safety of all employees. Rules were put into effect with very gratifying results as there is on record only one person that received severe burns, this accident being to a powder operator who turned off the water that is necessary to keep the revolving knives from heating up when they are cutting the lengths of powder to standard size. This woman was so severely burned that she was not expected to live when admitted to the hospital. The surgeon at the hospital did a good piece of work and the woman finally recovered.

In the manufacturing of powder, sulphuric and also nitric acids play a very important part. If you will allow me I shall give you a brief sketch of the manufacturing process as applied to the making of smokeless powder.

PROCESS OF MANUFACTURING SMOKELESS POWDER

Raw sulphur when taken from the railroad cars is dumped into a series of bins that are located directly behind the burner houses. This sulphur is then placed into a slowly-revolving drum where it is ignited and the fumes are then carried through a series of lead pipes. Oxygen is then added and the fumes pass through platinized asbestos. The mixture is then conducted through glass wool filters to insure that it is purified and at the conclusion of this treatment we have what is known as 60 per cent sulphuric acid, this acid later being concentrated to 99 per cent.

All dirty cotton is placed in the huge kettles that are known as digestors and from there it is conveyed by vacuum to the bleaching house where all foreign matter is removed. When the cotton reaches a certain stage of cleanliness it is put through a continuous drying process that finally delivers the cotton in a clean dry condition. This cotton is then blown by the fan through a conduit and finally delivered to the nitrating house storage room. The cotton is then placed in the mixing tubs and a certain percentage of prepared acid is added. After it has been mixed thoroughly a flood valve is opened and the mixture is dropped into the wringing machines where the excess acid is removed by centrifugal force. Any foreign matter getting into the wringers at this period or the shutting down of any individual wringer would cause the mixture to fire, and should this occur it would mean the closing down of that particular wringer for one-half hour to allow it sufficient time to cool. Airplane fans, thoroughly guarded are used to disperse the nitric fumes when a pot fire occurs. After the necessary time has elapsed the wringer is shut down and the contents are removed through the bottom of the wringer by the operator who forks the cotton down with an especially prepared fork. The fork has the tines capped with brass balls, this being necessary to eliminate the hazard of causing a spark when the fork hits the side of the cast iron pot; while the operator is forking the treated cotton into the opening it is flushed down into the drowning sump where it is kept in constant motion. This treated mixture is then pumped into long flumes where it can be deflected into any one of a hundred tubs where it goes through a boiling process, after which it is passed to a large tank and subjected to a considerable beating necessary to break up the cotton into very fine particles. From this point it passes through screens and finally brings up at the blending house where it is thoroughly mixed with other batches to insure a mixture that will be as nearly uniform as possible. It next goes to the final wringers where the excess water is extracted from it and it is then placed in an almost dry state into what are known as pyro cars and shipped in these cars to the clearing house. At this stage the mixture is known as gun cotton.

The gun cotton is now placed in tanks where a revolving spindle keeps it in motion and ether is added to the mass which emerges in jelly form. This is removed and pressed into blocks and placed into cans for transmissions to what are known as the press houses. These presses have a die placed in the lower end which is equipped with a number of holes the necessary diameter of the powder. Inside each hole there are placed

projections to cut the longitudinal holes which are necessary for the rapid combustion of the powder. The colloidal, as the powder is known in this state, is then raised by means of small elevators to the floor above the cutting machine floor and is placed in the mouth of the ram guide and the ram, in descending, forces the colloidal through the die holes and forms a continuous string that is fed to the cutting machines where it is cut up. The powder is then stored in houses where the ether is driven from the soft or green powder, and, after a certain period, it is removed to what are known as water dry or the natural air dry houses where it is allowed to reach the required seasoning necessary.

The final process before it is packed for shipment is blending. To accomplish this the powder is hoisted to the top of a tower and is then allowed to drop upon a large spreading plate from whose sides it falls into another hopper. From this hopper it then falls upon another spreading plate, and finally rests in a large hopper equipped with a gate which will allow a certain amount to pass through into weigh scales where it is automatically placed in boxes for shipment. All metal work that comes into contact with the powder is grounded so that static electricity, that may be generated, will not throw a spark and cause an explosion or a fire. Although thousands of pounds of acids were used we had very few bad burns. Our safety inspectors made it a point to spend a considerable amount of their time around the places where the greatest danger existed, cautioning the workmen at these points to pay strict attention to business and formulating among these workmen certain safe working habits that they readily adopted. Their success in keeping down acid burns exceeded our expectations.

CREDIT DUE TO WORKMEN

In summing up the entire situation in my experiences on a Government explosives plant I wish to give due credit for the excellent safety record made to the men who were in a large measure really responsible, and I may state that the finest number of real men that it has ever been my pleasure to work with were employed by the engineering and construction companies. Their accepted motto was, "SAFETY FIRST, LAST, AND ALL THE TIME," and safety coöperation could be had at all times.

CHAIRMAN LYNCH: I am going to call for the report of the Nominating Committee, and then we will ask the members to give their names to the chairman—either to me or to the new chairman—regarding those who wish to serve on the committee. Then later we will appoint the committee to take up the matters of standards.

Mr. Barratt, will you kindly report?

REPORT OF NOMINATING COMMITTEE

MR. MICHAEL BARRATT (Michigan Bolt and Nut Works, Detroit): It is the unanimous report of the committee that James J. Lynch be re-elected as chairman of this section, and R. A. Shaw as vice-chairman; and that R. F. Thalner be elected as secretary of this section.

The report of the committee was unanimously adopted. The meeting then adjourned.

Cement Section

October 2 and 3, 1919

H. G. JACOBSEN, Chairman

Manager. Accident Prevention and Insurance Bureau. Portland Cement Association, Chicago

THURSDAY MORNING SESSION

CHAIRMAN JACOBSEN: This is the fourth cement sectional meeting we have held in connection with the National Safety Council's Congress. The meetings we have previously held have been very successful and interesting and instructive talks have been given. I hope this year we will have more discussion of the various subjects. We have some very important subjects on our program; they should be of great interest to all cement men.

The first paper is by Dr. C. E. Coleman.

PHYSICAL EXAMINATION, FIRST AID AND CARE OF THE INJURED AT CEMENT PLANTS

DR. CHARLES E. COLEMAN, PLANT PHYSICIAN, MARQUETTE CEMENT MANUFACTURING COMPANY AND LEHIGH PORTLAND CEMENT COMPANY,
OGLESBY, ILL.

ORGANIZATION

At the two plants I represent we have committees of which the company physician is the chairman. There is a slight difference in the organization at the two plants. I like some features of both. At the Marquette plant we have a man from each department at the safety meeting and an alternate from each department automatically becomes a member of the committee when the regular member's term expires. They change every six months. Then we have a man from each department whom we try to train as first-aid man.

EQUIPMENT

We have a centrally located first-aid room with all necessary equipment for treating injuries and making physical examination of employees. In

the various departments we have first-aid cabinets, not the ordinary stock affairs, but cabinets we have fixed up ourselves. In these cabinets we have bandages of several sizes, tourniquets, hemostats, iodine, boric acid solution, applicators, cotton, 1 to 2000 bichloride of mercury solution, bicarbonate of sodium solution for burns, and aromatic spirits of ammonia. We also have blankets and litters at conveniently located parts of the plant.

PHYSICAL EXAMINATION

Every man hired is examined. When a man comes to me for examination I size him up as he comes in—his gait, height, approximate weight and general contour. I can tell by that to a fair degree whether he is physically fit or not. Then I go on with the examination.

The first thing I do is to weigh the man. Then I measure his height, look at his nose, throat, teeth, listen to his heart and lungs. Close examination is made for hernia and varicosities and particular stress is laid on examination of the eyes. It is surprising that some men are blind or almost blind in one eye and don't know it. That sounds funny to some of you, I expect, but it is true.

As an illustration we have a victim right in front of us. Mr. Jacobsen came in one day and said, "Why do you make such a close examination of the eyes"? I said, "Sit down and I'll show you." When I got through with him, I told him not to go to an ordinary oculist but to an eye specialist. Mr. Jacobsen's left eye I found to be in poor condition and 80 per cent of our men have some defect in their eyes. When I have finished with the examination of a man's eyes our examination blank is so complete that the man can take it to any oculist and have glasses fitted if necessary. It is just the same as if he had had an examination that he would have to pay for.

Next I have the man remove his clothing in order to make a thorough examination of his body. The teeth are also examined and a chart taken of them. Although we have not done anything in respect to dentistry work we give the man good advice as to the use of a toothbrush, etc. This examination is not made to find perfect specimens but to find the right man for the work. I think we have examined about 700 men at the Marquette plant during the last eight months and have had about ten rejections. One had hernia. The man was given good advice and told if he had his hernia fixed, he could come to work. Others had venereal diseases. A man with syphilis if in an infective stage is not put to work.

If a man has bad eyesight, we are not going to put him on a motor car—he might run over some one. If he has a bad heart we don't want him shoveling coal, or doing some manual labor like that. We give him an easy job. We have found positions for those men. In the past, if a man was deformed, had a leg off, or something like that, he would be a watchman. Three years ago there were two watchmen at the Lehigh plant each without a limb. Now one is second engineer and the other is running the coal house engine. Both are making more money and doing better work than they did before.

CARE OF THE INJURED

If men have small cuts or bruises they come in to see me during the clinic hour. I give them the necessary treatment and see them every day as long as necessary. I believe we are saving money by having these men lose that time each day to come in and see me. We have found that only a few piece-workers are hard to get in but that is all. The other men are willing to come and all are satisfied. The more serious cases, of course, we take to the hospital. We have no hospital at either plant.

A good treatment to prevent infection of wounds I have found is chloramine-T. That is a new chlorine preparation generally called Dakin solution. I use one tablet to a four-ounce bottle of sterile water. By bandaging the bruise and keeping it wet all the time with this solution the wound generally heals readily. There is another preparation we use—di-chloramine-T. It is an oily preparation and we use it in strengths of from one to five per cent. By using this solution on a rather bad burn a short time ago perfect healing was obtained.

We have a good many scalp wounds, but I believe we have not lost more than one day this year on that account, although in one of the cases four stitches had to be taken.

We have had several fractures at both plants this year, all foot or hand fractures. I take X-ray pictures of all fractures. A man often gets a bump and just a little splint is cut off a bone in a finger and this makes one of the most troublesome cases. The finger swells and a stiff joint is likely to result. For that reason I take an X-ray picture of everything that looks like a fracture. Of fifty or sixty X-ray pictures I have made this year, all but four or five proved to be fractures. In compound fractures, where the bone comes through the flesh, never pull the bone into the flesh, the thing to do is to put iodine on, because, as we all know, iodine cleans and infection will be prevented even if the bone should happen to slip back. We have a metal splint which can be adjusted to any angle to fit the limb and good results have been had in using it.

We have had one case of cement suffocation this year, the only case in two years. A boy had gone into a bin and someone piled the cement down, covering him. I got there almost immediately. The boy was taken home and did not seem to be in very bad condition. He carried a little temperature and spit quite a bit of cement for several days after I had given him ammonium chloride to bring up the secretions. The boy has fully recovered.

Shock is something we must be very careful with. Almost any severe injury may cause shock. There is only a slight degree of difference between fainting and shock. Fainting is caused by blood leaving the brain. Shock is the same thing, only to a greater extent. What must be done first is to get the head low. The symptoms of shock are pallor, rapid pulse, clammy, moist skin, and the temperature is usually sub-normal. Sometimes the finger nails and lips get blue. External heat must be applied as quickly as possible. I also use morphine atropin hy-

podermically. At the Marquette plant we have two hypodermoclysis outfits. In case of severe shock they will come in handy. We have not used them yet, but they are there in case we should need them.

An electric shock is usually not fatal at once. The heart beats for some little time after. It is necessary to get bodily heat and respiration almost immediately. The center of respiration in the brain is stunned and breathing ceases, although the heart is still beating. Remember that prompt and continued artificial respiration is of the greatest importance in these cases. First find out if the man has anything in his mouth. Then you can begin to apply the resuscitation method with which you are familiar. Personally I believe in the insufflation method. I use that method on a good many newborn children. The first aid schools say that by that method you are blowing carbon dioxide into the man and doing him no good, but I think by this method he gets more respiration than by any other I know. Lay the man down, put a piece of gauze over his mouth, blow into his mouth, fill up his lungs with air and then press that out, working about 18 times a minute. I do not believe in lung-motors at all at the plant.

METHOD OF TREATING BURNS

In treating burns our method is to use a saturated solution of bicarbonate of soda at the first-aid station. Then the doctor is called and if the burn is bad I use parresine, which is a wax. You can get ambrine, parresine, liquidine; they are all about the same. In treatment of burns you should carefully clean the part by douching it with a comfortably hot one per cent Dakin solution. Clean the part as well as you can; if there is any loose burned skin clip it off. If we have a third degree burn we use a waxed gauze which is rather open, somewhat like a fly screen. We spray this with the wax, then put on cotton and spray again and repeat this until we get like a little splint over the wound. A sprayer can be used in applying the wax; I use the DeVilbliss atomizer. When the atomizer is not available, a fine, soft camel's hair brush may be used. The brush is dipped into the melted wax and applied with the utmost gentleness not only to avoid unnecessary pain but to cover all parts definitely and smoothly.

To prevent infections we try to see every injury, no matter what kind it is. If a man has an infection—it may be a swollen hand—he generally comes in and says, "I didn't sleep last night." That is the reason he came to see the doctor.

We wrap the hand in a towel saturated with a 1 to 2,000 solution of bi-chloride. It does not have to be bi-chloride, you can use plain water; the reason I use bi-chloride is because if the man is infected I do not want to infect any other part. Wrap the hand completely with the towel. If there is a spot left open a blister will break out on that spot. After covering the hand we put it into the electric light cabinet from 15 to 30 minutes. I refer to the electric light cabinet illustrated and fully described in the July-August 1919 number of the Accident Prevention Bulletin issued by the Bureau of Accident Prevention and Insurance of the Portland Cement Association. After the first electric cabinet treat-

ment, patients say the pain is gone. This treatment is equally good in cases of sprains.

I have removed some very large pieces of cement from the nasal cavities of the workmen. The best procedure is to break the mass, so there will be no laceration, as this would be the outcome if the piece was removed *en masse*. The after-treatment is to keep the nostrils clean for a day or two. I usually use equal parts of iodine and glycerine.

CEMENT IN THE EYES

We also have a good deal of trouble with cement in the eyes. The thing to do is to stop the burning as quickly as possible. We get the man to the first-aid room immediately and by placing him on the operating table we have him in such position that we may make a pool of his eye. We never use eye cups, as it is never certain that the man will open his eye with an eye cup over it. We use a solution of boric acid; this neutralizes the lime in the cement and in a minute or two the burn has stopped. Then we use a few drops of cocaine. If you have no physician at the plant, use holocaine; you need no license for that. Holocaine will do the same work as cocaine, but is a little slower. The patient after this treatment is at ease; you have his confidence and can work on him readily. After having made the eye insensible, to remove any substance a good loupe is necessary. I use the B. B. loupe which is something every plant should have. As an after-treatment I use argyrol or a two per cent holocaine ointment. It keeps the pain down. If after an eyeburn a man's eyelids stick together the next morning, he has a little infection, and then we have to use 25 per cent argyrol. This spring we had a great deal of what is commonly called "pink-eye". A workman will say the cement is burning his eye. We find it is only one eye, and it is a case of catarrhal conjunctivitis. In those cases we use 25 per cent argyrol.

If a man gets a foreign body sticking to his eye, I make the eye insensible, pick the piece off with an eye spud and put argyrol on for two or three days. We have no trouble when we pursue that method, if the man comes in immediately. It is the man who lets it go for two or three days with whom we have trouble. We had a case recently. The man came to me and said, "Three days ago I hurt my eye; I think it is burned." I told him to go to an eye specialist immediately. That man by this time has lost complete use of the eye. The specialist could do nothing for him.

I think a very good feature is the daily clinic. All cases of minor injuries are seen and treated. We also carry a small line of medicines at both plants. I do not know what you gentlemen have to contend with but we have a large number of foreigners and they are all "bad sick" here, there, or other places. In such cases our small supply of medicine is a great help to us. It is given to the men gratis. It has taken a year to educate them to come to me, but they are coming every day now. It is not only the men from the plant, we have a number of calls from the people in the office.

In respect to general sanitation our plants are continually making improvements, by installing wash and bathhouses, lockers, improving our drinking water, etc. We find it is rather difficult to keep the plants clean, I do not know why. Because there is dust around is no reason why there should also be a lot of rubbish. I believe a cement plant can be just as clean as any other plant. I do not mean free from dust, but free from rubbish. Your workmen can do much in helping you in this respect if the right methods are used.

DISCUSSION

CHAIRMAN JACOBSEN: Have you any questions you want to ask Dr. Coleman? You had one, Mr. Josse, which I asked you to defer until the discussion of this paper.

MR. J. C. JOSSE (Continental): The doctor answered the question about the length of time the arm or the infected part was to be left in those cabinets.

DR. COLEMAN (Lehigh and Marquette): As I said, that all depends on the individual: some men can stand it longer than others. But the thing to do is to have the part thoroughly covered. That is, the wet towel, or whatever is used, has to cover the whole part entirely. Wherever it isn't covered, the man will become blistered, almost invariably.

MR. JOSSE: I have another question on this parresine treatment. You say that you build up this with gauze, cotton, etc., and the parresine. How long will that treatment stay on?

DR. COLEMAN: If it is a recent burn, you can leave it on for about three days.

MR. JOSSE: We have had burns recently, and they had to be treated every day.

DR. COLEMAN: Some of them do.

MR. JOSSE: The water got in beneath this treatment.

DR. COLEMAN: Did you use parresine wax?

MR. JOSSE: No.

DR. COLEMAN: That allows the serum to run out. That is why you can leave it on three days when you use that method. The cotton will absorb the effusion and you can leave it on longer. There are some men who, we say, are "pussy." The pus doesn't come from the inside, it comes from the outside, but we have to watch to prevent its getting on the inside.

MR. JOSSE: We had a case recently where a man was being treated and died of toxin poisoning.

DAKIN SOLUTION

DR. COLEMAN: Dakin solution is very effective. You can get tablets, and one tablet makes a quarter of one per cent solution. I use it as a gargle for all throat troubles, as a mouth wash for all conditions of the mouth, and for all kinds of infections, or wounds that we think will become infectious. I had a man whose skin was cut to such an extent that

every time he bent it opened. I didn't give it a chance to become infectious, although it was awfully dirty. I splintered it, cleaned it as well as I could, and had the chloramine on it, that is, the water solution, for three days. Then I took the bandage off. I didn't take it off in the three days, because I felt sure that I would get into trouble if I did. Then I took it off, and the wound healed by first intention. The tendon was exposed in that case, but there was no trouble, although I looked for it, as those men are not at all clean.

We sometimes have hobbies. The Dakin solution is mine, because I am getting results from it, and that is what we are after. We have had results with our electric cabinets, and we believe in them. And I don't feel that it is out of the way at all to say that his chloramine-T is the best thing we ever had for industrial work. It is cheap—we get 100 tablets for 65 cents. It is very easy to apply them. Put one tablet in a four-ounce bottle of sterile water. Don't use any but sterile water, because if you do it will precipitate the chlorine and you will have nothing.

Results were obtained during the war from this solution that could not have been achieved in any other manner. Men who had badly-infected wounds were cured by this method. The peculiar feature of it is that it irritates the outside of the wound, the good, live flesh, but it does away with the necrotic tissue; it seems to eat it up, and the healthy tissue builds up right under it. I think all plants could profit by using it. Of course, I suppose the physician would have to authorize it, but in the places where a physician does not come to the plant every day, if you will try chloramine-T in a watery solution and di-chloramine-T in an oily solution, you will eliminate many of the cases that are causing you a lot of annoyance now.

MR. SCHLICHER (Lehigh): In your ambrine treatment, what success have you had?

DR. COLEMAN: That depends a great deal on the size and character of the burn. Mr. Josse said they had a man who died from toxin. I presume he had an infected burn.

MR. JOSSE: Yes, although at first this man did not seem to be very seriously burned. The accident happened about 11 o'clock at night, and he was taken to the hospital immediately. The parresine treatment was given him at once, but the man got gradually worse.

DR. COLEMAN: When the analysis was made, wasn't there any sign of kidney trouble?

MR. JOSSE: No kidney trouble at all. He was only a 19-year-old boy. He had the most expert treatment we could give him, but he died just the same.

DR. COLEMAN: We had a man last year who was burned badly. He was like a human torch. I suggested at the time this happened that all men who work where they can easily catch fire should be provided with woolen clothing. This man had on cotton clothing, and he threw some coal dust into a place where it exploded, and it set him afire immediately. He had no pain at all. I knew he was going to die. We just used vaseline on him, but that was only because we wanted to do something. He had no pain, he was burned beyond pain. His essential nerves were

all gone, and he died the next day. His was a fatal case right from the start.

MR. JOSSE: We had a fatal case like the one you mentioned. The man's clothes caught fire from some coal dust which had exploded, and he started running. Before they could get to him, his clothes were burned off him, and of course he died. But the other case I mentioned happened because of the curiosity of the young fellow. He wanted to see just how things looked "in there", so he crawled in through some hot ashes.

DR. COLEMAN: How long did he live after it happened?

MR. JOSSE: He lived three weeks.

DR. COLEMAN: That sounds unreasonable, but it could have been pneumonia, and other things. The parresine treatment is good, if it is given properly. The whole idea of keeping the burn covered is to keep the air away from it, whether we use soda, vaseline, or some other method of covering it. I don't bother putting wax on the smaller burns; I just cover them well with vaseline, a sterile vaseline, and bandage them; but the more extensive burns—and we don't have very many of them—we treat with parresine wax.

MR. SCHLICHER (Lehigh): The reason I asked that question is because the ambrine people have put a case on the market, and I wondered whether you use that case.

DR. COLEMAN: No, we bought the parresine, which is practically the same thing. We bought it from the Abbott Alkaloidal Company, of Chicago. They call it parresine, but ambrine would do the same thing. It is a wax method.

MAJOR RENINGER (Lehigh): I saw them use ambrine in France.

MR. FORTUIN (Pennsylvania): Do you make a physical examination compulsory at the plants you are connected with?

DR. COLEMAN: Yes.

MR. FORTUIN: Do you ever have any objections on the part of the men?

DR. COLEMAN: Never, unless they know there is something the matter with them.

MR. FORTUIN: How long has that system been in force?

DR. COLEMAN: It has been in force for two years, and we have never had any difficulty, except in one case where a man had poor eyes, and he knew it. I happened to know this man's brother, who also had bad eyes, in fact the whole family had bad eyes. This man is likely to go blind any day, so I was only too glad when he quit.

MR. FORTUIN: I thought you said you had 10 rejections out of 700 men, or something like that. What was the cause of the other rejections?

DR. COLEMAN: Bad hearts, hernia, and venereal diseases. We don't always reject them, but we put them to work where they can work without injury. For example, there was a man who was injured while working for the city last year, who had a very bad hand. He came to our plant, after he got so he could use his hand for work, and as they needed men very badly at the time, they employed him. I told the employment manager at the time that this man could not do any hard work.

He went to work marking cars and I told him at the time not to do any hard work, because we couldn't hire him for that. After a while, they wanted to get cement out, and they put him on trucking. It was his fault, of course, and a few days later he came down to me with his hand swollen. If we have men who have hernias, we tell them not to do heavy work.

MR. FORTUIN: Instead of telling the man that he should not do certain classes of work, wouldn't it be more proper to tell the foreman who is directly over him what kind of work he can and should do?

DR. COLEMAN: Of course the foreman should be informed. We had a man not long ago whom we found in the coal house with a bad, leaky heart. He went to work in the morning, and in the afternoon he was examined. He had a very bad leak, and wouldn't have lasted a year in the coal house. We put him to work as a belt tender, and he is getting along very nicely now. He is making a living for his family, and will probably live for years.

MR. FORTUIN: It seems to me, under those circumstances, that a physical examination isn't of very much value if you take men, whether they are physically fit or not, and attempt to put them on special work, and then they are put on other work.

DR. COLEMAN: We have tried to fit the men for the work that is best suited for them, but it is a very difficult thing to do. The past summer, for instance, it was hard enough to get men at all. We have taken men who were nearly in their seventies. You have to allow for the fact that the labor market is very scarce where we are, and we had to take men whom we felt we didn't want—that is they weren't physically fit—and take chances on them.

MR. FORTUIN: That is what I wanted to bring out. Is that due to shortage of labor, or is it your usual custom? What practice would you use now?

DR. COLEMAN: We are still short, although we are getting a little better pick of men, but the labor market is still close.

MR. HALPIN (Marquette): It isn't as bad as it has been.

MR. JONES (Atlas): Have you any method of following up people who are absent from work because of sickness or accident in your plant?

DR. COLEMAN: We haven't gotten that far yet, but I think that is coming. I think that a little later on the physician will look after every man in his plant. If men are sent home, and we have men who live in different places around the plant—some in La Salle and Jonesville—I go to them. If they are at the hospital, I go to them there. We are keeping track of them pretty well. If we have a man with his finger off,—he is able to walk, but he isn't able to work—I have him report to me every third day in order to keep him in line, and as soon as he is able to work, we send him to report to the insurance company, and then he comes back to work.

CHAIRMAN JACOBSEN: Have you any other questions to ask the Doctor about this proposition? I have seen this work out from the very beginning, the method of physical examination and keeping close watch on

the men in case of injuries, and there is no doubt as to the benefit that can be derived, if it is done right and done conscientiously. I know of plants where certain accidents have occurred, and less than half the time that usually is lost by such accidents was lost in these plants. In some places, they eliminate about 75 per cent of their time loss on this account. It stands to reason that if a man comes in with a small scratch on his hand, and gets it treated, he is going to go back to work as soon as he can.

MR. FORTUIN: Has that been during the war period?

CHAIRMAN JACOBSEN: Yes. What is the difference after you have the men in the plant?

MR. FORTUIN: They don't want to stay.

CHAIRMAN JACOBSEN: You can't expect your men to follow out your instructions, if they are not looked after. You have to have somebody to handle that work. That is the basis of the whole proposition. If you have nobody to handle the work, it is not done.

MR. FORTUIN: I know of lots of large plants that have always, prior to the war, made physical examinations of their men, but they had to abandon that idea during the war period, because they had to take anything they could get.

CHAIRMAN JACOBSEN: I am not talking about the physical examination as much as the daily check-up on the men.

DR. COLEMAN: If we know our men, we know just about what to expect from them, no matter whether they are incompetent or not. I believe it is a check. Another thing that I want to mention is the thorough understanding between the employment manager and the doctor. We try to have that as much as we can.

CHAIRMAN JACOBSEN: Are there any other points that any of you wish to bring up on this matter? This is a very interesting question, of course, and it is something we ought to look into. We still have far to go on it.

MR. LAWNICZEK (La Salle): We have a scheme of checking up our men at our plant. We have our foreman report every man who does not report for work. Then, we find out what the cause of the absence is. In regard to fitting a man for a certain job, if a foreman should get a man who is not fit for a certain place, he turns him over to the employment man, and he is put into another department. During the war period, if the foreman couldn't get along with a certain man, we would turn that man over to the employment department, to be put into another department. In that way, we cut our labor turnover considerably. Lots of times it was the foreman's fault that the man couldn't work for him, and lots of times we have had to change a man from four to five different departments before we discharged him.

CHAIRMAN JACOBSEN: How long have you had that physical examination in force in your plant?

MR. LAWNICZEK: About three years, and it is working out very nicely. We had a case of strangulation in a rock-bed one time, and after the doctor examined the man, he found he had locomotor ataxia. If we had

known that was the condition of the man at the time we employed him, we wouldn't have used him in that bed.

CHAIRMAN JACOBSEN: The physical examination is a very difficult and delicate proposition, but because it is difficult, I don't believe there is any reason why we should not give it careful consideration. We will have to go on the next subject on our program now, which is "Sanitation in Cement Plants." Mr. B. L. McKay, of the Buffington Plant of the Universal Portland Cement Company, has been prevented from coming so Mr. G. C. Huth, of the Duluth plant of the Universal Company, will read that paper.

SANITATION IN CEMENT PLANTS

B. L. MCKAY, EMPLOYMENT AND SAFETY INSPECTOR,
UNIVERSAL PORTLAND CEMENT COMPANY'S BUFFINGTON PLANT,
BUFFINGTON, IND.

Sanitary conditions are great factors in the successful operation of every industrial enterprise and give to that industry character, which is the foundation of every success in life.

I fear the subject of sanitation has been sorely neglected in a great many of our industries and should be given more thought.

One of the greater problems in operating any industry is the shifting of men from one place to another.

Results accomplished by the safety and welfare movements have demonstrated that there can be no stability of labor unless working conditions are sanitary, agreeable and safe. One of the great secrets in handling men, if not the greatest, is to keep them contented, and in order to do this physical surroundings must not only be safe but healthful.

Plant sanitation equipment is a part of these surroundings and plays an important part not only in the happiness of the employee but also in the health and happiness of his family.

From my experience in employing men, I have found our sanitary conditions a great asset, as they appeal to the better class of men, for he who is clean physically is clean morally.

The tremendous attention bestowed upon the work of sanitation, the increasing large sums spent annually to preserve the health of the employees and their families are two of the outstanding features in the work of the United States Steel Corporation's Bureau of Safety, Sanitation, and Welfare. Already the annual expenditures run into millions.

DRINKING WATER

One of the first things I would like to mention is drinking water. Contaminated drinking water has unquestionably been one of the most potent agents in spreading disease in industrial plants, and it is only within the last few years that the importance of furnishing germ-free water has been recognized and acted upon. Therefore, one of the first steps in sanitation is good drinking water.

There isn't anything I know of more refreshing and healthful than a glass of pure, clear water.

The most sanitary and convenient method of furnishing drinking water to large numbers of people, such as work in industrial plants, is the bubbling fountain. It is all important that the design and operation of the bubbling fountain is such that the germs of disease from an infected person who has used it cannot come in contact with the subsequent users, and that they become entirely removed from all parts of the fountain coming in contact with the users.

These fountains are being used in our plants and give perfect satisfaction. Our drinking water is furnished from the Gary Water Works and is the same that is used in hundreds of homes in that city. I would like to recommend that these fountains be installed in every department and department building, just as near to the workmen as conditions will permit. Convenience should be the object in all sanitary installations.

LOCKERS

The next thing I want to mention is lockers. Upon entering employment one of the first requirements of an employee, is a place to keep his or her clothes, so that it is possible for them to make a complete change before starting and upon the completion of the day's work.

It is my experience that the individual locker system is most satisfactory to the employee, and by using a sensible locking system the lockers are always accessible for inspection. Employees are expected to keep their lockers clean, but inspection is necessary.

The lockers should be made of metal, substantially constructed, and connected in units to the best advantage of the space available and should be closely connected with both lavatories and bathrooms. Each unit of lockers should be set in a double row, back to back, on a concrete platform about 18 inches from the floor. This platform should extend about 12 inches on each side of the lockers. This makes a very suitable seat and is also convenient in flushing out the locker rooms as the platform keeps the lockers from any dampness that would result from the flushing.

Lockers should be of a sufficient height to take care of the average length coat. They should be set on a base of four legs about 8 inches from the floor or platform. They should be about 64 inches in height—width 15 inches and depth 18 inches. There should be a shelf at the bottom of the locker, for the shoes. This shelf should not be on a level but slant toward the back with a screened opening for ventilation. A shelf should also be installed at the top of the locker about 54 inches from the floor, and extending about 10 inches from the back. At least three hooks should be installed under the shelf, also, if possible, grooves for a cross bar for the purpose of hanging coat hangers if desired. Here also should be openings for ventilation, which, with the openings at the bottom of the lockers will allow a free circulation of air at all times. The top of the lockers should not be flat, as it has been the custom to build them, but they should be built with a slanting top, the pitch being toward the front, thus preventing the gathering of dust and rubbish.

A good locking system is that operated by the handle pulling down latch bars which fit in grooves at either end, this making it impossible to pry open the ends.

The system of locking that we are using is a metal bar fitted through the latch on lockers. Each bar has a hole at either end large enough to admit almost any lock. The two holes are for the purpose of putting two locks on each locker, one to be furnished by the man and the other by the company. This system of locking has been found very satisfactory and also very convenient as it has been the means of saving many an employee's lock from being broken, when he left his keys at home. Whenever this happens the key for the company lock is obtained from the foreman and the locker opened without any damage. This system has also been found very convenient for inspection.

LAVATORIES

Some of our lavatory equipment consists of white enamel steel ware, but the greater part is of cement and of a design to suit the purpose. Those of cement have been acid-proof treated, and have been found efficient.

Hot and cold water is always available and connected to mixing valve where it can be made the desired temperature. The lavatory units have no stoppage at waste openings, in order to assure each user that he may wash in clean running water, which has not been used nor can be used by any one else. Liquid soap dispensers are installed in all lavatories.

SHOWER BATHS

Shower baths should be equipped with shower heads, each shower contained in an enclosure for the purpose of privacy, and thorough floor drainage. The baths should be contained in well-lighted and well-ventilated rooms free from all draught, in order to prevent discomfort to the users. Shower baths should be closely connected with locker rooms.

TOILETS

Toilets should be located conveniently to and easily accessible from, all places where persons are employed, and with outside exposure for light and ventilation. This is very important.

Our standard consists of full porcelain and cement urinals equipped with pipes for constantly running water and separated by slabs for privacy. Solid porcelain closets with open front type of seats, automatically flushed by seat action. Each closet in a cabinet with a door. In every case lavatories, toilets, and wash rooms should be installed in each department and be for the use of that department.

A janitor should be placed in charge of every wash room lavatory, and toilet. All lavatories and toilets should be equipped with a faucet and hose for flushing purposes.

WASTE CANS

Waste cans should be furnished every department in order that refuse can be properly disposed of. This is a great problem and every effort

should be made to curb the fly nuisance that causes so much sickness. Signs should be posted in conspicuous places ever to remind the employee to help keep the plant clean.

WALKS AND ROADS

Good walks and roads throughout the plant is another step in plant sanitation. It permits thorough cleansing. There is a complete network of concrete roads and walks around our entire plant leading to and from every department. The roads and walks are washed and cleaned regularly. Another thing is the settling of dust on windy days, for dust is a carrier of disease. We have a system of fire plugs throughout the plant where hose can be connected and yards sprinkled as required.

It is a habit to take more or less pride in looking and feeling well dressed and clean, for Cleanliness is truly next to Godliness. I believe the better dressed and cleaner an employee is the greater asset he is to the business.

The concern then, which has all the sanitary conveniences will attract and hold a better class of workmen as well as educate the negligent, for the workman is not worth while who would not prefer employment in a place where he can wear a good suit of clothes to work, change when he gets there, put on working clothes, and when he has completed his day's work, bathe, and don his street attire, feeling like a new man.

A Bulletin issued by the Pennsylvania Department of Labor and Industry declares that the chief aim of education is to train the individual to do the right thing at the appropriate time without having to think. From habit the varied activities of our daily life become automatic, leaving the higher powers of the mind free for the performance of their own peculiar work. In order to make the nervous system our ally and not our enemy in relation to habits of health it is necessary to make automatic as early as possible as many acts as we can which will promote our physical well being. The employee and his trade, the employer and his profit, the product and the national output, are either helped or injured by the method of living of each individual. It is generally recognized that the chronic habits of unhealthy living produce industrial inefficiency, and is strikingly illustrated by alcoholism, but such losses among employees are easily controlled because they are apparent. On the other hand losses from faulty personal habits or bad housing conditions are more difficult to anticipate and remove. For this reason it is harder to convince a worker that habits of health and cleanliness will increase his earning capacity as surely as intemperance will decrease it. Factory, shops, and tenement supervision, restriction of hours of labor, prohibition of child labor—all these welfare movements inculcate in the people of the community, where they operate, habits of health which promote efficiency.

CHAIRMAN JACOBSEN: This question of sanitation in cement plants is probably bigger than we sometimes think it is. Years ago, I believe few industrial plants gave much attention to the question. It is a thing that has to develop slowly. It will probably take a year or two before you get the system working.

The idea of putting in a bathhouse, change room, and things like that, is a very good one, but if you build those houses and don't take care of them, the men will have them looking like shacks within a month. If you don't want to keep up the house you build, I would advise you not to build it, because you will do more harm than good. Where it has been done in the right way, it is very easy to see the results.

In the last two years I have visited 50 or more cement plants, and I have found probably 20 bathhouses among them, and most of them are in fairly good condition. The companies have come to realize that if they want to keep that equipment, they must keep it clean. Are there any gentlemen here who wish to discuss any part of this paper?

DISCUSSION

MR. FORTUIN: I don't think there is very much to discuss in that paper, but I presume that when Mr. McKay refers to bathrooms, he really means shower rooms, because you don't have bathrooms. In the past, there is no question but that nearly every cement plant considered its workmen; but the price of cement, as you all know, didn't permit spending much money. I think nearly every cement plant, as long as it is in prosperous condition, is only too willing to do everything possible for its employees, and will spend as much money as necessary to better their conditions. There is no question about that.

MR. JOSSE (Continental): And another thing, Mr. Fortuin, you will find that most of the cement plants are old plants. We can't take Universal as a criterion, because they have plenty of space. Take our plant, for example: we are set down on a small piece of ground, with a railroad on one side and a creek on the other, and we couldn't expand until we cut out enough quarry to expand. At present we are using Keokuk power. The engine and boiler rooms are being converted. We are moving the engines out, and they will probably be removed by the first of the year. That will give us room for a nice looking locker room and nice shower baths. We improvised a shower bath a couple of years ago, but it was a dusty and dark place, and the only persons who used it at all were the office men. I think it is just as Dr. Tucker says, the cement workers are the cleanest fellows in the world, if they can bathe on the company's time. And I suppose that is what it will all come to when we get our shower baths up; the men will have to bathe on the company's time if we want them to keep clean.

MR. FORTUIN: At our plant we now have locker rooms, showers, and toilets. It is a beautiful place and kept very clean, in fact we have a man who has nothing to do but keep it clean. We employ women in the bag department, and we have a separate place for the women. It is fine, and they appreciate it. We allow them to change on the company's time.

DR. COLEMAN: In the Lehigh plant, we formerly have had a man janitor. For the past four months, we have had a woman doing that work, and now we have a good, clean locker room; it is rather incon-

venient, because when the men come in she has to go out, but that is the only inconvenient part of it.

CHAIRMAN JACOBSEN: Major Reninger, wouldn't you like to speak a few words to us on your installation? You have probably had more experience on that than any of us.

MAJOR RENINGER (Lehigh): The installation that we have out at Oglesby is the installation we have at all of our 15 plants. We have tried to divide up our washrooms and locker rooms so that they would be scattered around the plant; instead of having one central locker room, we thought it would be better to have two or three. The foundry men, the carpenters, the locomotive men, the belt men, and all the others each have their own place. We have arranged our toilet rooms and locker rooms with the washstands in the center of the room. The washbasins are made of steel, white enameled.

MR. FORTUIN: Are the showers there, too?

MAJOR RENINGER: Yes. We built this locker room with the washbasins in the center.

MR. FORTUIN: Would you consider this advisable in a small plant?

MAJOR RENINGER: Yes. I would, because it avoids congestion. We originally had one big locker room, but we divided it up into a number of smaller ones. At one end, we have the foreman's locker room. That is separate from the workmen's locker room, and it is for the use of all the foremen. They come together there, and they have desks on which they can do their writing. Chairs are placed there so that they can sit down and have a conference.

Each man has his own locker, and at each end of the room we have shower baths; there are four shower baths in each washroom. There is an attendant, who keeps the place absolutely clean at all times. We try to keep the tops of the lockers free from any material whatever, waste or packages, or old shoes, or clothing. If a man leaves his stuff on the top of his locker, when he comes for it at noon, it is gone. They all know they are not supposed to leave rubbish around, and if they do, the janitor cleans it out. That is one thing we are very strict about. We have the open-type locker, so that we can see just what every man has in his locker. They can have their change of clothing in there, but they dare not keep any rubbish or any old clothes that they can't use. If they have any in the lockers, the janitor finds out whether or not they want to use it, and if they don't, he destroys it.

MR. FORTUIN: How about the dust?

MAJOR RENINGER: We have tried to keep the washrooms away from the plant as much as possible, that is, away from the dusty parts. They are well built, have windows and ventilation above the tops of the lockers. Of course, you can't prevent some dust coming in, but the place is washed twice a day, and we have walks leading into the washroom. We are now trying to have lawns around every washroom, so far as possible.

MR. FRAME (Alpha): Major Reninger, how do you obtain the hot water at the different washrooms that are scattered around your plant?

MAJOR RENINGER: That comes from the boiler. We pipe it from the boiler room to the shower bath.

MR. JOSSE: Did you every try the scheme of turning the steam into the cold water?

MR. MACFETRIDGE (Lehigh): Invariably you will have a man scalded, if you use that method.

MR. FRAME: Major Reninger, do your men do all their washing up on the company's time?

MAJOR RENINGER: Yes.

MR. HALPIN (Marquette): What percentage of the men do not use these lockers?

MAJOR RENINGER: I am sorry to say I can't answer that. I have been in the service for three years, and I do not know what has gone on during that time.

MR. KLECKNER (Lehigh): At our Newcastle plants they are used 100 per cent.

MR. HALPIN: It seems to me that the greatest difficulty with this bathroom question is that all the men will not use them. A large percentage of them would rather go home and wash there. How do you let the men wash, on company time? How do you arrange it? I believe you said you did that.

MR. FORTUIN: When the shift changes, the night shift comes on a little earlier so as to give them a chance to wash.

MR. HALPIN: I mean your day men, your men who work eight or ten hours a day.

MR. FORTUIN: The 10-hour men are allowed to quit 15 minutes early. They are also allowed 10 or 15 minutes when going for luncheon.

CHAIRMAN JACOBSEN: Mr. Huth, what is the system out at your plant at Duluth? Do the men wash on the company's time or on their own time?

MR. HUTH (Universal): They do it on their own time, and practically every man goes away from the plant clean. We haven't had any difficulty at all.

MR. SCHLICHER (Lehigh): Have you had any trouble with respect to foreigners and Americans washing in the same room?

MR. FORTUIN: In our plant in New York State, there is only one place where we have washstands installed, and there is no difficulty in that respect at all. We keep the lockers for the foreigners on one side of the room, and for the Americans on the opposite side. We try to keep the lockers separated, but there is no difficulty as to the washing. They get along splendidly.

MR. JOSSE: I believe the feeling of antagonism between foreigners and Americans is very rapidly diminishing. We have experienced a lot of trouble with Americans working with foreigners in different capacities, but I think that condition is diminishing very rapidly. The war and the Americanization movement the Government has started have helped a great deal toward that end. I think it is a very good movement, too.

CHAIRMAN JACOBSEN: I would like to know how you could teach the

cleaned the thing out when the night men started, and they were given the same instructions. They also had four men working on it.

They had it all cleaned out, as they thought. One man crawled in and said there weren't any more hot ashes in it. The mill, of course, was shut down and we were grinding clinker. That was all we could do. One young man came over from the clinker pile, and while the other four men were talking this young fellow crawled in under the drier. There must have been some hot ashes still hanging up above the drier in some way, because they came flowing down right in front of the manhole. The boy crawled right through the hot ashes to get out of the manhole, although there were three manholes he could have gotten out of. That is the man we thought wasn't burned very badly, but after lingering along for three weeks he died. The man was only in our employ about two weeks. The first man who was killed was a foreigner. How are you going to educate these men to have self control? That is all that was required. This foreigner, if he had stopped and brushed his leg, or jerked his trousers off, would never have been even blistered. These are very important things to know, and they are pretty hard to teach to the foreigners.

There are other dangers that you can get away from. For instance, there are burns. We never before have had burns at our plant, except small ones. We recently had a young man in the electric shop who had been shellacking a motor, and he got some shellac on his hand. After finishing the job, he went over to the gasoline can, poured out some on his hands to wash them, then reached into his pocket for a cigarette, lit a match, and both hands were on fire in an instant. He wasn't burned dangerously but he was burned so that it hurt him. That incident went all over the plant and it did a wonderful lot of good. I don't think there will ever be another man there who will light a match with gasoline on his hands. That kind of an accident is really a help, if it doesn't hurt the man seriously. He was only out one day, but it hurt enough so that he isn't going to do it again, nor any of the other men. It happened there was a safety man standing about three feet away from him at the time, but he didn't know what this man was doing, and could not prevent the accident. Everybody to this day "kids" this man about lighting a match with his hands full of gasoline.

The difference between the foreigner and the American is like the difference between a broncho and a thoroughbred horse. When a broncho gets scared, you can't do anything with him, but you can stop a thoroughbred. In that first accident, if he had been an American, very likely he would have arisen to the occasion and put the fire out, whereas the man being a foreigner his wits left him. He could have gone 10 feet to three or four men who were nearby, and they would have had the fire out for him in a few seconds, but he went the other way, just out of reach of everybody, and he had on only a pair of trousers and a thin undershirt, which burned off.

That accident made me feel bad, because I had begun to think we were just about "it" on accidents. It just shows you how quickly you can

"stump your toe"; of course it makes you feel pretty bad, but after you get away from the shock of the first few days, it is an incentive to work harder. I think the majority of our men now realize that everything we are trying to do is really for their benefit. While I admit that these accidents put the figures on the wrong side of the ledger, that isn't the first consideration with us.

SAFETY WORK GROWING

Our first consideration has been the conserving of man, his life and limb. But by doing that we are also cutting down our insurance rates and putting money where it belongs, because you are not going to make any money by selling your cement and making a profit on it, and then giving it to somebody who was hurt or killed while making the cement. That is a waste of energy and a waste of money, and those conditions have to be met and overcome. Of course, we are just scratching the surface safety work now. It is growing very rapidly and it is going to be easier for us later. The longer this safety movement works, the easier it is going to be for all of us. As you know, a great many of the workmen travel from one plant to another, and if they get safety instruction at one plant, and go to the next plant, that instruction will come in handy. While this pioneer work is very slow and very discouraging sometimes, I am sure we are getting results from it all over the country.

The only place where I know positively we are getting results is in the St. Louis district. I have a chart which I got from the coroner up in my room and I intended to bring it down here. The reduction in deaths in the industrial plants in 1918 over 1917 was 57 per cent. During the first eight months of this year, the reduction over that of 1918 has been 29 per cent. So you see this intensified work of the industries in and around St. Louis is telling.

Of course, the work is a little further along in St. Louis than it is in a great many other cities. We have had two years of intensified industrial safety work. For instance, we have foremen's and superintendents' meetings once a month. We start the latter part of this month and continue meeting all through the winter and early spring. These meetings are attended by from 1,500 to 2,000 foremen and superintendents, and we always have the best authorities on the subject under discussion that the United States affords, so that the St. Louis district is not a criterion for the rest of the country. But the same thing, you will find, is taking hold here in Cleveland very effectively, and you will find it going all over the country.

MEDICAL EXAMINATION NECESSARY

Missouri is about to have her compensation law go into effect, and the doctors' medical examination will then be necessary because we have records in the Safety Council from various states where this examination is not in effect in the different plants, and we have found that a man will come to the plant with an injury or a defect that is not ap-

parent, unless a physical examination has been made, and after working for a while, he will develop some condition which the compensation law allows him a certain amount for. Some of these cases have been traced, and we found that the same man had done the same thing in three or four different places, and got the same compensation in all of them. So it becomes almost a necessity, where the compensation laws are in effect, to really have some kind of medical examination. Even if you can't place the men where they should be placed, you have that record, so that you are protected when they sue for compensation. That, I think, is one of the reasons why we will all be compelled, especially in Missouri, to give our men the "once-over" at least, before we hire them.

ACCIDENTS SERVE TO CORRECT HAZARDS

The best time you can find out what your hazards are is when you have an accident. We analyze an accident when it occurs, and try in every case to eliminate the reason, or the cause, or the chance for that same accident to happen again. Mr. Jacobsen knows that we did that until this burn case; and never before had we had a case of that kind. Where this puff of fire came from we don't know, but it is our opinion that the fine coal dust was on top of the grating which these two men were walking over. We have latticed grating. The coal that is mined near St. Louis carries a very large amount of sulphur, from 4½ to 5 per cent, and burns very readily after being pulverized and dropping on anything that will catch it. We have to clean our coal room twice a day in order to keep this coal from burning. When we were able to get coal from southern Illinois, Franklin County and that part of the country, we weren't bothered that way. But since the war, that coal has all been diverted to Chicago, and we don't get any of it. So we have to have our coal room floors swept constantly; we have one man there who does nothing else. Twice a day, the millers shut down the mills and sweep all the coal off anything that is likely to burn. It is our opinion that some of this coal was hot, and they couldn't see it—it doesn't blaze, of course—and the man walking across the grating knocked some down. There was enough air and coal dust to cause a little flame to come up his leg. The man right next to him said there wasn't a puff big enough even to burn the hand. He didn't know this man was burning until he screamed. He said he wasn't two feet from him, but he managed to get away. He tried to grab him, but the man was so terribly excited that he couldn't hold him.

FIREPROOF CLOTHING

The solution, I think, to this burn case is fireproof clothing. That can be obtained very cheaply. The Commonwealth Steel Company furnishes suits of clothing to their men who operate acetylene burners and electric welders. They buy an ordinary suit of overalls, and the solution they use I think is magnesium chloride. It is very cheap. They buy the overalls and jumpers and soak them in this solution, and sell them to the men at just what the overalls cost them. When the men wash

the overalls, if they want to use them again, they bring them back and the company soaks them again in this solution.

That is what I am going to do in our coal room, and after this I am going to make a dustless coal room if I possibly can. We have analyzed the causes of our accidents, and we have eliminated 95 per cent of them by eliminating the causes. The only reason we hadn't eliminated the cause of this accident is because we never had one like it before and we didn't know there was any danger of one. Of course, we feel that we are responsible for this man who was burned, because he was burned while doing his daily work, and it is really up to us to compensate his family. But I don't think we can be blamed for the accident that occurred to the young man who crawled in under the drier to see how it was constructed, although, of course his family naturally think that we should pay for it.

EDUCATION OF MEN DIFFICULT

I don't know of anything else I can say in regard to educating the men, except that it is a continual grind and no fun. It is a hard job; you have something to do all the time. You can't let up on it for a minute.

Since we have started this safety work, and since Mr. Jacobsen has had this Bureau, we have given him a report of every scratch. In 90 per cent of the cases there is no time lost at all and no injury except a scratch, but they are brought into the laboratory and are dressed, and we make out a report regardless of how slight an injury it is. Mr. Jacobsen is receiving a great many reports, but with the exception of these cases very few of them are of a serious nature.

We had one other serious one that I think I had better tell about, because I think it will do us all good. We had a man who used to run a "dinky" for us, who was taken in the first draft. He was in the front line trenches for three or four months, was gassed, and got back after the armistice was signed. He came to us for his old job. That was about the first of the year and he got his old job of running a "dinky" on our stripping field. In March or early in April, we had a very long siege of rain. It lasted for about three weeks and the field got in such condition that we couldn't use him there; he wanted to work for us and we wanted to keep him on the job. We were constructing a little conveyor to try our pulverized coal in rock driers, and had it all up, and were just putting the screws in.

EFFICIENCY OF PRONE PRESSURE METHOD

The assistant superintendent and the draftsman took two men—one had been working on this job for some time and the other was this "dinky" engineer—along to put the hangers in the casings and put the screws in. About three feet away there are three wires running to an electric light transformer, carrying 440 volts. After they got everything ready to go to work, the young man who had been working on this job for about two weeks said to the "dinky" engineer, "John, those wires

over against the wall are wet; they are perfectly insulated, but they are wet and we had better not touch them, we might get a shock." John wanted to see whether that was really a fact, so he put his hand over on one of the wires, and both men were knocked off the conveyor. When we got to them one man was breathing but the other apparently was dead. We were taught the prone pressure method in a safety school at St. Louis last winter, and three of the men whom I had sent to this school started to work on this man. He seemed to have no pulse, no heart beat, and no breath at all; he was all blue. These boys rolled him over on his stomach and started to work on him. I telephoned the chemical company in our part of the town to bring their pulmotor. I think it was about 40 minutes before the pulmotor arrived, but in the meantime they had started artificial respiration. A doctor came with the pulmotor, and our plant physician was there. They decided not to use the pulmotor at all, but just give the man oxygen. He was out about an hour and ten minutes all told, before he started natural respiration.

The general opinion of all of the electric companies in St. Louis—I happen to attend a meeting with them every week—is that a man is easily resuscitated from an electric shock if he is reached within 10 minutes, but that after a lapse of from 10 to 12 minutes, there is no hope for an electric shock victim. This man is all right now, so far as the electric shock is concerned. He was unconscious for four days. When he started his natural respiration, it took six men to hold him.

There was a condition that we could have eliminated, and we did eliminate it inside of 30 minutes after the accident happened. Those wires were placed in conduit. They were underneath the eaves of the roof and we had no idea that anybody could ever touch them, but they were touched.

When you have an accident, if you analyze it you can eliminate the chance of the same accident happening again, so if we have accidents they are going to be new accidents. The old accidents, and the old causes, can be eliminated to a very large extent.

DISCUSSION

CHAIRMAN JACOBSEN: I believe that is a remarkable thing they did down there. If they hadn't known about this Schaefer method that man would certainly have died. Had they had a pulmotor, the man may have died just as surely, because perhaps no one at the plant would have known how to operate it, or the motor would have failed to operate. That shows what it means to be prepared for something that may happen five years from now. They may never use it—let us hope they will never again have a chance to use that method there or at any other mill—but let them be prepared when the emergency does arise.

I heard of a case, through a report I received from one of our member companies. It happened on the ground floor, so that the man had no occasion to fall any place except on the floor. There was a door leading outside; it was raining very hard that day and the wind blew the rain

in on the floor. One of the men volunteered to close the door, but the mill operator ordered him to leave it open. Immediately afterward he went over to start the motor, and that was the last of him. The rain had soaked the electrical equipment. The man died.

Those are the most important things in our work, I believe; those are the things we must know about. That method is so simple that a child could do the work. One person could do it alone, or at least he doesn't have to have a big crew with him. The main thing is, as Mr. Josse said, to get it done immediately.

MR. JOSSE: I was over at the safety exhibit yesterday afternoon. They have a small oxygen tank there with the pulmotor exhibit that has been perfected, I believe, on account of the gassing over on the other side. All there is to this is a small oxygen tank, and you can use the oxygen from any tank that you have at your plant for oxygen welding; just fill it any time you need it. It has a reducing valve so that the pressure is very slightly above the atmospheric pressure. It can be used in connection with the Schaefer method. The mouthpiece is strapped around the mouth; the man is laid on his stomach; then you turn on the oxygen and start working on him. Every time he exhales nothing comes into his lungs, but when he inhales, a little oxygen goes in. I think that process is going to be the real thing. There is no good done, of course, if the pulmotor is used by somebody who is not an experienced operator.

CHAIRMAN JACOBSEN: The Schaefer method is now considered by all authorities on that matter to be the most efficient method, and I believe everybody ought to train himself in it. In the last issue of the Accident Prevention Bulletin I had occasion to give a full description of it, and I believe all that is necessary will be found there in the chart. Get your men in the plant to experiment with it a little bit.

St. Louis, as Mr. Josse says, is one of the shining stars in accident prevention work in general, public as well as industrial. We have another man from that location and I think we ought to hear a little bit from him. His plant has started some novel methods of educating the men and getting them to see the dangers connected with their work. Mr. Ross, of the Missouri Portland Cement Company, will you tell us a little of your experiences?

MR. ROSS (Missouri): We have our committees—the foremen's committee thought it had done everything it could do in the way of suggestions, so we organized the workmen's committee. For the most part this committee is composed of foreigners. They were bashful at first and wouldn't say anything. We had a stenographer at the meetings to take the minutes down and we made a round-table of it; we brought in cigars and they got to joking; then they became very efficient and everybody was anxious to offer his suggestions.

One of the things we have done is to teach the Schaefer method to the men and to make an inspection of the mill. I suppose over 90 per cent of the men in the mill know how to resuscitate a man from shock. In line with accidents, we have worked out the scheme of taking a photo-

graph of how the accident happened and the manner in which it could have been avoided. We post that photograph up just as soon as we can finish it, which usually is the next day. I do that myself in our mill, and I think that is a better scheme than using some of the bulletins we receive. Those bulletins don't apply to cement plants, while the actual photographs of cement plant accidents do apply. The picture is put up in the morning, say at 8 o'clock, and about half an hour later if you go around, there will be a half dozen to a dozen men talking about it, past members of the safety committee and people who have not been on committees.

CHAIRMAN JACOBSEN: What size are the pictures, Mr. Ross?

MR. ROSS: They are about post-card size.

CHAIRMAN JACOBSEN: I wanted to bring this matter to your attention. As a matter of fact, I have slides here of all the photographs Mr. Ross has taken, and as soon as the management of this hotel will permit us to get our material, we will show them, which I think will be tomorrow. I have several other slides which I will show here, that I think you will be very much interested in seeing.

DR. COLEMAN (Lehigh and Marquette): We had a cement sectional safety meeting at La Salle this year, and there was lots of good stuff suggested. I have spoken to Mr. Jacobsen about having a kind of query column in his bulletin. What would help a whole lot is a description of this man being hurt by electric shock. If that had been printed a good many of us would probably have looked around and found some of those places in our own plants. I believe if we could bring up and discuss our views in the Accident Prevention Bulletin, it would be helpful.

MR. RICHARDSON (Marquette): I would like to ask Mr. Josse a question. When you have the workmen's meeting, that is the safety meetings, who presides?

MR. JOSSE: The workmen appoint their own chairman.

MR. RICHARDSON: And how often do you change?

MR. JOSSE: Every three months we change one man from each department, and those men elect their own chairman. We don't have a thing to do with it. I don't go near them at all; nobody does. They bring in their own recommendations in an envelope and put them in a box.

MR. RICHARDSON: And how do you eliminate some of those recommendations?

MR. JOSSE: We write to the men saying that a certain recommendation is good and will be complied with as soon as possible. We have three men who do practically nothing else but put up guards and do other work that the safety committee recommends. We say this recommendation is good and will be complied with as soon as our men can get to it, or that another is impossible for us to comply with at the present time. We may say, "If the conditions change so that we can do it, we will be glad to take care of it," or in another case, "If we comply with this recommendation, the hazard in another way will be greater than it is at present."

We let the men know that we examine their recommendations and give them considerable thought. It is surprising how few bad recom-

mendations they bring in. The men who are working right where the accidents occur can bring in some of the best recommendations you ever heard, and most of them are simple. We don't have any more scalp wounds. They have all been eliminated by screens at the points where the rock would drop off the elevator or conveyor. We haven't had a scalp wound for a long time, just because of these committees' recommendations. And it doesn't cost much money to comply with them.

CHAIRMAN JACOBSEN: I think Mr. Josse brought up a very good point in the talk he has given us—that is, to let the man know what is being done with his recommendation, and to recognize him as one of your organization. He is really an official you might say, when he is on the committee. It may be a good or it may be a bad recommendation. I don't believe the man will care much whether it is turned down or taken up, as long as he knows that action has been taken on the proposition. If a man turns in a suggestion and you let him wait a couple of weeks for an answer he gets "lukewarm"; then if he doesn't hear anything for a month he drops the whole proposition and you will never hear from that man again.

I believe there should be more efficiency in connection with the handling of that kind of work at cement plants, and not only cement, but any other industrial plant. It is the handling of human nature, that is the whole proposition. Good, common sense is going to put the thing over much more quickly than anything else.

MR. FORRUIN: Under the Pennsylvania state law, if you want to get credit for all they will give you under the Compensation Act, it is necessary to have a safety engineer in conjunction with the safety committee. But you can appoint any one, and call him a safety engineer.

MR. JOSSE: In St. Louis we discovered that there was no such person as a safety engineer. So last winter we had a Safety Supervisors' School, comprised of 15 lessons. And as I said in speaking about the Schaefer system, if we never got another thing out of that school we will have at least saved that man's life, and isn't that worth while?

Three of our men and I attended that school for the 15 lessons. Mr. Ross was also one of the members and several from his plant. He can also tell you of the wonderful benefits we derived. Of course, we were all new, we didn't know anything and we don't know very much yet, but all of that education helps and there is where we learned the Schaefer system and saw it worked out. They put a man up on the stage and showed how it was done, and it is very simple.

One day last week there was a storm in St. Louis and a wire of the Union Electric Company was broken so that it hung down on the street. A man passed this wire and put his hand on it to push it away and of course down he went. As it happened, there were a couple of boys passing at that instant who knew the Schaefer method. They turned this fellow down on his face and started working on him, and they had artificial respiration started when a doctor came along. The doctor stopped them. He said, "That man should not be on his face," and he turned him over, and started working on him. That man is dead today,

and the fellow who has to pay for that man's death is down here at a meeting today. He has now given instructions to all of the men in all of the departments not to pay any attention to what anybody says, but to keep the Schaefer method going.

CHAIRMAN JACOBSEN: That gives me another idea, and that is the doctor at the plant. I think the doctor is one of the greatest helps that you can have at your plants. If you have the right doctor, who knows the men, or at least knows their way of thinking, that doctor can help you more than you realize. Why don't you get your minor accidents reported? Why do the men sometimes go for a week before they come in with an infected hand which then is far beyond the doctor's help? Probably some of them don't like doctors; they think the doctor is always ready with the knife, and they have a general dislike for doctors' treatments. If the doctor can get all of that nonsense out of their heads you will get along far better than you do now.

How is your plant situated with respect to a doctor? How quickly can you get a doctor? That is another very important point. Sometimes you want a doctor quickly—you may have a man tangled up in a gear or something like that, and have an arm or a leg torn off. That man will surely die before the doctor gets there if it takes an hour or so before he arrives. I received a report the other day of a man who was smothered in a cement bin. I asked them how long it took to get doctor. It took them an hour. Of course the man was dead.

How are you equipped for taking care of your men at the plant when an accident occurs? Have you a room set aside for that particular purpose? It is not enough to say that the chemist—and that is the explanation I generally get—handles all that work in the laboratory. He can do that in case of minor injuries, a scratch of a finger, or something like that. But just let us take the case of a coal dust explosion in a coal house, or a premature explosion in the quarry, where you probably have half a dozen men injured at the same time—where are you going to take them until the doctor comes?

It is very easy to rig up a little room with a couple of cots and things like that in it, and keep it clean, and have that room used for nothing else. It may be years before you have to use the room, and I admit it is difficult to keep that in mind, but you must have it. In many cases it becomes dirty and is neglected. It is necessary to keep that room in good condition so that if an accident should happen you can take care of the victims, and the doctor will have a place to work when he comes to the plant.

DR. COLEMAN: With reference to being prepared, last summer soon as the hot weather came on I gave specific instructions that should any man be overcome with heat, either by heat stroke or exhaustion we should know about it immediately. A man in the boiler room became sick, as he thought. He was getting heat exhaustion. He went out and crawled between two buildings to take a rest. Luckily, a man came along investigated, and found the man unconscious, or almost. Suppose nobody there had known what to do—that man might have died before I could have gotten to him. But instead of that, he was carried

into the first-aid room. We have an electric fan there, and that was turned on him, alcohol was rubbed on his arms, a blanket was thrown over him, and he was kept warm. That is all that saved his life. How long he was lying there before found we do not know.

Another case: They were doing a lot of rebuilding this summer, and a man was overcome by the heat. The foreman said, "Throw water on him." He thought he had fainted. Fortunately, I was right at the plant when this happened, and in 10 minutes I was at the man's side. I gave him hypodermic injections and took him to the hospital, and in three days he was back at work.

Mr. Ross (Missouri): We recently had a lecture by our physician, who laid a great deal of stress on heat stroke and recommended that we post minutes of his lecture in our first-aid room, which we will do as soon as they are completed. About 40 former committee members heard this lecture, and every one of them will be given copies to digest thoroughly.

CHAIRMAN JACOBSEN: If you will let us have those minutes we will reprint them and have them sent out.

MAJOR RENINGER (Lehigh): There is one thing that we sent around to all of our plants, I think that was Circular No. 8, issued by the Bureau of Mines, describing their method of first aid. We sent about 25 or 30 copies to each plant. It was very complete. This circular can be had for about five cents a copy from the Government printing office.

CHAIRMAN JACOBSEN: While that circular is very good, Major Reninger, I think the more personal contact and local flavor you have to the thing, the better it will work. Now if your own doctor would give the men those instructions and have them printed probably on the company's letterheads, or something like that, it would take better than if it came from the Bureau of Mines. Of course, that is only my personal opinion.

Mr. Ross: This physician has been our doctor for 14 or 15 years; everybody knows him and they will pay more attention to what he has to say than they would to any Government bulletin, I think.

MAJOR RENINGER: Of course, I realize that there is nothing like advice from the physician, but what I meant was that by having those books around your plant, in a second a man could pick one of them up and look at it and know just exactly what to do. It illustrates the Schaefer method and all those other things.

CHAIRMAN JACOBSEN: As a matter of fact, all of our plants should make it their business to get all the Government bulletins describing any kind of work relating to our industry, and I think we should see that the men get those bulletins. There have been some very valuable bulletins issued on explosives, and things like that.

Dr. Coleman: Could I ask Mr. Halpin to tell you what he told me about our meetings that lagged this summer and what happened at the plant?

Mr. Halpin (Marquette): What the doctor refers to is this: During the summer, we were shut down for some time because of our construction work, repair work, and other things. We let the meetings go and

we lagged on safety work, and our accidents increased I believe, about 60 per cent during that time in comparison to previous months in that year. That is a little evidence of what will happen when you let a thing go, which is a very easy thing to do, unless you are at it all the time.

MR. FORTUIN: Do you think those accidents were due to your laxity in regard to safety work, or due to the fact that you had men employed on work they were not accustomed to?

MR. HALPIN: I don't believe it is on account of change in work, because the same men do the same work they do every day, even during the construction period.

MR. FORTUIN: Nevertheless, when a plant is down, the men are on repair work, and they don't work with the same efficiency that they do when the plant is operating.

MR. HALPIN: You may attribute part of it to that. I suppose. I won't say we were down all the time. We were down for three weeks, and then we ran, but still the construction work went on, on the outside. But I know that the cause of the accidents was that we just let everything lag; nobody tried to do anything. We let the meetings go for about three months, whereas before that we had had a meeting every two weeks. The men got so they didn't care. The first meeting I called, we had about 10 men where we should have had 20. They didn't care to come; they were "too busy."

MR. JOSSE: I believe the only way to get full attendance is to have your meetings on the company's time.

MR. ROSS: We have a meeting every week, even if we have to shut down some department of the mill in order to hold it.

MR. HALPIN: Of course, the foremost idea in all plants is "cement first," and that is the way we went at it. Everything was thrown aside to load cement. Sometimes you have to teach the management a great deal, or you won't get anything out of the men. The battle is with them more than with the men.

MAJOR RENINGER: I might say that we had the same thing. But we were pretty fortunate in the East. We have five plants where safety work has fallen off during the war, and we didn't know just what to do to reestablish it and to get the men interested in the safety committee. So we got the plants at Ormrod, West Coplay, and Fogelsville together, and we have a meeting once a month now. The month the meeting is at West Coplay. All the safety committees from the three plants get out of their particular plants in the morning, leave at about half-past ten, and get over to West Coplay at about half-past eleven. We have our own boarding house at each plant for the office men and the foremen. We give the men a good dinner, then make an inspection of the plants and quarries, then come back and have discussions. You would be surprised to see how clean that West Coplay plant is, because there are safety men coming from all the other plants, with their eyes wide open. Those men find the smallest defect that can be found. What one man doesn't catch, somebody else will, and you won't

be surprised to see what a great difference that has made in the last four months in all three of those plants.

CHAIRMAN JACOBSEN: That is always the case when a new man comes into a place—he generally sees twice as much as the old man. It is a good thing, if a company has more than one plant, to have a little friendly rivalry between them.

MAJOR RENINGER: We try to get the Vice-President, Mr. Ritter, out there, or Mr. Bear, the chief engineer, or Mr. Woodward, in case the men have any questions to ask, and you would be surprised to see how easily they go at it.

CHAIRMAN JACOBSEN: When I go into a cement plant I find a whole lot of things to talk about, but I have to be very careful because I am just there by tolerance. I recently made a visit to a plant in Oklahoma. They hadn't had any bad accidents at this plant for a long time. I said to the plant manager, "You are running along rather smoothly now; I think you are doing fairly good work." "Yes, we are," he said, "although the other day we had a surprising accident. We had a line-shaft about eight feet from the floor, with a collar and set screw. Eight feet from the floor that shaft was running 20 revolutions per minute. Next to it was a platform with a stairway. A man wanted to get up there, and instead of using the stairway, he crawled up there in some manner—we don't know how—and got caught in that setscrew and was killed." What would this manager have said if anybody had come in and said that setscrew was dangerous? A person would have been a little in doubt as to whether that point should be brought to his attention or not, because he could hardly see the setscrew. This shows that small things can cause big accidents.

Are there any other points you would like to bring up? If not, a motion to adjourn is in order.

(Motion made and carried to adjourn.)

FRIDAY MORNING SESSION

CHAIRMAN JACOBSEN: The first paper we have this morning is "Hazards in Cement Stockhouses. Packing and Shipping Departments." I think you will all agree with me that in these departments we have some peculiar hazards which very often are difficult to take care of, and a little deliberation on that subject will be of advantage to us all. Mr. Russell Frame, of the Alpha Portland Cement Company, will read a paper on this subject.

HAZARDS IN CEMENT STOCKHOUSES, PACKING AND SHIPPING DEPARTMENTS

R. FRAME, SECRETARY, CENTRAL SAFETY COMMITTEE, ALPHA PORTLAND CEMENT COMPANY, EASTON, PA.

A study of the causes of personal injuries in connection with cement manufacturing will disclose that the screw conveyor and sliding materials

are always among the leading hazards. The Stock House and Packing Departments, having such a large proportion of these risks together with other dangers, are worthy of careful consideration.

Taking the experience of the Alpha Company at eight stock houses and six packing rooms, during a period from January 1, 1918, through July 31, 1919, they furnished about 8 per cent of the total injured, the same percentage as to total days lost, and the only fatality on our records during the years of 1917 and 1918. Half of the men injured were compelled to go off duty. This runs close to the general average from the studies of the Association.

BINMAN'S FATAL ACCIDENT

With reference to the fatal accident, the employee (a foreigner) had been in our service over two years and was following his regular occupation as binman in a small stock house in which the cement was stored on the bin plan. The employee was directed to do his work in Bins No. 5 and No. 6, each one having a capacity of 4800 barrels. This certain afternoon there remained 400 barrels in each bin which had to be hoed in feeding the cement to the screw conveyor. After loading one car of cement the foreman failed to receive an answer to his signal and upon investigation found that the deceased instead of working in Bins No. 5 and No. 6, had gone over to Bin No. 3, where he could secure the required cement with far less real work on his part as compared with the hoeing he would have to do in the former bins. His portable light he left hanging in Bin No. 5. Working on a contract basis we think caused him to change from an almost empty bin to a full bin where he could have less wearisome working conditions, and his further neglect to afford himself ample light contributed to the recklessness resulting in his death.

HAZARDS OF STOCK HOUSES

Cement stored in bins presents greater danger to the workmen during the course of its removal than is usually found in the Open House.

At Martins Creek we have two types of stock houses. No. 1 has been partitioned off into bins where a known quantity of cement can be stored for special orders, tested and sealed, and drawn during the presence of the inspector who is sent to the plant to see that the cement in his shipment comes from this particular bin. The capacity of the bins is as follows:

- 1 bin 10,000 barrels
- 1 bin 6,000 barrels
- 2 bins 5,400 barrels (each)
- 1 bin 4,000 barrels
- 1 bin 2,300 barrels

and the remainder of the bins each holding 2,600 barrels.

No. 2 Stock House is 270 feet long, 73 feet wide, and the walls are 39 feet 6 inches high. The capacity is 185,000 barrels. There are no bins such as described in Stock House No. 1, the cement being discharged at different points from the overhead screw conveyor and left to follow its natural course as it strikes below. This has been termed an "Open Stock House".

The storage bin has a limited capacity and while being emptied the cement tends to cling to the surface of the partitions and therefore gives the working face a steep pitch. When the cement is being disturbed to cause a flow, the workman must be on his guard in event of abrupt and heavy slides of material, which very often occur. The space in which the man can safely do this work is limited, the bin may not have adequate natural or artificial lighting, the flow of cement creates a continuous dust and the man will have his entire lower limbs wrapped up with cement sacks that retard quick movements—all of which increase the chances of injury. In case a man is covered up by cement it takes only a few moments for him to smother to death.

In an open stock house having tunnels the conveyors in which are fed by spouts and arranged at short distances apart, the cement that does not flow to the opening freely will remain in small low piles in the stock house. Men have plenty of room, more light, and better ventilation during the course of hoeing the cement.

When walking over the top of cement in an open stock house during the course of taking an inventory, care must be exercised against starting a slide. At one of our plants a Finishing Mill foreman, appreciating this danger, has been known to follow the chemist in the course of this inventory without the knowledge of the latter, so that he might be close at hand in case of accident.

Sometimes we find a small leak in the stock house roof or sidewalls, through which moisture will penetrate and reach the cement when the storage is well filled. In cleaning the last cement from the stock house, there is a danger from any cement which has hardened sufficiently to hold fast to roof supports, to other overhead construction, and to the sidewalls. At Plant No. 6 a formation which was clinging to the eave of the roof fell and struck the binman across the back, causing a disability of 70 days duration. Another man was injured in removing hard cement from the stock house sidewall.

In 1914 the Association received a report of a man being killed by a slide of cement caused by jar from the railroad. This brings to mind another source—the deep-well blast in the quarry. Every man should be ordered from the stock house during such blasting. Our experience shows that slides are induced by the accompanying jar. Particular care should be observed when working in freshly-ground cement, as it is known to move quickly and in heavy slides upon disturbance.

During the course of the removal of cement, the safe practice is to work not less than two men at any one time; to furnish a long rod and long handled hoe to start the cement, ropes where conditions permit their use, and careful instruction to men as to the danger should they undercut the cement to induce slides, together with a rule that hoeing should be begun from the top of the pile and the cement worked on the terrace plan. Compressed air is a good agency to start a flow of cement from a bin. The floor of the stock house between the tunnels, when constructed on an angle, will induce a greater free flow of cement. The "Association Bulletin," of February, 1917, contained an interesting account.

of the man in the bin being furnished with an extension carrying a push button to signal persons on the outside when in danger.

Drawing cement in tunnels by reason of the limited ventilation is a dusty occupation and there are numerous cases of cement getting into the eyes. A good design for tunnel construction is that described in the August, 1918, number of the "Association Bulletin." We have the conveyors in the tunnels of one stock house set in a concrete trough which is built up from the floor and on one side of the tunnel so that the attendant cannot walk over the conveyor gratings. This gives room for thorough inspection, and is convenient in case of repairs. Where artificial light is required, due care should be given to keeping the system in good service.

All bins need strong iron ladders. These should be guarded, and connected with the ladder at different heights in the bin there should be working platforms protected by guard rails and toe board. This construction will give the workman a chance to go about his work more freely, and affords better safety. We had an employee who lost 49 days when, to avoid a slide, he jumped on a wooden ladder with such force that he broke the wooden rungs and fell into the cement. Last year a report was furnished the Association of a fatality due to the bin collapsing. In this connection the construction of bins must allow for a liberal factor of safety. At one of our stock houses, iron columns in between which were inserted wooden planks were found inadequate, as the columns buckled and broke loose at the top fastening. An all-steel bin designed by the construction company's own engineer proved a failure in a near-by plant. When wooden partitions are used a liberal use of iron supports and a frequent inspection is advisable. Reinforced concrete makes very strong bin partitions. Since 1910 we have had them in one of our stock houses, built of 8-inch walls, 17 feet by 30 feet. for a bin of 3000 barrel capacity.

Recent storage construction shows the silo method of reinforced concrete to be in favor. Single containers, built high and narrow so as to promote self emptying, with port holes through which to reach from the outside to disturb any cement that clings to the side walls, would remove many of our present hazards. In addition the tunnels connecting these single containers would permit all necessary openings direct to the outer air to secure good ventilation, better light, easy access, and a general improvement in present working places.

The dangers of a screw conveyor are too well known to require a lengthy review. They are like poison gas in effect, causing death or permanent injury. Long ago the screw conveyor was indicted, found guilty, and sentenced for life behind strong iron bars, made up in form of a heavy grating $\frac{3}{4}$ inch rods spaced at $2\frac{1}{4}$ in. centers, secured to angles—3 in. by $2\frac{1}{2}$ in. by $\frac{1}{4}$ in.—placed legs down, in sections 11 ft. 9 in. long and bolted securely in place. This guard is your gas mask, and we must insist on the same recognition of its value by keeping it in place, as all soldiers who were compelled to have their masks on their chests ready for instant use. Many casualties in the late war were due to soldiers not having gas masks for immediate protection, and the cement industry can poin

to a long list of amputated limbs and fatalities caused by the lack of appreciation of the awful dangers of screw conveyors and the necessity for the best guards and inspection service to overcome this menace in every department and in every location in the Plant.

To eliminate further danger and dust, a ¼-inch thick plate, the full width of the conveyor and covering the entire length, excepting such places where material is inserted, is added. The plate is fastened with bolts to the grating angles.

HAZARDS OF PACKING AND LOADING

In the packing room, the Bates Machines need guards on the main drive belt, the gears, the pulleys on the bin feeder drive, and the eccentrics in back of machine. Our records show one man lost two fingers in the gears and another had a close call from fatal injuries by having his clothing caught on small feeder drive pulley which had a piece broken from flange. Twenty per cent of our accidents in the packing room and stock house are due to cement spurting into the face and eyes of the operator on Bates Machines, due to a bag bursting or a small hole in same. Only a small percentage of our employees will wear goggles.

I have been advised that a member company follows a practice of having a small equipment at the stock house for giving immediate treatment—only an eye wash—as soon as a man gets cement in his eye, claiming that if the chemical action of the cement is neutralized immediately, the usual burn will be prevented. They have now followed this method about eight months and during that time have not lost one single day from a cement in the eye accident.

On hot days in packing freshly-ground cement, the men often experience chafing of the arms and fingers. Our experience has been that there is a good deal of lost time on this account and the extent of this disability may escape attention because the ailment is not classed as an accident, and therefore the same complete reports of the full facts are not received and kept on file. The decisions under Compensation Laws have been so liberal to the claimants that we may expect to be required to pay compensation for a serious infection or death resulting from this cause. We hope the medical department of some member company can offer an ointment that is quick healing and antiseptic, to be kept on hand for immediate use in case of chafing and the men educated to obtain prompt treatment, as a means to reduce this lost time.

The question of dust control in the packing room is in the mind of every manufacturer. State factory inspectors have registered a criticism on working conditions, and who knows how much longer the workman will tolerate them.

The Security Lime and Cement Company is reported as having secured good results with an installation of the Bates Valve Bag Company which produces a draft and collects the dust so successfully that the air in this department of the Security's plant is practically free from cement dust. The Alpha Company is about ready to try out a collecting system, recently designed.

Trucking has its hazards in men striking their hands, slipping on the

floor, and upsets when passing over the runway. New men need instruction as to proper methods in handling a truck.

The shifting of cars at packing rooms has its dangers. Failure to give the workmen proper notice before the shift is started, neglect of the men to heed the warnings, cars breaking loose, men crossing in front of and jumping on cars, are responsible for accidents. At one plant where the tracks to packing room are on a grade, we have derailleurs and the crew must give the packing room full notice of a shift about to be made before the cars can pass the derailer.

The stock bins and overhead walks require the standard guard rails with toe boards. A fatal injury on our record shows that while engaged in conveyor repairs over the bin a bar slipped and caused the man to fall from the platform on top of bin. The same standard guards that are generally used in other departments of the plant will afford necessary protection to belts, pulleys, gears, sprockets, chains, clutches, and electric apparatus which make up the general machinery hazards. Care should be exercised to see that machinery, particularly that in tunnels and elevators, is equipped with locks to prevent starting up without notice while men are working in positions where they can be caught.

Education of the workmen in safe practices has a large field in the stock house and packing rooms as it takes time to train new men and because of the importance of having an efficient crew on duty each day to load your cement promptly, and therefore have it arrive at its destination in shape satisfactory to your customer.

DISCUSSION

DR. COLEMAN (Lehigh and Marquette): At our plant we recently had a cement-burn case. I never saw a man so badly burned. If he had been in fire he couldn't have been burned more badly. He lost two days. His arms were burned from the wrists up to the back and he was burned around his waist. We used a zincochinol ointment, and I really believe if we could get the men to put that on before they go to work in the hot weather, it would prevent that burning.

CHAIRMAN JACOBSEN: That question of cement burns is a very important one. We all have trouble with it in the summer time. I don't know that it should really be called a burn. It is really an irritation of the skin I suppose, caused by the dampness of the skin and the cement dust coming in contact with it, and the effect of the clothing rubbing on the skin.

DR. COLEMAN: Yes that is right, but it is a burn.

MR. FRAME: It has been our experience that often our regular packers will want to take time off because of chafing on their fingers, hands or arms. Of course, we don't class it as an accident, but we may get caught some day.

MR. MACFETRIDGE (Lehigh): It may become a compensation case.

CHAIRMAN JACOBSEN: I don't think there is any question about that; it is caused during work at the plant.

MR. FRAME: Mr. Chairman, do you get many reports of disability from that cause?

CHAIRMAN JACOBSEN: Not a great deal of time lost. They are mostly just doctors' treatment cases.

MR. FORTUIN (Pennsylvania): The old-time packers use lard for that and when the new packers come on, they are instructed also to use lard. It takes all that chafing away, and also takes the cement out of the pores. The only trouble they have is when their fingers get sore, which is in the summer time.

MAJOR RENINGER (Lehigh): Do they apply the lard before they start work?

MR. FORTUIN: No, when they get through.

CHAIRMAN JACOBSEN: Dr. Coleman, what effect do you think bathing facilities would have on it?

DR. COLEMAN: No effect at all; the man is burned when he comes in.

CHAIRMAN JACOBSEN: Do you remember when we had Dr. Turner at our cement safety meeting at Bethlehem? He holds a different viewpoint on that. He claims it can be eliminated to a great extent if the men will keep thoroughly clean.

DR. COLEMAN: At the Lehigh plant, I believe 85 per cent of the men bathe freely, and we have just as many cement burns there as we do at Marquette, where they don't bathe quite so freely.

MR. FORTUIN: If you want the cement off your hands, or your neck, or wherever it may be, you either have to take it off with a dry towel or use cold cream; water won't take it off. Cold cream is really the best. That is what I have used; it takes it all off.

DR. SNELLING (Trojan Powder Co.): I would like to make a suggestion along that line. I believe the primary cause is really a preventable one. I am not acquainted with this particular phase of the matter, but I have had experience with a somewhat similar matter, in which irritation was brought about by working with a dusty chemical. In that particular case, I found that the trouble was confined to men who perspired freely, and occurred on those parts of the body where the chemical could touch the skin, and where the man perspired freely. It was a rather serious problem at the time it came up, and I investigated the matter. I decided I would prevent it from the beginning by preventing perspiration.

It happened that at this time a proprietary medicine was coming on the market for the use of ladies who didn't want to perspire under the arms, particularly. We analyzed that material and found it was perfectly harmless; it was made up of aluminum chloride. It costs only a few cents a gallon, and it completely eliminated our trouble. I can't see why, at the beginning of the hot weather, you couldn't let the men try a wash of this with a piece of absorbent cotton. It closes the pores, and prevents excessive perspiration. I don't know whether that will solve your problem.

MR. FORTUIN: I don't think Dr. Snelling understands the method of packing cement. Have you ever been in a cement house where cement was being packed, Dr. Snelling?

DR. SNELLING: No.

MR. FORTUIN: The men get sores on the neck, as well as the hands, and they perspire all over their bodies. They become saturated.

DR. SNELLING: Really, though, it would be where there was an excessive amount of dust and an excessive amount of perspiration. If it weren't confined to those particular parts of the body, you would have this difficulty all the time.

DR. COLEMAN: I tried a 3 per cent solution of formaldehyde on the feet, and it worked there. I have never tried it on the body. I think though, that if we use some grease it probably will eliminate a great deal of trouble.

MR. FORTUIN: I would like to ask Mr. Frame, when he refers in his paper to a man working in a bin and the foreman not receiving an answer to his signal, what that signal is.

MR. FRAME: Electric lights. By pressing a button the light is turned on and off in the bin where the man is working.

MR. FORTUIN: Is there a light in each bin?

MR. FRAME: Yes.

MR. FORTUIN: Isn't it a fact that when no cement comes to the bin they try to locate where the man is, rather than go to the signal?

MR. FRAME: Yes, but this foreman gave the signal on account of a car being finished. They loaded the car and he wanted the man out there for some purpose or other. He gave the signal and the man didn't answer.

MR. FORTUIN: But at other times they don't try to locate a man as long as the cement is coming into the bin?

MR. FRAME: No. Of course they would signal him in case of a breakdown in the packing room.

MR. FORTUIN: When you referred to the chemist taking inventory of your bins, you said that the foreman followed him up for fear he might be covered up in a slide. Haven't you a walk over your bins?

MR. FRAME: In this particular case it was an open stockhouse and not a bin stockhouse, and there was no walkway on the side at all, but only overhead where the screws come close to the roof.

MR. FORTUIN: Can't he see down into the stockhouse that far?

MR. FRAME: He can, but he won't trust his judgment that far. He would rather walk over the stock piles.

MR. FORTUIN: You also referred to ladders in bins. Couldn't you get your men inside the bins by having an opening in each bin from the outside, through the stockhouse wall?

MR. FRAME: Possibly we could, but we never have had that arrangement.

MR. FORTUIN: Wouldn't that be better than having a ladder going into each bin?

MR. FRAME: Hardly. Suppose your opening would have to be on the far side of the bin. If your bin were full you would draw from the front side, and a man couldn't get into the bin unless it was a very high door.

MR. FORTUIN: If the bin were low you wouldn't have occasion to use a ladder.

MR. FRAME: After the first big tap you have to use a ladder to go into the bin.

MR. FORTUIN: We don't have ladders and seldom have occasion to go into the bins. If we do, we have a manhole on the outside that can be taken off.

MR. FRAME: How large a bin is that?

MR. FORTUIN: Four thousand barrels capacity.

MR. FRAME: How much of it will flow freely?

MR. FORTUIN: It will leave three or four hundred barrels.

MR. FRAME: We don't have a bin that will empty out that much.

MAJOR RENINGER (Lehigh): Do you put toe-boards on your screw-conveyor platform?

MR. FRAME: Yes.

MAJOR RENINGER: We had them in most of our places, but the Pennsylvania law at the present time has eliminated that. We take them away, so that we can clean up our top runways.

MR. FRAME: Our standard is open walkways.

MAJOR RENINGER: That is our standard but we don't have them in all of our plants.

MR. FORTUIN: There is one other question I would like to bring out. Mr. Frame refers to the packers invariably getting dust in their eyes. That is a point we raised at a local council meeting in Allentown, at which I had the pleasure of presiding. The matter was brought up for the reason that there was a law being formed to compel the wearing of goggles in cement plants. We attempted to find out from the members present as to whether their eye accidents were mostly due to cement in the eyes. The majority of them said they didn't have any.

This matter brings up that same subject. Apparently they have lots of trouble, and I would like to find out from the representatives of other cement companies, out West, whether they have the same troubles. We have them, as I explained at that time, but we have compelled our men to wear goggles. We get special glasses for them. Our safety committee compels them to wear the glasses, and if they don't wear them they can't work in our plant. We enforce that rigidly.

MR. MACFETRIDGE (Lehigh): What do you do during the labor shortage, even "fire" them then?

MR. FORTUIN: Our men do wear them, although we did have some trouble at first in getting them to do it.

CHAIRMAN JACOBSEN: I remember once I had the pleasure of visiting the Alpha Cement plant at Cementon. I noticed all the packers wore glasses there. I asked them whether they had any trouble and they said, "No, we prefer to wear the glasses and take no chances on having our eyes burned." I don't know whether they maintain that practice any more.

MR. FRAME: Possibly we had a different crew of men at that time.

MR. FORTUIN: I would like to find out whether there are mills not in our district that are having this same experience.

MAJOR RENINGER: I can speak for our Western plants. Take for in-

stance our Mitchell plants—49 accidents reported, 19 of them eye cases from cement dust. They don't wear glasses. We have tried to install that system but they absolutely refuse. We have the same trouble at Mason City, Iowa.

MR. FORTUIN: The reason I bring that out is that at the meeting the majority of the representatives claimed they had no eye accidents due to cement getting in the eyes when packing cement.

MR. MACFETRIDGE: The condition existed but I don't suppose they thought it serious enough to give it any attention.

DR. COLEMAN: Could you enlighten me as to what kind of glass that is? And do the men have trouble with the moisture on the glass?

MR. FORTUIN: I think they do sometimes. I really don't know, Dr. Coleman. The glass is made by Wilson, of Reading. It is a light-weight glass. We use two kinds, the heavy ones for chipping, and the light ones in packing.

DR. COLEMAN: I tried wearing glasses myself. I tried regular automobile glasses; they fit very tightly and kept out the dust, but I perspire rather freely and my trouble was that there was a steam on the glasses most of the time, and I couldn't see. We have had a lot of trouble from a stream of cement getting out of bags at the packing machine. I think the week before last we had a lot of bad bags, and we had seven cement burns in one day. One man lost one day but that was all the time lost.

MR. LAWNICZEK (La Salle): We don't have very much trouble with cement in the eyes, unless we get new packers. At this time of the year, when we get new packers, they forget to turn off the valve. The bursting of bags doesn't bother us any because our men sit above the machine.

MR. JOSSE: To eliminate the danger from old bags we tack some sacks underneath the man's seat, so that the sack hangs down below the bag. When the bag comes down, the sack tacked to the seat being pliable, it is not in any way impeded.

MR. MACFETRIDGE: We don't trip our bags; we lift them off.

MR. FORTUIN: When the bag is placed on the valve it gets right on the seam and becomes all wrinkled—this will happen to new bags sometimes—then when it straightens out under pressure a hole gets into the bag and the cement shoots right out toward the man's face.

MR. MACFETRIDGE: Our packers sit higher and don't catch that, but it catches the men down below.

MR. JOSSE: That is why we have the sacks nailed down on the bench behind the man sitting up on top. I don't think you have so much trouble getting the men on the machines to wear goggles as you do the men on the trucks.

MR. MACFETRIDGE: The man on the truck is the man who needs the glasses, but he won't wear them on account of perspiration and dust.

MR. JOSSE: I saw a goggle over at the exhibit which they claim eliminates that trouble. It has a very fine gauze right up close to the glass, which keeps the dust out, but the air can get in.

CHAIRMAN JACOBSEN: It seems to me that if Mr. Fortuin has been able

to get his men to wear the glasses, there is a possibility that all the plants might do the same thing. There is no question about their being a safeguard, and glasses should be used as much as possible. In regard to eye accidents though, I wish to tell you that if we had only the time lost on eye accidents in packing houses to contend with, we would have very few days lost. Most of the eye accidents that we get are usually caused in the machine shop, and there are other places that cause really bad eye accidents, so it would pay you to give a little more attention to wearing glasses in those places particularly. I never saw anybody wearing goggles around the crusher and we have a number of bad accidents there. And in the quarry and various other places, we have many eye accidents.

Are there any other things you would like to take up in regard to Mr. Frame's paper? What about the screw conveyor? I think we ought to consider that a little bit.

Mr. MacFETTER: Everybody is guilty, there is no argument.

Mr. FORTUIN: If we keep them covered the men take the covers off.

Mr. MacFETTER: And if you "fire" the men the plant can't run.

Mr. HALPIN (Marquette): We have a watchman at our stockhouse who visits the alley once every hour. He has a station there and he has to go in once an hour to see that the conveyors are covered.

Mr. FORTUIN: Are they loose covers?

Mr. HALPIN: They are wooden conveyors and the covers are nailed down.

CHAIRMAN JACOBSEN: There is no question about the danger. We all know that, but how to eliminate the hazard is another proposition. I think it is mostly a matter of education.

Mr. JOSSE: It is a matter of education, just as I said yesterday. It is a slow and hard process, but it has to be gone through, and if all of us work toward the same goal we will get the men educated some time.

CHAIRMAN JACOBSEN: I think you ought to put up to the men in actual figures what has happened on screw conveyors, and get them to see it in that light. A man may work around a plant for years without appreciating the danger, he may walk along on screw conveyors until the day that some one has left off a cover, and then he is hurt. If they could see in plain figures what happens every year, in the way of accidents on screw conveyors, they would probably look at it in a different light. What do you think of that concrete screw conveyor cover I had in the Bulletin some time ago?

Mr. JOSSE: It would be all right if it were not too heavy to lift. I feel this way about it: I think that we have disciplined our men, or the safety committees have disciplined them so that very rarely do they leave the covers off any more, whereas the covers used to be off all the time. I would say it is a matter of education among the men themselves, and the safety committees in your mills can have more effect on the men who take these covers off than the bosses can.

Mr. LAWNICZEK (La Salle): Do you bolt your cover?

MR. JOSSE: We bolt some of them. We use a C-bolt. The others are just laid on. Those that are taken up frequently are just laid on.

MR. LAWNICZEK: We used to have a triangle on each side; we didn't use any clamps; that holds the cover down, and also prevents the dust from coming out.

MR. JOSSE: That is good.

CHAIRMAN JACOBSEN: What about the question of the cars at your pack house, the box cars, or whatever you ship your cement in? We have had a number of accidents at the packhouses by men being caught between cars, run over by cars, caught between the car and the platform, or even between the car and the roof of the platform. There is a hazard there that is worthy of consideration.

MR. MACFETRIDGE (Lehigh): Whose hazard is it in case the railroad company sets in several empties, and the brake fails and your men don't know it?

CHAIRMAN JACOBSEN: I think you will be held responsible.

MR. JOSSE: About a month ago three of our negroes were hiding between a string of cars, which were five or six feet apart. They were in the yard gang, and were taking a rest. The switching crew hitched to this string of cars four cars of coal ahead, and of course pushed the cars together. Two of the men got out but one was caught. It gave him a terrible wound. It took about 200 stitches to sew him up. But to come to the point of who is to blame for this accident, it is a mighty close question in Missouri. It is going to be a hard job to decide. The Missouri Pacific Railroad representatives, of course, have investigated it, and they got all the details from the other men. We are taking care of the injured man and are waiting to see whether the Missouri Pacific is going to pay for this or not. We are going to have a pretty close fight on it, I believe.

CHAIRMAN JACOBSEN: They were not hurt during their course of employment, they were just fooling around when they were hurt.

MR. JOSSE: Of course, the industrial contract these railroads have with all industrial plants that have switch tracks has the clause that if any of your men are hurt by their crews, you are responsible, but I believe the court holds that they can't make you responsible, because there is no comeback the other way. It is not a two-way contract, and therefore we are not responsible. So we are going to have a fight.

MR. MACFETRIDGE: Would you naturally think, then, that it is up to us to inspect all the equipment that comes in there, to find out if there is a defective brake?

CHAIRMAN JACOBSEN: There is no question about it so far as the compensation law goes. If a man is hurt at your plant, you will be held responsible for him.

Is there anything else on this paper? If not, we will go on to the next one, which I know you will all find very interesting. The title of the paper is "Safety Factors in the Use of Explosives in Cement Rock Quarrying," and it has been prepared by Dr. Walter O. Snelling, Director of Research, Pennsylvania Trojan Powder Company.

SAFETY FACTORS IN THE USE OF EXPLOSIVES IN CEMENT ROCK QUARRYING

DR. WALTER O. SNELLING, DIRECTOR OF RESEARCH, TROJAN POWDER COMPANY, ALLENTOWN, PA.

A cartridge of explosive may be thought of as a small bundle in which a very large amount of energy is bound up in latent form. Just as a knife owes both its usefulness and its danger to its sharp cutting edge, so it is the ability to explode which gives an explosive its utility and its hazard.

By a better knowledge of the characteristics of explosives, and a more complete understanding of the proper methods for their handling, the number of accidents arising from their use is constantly decreasing. Accidents do not "just happen"; behind every accident there must be a chain of circumstances which lead, step by step, up to the final result, and the more complete our information is in regard to the influences of all the factors entering into any given operation or procedure, the simpler it will be finally to bring that operation or procedure to a basis in which the chance of accidents will be reduced to a minimum.

It is always helpful to bear in mind that explosives form no exception to the general rules of cause and effect. In order to liberate the energy that lies latent in a cartridge of explosive it is necessary to apply to the explosive material a sufficient impulse of some sort to commence the chemical changes which we call detonation. Friction, or a heavy blow, or even a very tiny spark, may be sufficient to start the cycle of chemical and physical changes which lead to explosion, but without such primary impulse the explosive will remain inert, and its bound energy will be dormant for months or even for years. Accordingly it becomes quite important for every one whose work has to do with explosives to become as familiar as possible with their characteristics, and to acquire a thorough knowledge of the principal conditions which may lead to accidents in connection with their use.

UNLOADING THE CAR

The first point at which the quarry superintendent is likely to be concerned with the handling of high explosives, is in unloading the car which brings the material from the manufacturer's plant or magazine. The manner in which the cases are packed in the car is prescribed by the rules of the Interstate Commerce Commission, the method having been carefully worked out with the thought in mind of reducing transportation risks to a minimum, and insuring the consignment of explosives reaching its destination in good condition.

It is quite uncommon to have a car of explosives arrive in damaged condition, but where the contents are found to be damaged, and cases are broken or otherwise in improper condition the matter should be reported to the transportation company, and the condition of the damaged cases should be carefully determined. If there is evidence that the roof of a car has leaked it is always advisable to examine the condition of the

cases of explosives under the leak quite carefully. Nitrostarch explosives when very wet become insensitive and difficult to explode, while nitroglycerin explosives under the same conditions tend to "leak" nitroglycerin, and this free nitroglycerin is of course far more dangerous than is the nitroglycerin in absorbed condition in the original explosive. Cases of explosives which show exudation of nitroglycerin should be handled with the most extreme care, and every precaution should be used to avoid any friction, or any jar or blow that might be sufficient to cause an initial explosion which would undoubtedly communicate at once to the entire lot of explosives.

In unloading a car of explosives, just as in handling the cases of explosives in all subsequent operations, care should be taken to avoid unnecessary rough handling. It is true that cases are on record where boxes of dynamite have fallen in quarries for a vertical distance of 100 feet or more without explosion, and it is also true that railroad accidents have occurred in which cars loaded with explosives have been literally torn to pieces without explosion resulting. It is just such facts as these that make it so difficult for the average user of explosives to hold a proper mental conception of the degree of care which should be used in handling explosives, and to draw a clear distinction between that over-cautiousness which leads to a general fear of explosives on the one hand, and such careless handling on the other hand as amounts to true foolhardiness.

A case of high explosives need not be handled with quite the same care that would be given to a crate of eggs, nor can it be handled with quite the same roughness that would be used with a block of stone. Between the two extremes lies that safe ground which leads to the handling of a case of explosives with that degree of care which its nature warrants, and yet with the absolute assurance that when handled in this careful way the case of explosives is practically as safe to handle as any other box of like weight would be.

It is needless to say that the throwing of cases of explosives from a car to a man on the ground is to be condemned, as is also the too rapid passing of cases of explosives through a chute. I have often seen explosives loaded through a chute of considerable length, and once during the unloading of explosives from a boat I saw a case of explosives broken open by striking another case of explosives which had become stuck at the bottom of the chute. I do not doubt that this sort of handling could be repeated many times without explosion, but nevertheless I feel confident that the operation involves some risk and is therefore to be condemned. The handling of the cases, a few at a time by means of a small truck is decidedly preferable to the use of a chute unless it is quite a short one, and the passing of a case of explosives from one man to another is a great deal better than the throwing of the case, with the possibility of the man failing to make a good catch and dropping the case.

MAGAZINES FOR STORAGE OF EXPLOSIVES

A good deal might be said as to magazines for the storage of explosives. It is most desirable that a magazine should be water-tight and well ven-

tilated, and in addition should be located sufficiently far from surrounding buildings to offer proper safety. As to the actual type of construction for a magazine opinions differ widely. The Bureau of Mines advocates magazines made of cement-mortar, and Tech. Paper 18 gives a rather full description with bill of materials for a magazine with a capacity of 20,000 to 30,000 lbs. of explosive. At the time Tech. Paper 18 was published the cost of a magazine of this kind was \$400.00, but the price would of course be materially higher at the present time. The walls of the Bureau of Mines magazine are 6 inches thick, and the roof and door, both of which are also of cement-mortar, are 3 inches thick.

The principal advantage of cement mortar of the composition suggested by the Bureau of Mines is that the material is substantially bullet-proof, and yet crumbles so readily under a blow such as would be produced by an explosion as to greatly reduce the danger from large flying pieces of material.

MAIN AND AUXILIARY MAGAZINES

Where it is desirable to carry a large stock of high explosives at a quarry, it is preferable to provide a main magazine located at a safe distance from the quarry, and an auxiliary magazine close to the quarry for the day's supply of explosives. The magazine for high explosives should always be located a proper distance from the detonator magazine or storehouse, and it is very important always to bear in mind that detonators and high explosives should never be stored together. In spite of the fact that the storing of detonators with high explosives has been most strongly condemned by government and state bureaus, and by practically all investigators who have studied the matter, one occasionally sees rather clear violations of this simple rule of safety.

MAGAZINE SITE

The selection of a magazine site, particularly for the main magazine, is a matter to which some thought can profitably be given. It is well recognized that an outcropping rock ledge forms a less desirable location for a magazine than alluvial earth or sand, since in the event of an explosion the earth waves are transmitted to a considerably greater extent through rock, and destructive effects are thus more extended than when a magazine is on a compressible and less rigid foundation.

METHODS OF THAWING EXPLOSIVES

Where nitroglycerin explosives are being used during cold weather it is necessary to provide a thaw house in order to insure the explosives reaching the work in proper condition. It is interesting to note that frozen explosives appear less sensitive to a detonator, and more sensitive to ordinary shocks or blows than the explosive in its normal condition. This subject has been under investigation for a number of years, and a large amount of information as to the cause of this peculiar phenomenon has been accumulated. At the present time the belief seems to be that although frozen nitroglycerin is relatively much less sensitive

than liquid nitroglycerin, yet frozen explosives, in part because of their rigid condition and in part because of the presence within them of crystals of nitroglycerin, are in unfavorable condition to resist friction and forces which tend to distort the form of the cartridges.

The thawing of frozen explosives should always be carried out at a relatively low temperature, and any effort to quicken the thawing action is to be condemned. When only small amounts of explosives have to be thawed, a double jacketed vessel may be used, in which the heating agent is water at a temperature of about 50 degrees C. (122 degrees F.) The temperature should never exceed 55 degrees C. (130 degrees F.)

While explosives are being thawed their sensitiveness seems to be increased somewhat, and accordingly both during the thawing operation and while the explosive is still warm after thawing, exceptional care in handling should be exercised.

Where a considerable amount of explosive has to be thawed, it is best to make provision for thawing at one time the entire amount of explosive used in a day, and for this purpose a special thawing house is necessary. The thawing house should be located at a safe distance from all quarry buildings, and should be provided with some means of indirect heating. Technical Paper 18 of the Bureau of Mines describes a type of thaw house which is recommended by the Bureau, and in which exhaust steam or hot water is utilized as a means of supplying heat, the heating coils being placed in a small shed adjacent to the thaw house proper.

"Make-shift" methods of thawing have led to frequent accidents, and it should always be borne in mind that the thawing of frozen explosives is an operation which should be given careful thought. Where electric current is available it has been the custom in some quarries to place resistance coils or resistance bars in a magazine for the purpose of maintaining a temperature above that at which the explosives freeze, but accidents have been directly traced to this arrangement, and indirect heating, with the heating element placed in an auxiliary fire-proof box connected with the thaw house by a flue or by some other like means, is much to be preferred.

In thawing explosives the use of a high temperature for a short time is much less desirable than a considerably lower temperature for a longer period. Although temperatures as high as 50 degrees C. (122 degrees F.) are sometimes used a temperature of 40 degrees C. (104 degrees F.) is much to be preferred. The long-continued exposure of explosives in a thaw house should be avoided, and the Bureau of Mines has called attention to the fact that some explosives, such as gelatin dynamites, have been known to decompose and explode after only a few days when continuously heated.

PRIMARY AND SECONDARY BLASTING

The characteristics of different types of explosives is really the subject for a paper in itself, and I feel that this matter, and a study of the factors on which the selection of explosives for any particular type of blasting depends, would require more time than can be properly given to them in this paper. With proper explosives from 3½ to 4½ tons of

rock can usually be obtained per pound of explosive used, but this also is a factor which is dependent upon many conditions in the quarry, so that a direct comparison between blasting in one district and in another district is often impossible, and sometimes leads to conclusions which are unfair to really good practice in a district in which unfavorable conditions such as clay parting seams exist. I have known of districts in which the "lay" of the rock and its toughness have caused $2\frac{1}{2}$ tons per pound of powder to represent really excellent blasting, and I have also seen districts in which 4 tons of rock per pound of powder was being produced by blasting methods which by improvement could easily have been raised to at least $4\frac{1}{2}$ tons per pound of powder and possibly some little higher.

It should be remembered that the cost of the powder in the blast is far from being the sole factor to be considered in blasting costs. Many a quarry superintendent has found to his cost that a primary blast in which too little powder was used may lead to an increase in the cost of shovel work and of secondary blasting entirely out of line with the small difference between the cost of the powder originally used, and that which would have been required for a well-balanced shot.

It is the cost of the rock at the crusher which the quarry superintendent should regard as his standard of comparison, rather than the cost per ton of the rock immediately after a shot. Frequently it will be found that adding one or two cents per ton to the cost of the primary blasting will result in a reduction of three or four cents in the cost of secondary blasting and steam shovel operation, and the wisest economy is that which looks beyond the first cost, and gives careful consideration to the ultimate cost.

Secondary blasting is at best to be regarded as a necessary evil. Modern practice tends to reduce secondary blasting to a minimum by the following methods:

- a. Improvements in primary blasting, for the purpose of reducing to a minimum the amount of rock which must be block-holed or bulldozed.
- b. Increase in the size of shovels and cars, and increase in the opening of the crusher to take rock in larger sized pieces.

These two methods of procedure should in fact go hand in hand, and as manufacturers are today building crushing machinery of greater strength and with increased size of inlet, and increased skill on the part of the superintendents and foremen is leading to constant improvements in blasting methods, we can confidently look forward to a steady improvement in regard to secondary blasting operations.

METHODS OF FIRING

Two methods of simultaneously firing a number of shots in quarrying are available, one method being by the use of electric detonators, and the other by the use of detonating fuse or cordeau.

Cordeau, frequently known as "Cordeau Detonant, or Cordeau Bickford" is lead tubing filled with T. N. T. Experiments have shown that such cordeau explodes at the rate of approximately 5,300 meters per second,

and accordingly where a number of holes are connected together by means of lines of cordeau the holes become in effect one single hole.

Electric detonators are copper capsules which contain a detonating charge of fulminate of mercury or equivalent material, and a small loop or "bridge" of very fine wire, which can be heated red hot by the passage of a very small electric current. As the rate at which an electric current travels is stated to be 300,000 kilometers per second (186,000 miles per second), it is evident that where a number of electric detonators are connected to a single source of electric current, their detonation is absolutely simultaneous for all practical purposes.

Both cordeau and electric detonators have their advantages and disadvantages for the simultaneous firing of large blasts. Where a number of widely separate charges are to be simultaneously fired electric detonators have some advantage over the use of cordeau, while on the other hand cordeau has some advantage in wet holes, and particularly in holes where the explosive charge is interrupted by lengths of stemming for the purpose of "raising" the average height of the charge.

One of the advantages possessed by cordeau is that as the line of cordeau extends the entire length of each hole, the entire column of explosive is brought into detonation at a speed which is determined by the rate of detonation of the cordeau itself. If, for example, a hole 100 feet deep were to be filled with an explosive having a rate of detonation of 3,000 meters per second, and the explosion of its charge to be brought about by an electric detonator placed in the bottom of the hole, the detonating wave would pass through the column of explosive at this rate of 3,000 meters per second. If instead of this arrangement a line of cordeau extended from the top to the bottom of the hole it is evident that this would communicate detonation to all parts of the explosive in contact with the cordeau at the rate of detonation of the cordeau itself, instead of at the normal rate of detonation of the explosive. The explosive would still probably detonate at its normal rate, but the cordeau would increase the rate at which the column of explosive would appear to detonate through its length. Opinions differ as to the advantages which are gained from this simultaneous detonation of the entire length of a column of relatively slow explosive. For certain special purposes there can be little doubt that it helps bring about a desired "timing" of the explosion of several different types of explosive used in a single blast, and possessing different normal rates of detonation. The use of cordeau as a convenient and safe means of simultaneously firing a number of holes is increasing, and many quarries have replaced the use of electric detonators by this method of firing holes.

When electric detonators are used in blasting in well-drill holes, the best practice is thought to be the use of at least two detonators in each hole. The detonators should be so spaced that the uppermost detonator is about equally far from the top of the column of the powder and from the center of the charge, and the lower-most detonator is similarly equally far from the bottom of the charge and from the middle of the charge. By this arrangement the detonator occupies the center of the column of explosive of which it is to bring about the detonation. In a

well-drill hole having 60 feet of powder the lower detonator would be 15 feet from the bottom of the hole, and the upper detonator would be 15 feet from the top of the column of explosive, the two detonators being 30 feet apart. Whenever electric detonators are used, care should be taken that several feet of powder are above the detonator, before tamping the powder, since the fulminate contained in detonating caps is much more sensitive than any high explosive used for blasting purposes, and the striking of a detonator by the tamping bar, and particularly the grinding of a detonator between the tamping bar and the side of a hole, would be practically certain to lead to an accident.

In lowering electric detonators into the hole the best practice is to attach the detonator properly to a cartridge of explosive so that the cartridge will hang perfectly plumb when suspended from the wire. The cartridge is then lowered by means of the wires to its proper position in the hole. If sufficient care is not taken to have the cartridge of explosive hang plumb from the wire it is very apt to strike against the side of the hole while being lowered, and to cause a "jam." On account of the detonator being in the cartridge, a cartridge so caught should of course be dislodged with considerable caution, and it is better to take a little more care in arranging this priming cartridge, so as to avoid the difficulty and danger of attempting to dislodge it when caught.

When cordeau is used in the hole, it is also best to use a cartridge as a "weight" to carry the cordeau to the bottom of the hole. The advantage of having a cartridge on the end of the line of cordeau, in addition to keeping the cordeau straight, is that it enables the blasting foreman to tell by the "feel" as soon as the line of cordeau has reached the bottom of the hole.

No advantage is gained by having more than one line of cordeau in a hole, and accordingly this is never done. If there is reason to believe that a line of cordeau has been broken off in the hole it is sometimes good practice to lower another line of cordeau into the hole to the depth at which the break of the first line is known to have occurred.

In using cordeau, it is well to remember that in spite of the remarkable rate at which the explosive wave passes through the material, it does not have the ability to jump a gap. Even so small a space as two or three millimeters (one-eighth of an inch) acts as an efficient barrier against the transmission of the detonating wave, and for successful results it is imperative that there should be no break whatever in the continuity of the line of cordeau.

SAFETY IN LOADING WELL-DRILL HOLES

In primary blasting the use of well-drill holes has now largely supplanted earlier methods of bench work, and although I will discuss safety precautions mainly from the standpoint of well-drill methods, the same principles will generally hold good wherever open cut blasting work is being done.

In the loading of holes particular watchfulness should be given to insure the complete absence of sparks or hot cinders from the steam shovel,

from locomotives, or from the steam well-driller. Those who have watched a steam shovel at work at night will probably have a better appreciation of the menace that sparks represent, than those who have only seen the work going on by daylight, and it should be remembered that it is not only those sparks which are visibly red which are capable of igniting explosives, but that hot cinders which appear quite black may be at a sufficiently high temperature to bring about an ignition. I am inclined to believe that rather more accidents during loading are caused by hot cinders than are usually attributed to that cause, and the only safe practice is to keep all sources of sparks away from the vicinity of the holes during the time that loading is going on. Some quarries have small tents which are placed over the holes while they are being loaded, and while this is better than no protection whatever, yet it is not so satisfactory as the complete removal of sources of sparks during the time of loading.

Of course lighted pipes, cigarettes, or cigars should be rigidly excluded from the vicinity of loading operations. It is even best that men engaged in loading should have no matches in their possession, since a hole in a man's pocket or some other accidental condition hard to anticipate may lead to a match dropping down in the hole, or falling on the rock near the hole where it may be stepped on by the men loading the hole. Even gasoline engines are to be considered as a potential source of sparks. It is true that a gasoline engine only occasionally throws out sparks, but the carbon which accumulates on the piston head and at the end of the cylinder is ejected from time to time in glowing condition, and this, together with an occasional backfire makes a gasoline engine a possible source of accident if too near a hole during loading.

In loading the hole with explosive, it has been proposed from time to time to use holders or clamps of various sorts, in order to avoid dropping the explosive to the depth of the hole. These are not commonly used however, and experience seems to show that the hazard in dropping a cartridge of explosive through a hole 100 or even 150 feet deep, is very small indeed. The first cartridge would naturally seem to be the one most likely to explode if detonation from the shock of dropping were really a considerable factor, since the later cartridges drop on the cushion formed by the cartridges already in the hole.

PREVENTING "BANGERS"

The experienced blaster is able to learn a good deal about the condition of the hole from the sound made by the first cartridge as it drops down, and the sound of the cartridge striking the bottom of the hole, or striking the surface of the water if the hole is wet, is used to determine the fact that the cartridge has gone completely to the bottom. It is excellent practice to "follow-up" the hole by measurements after each case of powder has been loaded, a case of powder ordinarily giving a "rise" of about 4 feet. There is always the chance of cartridges "banging" on the side of the holes, and thus leaving an air gap between the powder beneath which has been loaded properly and the point at which the first cartridge thus becomes crossed in the hole. If the "rise" in the hole is carefully followed by frequent measurements such a "block" in the hole will be

promptly noticed, and the condition can be readily corrected, but if a considerable amount of powder is loaded over the crossed cartridge before it is discovered that a "choke" exists, the matter is naturally more difficult to correct. An experienced loader can usually tell from the sound made by each cartridge as it drops that it has landed properly on the powder already in the hole, but occasionally a cartridge will hang on the sides of the hole even with good loading practice. A single cartridge can be dislodged safely by the careful use of a tamping stick, but if the "hanging" of the cartridge has not been noticed, and more powder has been loaded on top of this cartridge, so as to leave a column of two or three feet of powder above the choke, the dislodging of the material becomes more difficult. Efforts to dislodge such a choke by the vigorous use of the tamping bar are decidedly dangerous, and this procedure should never be followed. The best practice is of course to prevent any column of powder from building up on a "choke," by using the measuring line sufficiently frequently to keep in close touch with the level of the powder in the hole, and by paying proper attention to the sound made by the dropping cartridges as they land on the powder beneath. If a "choke" should occur however and more than a foot or so of powder should be built up over the crossed cartridge, the safest procedure is usually believed to be the cautious driving of a sharpened stick about 2 inches in diameter through the "choke," followed by the flushing out of the powder above the "choke" by means of water. Unless a quite excessive amount of water is used, this procedure will not cause the loss of the hole, as the powder will detonate in spite of a rather considerable amount of water which may be present after this treatment.

The size of the cartridges used in loading the hole is not a matter of indifference. For the standard 5½-inch well-drill hole the 4½-inch by 10-inch cartridges are commonly used, unless the hole is quite rough and ragged, in which case 4-inch by 8-inch or 4-inch by 10-inch cartridges are used. Using cartridges which are too small is a disadvantage, because the proper density in the hole is then more difficult to attain, while using too large cartridges is a disadvantage, because the chance of such cartridges catching on the side of the hole is materially increased. As a matter of fact the chance of a cartridge catching a hole is increased by the use of cartridges which are either too small or too large, and for well-drill holes the cartridges should preferably be one inch smaller than the diameter of the hole.

In measuring the hole a special tape given the best results, although in many quarries the tamping stick may be used instead. Whatever may be the method adopted to keep track of the bottom of the powder in the hole, the point which should be remembered is the accuracy of the measurements being made so frequently as to enable the loader always to know the height of the powder in the hole.

DISCUSSION OF CARTRIDGE TAMPING

The extent to which powder should be tamped during loading really depends upon the type of explosive which is being loaded, and therefore should more properly be considered in connection with a discussion of the

selection of powder for various types of blasting. Tamping of the explosive during loading is quite desirable in the case of the more plastic nitroglycerin explosives, but increasing use is being made in cement rock quarrying of explosives which require little tamping, and indeed in many quarries the explosive is not tamped during the loading, the tamping bar being only used at the end of the loading operation in compacting the stemming in the hole.

I have seen some rather surprising tamping bars at various times, ranging all the way from solid iron bars to iron tipped wooden rods. Once, in investigating a "mysterious" accident which had occurred on a piece of railroad work on which a nitroglycerin explosive of low nitroglycerin content was being used, I found that although suitable wooden tamping bars were supplied to the powder men by the contractor, a powder foreman had "shoes" made of lengths of iron pipe fastened to the end of each of the bars, "to keep them from fraying out so quick," and naturally the inevitable happened, and several men lost their lives in the resulting explosion.

Even wooden tamping bars can be unsafe if too heavy or if carelessly handled. It is not infrequent for sharp pieces of rock to become imbedded in the bottom or sides of a wooden tamping bar, and no one needs to be told that such a tamping bar will strike a spark under favorable conditions by rubbing against the side of a rough hole. The tamping bar should not be too large, in order to avoid excessive friction against the side of a hole, this precaution being particularly important in connection with piston drill holes.

A suitable layer of powder should always overlie each priming cartridge containing a detonator. Detonators are always to be treated with great respect, and having two or three feet of powder above the detonator before allowing any tamping to be done is an excellent rule.

TAMPING THE STEMMING

The energy that might otherwise be spent in tamping the powder can be utilized to advantage at the top of the hole in thoroughly tamping down the stemming which is applied over the powder. The first two or three feet of stemming should not be tamped, but after this the stemming can be tamped down quite hard, and indeed, if care is taken not to damage the line of cordeau or the electric feed wires, it may almost be said that the harder the tamping of the stemming material, the more efficient the shot will be. Experiments have demonstrated this point rather thoroughly, and a shot which is well confined does perceptibly more work per pound of powder used than can be obtained from a shot in which poorer confinement has been provided.

If explosives are to be tamped, however, it is most important that too much force should not be used. A rather considerable number of accidents have been due to improper use of the tamping bar, and to the use of unsuitable materials as tamping bars. It should be evident from what has already been said that the presence of any iron surfaces on the tamping bar is a potential source of danger, and that the use of too heavy a tamping bar also involves a rather heavy risk. I have sometimes been told

that a heavy tamping bar has advantages when it is properly used, and there may be some truth in this, but the fact remains that when improperly used such a bar becomes a source of danger, and the chance of the bar being improperly used is always present. I have been told of one case in which a type of tamping bar which has been used for some years with perfect safety by a powder foreman was used in his absence by a less experienced man, and in the course of the loading operation a choke developed and an effort was made to drive it out with the tamping bar, and an accident resulted. A lighter tamping bar would have been safer in this case, just because of the possibility of the misuse of a heavier bar by an inexperienced or careless man.

It is usually unnecessary for workmen to stand on the rock lying in front of the line of holes after the loading begins, and this is a safety precaution which may accordingly be given consideration. Should a premature explosion occur from any cause during the loading operation, the chance of men being injured is naturally less if the workmen are on the far side of the line of holes, instead of between them and the quarry face.

CONNECTING WIRES FOR FIRING SHOTS

It is of course evident that the final connecting up of the electric detonator wires, or the cordeau connections, should not be made until shortly before the blast is ready to be fired. When electric detonators are used, the method of wiring or connecting up a shot is a matter to which thought should be given. Where only a few shots are to be fired the detonators are often arranged in series, and fired by a blasting machine of the usual type, but in quarries where a good deal of blasting is being done, and where quite a number of holes are to be fired at one time, the parallel method of wiring is often preferred, the electric current being furnished from the power circuit. The connections should always be in parallel when current from a live wire is used in firing the blast.

As electric detonators are sensitive to relatively small currents, and may be fired by "stray" currents the existence of which may not have previously been known, the wiring should always be in the hands of competent and trustworthy men, and the holes should not be connected up until the shot is practically ready to be fired. Several cases are known where electric detonators have exploded apparently without cause, and investigation has shown that the wires were abraded at certain points, so that direct contact was established with moist earth or with some conducting metal. In coal mining several accidents have occurred through stray currents from a passing electric locomotive finding passage through an abraded wire to a charge which was not yet ready to be fired, and at least one accident in a cement quarry has been found to be due to a quite similar cause. These accidents only emphasize the point already brought out, that the lead wires connecting up the separate holes should only be attached when the tamping of the holes has been completed, and when the blast is ready to be fired. In addition, the lead wires should always be kept in good condition, and should be taped if any abraded spots are found.

One of the points which is to be avoided in the connecting up of a blast is too great haste in making the electrical connections. Wires loosely twisted together do not form a good electrical connection, and more than one quarry superintendent has no doubt criticized his powder foreman and his blasting men for a poor blast that has in fact been due to the failure of some of the holes to be fired by the electric current, the detonation of these holes coming through the shock from adjacent holes, and too late to enable the explosive to do its proper share of work in the blast.

The lead wires should not be brought near the exploder wires while loading is going on, and all the connections of the blast should be completed before connecting the battery to the lead wires. The custom of having shots connected up to the lead wires and firing battery before work around the holes has been completed is strongly to be condemned, and there is always the possibility that some one will unintentionally fire the blast under these conditions, in the effort to "test out" the battery or the connections without realizing that electric detonators are in the circuit. Probably the safest method that I have seen for preventing accidents from the unintentional applying of current before the blast is ready, is the placing in the circuit of a special block, which leaves the circuit open unless a special form of key is placed in it. The key is retained by the man responsible for the blast until the time that the current is to be applied, and is then inserted. Where firing is done from a power circuit a modification of the same principle may be applied, or the switch connecting the lead wires may be locked in position in some suitable way. The one point which I consider quite important is that one man should be responsible for the circuit, and that this man alone should have the key controlling the switch or the safety block.

In firing with cordeau the electrical circuit should be made before the exploder is placed in the special union which connects the detonator with the main strand of cordeau. The manufacturers of cordeau provide special attachments which may be used either with electric detonators or with detonating caps, and in addition special tools are provided for slitting cordeau in the making of connections and joints.

SAFETY IN SECONDARY BLASTING

The rules for safety and efficiency in the handling of explosives in connection with secondary blasting operations are of course not dissimilar from those rules which should be followed in primary blasting operations. In block-holing one pound of explosive will represent fully the execution that ten pounds of the same explosive will even in a well placed "dobie" or mud cap shot, while a poorly placed mud cap shot is notoriously wasteful of explosive. It is frequently economical to use the larger quantity of explosive required by the mud cap shot, because of the cost of the drilling of the holes in the block-holing method. A few years ago the situation was much more difficult than it is at present, but recent improvements in light air hammers have materially cut down the cost of secondary drilling, so that the alert quarry superintendent will bear con-

stantly in mind the advantages for and against the block-holing method. Where mud capping is done, it is well to remember that earth and clay are much cheaper than explosive, and that a somewhat larger pile of dirt will be equivalent to a noticeable amount of explosive in the charge that is necessary to break the rock.

Proper protection for workmen in the quarry from fragments thrown by the blast should of course be provided. The usual cylindrical safety shanties of boiler plate provide rather satisfactory protection if located at a suitable distance, and if the doors or openings are turned away from the direction of the blast. In firing a large blast no one should be permitted to remain on the quarry floor in front of the blast even though the distance may seem safe, for small pieces of stone are frequently projected with exceptionally high velocity and are capable of causing serious or even fatal injuries at a distance considerably in excess of what would appear normally to be a safe distance.

PERCENTAGE OF ACCIDENTS DUE TO EXPLOSIVES

I do not believe it is best to end this discussion of safety factors in connection with the handling of explosives, without calling to your attention the rather small percentage which accidents due directly or indirectly to explosives bear to all accidents which occur in connection with cement rock quarrying. Some years ago I had occasion to investigate and classify the accidents which occurred in coal mining over a period of years. I had read, as all you have, of those terrible accidents due to the explosion of coal dust which at times sweep through the entire extent of the mine. One such accident, at the Couriere mines in France, led to the loss of more than a thousand lives, while in our own country two such accidents led to the loss of 350 and of 250 lives respectively. On taking up the matter of tabulating all accidents which had occurred in coal mines however, and of classifying them according to their cause, I was rather surprised to find that accidents due to explosives and explosions together were really rather a small fraction of the total number of accidents which occurred. The Bureau of Mines has recently reported that for the year 1918 there was a total of 2,579 fatalities in connection with coal mining in this country, and of this total 135 deaths were due to explosives, and 129 deaths were due to gas of coal-dust explosions. Accordingly only about one-tenth of all fatalities were due to either explosives or explosions, and only about one-twentieth of all the fatalities which occurred were directly due to accidents from explosives.

Government statistics in connection with quarry accidents show rather similar results. In Tech. Paper 165 of the U. S. Bureau of Mines accidents classified by cause are shown for the year 1915, and of 149 fatalities in quarries or at rock dressing plants and mills the number killed by explosives was but 28, this figure including not only all fatalities due directly to explosives, but also all fatalities due to flying pieces from blasts and other indirect causes.

ACCIDENTS FROM EXPLOSIVES IN CEMENT ROCK QUARRIES

Mr. Jacobsen has very kindly given me figures in regard to accidents from explosives reported to him during the year 1918 by members of your association, and from these figures I note that of all fatal accidents of which he has record which occurred during the year 1918 somewhat less than 8 per cent were due to explosives, and somewhat more than 92 per cent were due to other causes than explosives. Of all accidents, including fatal and non-fatal accidents, those due to explosives constituted somewhat less than 2 per cent of the total and those due to other causes than explosives constituted more than 98 per cent of the total.

This is a rather satisfactory record, and shows quite clearly that explosives, far from being one of the most dangerous factors that you have to contend with, are really less dangerous than many other factors to which much less attention is usually given. Falls and slides of rock cause many more fatalities than do explosives, both in coal mining and in rock quarrying.

The ratio which the number of fatalities due to explosives bears to the number of fatalities from all causes is considerably higher in quarrying operations than in either coal mining or in metal mining. It is interesting to note however, that the number of accidents due to explosives in the quarries of the members of your association, compared to the number of accidents from all causes, represents a materially lower ratio than that which exists in the quarry industry as a whole. The last available figures from the Bureau of Mines show that 19 per cent of all fatalities in and around quarries and including crushers, rock dressing plants and mills were due to explosives, while the figures which Mr. Jacobsen has collected covering the operations of the members of your association show that the percentage of fatal accidents due to explosives was only 7.9 per cent of all fatalities, or less than half of the ratio which exists when all quarrying operations of the U. S. are considered.

It should be our aim to improve still further the good record from a safety standpoint which explosives now have in quarrying operations, and I feel sure that this result will be obtained by that spirit of cooperation and mutual helpfulness for which your association so truly stands.

DISCUSSION

CHAIRMAN JACOBSEN: As Dr. Snelling said, there are very few accidents happening from explosives in the cement rock quarries. We ought to be proud of that. Still we ought to remember that we have a condition there where the carelessness of one man can do an enormous amount of damage, and we ought to keep that in mind all the time. I know there are several people here who want to ask Dr. Snelling questions, and I also know there are several who have had experiences lately which will be of considerable interest in connection with this subject.

MR. LAWNICZEK (La Salle): I would like to relate an incident that happened at our plant the day before I left. We occasionally fire "dobies" ahead of the shovel. We have a signal, and also a shelter

house for the men to go into before the shot is fired. One of our men was carrying a fuse, along with the dynamite he had to use for the "doby." As he was passing the shovel, it was fired, and a cinder fell down and the dynamite became ignited. He had the fuse in his hand, and that caught fire, but he had presence of mind enough to throw the dynamite away. As it exploded it tore two of the doors off the shovel and blew all the windows out of a locomotive that was standing close to it. Fortunately no one was hurt, although the force of the explosion blew the hat off the engineer who was in the cab.

CHAIRMAN JACOBSEN: Dr. Snelling has a paragraph in his paper, which he did not read. He recommends that you look at your steam shovel at night in order to get a good idea of what the actual condition is, and particularly on a dark night; then you will probably get a little better idea of what comes out of the smoke stack. During the daytime, nobody notices that, of course, nor ever thinks of it. From this case you can see that there were sparks that nobody would think of ordinarily. I have often seen powder stored in big quantities without protection, and there is no reason in the world why an accident couldn't happen in a case like that.

Mr. Josse (Continental): I have a few questions I would like to ask Dr. Snelling. I want Dr. Snelling to understand that I don't mean anything personal in this. This is for the benefit of the Cement Association—that is what we are here for, and if we can get anything out of this discussion we want to get it. While this one question I am going to ask you refers to your own powder, I don't wish you to take this as a personal matter at all.

Three years ago we were loading a large shot, 22 holes. We had used a lot of Trojan powder, and we thought we knew how to handle it. We loaded 21 holes, and were on the 22d hole. We had about 150 pounds of powder in it. The "powder monkey" was sitting on the side of the hole, and the men were handing him the sticks, and he was listening to hear them hit. He dropped a cartridge in, and the next thing we knew his head was blown off and six or seven others were injured.

We have asked six or seven different powder experts of their opinion in this case and none of them has been able to tell us anything. So we are still in the same frame of mind that we were in at that time. I would like to have you explain if you can what happened to fire that cartridge. There wasn't a pipe or a match on the job, nobody was smoking, no fire from a "dinky," or anything; we were a quarter of a mile away from a "dinky." I had personally left the hole about 20 minutes before it happened.

DR. SNELLING: For a number of years past my work has been primarily in connection with research, and I have learned to have very great confidence in the uniformity of natural laws. I do not believe that any accident ever happens without an adequate cause, and accordingly I feel that in investigating any accident it is desirable to look at the situation from this point of view. We have all seen cartridges of explosives dropped into much deeper holes than in the case mentioned by Mr. Josse,

and I know that day after day many holes are being so loaded in different parts of the country without accidents. I have perfect confidence that under normal conditions powder can be dropped into holes day after day without accident, and accordingly it is necessary that we should consider this particular affair as quite an exceptional matter, for which we are justified in looking for some most exceptional cause.

Conditions could not have been quite the same at the time this hole was being loaded as prevail in the many other holes which are loaded each day in the same manner without accidents occurring, since otherwise we would hardly have justification for our belief in the uniformity of the working of the laws of nature. Some condition must have been different, and accordingly our problem narrows down to a search to determine what possible factor could have been present in this particular case, to cause a result so wholly different from normal conditions. There are cases on record where holes being loaded with high explosive have been known to detonate during the loading operation, and in at least one of these cases it is known that a piece of stone from the side of the hole dropped down the bore the instant before the explosion occurred.

DUPRÉ'S "SENSITIVENESS TEST"

It is well recognized that a thin layer of an explosive caught between two sliding surfaces may under certain conditions be caused to explode. A chemist by the name of Dupré, connected with the British Service, gave this matter some little study some years ago, and developed a "sensitiveness test" which furnished quite a surprise to explosives men in general. Mr. Dupré found that by spreading almost any type of explosive in a thin layer upon a wooden floor, and striking it a sharp but glancing blow with the handle of a broom, he could produce the ignition or explosion of the sample. Many explosives which have proved to be very safe in commercial use were found to ignite or explode when subjected to this test, and accordingly it is necessary for us to believe that under quite exceptional conditions of friction, and particularly under the influence of a glancing blow from a hard and sharp object, almost any explosive can be caused to ignite. A piece of stone dislodged from the collar of a hole might furnish, in some exceptional case, the particular combination of sliding friction and glancing blow that has proven to be the most effective in causing an ignition. Unfortunately it is not a wholly impossible thing for pieces of stone from the edge of a hole to loosen and drop down, and in the light of Dupré's "Broomstick Test" it seems rather clear that a piece of stone of the proper size and shape might produce under rare conditions just the conditions of friction that would bring about an ignition. Fortunately, the dislodging of a piece of stone from the collar of a hole is far from being a common occurrence, and in addition the size and shape of the stone would have to be just right, in order to be effective. If the stone were too large, or if it were too small, the conditions necessary to produce the glancing blow might be absent. In addition the stone would have to have sharp edges of the right type, in order to provide a surface capable of limiting

the friction to a narrow edge. Provided all of the factors were within the necessary limits however, a stone could undoubtedly cause an explosion, and I might add that this result would occur without reference to the particular type of explosive which was being used. I have recently installed at our research laboratory a pendulum friction machine of the type designed by the Bureau of Mines for the purpose of testing the sensitiveness of explosives to sliding friction, and I believe it is only fair to state that no nitroglycerin explosives which we have tested have shown as great resistance to sliding friction in this test as nitro-starch explosives have shown.

It is my desire always to be perfectly fair in any discussion of accidents, and so I think it is only proper for me to say that any explosive may occasionally be involved in an accident, no particular type or class of explosives being free from this danger. If a material is an explosive, it necessarily is capable of exploding when certain conditions are present, and such conditions sometimes arise through wholly unanticipated causes. In investigating accidents you will occasionally find however, that some of the conditions are very hard to determine and even when you think you have fully determined all of the possible factors in the case, there may still be other factors which are hidden.

Now you say that there were no steam shovels around, no matches, nothing which could cause sparks. My experience in powder plants has shown me that matches will sometimes be carried in spite of the most careful instructions, and even detonator caps are sometimes carried loose. A tiny hole in a man's pocket may lead to either a match or a detonator cap falling to the ground, under conditions quite favorable to the causing of trouble. For several years past I have devoted some attention to a study of the many possible causes of accidents in the handling of explosives, and I can assure you that these causes are of the most diverse nature. In the particular case which you have mentioned however, I am inclined to believe that a piece of rock falling down the hole represents the most reasonable explanation of the matter.

I do not know whether this fully answers your question or not.

Mr. Josse: I think it does. You have brought out a point that has been the only question in my mind, after making a most thorough investigation covering a period of six months. You mention friction. In my opinion that is the only thing that could have caused our accident.

When we first bought Trojan, it was supposed to be less sensitive than the gelatin and nitro-dynamites, so when we got our first small batch to try—there were only about 5,000 pounds—we took several cartridges up on top of the quarry, and threw them as hard as we could over into the middle of the quarry, to see if they would explode. They did not. Another test we made was to set up a 5 by 10 cartridge about 50 yards away, and shoot it full of holes with a rifle, and it didn't explode. Finally, we were using No. 6 detonators on our "doby" work, and very frequently a No. 6 didn't explode a stick of Trojan, so we felt quite confident that it was not as sensitive as the other dynamites.

In the accident I referred to we were using 5 by 10 sticks, dropping

them 80 feet, and we had dropped about 150 pounds. Before dropping the cartridge, we had men on each side of the "powder monkey" rip the paper with a knife, so that when we tamped, it would fill the hole.

My opinion is that some of the dynamite from the cuts on the side of the cartridge probably adhered to the side of the hole, and in dropping the stick, it received the proper amount of friction to explode it. I think that is very likely the only way the powder was exploded. It had dropped about 70 feet, and it had been dropped long enough so that the other man was handing another stick to the "monkey." It almost got to the bottom of the hole before it exploded and it shot off the 150 pounds that was in there. The next hole, 10 or 12 feet away, was not disturbed.

MR. MACFETRIDGE (Lehigh): Isn't there also a possibility that in drilling the hole, there might have been a jagged rock sticking out of it, and when the dynamite went past that projecting piece of stone, it would create sufficient friction?

DR. SNELLING: One particular point has been brought out which I believe could be given a little further discussion. Most quarries slit their cartridges, and if it were not that many holes are loaded with slit cartridges every day, and as such an accident as has been mentioned is extremely rare, we might possibly attach importance to this factor. As a matter of fact however, the mere slitting of a cartridge probably has no particular significance as a factor in the producing of friction, although I will not say that under exceptional conditions this might not be true. In this connection I will relate a little incident which happened in Washington a few days after the sinking of the Titanic. There was a little gathering of prominent scientists, and one of them said "Did you know that the sinking of the Titanic was caused by striking a rock?" As we all knew that the Titanic had sunk in mid-ocean by coming in contact with an iceberg, there were of course general protests from the others in the group, but the scientist who had brought up the subject held his ground, and said that he would undertake to prove to all of us that the Titanic struck a rock, and that it was this fact which had led to the loss of the vessel.

He then took up the matter step by step, showing that icebergs are merely floating parts of ice sheets or glaciers, and that the lower part of every glacier contains rocks which it picks up during its formation, and which it holds rigidly. This man was a noted authority on the Alaskan glaciers and his statement of the manner in which the lower portion of the glacier picks up and holds jagged pieces of rock was most convincing. He then took up the matter of the physical characteristics of ice, and showed us that ice is entirely too brittle a material to be in any way capable of making a slit through the heavy steel of a vessel's hull, except by head on impact. But the Titanic did not strike the iceberg head on, but instead sidwiped the iceberg, the shock of impact being so slight that some people on the boat did not know that anything unusual had happened. He then showed how utterly impossible it was for any projection of ice alone to be capable of cutting the steel hull of a boat by a sliding impact, since in such a case the projecting

piece of ice would have been ground off by sliding against the boat's hull, and under no conditions whatever could the very heavy plates of steel have been cut by the fragile ice. But if a piece of rock were held rigidly in the side of the iceberg, it would provide just such a cutting edge as would be necessary to explain the peculiar rip through the steel plates which extended almost the whole length of the vessel. The mass of the iceberg would have furnished the necessary rigidity, and the sharp edge of the rock would have provided the necessary cutting edge, and the whole incident became explainable. I left the gathering fully convinced that the explanation was the correct one, and that except for some firmly held piece of stone in the side of the iceberg the Titanic would have gone on its way quite uninjured from its brush against the side of the iceberg.

In an unusual accident, we are fully justified in looking for an unusual cause. Is it not possible that a small stone, or still more likely a small splint or flat stone might catch in the slit of a cartridge and form a sharp cutting edge as the cartridge went down the hole? If a cartridge of explosive alone could produce sufficient friction by sliding down a hole to produce an explosion, then we would expect to have accidents every morning and every afternoon, since cartridges of explosive, both slit and unslit are dropped every day down many holes in many different kinds of rock, sometimes through smooth bore holes and sometimes through rough ones. We have all heard the "pound" of the cartridge as it strikes the bottom of the hole, and we know that it must be moving very fast to make such a thud, and that the friction against the side of the hole must be considerable. Yet such an accident as you have described is not only uncommon, but indeed is exceptionally rare. You have yourself brought out the point that you threw cartridges of Trojan powder to the bottom of your quarry, and that you shot through cartridges with a rifle, which is not very gentle treatment by any means.

My own belief is that the mere friction of a cartridge cannot under any conditions cause an ignition. There must surely have been some other condition present. A sharp fragment of rock catching in the slit, or a small piece of stone being dislodged by the cartridge, and following it down the hole, seems to be a much more logical explanation. Perhaps some of you have had the experience of getting a bad cut on your finger from turning the pages of a book. It seems unreasonable, because your skin is tougher than the paper, but if you get the edge against your skin in just the right position, you will bring blood. So a small piece of stone, falling down a hole and exerting friction from a narrow cutting edge against the side of a hole could undoubtedly produce sufficient friction to cause an accident and I might add that this would occur without particular reference to the type of explosive against which the sharp cutting edge should exert its friction. Fortunately, however, such a condition is extremely uncommon.

MR. MACFETRIDGE: Had that hole been sprung a short time before the accident occurred?

MR. JOSSE: No.

MR. MACFETRIDGE: We had an accident happen once, where we had sprung a deep hole. Twenty or thirty minutes afterwards they were working on that hole, and there was an explosion which killed two men.

MR. JOSSE: Another point was brought up, namely that perhaps we had just drilled the hole, but the hole hadn't been touched for 14 or 16 hours. It had been drilled the day before, the evening of the day before.

DR. SNELLING: While we are on the matter of unusual causes of accidents, I would like to bring to your attention a matter which came up during the building of the Panama Canal. They had several accidents in springing holes, the exact cause of which was at the time unknown. They would drill a hole, and sometimes on getting ready for the first spring, the powder would go off. I was asked to look into the matter, and found the situation to be very perplexing. The explosive which was being used was nitroglycerin dynamite made under government specifications and carefully inspected before it went down to the Isthmus. The examination of the explosive did not disclose anything which would give us a clue, but later the accidents were considered to be due to the production of heat from chemical action in the hole resulting from certain minerals coming in contact with air and water during the drilling of the holes. I myself had an interesting experience along this line, in connection with a specimen of a mineral called marcasite, which is a sulfide of iron quite similar to ordinary pyrite, but of slightly different chemical constitution. I obtained a very fine specimen of this mineral and put it away in a case, quite proud of the excellent purchase I had made, but after only a few days the specimen was reduced to a pile of oxidation products, quite different from the original material. The specimen had been dug up only a few days before I received it, and although it had been perfectly permanent for thousands of years while buried in the earth, it commenced to go to pieces almost as soon as it came in contact with the air. The chemical changes which go on under these conditions can produce heat, in just the same way that lime will produce heat when it comes in contact with water, and the accidents in the Panama work to which I referred were finally concluded to be due to this particular factor. Of course such a condition as this is most unusual, and I do not remember of any other case in which sufficient heat to produce ignition of powder has ever been found to be due to the oxidation in the hole of minerals, although of course you are all familiar with the fact that piles of coal containing certain sulfur minerals are very apt to catch fire simply from the heat developed within the pile by chemical changes produced by the oxidation of the sulfur minerals.

Fortunately minerals of this type do not have to be considered as factors in the quarrying of cement rock, and accordingly I brought the matter up only because of its interest as a most exceptional cause for the ignition of an explosive.

CHAIRMAN JACOBSEN: I have jotted down a few things which I just took from our accident reports that we receive from the various companies, to show you how we have accidents, due to handling explosives. The first one says, "Touched lighted match to blasting cap, to see if it

would explode." It did, and the man knows, he is short three fingers. Another is a defective, or delayed fuse, which caused delayed explosion, and the man was hit by a stone and killed immediately. Then we have a number of accidents, due to flying stones from shots. The men have been out in the quarry so many times, probably during shooting, that they think they are perfectly safe. They do that once too often, perhaps, and I believe we ought to pay more attention to that point. Mr. Fortuin, you had an accident at your quarry at the beginning of last year: you had a number of men hit by flying stones at the same time, or something like that. It was nothing very serious, but it might have been.

MAJOR RENINGER (Lehigh): Do you have a shelter house?

MR. FORTUIN (Pennsylvania): Yes, but they didn't get in them.

MAJOR RENINGER: Do you have enough of them?

MR. FORTUIN: Yes. You bring one thing to my mind now. We blow a whistle from the time we are ready to blast until the blast is over, and then we give the double signal, to show that the blast is over. On the blowing of the whistles, all the men are supposed to seek shelter. On this occasion you refer to they didn't, that is they didn't get far enough away, and this shot spread out farther than they had expected it to.

QUICK THINKING SAVES LIFE

MR. FRAME (Alpha): We recently had an incident that might have resulted seriously in our No. 4 quarry. The blasting gang was lighting a number of "dobies", probably ten or twelve, and about half of them had been lighted, when the man caught his foot between two large stones, and couldn't release himself. Of course, he was very much frightened, he knew the fuses were burning behind him, so he yelled as hard as he could, and some of the men nearby quickly ran in and pulled the lighted fuses from the dynamite. It took quite a little effort to extricate the man from his position. It shows that quick thinking on the part of his fellow men saved that man's life.

MR. SCHLICHER (Lehigh): I would like to know whether Doctor Snelling ever had any caps explode while they were being handled?

DR. SNELLING: I never have. I have always wondered at the freedom from accidents with caps, due to the fact that occasionally you would expect, fulminate would get loose, and would get between the metal surfaces of the box. I have several times made the same inquiry and so far I have never heard of a case where a box of caps has exploded while being opened, although it has been reported that a coal miner met with an accident while opening a box of caps in the mine, a drop of blazing oil from the miner's lamp dropping into the box while he was opening it.

MR. SCHLICHER: We had an accident in our quarry last May, where a box of caps, containing about 40 or 50, exploded and the man who was opening the box had two hands blown off and the side of his face blown off. He died that night. Nothing was near them to have caused the explosion. One of the other men had put off a shot, and a small stone

hit this box. The man walked over to it, took the lid off, and off they went right in his hand.

DR. SNELLING: I think the stone hitting the box is very likely the explanation of the accident. In the manufacture of caps care is taken to get rid of loose fulminate, by putting the caps in a drum with sawdust which is then agitated. The caps are then sieved to separate them from the loose fulminate and sawdust, the object being to get rid of any particles of fulminate which might be free.

Now, in this particular case, the stone which hit the box undoubtedly damaged the caps. It probably loosened the fulminate in some of the caps, so that this could get between the tin lid and the sides of the box. Any quick movement in opening the box would undoubtedly be sufficient to set it off.

MR. SCHLICHER: According to that, don't you think it would be better to keep them in a paper container?

DR. SNELLING: That is a matter that has been considered, but I believe that accidents have been too infrequent to make the cap manufacturers feel that any advance would be gained by changing their present practice.

MR. SCHLICHER: I took this matter up with one of the Du Pont men, and he told me that this was only the second accident they knew of that had happened in that way.

CHAIRMAN JACOBSEN: There is just one thing more I would like to have you hear. This is in connection with explosives, and it is a matter that Mr. Josse will bring up, and ask Dr. Snelling's opinion about.

MR. JOSSE: This matter is not a new one to several of the gentlemen in the room, they have heard me ask this question before, but for the benefit of those who have not heard it I want to mention a peculiar accident of thawing we had last February. We had a small shot ready, the holes ready, and were waiting for the dynamite. The car came during the afternoon. The quarry foreman told me all the dynamite was hard. The weather at that time was mild, although it had been freezing before. The foreman suggested that we unload the dynamite and haul it up on the hill and thaw it near the holes, which we decided to do. All the dynamite was taken up on the hill, and we had a thawing house that we pulled around with a team wherever we needed it. It had double walls and there was no floor in it. We pulled this thawing house down near the shot, and we unpacked about 5,000 pounds and laid it on the shelves inside. The floor was the earth, but we threw dirt around the edge to keep the air out. There was a four-inch square hole for each steam line to go into the radiator. This radiator was a large pipe, laid on a couple of stones off the ground. We had an exhaust line of a quarter-inch pipe. The "dinky" engine was 135 feet away, and we connected the steam line. The quarry foreman had given instructions to the watchman that in case the dynamite was soft about midnight, or getting soft, to shut off a little steam, and if it wasn't soft, to turn on a little more steam, but not to carry the steam above 70 pounds.

At midnight the watchman went in and felt the dynamite and it was getting soft, so he shut off a little steam. Shortly afterward he said he heard a cracking noise, and looked over, and the entire house was burn-

ing from the inside; the flames were licking the outside. He didn't know what to do. He shut off the steam immediately and notified the second quarry foreman. The rest of the dynamite was piled up about 30 or 35 feet away. The entire house burned up, the heat from this ignited the other pile, and that entire 14,000 pounds of dynamite burned up and didn't explode.

I presume this was covered at a cement safety meeting we had in St. Louis, where it was said that ignition can happen, even though your dynamite is being thawed perfectly, that it can happen from the internal heat of the dynamite itself. But in my opinion, or at least from the knowledge I have of other cases, there are very few cases where so large an amount of dynamite burns up and does not explode; we certainly were very fortunate that it didn't explode. It would have killed 75 people if it had exploded, because the boarding houses—not over 500 yards away—had 50 men sleeping in them, and those houses would have crumbled like shells. There are 20 small three or four-room houses up there besides, and I presume about 75 people were sleeping in them.

The weather report showed that the wind was blowing away from the "dinky," and it was blowing the smoke and the sparks, if there were any, away from the dynamite, and that is the only thing, in my opinion, that kept the dynamite from exploding. That is another case of unusual things happening, I think. Did you ever hear of a large amount of dynamite burning up without exploding?

DR. SNELLING: Yes, I have on several occasions known of large amounts of dynamite burning without exploding, and I have also made burning tests myself, using considerable amounts of material.

The cause of the original ignition of the powder is a matter of some interest in this case, and I believe must be laid to the self generation of heat in thawing. This is a factor about which comparatively little is known, and I believe a few years ago the whole subject was practically a mystery. In the course of some work which was being done at the Bureau of Mines we tried to see what would happen when nitroglycerin was heated, and a box was constructed of heavy plates of steel, and provided with a small window of very heavy plate glass so that occurrences in the inside of the box could be observed. The purpose of the work was to find out what we could about the cause of the "unexplained" accidents which occur in thawing nitroglycerin explosives. Accidents during the thawing of dynamite had frequently occurred under circumstances which were very hard to explain, the explosive sometimes catching fire, and sometimes detonating, and in either case the causative factor being very hard to determine.

We put a small tube containing nitroglycerin in the apparatus, which was so arranged that we could heat the tube by means of a small electric heater, and could control the temperature from the outside of the box.

After a few experiments, we noted that the nitroglycerin appeared to be hotter than the heater was. To explain this I will tell you how we made the experiment. We had a glass vessel filled with paraffin oil, this glass vessel resting on an electric hot plate. The test tube containing the nitroglycerin was surrounded by the bath of paraffin oil, and we

had thermometers, or rather electric thermocouples for measuring the temperature, placed in both the paraffin bath and in the nitroglycerin in the tube. As we assumed that the nitroglycerin could only be heated by taking up heat from the paraffin bath, we naturally assumed that the nitroglycerin in the tube would always be slightly colder than the paraffin bath, in proportion to the heat "lag," but we never thought that there would be any chance of the nitroglycerin becoming hotter than the oil. In making the experiment, however, we found that although at the beginning the thermocouple in the nitroglycerin indicated a lower temperature than the thermocouple in the paraffin bath, yet after a short time the thermocouples registered the same temperature. This was a most unusual matter, because if you are heating a thing, the thing which you are heating should not become hotter than the source of heating. So I had the heat cut off, but even after the current was cut off from the electric heater and the paraffin bath began to drop in temperature, the temperature of the nitroglycerin kept right on rising, and a few minutes later the tube exploded.

This was a most interesting and unexpected result, and we continued the experiments for some time. The results have been published in Technical Paper 12 of the Bureau of Mines. We found that there was a certain temperature beyond which any particular sample of nitroglycerin could not be heated without starting internal changes which themselves produced heat. Accordingly if you raise the temperature of the nitroglycerin to the temperature at which it begins to give out heat from internal changes, it will keep on getting hotter, even if you take away the original source of heat. Just how rapidly it will heat up will depend on the mass of the sample, and most nitroglycerin explosives are good heat insulators, so that the heat that is evolved is stored up and this increases the rate at which further decomposition goes on.

This gave us another line to work on and we made some tests to see what would happen if nitroglycerin were heated to the point where decomposition with evolution of heat commenced, and were then rapidly cooled so as to withdraw heat as fast as it was being generated. We surrounded a tube of nitroglycerin with a jacket through which we could pass very cold water, and under these conditions we succeeded in distilling nitroglycerin, the decomposition going on at a temperature between that at which the internal changes commenced and that at which detonation occurs.

It seems probable to me that in the case which you describe some portion of a box of the explosive must have been placed where it received heat sufficient to commence internal changes, and where it received heat more rapidly than it could give the heat off from the free side of the box. If you had a wall made of boxes of dynamite three boxes deep, you could only apply heat very gradually to the innermost box, without danger of supplying heat faster than it would be transmitted through the other two boxes, which would tend to act as heat insulation. Just as your winter overcoat is effective in keeping the internal heat of your body from radiating outwards, so the two outside boxes would serve to hold in the heat applied to the innermost box. In the case which you

have described a box probably got heated, not to its explosion temperature, but to the temperature at which it commenced to evolve heat from internal changes. The outer boxes still served to hold in this heat and accordingly the temperature kept right on rising, until finally the temperature became sufficient to cause some of the explosive to ignite.

There are many cases on record of large quantities of dynamite and other high explosives burning up completely without explosion, although there is of course always some risk that the burning will pass over to an explosion. If your boxes had been long exposed to radiant heat, this fire would not have lasted a great length of time before it would have set the other boxes on fire.

MR. JOSSE: In 10 minutes everything was all burned up.

DR. SNELLING: I am inclined to believe that the fact that the dynamite in the second pile caught fire in the case which you described, was a fortunate occurrence. In other words, I believe that dynamite which is on fire is safer than dynamite which is being baked by radiant heat, but which is not on fire. When a stick of dynamite is burning the material burns away faster than the heat penetrates the cartridge, and under these circumstances explosion is much less likely than when the cartridge is penetrated by heat without the heated portion being continually removed. As you all no doubt know, miners sometimes place cartridges of dynamite in the oven of their stoves at home to thaw, and then forget and leave the material there until someone starts the fire up again. Under these circumstances the dynamite seldom catches fire, but nearly always explodes, thus proving that it is safer to let a large quantity of dynamite burn away than it is to heat it up gradually without letting it catch fire.

So, taking all things into consideration, it seems to me that the whole set of circumstances that you have described were all rather favorable to you, and the fact that the two piles were close enough together to allow the second pile to catch fire from the first probably prevented an explosion, which might have occurred had the distance between the two piles been such as to permit the second pile to heat up more slowly from the radiated heat from the thaw house.

CHAIRMAN JACOBSEN: Does that answer your question, Mr. Josse?

MR. JOSSE: Yes.

CHAIRMAN JACOBSEN: We have one more paper on our program, which is on "Platforms, Walkways, Stairs, Ladders, and Floors in Cement Mills." This is a very important point in our accident prevention work. The paper has been prepared by Mr. E. R. Abbott, Safety Engineer of the Canada Cement Company.

PLATFORMS, WALKWAYS, STAIRS, LADDERS, AND FLOORS IN CEMENT MILLS

E. R. ABBOTT, SAFETY ENGINEER, PLANT NO. 1, CANADA CEMENT COMPANY,
LTD., MONTREAL, CANADA

The above subjects have been taken up so thoroughly with regard to construction and safe practices, in bulletins issued by the Association

(Nos. 2 and 18), the *Safe Practices* pamphlets issued by the National Safety Council (Nos. 2 and 11) and in Hansen's *Universal Safety Standards*, that very little can be added. This paper will be in the nature of personal experiences we have had at Canada Cement Company's Plant No. 1 and I will endeavor to show good and bad points that we have found.

Cement plants that are being designed today take into consideration accessibility to bearings, overhead drives, etc.; but in many of the plants built several years ago this was not done and it is difficult to make these places safe for workmen.

About five years ago we took up seriously a Safety-First Campaign, and it was early realized that good housekeeping and a clean mill were necessary if we were going to make any progress with the campaign. It became apparent to us that in order to keep our mill clean it was necessary that we should replace the wooden platforms and walkways with platforms made of material that would not allow the dust to sift through when being swept and cleaned up.

PLATFORMS

In our grinding departments the ball mills, pulverizers, and tube mills are driven by motors placed on elevated platforms, or galleries, about 10 feet above the floor of the mill building proper. The pulley of the motors overhangs the edge of the platform, the center of the motor pulley being about 5 or 6 feet above the center of the mill pulley. When these platforms were originally installed they were built of timber covered with a 3-inch wooden floor. These platforms were never very satisfactory, owing to the fact that there was more or less vibration to the motors, which caused serious trouble with the bearings and coils. Another objection was the fact that whenever the floor was cleaned a shower of dust was precipitated on the floor beneath, through the cracks caused by the drying out of the flooring boards. It was also difficult to keep railings in proper repair, due to the vibration. Eventually we replaced these wooden structures with solid reinforced concrete platforms, with standard pipe hand rails along the edge, and steel and concrete stairs leading from the main floor to the platforms. These platforms have been highly satisfactory in every respect.

A more difficult problem was presented in the replacing of wooden platforms around elevators, along line shafting and other necessary overhead walkways and platforms, as well as floors in bridges, connecting different buildings and carrying conveying machinery. Owing to the fact that our mill had to be kept in operation while these replacements were being made it was necessary for us to use different types of construction. Wherever possible we put in forms and cast concrete slabs reinforced with wire mesh. This we consider the most desirable type of platform floor. In some cases we used what is known as "Ferro Dovetail" sheeting, covered with 2 inches of concrete on the upper side. This makes a very satisfactory floor, provided the lower surface is kept painted, or is covered with cement plaster. Another method was the use of perforated

steel plates, but we only used this material where it was impossible to make use of concrete as these perforated plates had the same objection from the standpoint of cleanliness as the wooden platforms.

Pulverized coal is conveyed from the coal house through an overhead bridge to the kiln room. To eliminate dust collection on the floor of this bridge and thus lessen the liability of an explosion, a floor was constructed of flat iron bars on edge, spaced about one inch apart.

We have under contemplation plans to erect in our coal house, a system of walkways leading from all elevated platforms to a stairway built outside the building, so that employees will have a quick and easy exit in case of fire or an explosion.

STAIRWAYS

Stairways have been the cause of a great many accidents. Beyer states that out of approximately 90,000 accidents reported in one State during one year, from all causes, about 1 per cent came from falls on stairs. In addition to minor accidents these falls caused fractures and other serious injuries in many cases and one death.

The most satisfactory type of stairway for mill buildings, that we have used, are those made from 7-inch channel stringers with treads of 9-inch channels filled with concrete and finished rough with a wooden float. Standard specifications call for risers on all stairways where the distance to the floor is over 5 feet. If sheet metal be fastened to the underside of the stairs, thus preventing any material from falling through, risers are not required.

We also use stairs of solid concrete and those that have been erected inside the mill building have proved very satisfactory, but we have not had the same success with the outside ones. This is principally due to the fact that in removing snow and ice in the winter time the concrete becomes chipped and damaged to such an extent that it is dangerous and is exceedingly difficult to repair. The most serviceable and durable type of stairs that we have found for outside use is made of channel stringers, with $\frac{3}{8}$ -inch plate tread covered with 2-inch planks which are bolted to the plate.

ALLEYWAYS AND TUNNELS

All our conveyor tunnels under storages at this plant are of solid concrete construction. Where single conveyors are used the conveyor is placed against the wall at one side with a walkway along the other side. These tunnels are constructed 7 feet wide and 7 feet high. Where double conveyors are used the tunnels are constructed 11 feet wide and one conveyor is placed against each wall with a walkway in the center.

In the tunnels under the cement storages we had trouble with cement gradually building up on the floor, owing to dampness, in spite of the fact that care was exercised to keep the floors clean. To overcome this we laid over the concrete, a matched wooden floor, which has proved very satisfactory and is easily kept clean.

FLOORS

We do not know of a better material for floors in a cement plant than concrete. Reasonable care must be taken in the moving of heavy material on concrete to prevent pitting. One point in connection with concrete floors in a cement plant, that may be used to advantage in order to facilitate keeping the mill clean, is to eliminate the right angle between the wall and the floor. This is easily done by making what might be called a concave baseboard around the walls.

The following is a summarized specification for stairs, and guarding of platforms, which has been taken from the Association's Bulletins (Nos. 2 and 18). We have adhered to these specifications whenever possible.

"Greatest pitch of stairs allowable 50 degrees. Most desirable practice is riser is to tread as 8 is to 9. Steepest allowable is riser is to tread as $9\frac{1}{2}$ is to 9. Landings should be provided so that rise in one flight is not more than 12 feet. Direction of travel should change at least 90 degrees at each landing. Minimum width of tread 9 inches inclusive of nosing. Maximum rise allowed $9\frac{1}{2}$ inches. Risers should be provided where the distance to the floor is over 5 feet, or where material may fall into moving machinery. Standard double pipe railings shall be provided on all open sides of stairs. Hand rails 36 inches above the center line of treads should be provided on all enclosed sides of stairways."

Platforms should be guarded as follows: Toe boards shall be provided and shall be 6 inches or more in height and shall fit tightly to the floor. Railings shall be provided. Height of top rail above platform to be 42 inches or more. Distance from floor or top of toe board to center of lower rail, to be not more than 18 inches. Posts to be not more than 12 feet apart. In general where we have passageways between belts, pulleys, etc., pulleys and belts are enclosed by screens and angle iron bars.

WALKWAYS

Under the heading of walkways might be mentioned the advantages to be derived from concrete walks around a cement plant. A few years ago we had no walks connecting our buildings and consequently the yard levels were always changing, especially near the doors, and it looked as if in a few years the floors of many of our buildings would be below the ground level. In wet weather the yard was a morass and much good lumber and material was destroyed by being used as temporary walkways. It was decided to establish permanent yard levels and construct concrete gutters around all buildings, close to the wall, to catch the cave water, and beyond the gutters concrete walks. The original program was carried out and extensively enlarged. This expenditure has been a good investment. We are able to keep the yard clean, which we never did before and we spend less money in doing it. Many other advantages might be mentioned, such as saving time of employees, in moving about the plant or trucking materials from department to department, where it was formerly necessary to use a horse and cart.

We consider the liability of men being caught in conveyors one of our worst hazards. Screw conveyors are covered so that there should be no

danger of men breaking through and we have taken an extra precaution by providing a walkway where men are likely to cross over.

Bucket conveyors, travelling at a low rate of speed of about 30 to 50 feet per minute, do not seem hazardous, yet we had a fatal accident caused by a man stepping on one of the conveyors when crossing over. The only way to guard against accidents of this kind is to provide liberally proper walkways across conveyors to obviate the tendency of a workman taking a short cut. In the construction of walkways over conveyors we have used light angle iron frame with sheet iron floor and steps covered with fabric belting to prevent slipping. In several cases where we have two bucket conveyors running side by side we combine a gear covering with a walkway.

CHAIRMAN JACOBSEN: The question of stairways and walkways in cement plants, I think is probably one of the most important we have. I suppose none of you gentlemen have been around to as many cement plants as I have. I have seen some awful conditions in regard to walkways and platforms, stairways, and so forth. We have some slides here which show the various conditions.

(The chairman showed slides.)

Mr. Josse then demonstrated an electric switch box with a quick make and break attachment invented by one of the workmen at his plant.

CHAIRMAN JACOBSEN: If there is nothing else to bring up we will close. Our Cement Section I believe has been very successful, and I hope that we can meet again in far larger numbers next year. Let's have at least 200 at our next meeting. If you have nothing else to bring up now, a motion to adjourn is in order.

Adjournment.

Chemical Section

October 2 and 3, 1919

E. H. FIESINGER, Chairman

Safety Engineer, Solvay Process Company, Syracuse, N. Y.

H. C. SLADE, Vice Chairman

Safety Engineer, Hooker Electro-Chemical Company, Niagara Falls, N. Y.

S. M. SCHOTT, Secretary

Morgan & Wright, Detroit, Mich.

THURSDAY MORNING SESSION

THE meeting was called to order at 9:45 A. M., Chairman Fiesinger presiding.

CHAIRMAN FIESINGER: On the nominating committee I will appoint Mr. S. H. Kershaw of the Hercules Powder Company, Mr. Ira V. Kepner of the Pennsylvania Salt Manufacturing Company, and Mr. H. F. Doepke of the National Aniline and Chemical Company.

The first paper on the program is by Dr. Alice Hamilton, of the United States Bureau of Labor Statistics.

DR. ALICE HAMILTON: I am familiar with only one branch of the chemical industry and that is the dye industry—the making of dyes and dye intermediates—and I will confine myself entirely to that.

It is quite impossible for me to talk about the protection of the workmen in the dye industry without going into the chemistry of it. I will ask your indulgence if I make glaring blunders. I shall do my very best in handling that frightfully complicated subject.

During the war I had an opportunity to learn about the dye industry. Then, after the armistice, I took up this industry in earnest. It is so complicated and difficult to understand, and I haven't as yet, a clear understanding of it—I am still groping around in a mass of chemical formulæ.

It seems best to confine myself in this paper to what I saw in France, Switzerland, England, and Germany, during this last summer.

A STUDY OF FACTORY SANITATION IN FOREIGN DYE WORKS

ALICE HAMILTON, M. D., UNITED STATES BUREAU OF LABOR STATISTICS,
WASHINGTON, D. C.

While I was engaged in investigating the explosives industry for the Bureau of Labor Statistics, from the spring of 1916 up to the day of the armistice, I had an opportunity to learn something of the dye industry, especially the making of intermediates, so closely connected with the making of explosives. Then after the armistice I took up the dye industry in earnest, but I have found it so complicated, so infinitely more difficult than any other industry I ever studied, that I often despair of ever getting a real understanding of it. Certainly I have not yet anything like a real understanding, only a very superficial one, and I must ask your indulgence if I venture to discuss the protection of workers in the strange and complicated processes of dye manufacture. It is impossible to do so without going somewhat into the chemistry of these processes, but I realize to the full my hardihood in attempting to do it before an audience such as this.

In this paper it seems best to confine myself strictly to what I saw in the dye works in France, Switzerland, England, and Germany, my visits being of course made only for the sake of discovering what methods were used for the protection of the workers against industrial poisoning. The experience of the Germans is so much longer than ours that we should expect them to be able to teach us a good deal, and even the English and the Swiss have been in this industry many more years than we. I succeeded in gaining admission to a plant in Basel, Switzerland; one in St. Denis near Paris; one near Frankfurt-am-Main, several in Manchester, and one each in Huddersfield and Liverpool.

DANGEROUS COMPOUNDS USED IN THE INDUSTRY

It may be well to take up first the experiences of those countries with actual cases of poisoning from the substances made or used, for in some ways this was to me surprising, both with regard to the compounds which they have found to be dangerous and those which appear, in their experience, to be fairly harmless. Of course, the dangers from nitrobenzene and aniline are recognized everywhere, taken for granted, the former being considered there as here the more dangerous of the two. The French have had some severe cases of industrial poisoning from mononitrobenzene, and not a few fatalities. The factory I visited is of very open construction, amply ventilated, but they believe that ventilation is not enough, for more important than fumes is skin contact. There is still some controversy over this question in England. For instance, in one plant the manager, who has had 28 years' experience in this industry, is sure that aniline and nitrobenzene are absorbed through the skin, while the doctor, whose experience extends over 11 years, is sure that poisoning is always caused by fumes. The experts of the British Factory Inspection

hold to the skin theory and so do the Germans, though they will take no risks with fumes. The elaborate precautions which the Germans have taken to eliminate poisoning by these two compounds will be described later. I saw them in one plant and they were described to me by a chemist who was employed more than 20 years in a factory now inside the French zone of occupation.

I was interested to find out how far the occurrence of bladder tumors in old aniline workers was known to men in the industry and so I asked every one about this, but the only men I met who had been long enough in the trade to know much about this very slowly developing form of chronic poisoning, were the Germans and the one British firm. Both told me that whatever the substance is that reaches the bladder and sets up an irritative process eventuating in cancer, it is derived from an amide not a nitro compound. Nitrobenzene workers do not have more than their share of bladder carcinoma, aniline workers do. It is of course rare. The oldest British plant has had only two or three known cases in 20 years, although their physician has heard of several more and believes that cases could be discovered in any one of the older plants.

Aniline salt was said not to give trouble, though in two plants where this was said, it did not seem to me that poisoning would be impossible, and aniline salt can be used to produce in animals all the typical symptoms and blood changes of aniline poisoning. In one English plant which I did not visit, there had been trouble in the aniline salt department and this had led to local regulations of the process in the Manchester district; all tanks must be covered, provided with fume pipes and exhaust ventilation. The general opinion is that what cases do arise in the aniline salt department are caused by the aniline itself. For instance, I was told of a severe case of hematuria, blood in the urine, but the man had spilled aniline on the floor and undertook to sweep it up, walking into it as he did so. Before leaving aniline, I want to mention the occurrence of jaundice, which may follow poisoning by aniline, or one of its derivatives.

DINITROBENZENE HAZARDS

Dinitrobenzene is dreaded in the British factories, both because of the dermatitis and because of systemic poisoning. They had a great deal of experience with it as an explosive before and during the war and say it is much worse than trinitrotoluene (TNT). The French have had distressing cases of chronic poisoning but no fatality from dinitrobenzene (DNB). In Germany the barrels of DNB and of nitrochlorbenzene were stored for shipping in an open-walled building, because they had found that during warm weather a perceptible amount of fumes might arise from them. One English physician told of a symptom he had noticed in two DNB men, attacks of staggering gait, coming on at intervals for about a week. The men walked as if they were drunk. Women are said in England not to stand DNB as well as men.

Dinitrochlorbenzene is said to be more dermatitis-provoking than DNB, but not so likely to set up grave systemic poisoning. In one plant they said that even the shippers who loaded the barrels of dinitrochlorbenzene on the cars got dermatitis. The chlorbenzenes are not considered

as toxic as the non-chlorinated bodies, although I heard of one fatal case, a boy who spilled mononitrochlorbenzene on his clothes and died the same day. Other cases were spoken of, not fatal, the men usually not showing any symptoms while at work, going home and growing more and more drowsy, becoming cyanosed and then collapsing. Of course, that history is characteristic of all this group of poisons.

With regard to other nitro and amido compounds opinions differed, suggesting to me that in one plant a certain powder or fluid was more carelessly handled than were others and therefore was regarded as more dangerous because it gave rise to more poisoning. Thus, in one English factory I was told that paranitranilin was about the worst substance of all, in another they had had no trouble with it but were bitterly prejudiced against the nitrochlorbenzenes. Metaphenylandiamine was a fruitful source of dermatitis in one plant, never gave any trouble in a second. Of course, dermatitis is the great problem. Not that it is as serious as systemic poisoning but it is so much more common and then it really does cause more disability. At least, it is my experience that men will endure fairly serious symptoms of general poisoning without quitting their job, but they will not endure an itching, burning eruption, and the latter is much slower to clear up than the general poisoning, as a rule. All nitro and chlor compounds may give rise to dermatitis, according to foreign experience, and also the amido compounds though not so markedly.

Dinitrophenol seems not to have given much trouble in England or Germany but in France it was the worst of all the munition poisons and during the war caused more than forty deaths among munition workers. So far as I know the particular isomer which has this rapidly toxic effect on men is the one used in dye manufacture, and although I know of no cases of poisoning in American dye works, I speak of it in this connection because it is a peculiar poison, different in its action from any known nitro or amido compound, and we should know what effects it may be expected to produce.

The isomer formed in the course of manufacturing picric by the French method is the 1-2-4 grouping with OH occupying the 1 position. In man and in animals the effects are about the same, a rapid rise of temperature, profound sweating, rapid, panting respiration, great agitation and fear, temperature increasing, great thirst, constriction in chest. Often the symptoms preceding the attack are very slight and several times the men were overcome on their way home far from any help. When death occurs it is usually only a short time after the onset of the attack. Absolutely nothing characteristic is found in the organs at autopsy. Animal experiments carried on with the other isomers of this compound do not bring on this train of symptoms. I may mention the fact that this was also one of our war poisons. Three men who were engaged in handling dry dinitrophenol for French picric acid were severely poisoned and all died after only a few hours.

According to experiments reported by the French, the dangers from nitro and chlor compounds are about as follows: At the head of the list

come this 1-2-4 dinitrophenol and dinitranisol. Next come trinitrophenol or picric acid, trinitranisol and dinitrotoluene—the 1-2-6 isomer, the others being less toxic—and in the third class come mono and dinitrochlorbenzene and paradichloronitrobenzene. The last place is taken by chlorbenzene.

DIMETHYL SULPHATE

Dimethyl sulphate has for some time had a bad reputation in the dye industry and this is borne out by the evidence given in some of the German and English plants, but not in all. Those that still use it to methylate aniline or to methylate nitrophenol to nitranisol for dianisidine, say that it is quite safe, with a little care, while those that do not use it say it is bad stuff and they would not have it around. I never know in such cases which is cause and which effect. There are two English plants in which the men handle dimethyl sulphate with less caution than they do caustic soda.

I was told that inflamed eyes or burns on the skin were the worst results to be expected, that only one man had been badly blistered, that the burns were not so bad as those from caustic soda, and that systemic symptoms were unknown. On the other hand, certain English factories will not use it, the Swiss one does not and neither does one of the German factories, while in the other it is claimed that if handled with care there need be no fear of accident. The famous case of fatal dimethyl sulphate poisoning which seems to have fastened the stigma on this compound occurred in the Mannheim factory. As I remember it, a chemist spilled dimethyl sulphate on his person, sustained severe burns, and also developed a pneumonia which was rapidly fatal. No other such case has appeared in the literature, so far as I have been able to discover, and yet we know that dimethyl sulphate was one of the war gases and that experiments on animals show it to be capable of causing death through the production of pulmonary edema, or dropsy of the lungs.

The occurrence of chrome ulcers on hands, lips, nostrils, eyelids, and even on the feet, from getting shoes soaked in chromate solution, is recognized as a danger and a very troublesome one in alizarin dye works where the anthracene is oxidized to anthraquinone by means of this agent. Very strict cleanliness of person and premises is necessary to avoid such accidents. Phosgene has long been known to the Germans and they have learned to treat this very poisonous gas without risk, but the British have had some accidents with it, none fatal, they say. There were a good many in connection with the manufacture of gas bombs, as one would expect.

Benzidin fumes are complained of in one English factory; in all other places I was assured that benzidin itself is harmless, though its manufacture may be one of the most dangerous of all processes. Pyrogalllic acid is said by the Germans to be one of the worst poisons in the dye industry, setting up symptoms almost exactly like those of arsenic. Sulphuretted hydrogen seems not to give rise to as much apprehension over there as in this country, yet the French factory makes its sulphur dyes in an open-walled building and in one of the English factories the

making of sulphur dyes was pronounced by far the most troublesome branch. This was, however, more because of the intermediates used than the sulphuretted hydrogen. In the plant near Frankfurt the work is done in an enclosed room but the draft inside the apparatus is so strong that there can be an opening in the top of the kettle 8 by 10 inches and yet no gas escape. In several places I was told that the danger from this gas was obviated by burning the fumes after the reaction, and I would like to learn if that is done in any of our plants.

ARSENIURETTED HYDROGEN

I have saved till the last the poison about which I heard the most, arseniuretted hydrogen, evolved in the course of several processes where acid and metal come together and one or the other is contaminated with arsenic. In Germany this danger in the dye works has long been known and some of the elaborate precautions taken in German plants are based on the fear that such fumes may be formed and escape. In England they have recently had a series of cases of arsenical poisoning and have ordered precautions against such accidents. In this country we have not, so far as I know, recognized the danger, although I believe that five cases of this have occurred in one plant in New Jersey and three in another.

In English factories these accidents have taken place in the course of several processes. One fatal case was in a plumber who went into an empty sulphuric acid tank to repair it. That is, it was technically empty, it had been washed out and there was only one bucketful of fluid left at the bottom, but the acid contained arsenic and the man died two days after with hemorrhagic nephritis. A very similar instance occurred in New Jersey recently, three men being overcome by fumes of hydrogen arsenide in an iron tank which had contained chamber acid but was supposedly empty and clean. Two died, the third recovered. Here the acid carried arsenic.

The other sources of poisoning from AsH_3 are in reduction processes. In reducing nitrobenzene to aniline these fumes may be formed and for that reason it is dangerous to send men into a reducer for repair work, aside from the danger of the aniline or nitrobenzene. The arsenic may be in the iron but is more likely to be in the acid. One English manager told me he had had four men invalidated at one time by an accident of just this kind. In reducing nitro to amidonaphthosulphonic acid the same risk must be thought of, but it is especially in the making of benzidin that precautions against arseniuretted hydrogen are necessary. The British Home Office will soon be publishing reports of a number of cases of arsenical poisoning that occurred in connection with alkaline reduction processes followed by acidification in making benzidin.

As I understand it, benzidin is made in these English plants as follows: nitrobenzene is first reduced by means of zinc dust and caustic soda. The English expert from the Factory Inspection Department believes that AsH_3 can be evolved at this stage, the plant chemists are sceptical. There is no doubt, however, as to the danger in the next

stage, when hydrochloric acid is used to dissolve out the zinc dust and leave hydrazobenzene. The process must go on in the cold, for otherwise some of the hydrazobenzene might be converted to benzidin and go into solution and be lost, so chunks of ice are added at the same time as the acid, necessitating an opening up of the acidifying kettle. This is where the serious accidents have arisen, for there may be a sudden evolution of AsH_3 , a "boiling up" as the men call it, when the acid and ice go in. The arsenic is usually in the zinc in these cases, and zinc is likely to contain a larger amount than the acid ever does. Since the zinc is finely powdered, the conditions are ideal for the production of AsH_3 . The next step is also attended with some danger, the filtering out of the hydrazobenzene, for if AsH_3 is present the filter water may give off fumes of it. In one English plant especially it was evident that poisoning from this source had taken place, for my guide, the chemist, was very insistent on the necessity for good drains under the filter press so that the fluid would be carried off at once, and for thoroughly flushing the floor as soon as the filter press was opened. The use of compressed air to blow out the presses was, he said, of advantage as it served also to blow away all traces of arsenic. Finally, in the last stage, when the hydrazobenzene is heated with hydrochloric acid to form benzidin, it is still possible to have fumes of arseniuretted hydrogen, but it is not as dangerous a point as is the acidifying stage.

Other departments in which accidental evolution of fumes of hydrogen arsenide should be looked for are the making of the homologue of benzidin, tolidin, by the reduction of orthonitrotoluene, and the making of dianisidine by reduction of orthonitranisol, both being alkaline reduction processes followed by acidification.

PRECAUTIONS FOR REMOVING FUMES

The seriousness of this menace is shown by the precautions taken in English and German factories to guard against it. While going over the German plant I remarked on the universal practice of providing a fume pipe with exhaust on all kettles and autoclaves, regardless of the harmlessness of the compounds in them. My guide told me that experience had taught them that accidental contamination of acids and metals with arsenic could not be guarded against and that the only way to be sure of preventing arsenical poisoning was to treat all fumes, gases, steam, as potentially dangerous and see to it that they were carried off. The rule is to turn on the exhaust before the receptacle is opened. The English plants were in the course of installing fumes pipes at all points which they had learned could possibly be dangerous. In one, they have built a long slide or chute for the ice to run down, so that though the kettle must be opened to admit it, the man in charge may stand at the far end of the chute and not get the whiffs of fume that may be given off when the ice falls in. The acid also goes in through a long pipe which he can control at the same point. A valve is placed over the manhole which drops back as soon as the ice has passed through. This was the place that had the notorious cases of poisoning and till they could get in the

necessary changes in equipment they were obliged to use chemically pure acid and zinc. In another plant they had trouble in acid reduction of nitro to amidonaphthosulphonic acid and since then they have used contact acid only in this process, but even so the iron may contain As and so they test the fumes for it from time to time with mercuric chloride paper.

This crude way of chilling with chunks of ice dropped into the acidifying tub is not usual in this country as it seems to be in England. In our plants chilling may be provided for by brine coils or it may not be needed, for there are other ways of getting rid of the zinc dust. But in one New Jersey plant in which the ice method was used five cases of poisoning occurred on one night shift and one of the men died. I came on the histories of two of these men in a hospital record while I was studying munition poisons. One of them was at first supposed to be a case of typhoid fever, later diagnosed as aniline poisoning, the other was said to be caused by alpha-naphthylamine. Both men had been employed in a plant making benzidin base and sulphate, and naphthionic acid. I visited this plant and found that they were making benzidin by the usual process from nitrobenzene, and naphthionic acid from alphanaphthylamine and sulphuric acid. The Company had installed a fume pipe system with a fan but had never completed it. From the meagre account to be obtained in the hospital—no account at all could be obtained from the company—it appeared that the men had been overcome by fumes evolved accidentally while they were working on the night shift. One of them had been there some months, the other had gone to work that night for the first time.

A SERIOUS CASE

Luckily it was possible to run down one of the men and I sent an investigator to interview him. This is his story. He worked on benzidin in a process which involved watching the color of the compound formed and when it changed from red to white the process was completed and acid was added. I believe that means that he was told to see when the reddish oxyazobenzene was converted to the deep red azobenzene and then to the white hydrazobenzene. Then, he said, acid had to be added. He had had attacks of illness quite often and attributed them to the fumes which were so bad that few men would work there for any length of time. He, being foreman, was not obliged to stay in the fumes as the men did, but they affected him nevertheless, giving him kidney trouble as shown by dark colored urine and pains in the lumbar region. He suffered also from a band-like feeling around the body and from severe pains in the back of his neck, his appetite was poor and he often vomited, he was depressed, sometimes almost melancholic. On the night the accident happened, this man whom I will call "C", and the two men whose histories appear in the hospital records, "D" and "E", and two more were at work. The chemist was not there and they had to guess at the amount of acid and when it was added the mixture suddenly boiled up and all five were "knocked out." C went home and lay on the floor feeling sick but no more so than he had at other times. When, however, he

saw that his urine was apparently pure blood he realized that his condition was more serious. As a matter of fact he was ill for three months and his wife said that he looked like a yellow corpse. Apparently he suffered from anemia and jaundice.

D was treated at home for about two weeks for supposed typhoid fever showing that abdominal symptoms were prominent. The history I obtained begins on the fifteenth day after the accident when the man was received at the hospital unconscious. There were ulcers on his tongue, and throat, muscular tremors, weakness, diarrhea and vomiting of greenish fluid. The typhoid test was negative, there was albumen in the urine but no blood, there was a very profound anemia, the red blood corpuscles being reduced to 1,780,000, the hemoglobin to 40 per cent. Both spleen and liver were enlarged. There was difficulty in urination and pain. The man's condition grew worse, especially the retention of urine, the nausea and delirium, and he died on the third day.

E went to the hospital forty-eight hours after the accident. He was then deeply jaundiced, in great pain, vomiting greenish fluid, voiding blood-red urine. The pain was in the lower chest and in the bladder region, especially on urination. These symptoms persisted for two days, then slowly improved and he was discharged on the sixth day. "cured" according to the record, but according to C's story—the men are cousins—he has never regained his health nor been able to do a real day's work since. No blood examination was made in this case but hemoglobin was found in the urine.

Now the fact that the men were rapidly overcome by a sudden pouring out of fumes in the course of some process in which various amido derivatives of benzene were used or formed, would lead one to assume that the fumes were those of aniline or some similar body, but although this might explain the early symptoms, it would not be possible to attribute the later ones to poisoning by aniline or an allied substance. On the other hand, typical arseniuretted hydrogen poisoning brings about just this train of symptoms, headache, prostration, nausea, profound destruction of red corpuscles as shown by hemoglobin in the urine, vomiting, diarrhoea and later jaundice and extreme anemia. The English authorities told me that a case of supposed nitro or amido poisoning which does not clear up but progresses to pronounced anemia will probably, though not certainly, prove on examination to be one of arsenical poisoning. In these American cases no search was made in the urine for arsenic. In England such a procedure has become usual, indeed it is resorted to in all dubious cases which arise among the process men. I saw the records of one plant physician who had recently examined sixteen men for arsenical poisoning, including a quantitative estimation of arsenic in the urine. Traces of arsenic were found in almost all, but in only five was the amount great enough to be significant. These five men were with one exception employed in the benzidin department. The fifth was said by the physician to be working in the diamidodiphenylamine department at a reduction process which required sodium bichromate, hydrochloric acid, zinc dust and iron filings. The symptoms in these cases might have

passed for aniline poisoning; dark urine, headache and abdominal pain, jaundiced skin or simply a sort of lividity, or in two cases, no subjective symptoms at all, only the dark urine and livid color.

I think you will agree with me that, in the light of this English experience, it behooves us here in America to revise our views of the dangers that may be encountered in different departments of dye and dye intermediate manufacture and also our views as to what is adequate protection against industrial poisoning in this industry.

METHODS OF PROTECTION

As for the methods of protection used in Germany and England—I did not see anything really new in France and Switzerland—part of this has already been spoken of but there are still some details deserving of mention. For instance in one English plant they have had a bad time with DNB. Consequently they do as little work with it in warm weather as possible. Every new man who is put on DNB is watched carefully for the least sign of dermatitis or blueness and when it appears he is taken off and put to other work, but that other work must never bring him in contact with other nitro or amido compounds. Their theory is that some men may acquire gradually an immunity to DNB if they are exposed to it with caution, though others will never be able to stand exposure and must be taken off.

In the German plant there is no contact with DNB. It is melted and blown from tank to kettle. In the case of benzol an English chemist told me that they never let a pipe-fitter or repairer enter a benzol tank or still, even after it is thoroughly cleaned, till at least two days have passed, because they believe that the benzene actually soaks into the metal and must be allowed to evaporate first. Of course I need not refer to the many cases of distressing poisoning in this country in stills or tanks that were supposedly empty and free from any benzene fumes. Melting caustic soda and blowing it through pipes is not unknown in this country, but I wish it were the usual procedure, as it is in England and Germany.¹

To generalize about the precautions used in those two countries, I should say that in Germany every stage of the process has been looked upon as potentially dangerous and safeguarded, in England every stage at which any trouble has ever occurred is safeguarded. The German plant was a surprise to me even though I was fully prepared to find it good. The standard of cleanliness is so high that I can only say that the passages between buildings are as scrupulously clean as are our clean plants.

¹One interesting little detail that I might pick out from many is the method of filling the reducer for phenylenediamin and toluylendiamin in an English plant. The covered truck containing DNB or DNT has an opening in the side that is level with the lip of the man-hole of the reducer and the lid of this opening drops down so as to form a bridge from truck to reducer, along which the man pushes the DNB. Over it is a fume pipe with fan.

Inside the buildings it would be hard to guess what process was being carried on nor would the appearance of the workmen help much, for very few of them carry stains of color on their blue overalls. It is very remarkable to see the clean suits of men in the sulphur black department and in barrel packing. Perhaps one single instance will be enough to give you an idea of their attention to detail. In one room I commented on the condition of the floor and on the total absence of any odor. My guide, the chief chemist, explained that the men are not allowed to lay anything on the floor and showed me an iron shelf near the autoclave, where any piece of apparatus must be laid. It is for the chemist in charge to see that these shelves are kept clean and in his daily inspection of the room he sees to it that they are wiped off if any fluid or powder has fallen on the surface. Nothing is ever permitted to fall or drip on the floor, there is a great commotion at once if such an accident takes place. You see, compensation for occupational poisoning is paid, not by the individual plant, but by the association of all German establishments doing this sort of work, the "Berufgenossenschaft." In case of sickness from poisoning a committee visits the plant in question and the chemist responsible for that department has to appear before it and explain how it happened. Of course if it was caused by such a thing as a leak or spill, he has a decidedly uncomfortable time.

BRITISH PLANTS PROVIDE WARM FOOD

The standard of cleanliness in British plants is somewhat higher than in ours. I saw plants as clean as our cleanest and as fairly clean as our fairly clean ones, but none that were as bad as our worst. Where the British excel us, however, is in the intelligent placing of their exhaust ventilation, the attention to detail and the personal care of the men, especially of their food. I believe it is true in general of English industry that far more attention is paid to the feeding of the force than over here. They look on the dinner pail, with its cold, soggy sandwiches and cold soggy buns or pie, as distinctly bad because such food leads to indigestion and indigestion encourages poisoning. In all these dye works I saw kitchens equipped simply and inexpensively but with plenty of boiling water for the eternally necessary tea—I do wish our workers had the habit of stopping in the morning and afternoon for a hot drink with sugar and milk—and with a warming oven for the food the men bring with them. Opening this oven you see numbers of bowls of meat and vegetable stew or meat pie, being heated for lunch. A hot midday meal is considered a necessity. These Englishmen also believe that it is a matter of great importance to see that men and women do not start work in a poisonous process without a proper breakfast and as the only way to secure it they give each one a pint of milk as he comes to work. One manager has great faith in hot milk as a treatment for aniline poisoning and told me how he had brought it to a workman overcome by aniline. The doctor could not be got, so the manager had the man stripped and put in a bath and then he poured down hot milk and porridge till the man could hold no more.

The German plant furnishes hot coffee the first thing in the morning and soup at noon, charging the men one-tenth of the cost.

Washing facilities in English plants are much like ours, except that you always find at least one bath-tub in addition to the showers. This is partly because some workmen dislike showers, but also in case of accident. A foreman told me that he had once tried to hold under a shower a man who was unconscious from the effects of aniline spilled on his clothes. He insisted after that on having a tub installed. In the German factory the bathing provisions are more numerous than in any other place; I saw no less than 1,200 showers for less than 3,000 men. The provision of soap is general in Europe, but the English have not yet lost the roller towel habit. The Swiss lavatories were exquisitely clean and perfectly equipped. In the French factory, which also had a good equipment, they told me of an amusing device they had resorted to during the war to make the dinitro-phenol and picric men bathe. They were made to strip off their working clothes on one side of the room and between them and their street clothes was a wide gutter with running warm water. They simply had to get into it to reach their clothes.

One detail in connection with bathing facilities is worth mentioning. You know we have rather prided ourselves of late on giving women employees shower baths with the nozzle placed low so that they may bathe without getting their hair wet. The English are even cleverer. They attach to the hot and cold water faucets a two-branched rubber hose with an ordinary bath tub spray. Then the woman may direct the stream just as she wishes and a very short or a very tall woman is not at a disadvantage as she is with a fixed spray.

Working suits are furnished in the French factory and in the Swiss and German and some of the English. They were surprised when I said that some of our largest companies had refused to pay more than fifty per cent of the cost of overalls for their TNT and picric men during the war. Europeans all suppose that American industry is characterized by a lavish liberality in matters of that sort, whereas, with some striking exceptions, our plants as I have seen them in the dye industry are not quite so liberal as are the European. The clothes provided, laundered and repaired by the German company are of good blue jeans and are renewed after three months or six months according to the process. Then the old suit is given to the man, and since he knows it is to be his, he takes good care of it. They are quite a remarkable lot, the men in that German dye works. When I went into the locker room I saw clothes hanging in open compartments. My guide explained that they dried and aired so much more completely if they were not shut up. "But does nobody steal them?" I asked. "Certainly not," he said. "our men do not rob each other." Also in one of the Manchester factories the men's clothes are hung on the walls with no fear of their being stolen.

MEDICAL CARE IS EMPHASIZED

Medical care is much more emphasized in England than in the other countries, though everywhere a physical examination is made before em-

ployment and an effort made to exclude alcoholics and those of poor resisting powers. But in Germany there is no regular examination of process men, once they have been employed, so long as they make no complaint of illness or are not absent from work. In England, in the best managed plants, not only do the physicians see every process man once in a fortnight, but they try to see him at work, they make regular trips through all the process departments. They say it is absolutely essential for the physician to know just what the man is exposed to and under what conditions he is working and how much heat and physical strain there is in his work, and also that you can judge better of a man's appearance if you come on him suddenly in his workroom than if he comes to the office prepared to see you and either to make you think he is ill or to make you think there is nothing the matter with him. They make more of a case of poisoning than we do. One of the plant doctors and I were accosted as we were making our trip over the plant by a man who had been home for four days with aniline poisoning. His lips were pale but not blue and he felt pretty well, he said. The doctor looked at his gums and finding them still bluish, told him to go off and visit his father on the farm for ten days and then report back for examination.

CHAIRMAN FIESINGER: We will now take up the discussion of Dr. Hamilton's questions.

DISCUSSION

MR. C. P. TOLMAN (National Lead Company): It occurred to me that it would be a simple matter to put the ice in the chamber safely if an "air-lock" were used. The "charging" chamber would have two openings, one to receive the ice and the other to let the ice pass on into the main chamber. These openings should be interlocked so that only one could be opened at a time. A rotating drum could be used, the drum having one opening and being mounted in a cylindrical casing. The cylindrical casing would have two holes; for example, one at the top to admit the ice, another in the bottom so that when the drum is rotated the ice will fall out of it and into the chamber where it is needed.

Nothing was said about providing an air inlet for the ventilating system. It seems to me in dealing with the question of safety from gases that in addition to maintaining a suction on the apparatus it is desirable that an actual flow of air should be provided to keep down the proportion of the dangerous gas mixed with the air in the suction system. My thought is this: In a closed suction system the air is not changing and will take up gas to the point of saturation, whereas if there is a constant inlet of air there will be a corresponding movement, thus limiting the strength of the mixture.

With reference to the "absorption" of gas by the metal, the surface condensation on the metal is an important item to consider. This condition can be overcome by heating the metal (if that is permissible), and the metal can be better heated by a steam jacket than by blowing live steam into the tank. The steam jacket is more efficient and is free from danger of scalding the worker—a danger that is present always when a steam hose is used.

MR. A. H. MASSEY (E. I. du Pont de Nemours & Co.): I would like to ask Dr. Hamilton with reference to fatal cases of toxic poisoning: Did you have access to the physical record of the man beforehand? Was he subject to cyanosis right along, or was he a man that was practically immune? What was his physical condition?

DR. HAMILTON: All the men are examined before employment by a physician and rejections are made about on the same basis as we make them here. A man is rejected who has any evident lesion in the lungs, or in the kidneys, or is markedly anemic—bloodless—and they lay more stress over there on the presence of gout; in England they wouldn't take a gouty man. They try not to take an alcoholic. They do not like to take fat men, since they are more liable to get dermatitis, perhaps because they perspire so freely. Every man employed in one of these dye works passes the physician's examination and the physician sees the process men every two weeks. If he had never seen the workman with blue lips before and then an attack of cyanosis came on, it would be perfectly fair to conclude that the work was responsible for it.

MR. S. W. EVANS (Goodyear Rubber Company): What is your treatment for aniline poisoning?

DR. HAMILTON: I do not go into the matter of treatments because I am not a practicing physician. For aniline poisoning the physician in charge of the plants in Manchester uses a mixture of stimulants.

MR. D. F. CONKLIN (Ocean Accident and Indemnity Corporation): I want to ask the Doctor what she thinks is the best preventive for aniline poisoning in its manufacture. Would ventilation cure the ills?

DR. HAMILTON: No! decidedly not. The ventilation is not nearly so important as cleanliness. There are a few cases, but I do not think there are any very serious cases, of fume poisoning, so far as I know. The absorption through the skin is the important factor in poisoning.

CHAIRMAN FIESINGER: The next paper is "Lead Poisoning and its Prevention." In the chemical industry we have heard about lead poisoning, but we have never heard anything about its prevention. This morning we have one of the pioneers to discuss that paper for you—Mr. C. P. Tolman.

LEAD POISONING AND ITS PREVENTION

C. P. TOLMAN, CHAIRMAN, MANUFACTURING COMMITTEE, NATIONAL LEAD COMPANY, NEW YORK CITY

The chairman has said, "you have heard a lot about lead poisoning but nothing about its prevention"; that was exactly my point of view in preparing this paper. I felt it useless to spend time over the statistics and symptoms of lead poisoning. We recognize it among industrial hazards, and our particular interest is in preventive measures.

Unusual exposure to the fumes and dust from lead compounds is quickly followed by well defined symptoms and consequently the hazard was recognized as early as 1656.

The peculiar situation about lead poisoning is that unlike other hazards

which develop with the development of mechanisms, and with the mechanizing of hand operations, the development of machinery has been the direct measure of decreasing lead poisoning.

Certain manifestations of lead poisoning have a special appeal to the sympathies and, as a result of the incidental publicity, there has been a vast improvement in working conditions, beginning years ago, as compared with other dust hazards, such as stone cutting, cement manufacture, and abrasive operations generally. These dust hazards are free from the idea of poison and we hear little about them, but the results industrially are probably more serious, measured by the number of sufferers. Exposure to these abrasive dusts results in extreme susceptibility to lung troubles. There is generally a considerable lapse of time between exposure and disease and on that account the cause is not properly recognized. I mention this because the principles utilized in handling lead compounds apply equally to dust hazards in general.

MUST KEEP DUST OUT OF NOSE AND MOUTH

Industrial experience and medical experiments have demonstrated that in lead poisoning, lead compounds, as dust, or fumes, enter the human system through the nose and mouth. Experience does not support the theory of absorption through the skin. Our problem is to keep lead compounds away from the workman's nose and mouth—a dust problem plus a problem of personal cleanliness.

The labor in lead factories is largely unskilled and for the most part foreign born. Cleanliness is hard to teach. Special stress is laid on the necessity of washing the hands before eating and in all factories one wash-stand with hot and cold water, soap, hand brush, and towels is provided for each two employees. In most factories there is one shower-bath to each five men employed. In the other factories the ratio is one to four. Ample paid time is allowed at noon and at night for washing, and experiments have been tried of rewarding the men for each bath taken. Two locker rooms are used, one for working clothes and the other for street clothes.

Medical supervision is one of the most effective preventive measures. Under this system each man is examined within a few days of his employment and a record made. Thereafter he is examined at regular intervals. Our regular physicians naturally become expert in the recognition of early symptoms, and prompt measures are taken. This system also eliminates alcoholics and others especially susceptible to lead.

The success in dealing with the human factor depends entirely upon the local factory organization. Everything that has been said about the importance of the foreman in safety work applies several times over in this connection. He must not only instruct the men, but he must continuously be an example to them, and we have different degrees of success in the personal side of the problem in proportion to the natural ability and training of our foremen.

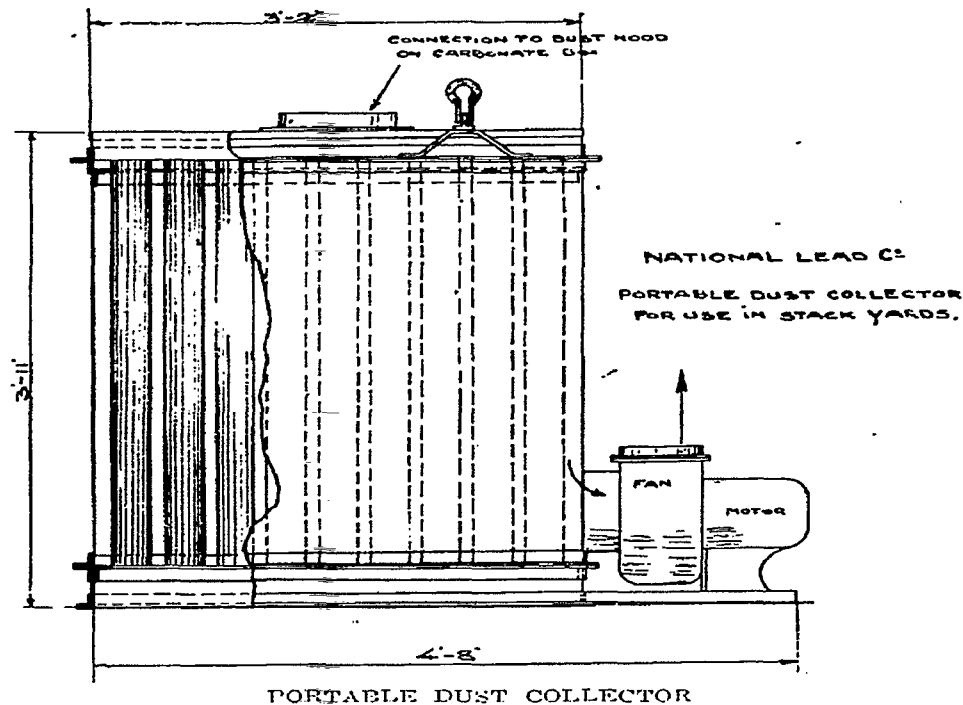
Among Safety men it is agreed that of one hundred preventable accidents, not more than forty can be prevented by mechanical devices or

improvements. This proportion does not apply to dust hazards. Most dust hazards can either be eliminated or substantially reduced by adequate special machinery, in which I mean to include dust systems.

The lead industry is fortunate in that the value of the dust collected often pays a substantial profit. The portable dust collector, described below, annually saves dust which in value amounts to over 20 per cent on the investment.

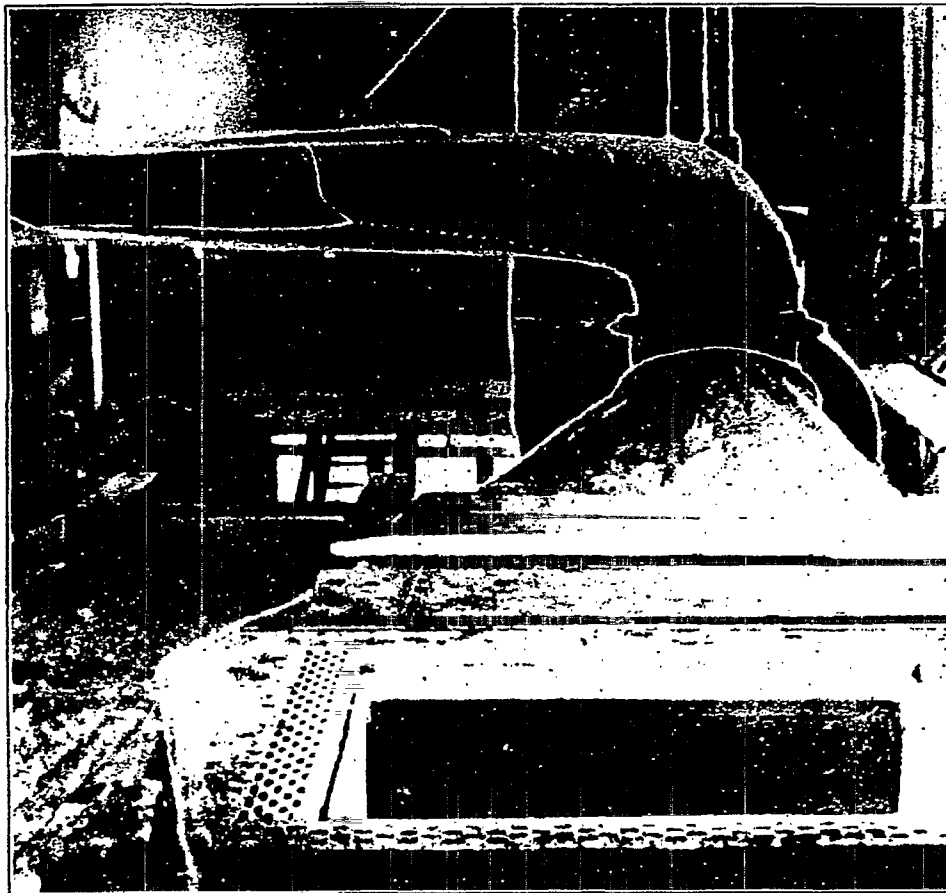
PORTABLE DUST COLLECTOR PAYS A PROFIT

In the Dutch Process of manufacture of white lead, the metallic lead is converted to white lead in small earthenware pots which, when the



lead is finished, must be emptied into the box in which it is taken to the mill. Naturally emptying these pots was a dusty operation, and because of the large area of corroding yard where the work was done no simple solution was evident. The process requires from three to four months and is carried on in bins, there being some twenty-four alternate layers of tanbark and pots in each bin of an approximate average depth of two feet to each pair of bark and pots so that there is a range of something like twenty-four feet between the bottom and the top layer. A solution was finally found by making a portable dust collector which is handled by an electric crane from tier to tier as needed.

This portable dust collector weighs slightly over 400 pounds, is a self-contained unit consisting of an electric motor driven suction fan and the necessary tubular cloth filter; the whole being enclosed in steel. A flexible canvas pipe, provided with internal wooden rings to prevent collapsing, connects to a cover, which cover is placed on top of the carbonate box. The cover has suitable openings through which the carbonate of

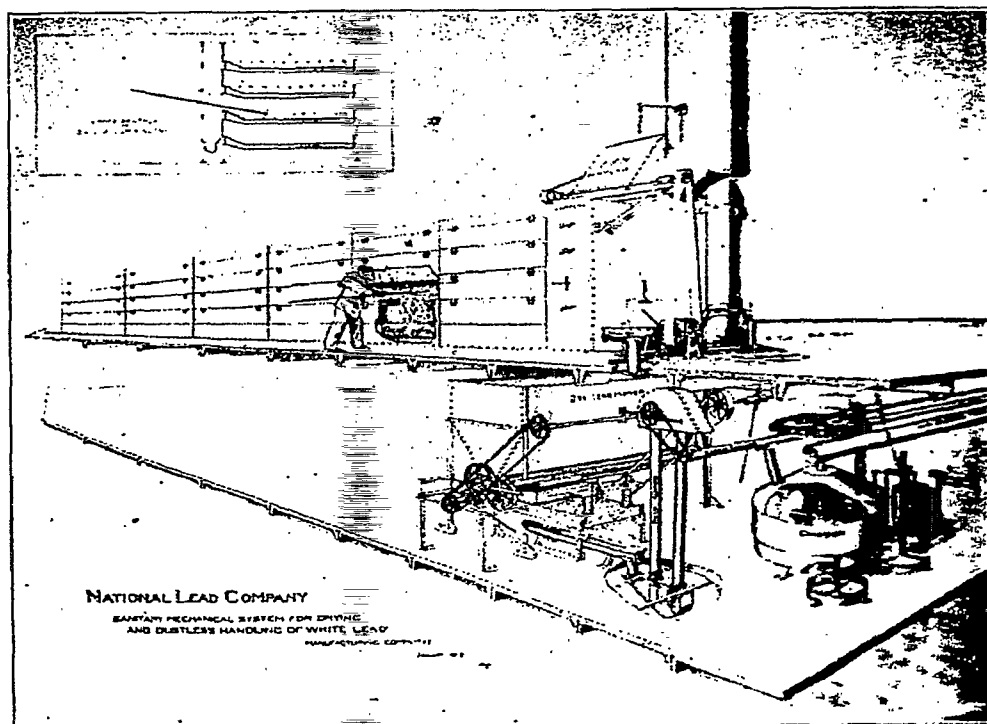


EXHAUST HOOD AT DUMP

lead is emptied from the earthenware pots. The action of the fan maintains a strong indraft of air through these openings, successfully keeping the dust within the system and recovering it by means of the cloth filter—the fan discharging clean air.

The white lead, when it comes from the corroding yards, is brought in boxes by electric cranes and dumped into hoppers, discharging into the

separating machinery of the mill. This dumping operation was formerly one of the serious dust hazards. This hazard was eliminated by designing a carbonate box with an automatic bottom dump. The bottom of the box is made up of two hinged doors connected by pivoted links to a rod, the top of the rod being formed into a ring to receive the crane hook. When the crane lowers this box into position on the mouth of the dump, the weight of the box is supported by the top of the dump. A further lowering of the crane hook allows the bottom to open downward completely discharging the contents of the box into the dump. A dump



METHOD OF REMOVING WHITE LEAD FROM DRYING PANS

was designed to cooperate with this box. A swinging suction hood is brought into position over the box, after it is lowered into position and before dumping, and in addition there is a perforated plate entirely around the margin of the top of the dump, covering an air duct which also surrounds the dump. The hood takes off all dust coming out of the top of the box and such dust as escapes from the bottom is carried away through the perforations leading into the marginal suction duct.

As you probably know, white lead in the mill is handled wet in a water floating system, so that in the milling operation there is no dust hazard. When the lead is finished, however, it is necessary to remove

the water, and this is usually done by evaporating the water on drying pans. The lead was removed from the drying pans by shoveling or hoeing, conveyed to a storage bin and then as needed taken from the bin, batches being weighed on scales. These batches were then transferred to "chasers" where the white lead was mixed with oil and again became free from the dust hazard. The problem of eliminating dust from these series of operations for a while appeared insuperable. The solution finally came about through the cooperation of several individuals, and we now have an equipment which practically eliminates the dust hazard.

The drying pans are completely enclosed in sheet steel and the enclosure connected to a suction fan. On the operating side the enclosure is made double with a space of about twenty inches between the inner and the outer casings. Both inner and outer casings are made up almost entirely of doors of convenient size, and the doors are arranged to operate in pairs. That is to say, an outer and an inner door both being opened affords access to a convenient section of the drying pans. Between the inner and the outer enclosures, at the bottom, is a screw conveyor, so that when the workman hoes the lead out of the pan it falls down between the inner and outer enclosures into the screw conveyor and is carried to the storage hopper. Meantime the powerful suction on the enclosed pans is drawing air through the opening, protecting the workman from the incidental dust. The storage hopper itself is entirely enclosed and is connected to a weigh hopper, also enclosed, making it possible to weigh out any desired quantity without handling the lead at all in the open. A screw conveyor from the bottom of the weigh hopper carries the weighed charge to the chasers and delivers it within the enclosure of the chaser. At that point linseed oil is added and the white lead in oil reduced to a paste in which form it is discharged from the chaser.

These examples are fairly typical of dust prevention apparatus and give some idea of the range of operation possible under dust control; the operation of filling a weigh hopper to an exact weight and then discharging under dust tight conditions is particularly interesting.

When dust prevention is not complete, and that is particularly the case during repair work, respirators must be worn. Respirators to be effective must fit the face, and must be kept in proper order. Each man must be given a respirator for his individual use. Ordinarily, the man takes care of his own respirator, except for repairs. In one factory the respirators are turned in each night. They are thoroughly cleansed and put in order by one man, who is held responsible. In the morning each man claims his own respirator by his number check.

DUST HOODS SHOULD BE CAREFULLY DESIGNED

Dust hoods should be more carefully designed than is generally the case. It would appear that they are usually left to the sheet metal worker. It is impossible to lay down standards, for different conditions require different treatments. A heavy coarse dust requires stronger suction than a light, fine dust. The angle of the hood, for efficiency, must

be different for a strong draft and for a weaker one. It is often possible, where furnaces or kettles are concerned, to develop the necessary suction from radiated heat, or by using the hot gases directly. The suction from such a source is of low intensity, but of relatively large volume and for efficient use requires that the hood be provided with an uptake pipe of generous size, both in diameter and height. Inasmuch as this method, when available, saves the operating and maintenance cost of a fan, it is well worth while to spend time and money on the design, experimenting, if necessary, to get the best results.

The best result is not always obtained with an overhead hood. It is sometimes better to draw the dust downwards, as in protecting the operation of heading barrels. Conditions may require hoods at one side



BAG SHAKING DEVICE

Through door at center (closed during operation) the rows of bags may be seen.

of an operating space, or a combination of two or more hoods. Hoods of suitable design and location will not only give vastly better results, but will effect a substantial saving in fan power.

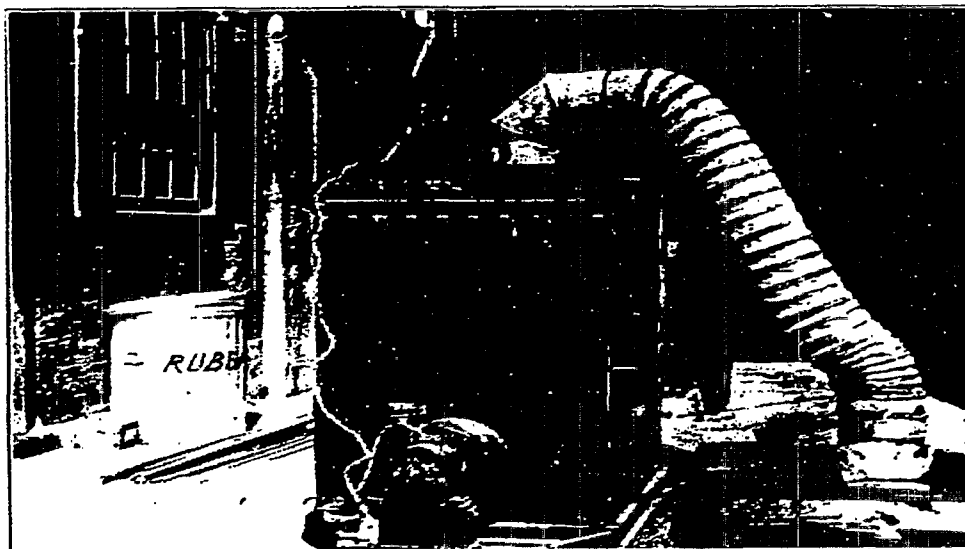
Usually it is neither desirable nor feasible to discharge a dust system into the air. A collector of some kind must be used. Electrical perception of dust is limited in application to large units and is too familiar to the technical men interested to warrant discussion here.

Dust separators of the cyclone type are effective for the heavier and the coarser dust, and will remove the bulk of such dust from the air or gas. For the removal of fine dust, although a cyclone may be used for roughing out, cloth bag filters are used for the last stage of the opera-

tion. The design of the filter depends upon the character of the dust present. The air, or gas, must be fairly dry; if too moist, the filter will clog and the suction decrease correspondingly.

As ordinarily built, a bag filter comprises an air chamber into which the fan discharges the dust-laden air. Evenly spaced openings in the bottom of the chamber are provided with collars for attaching dust bags. These bags, which are really tubes, extend downward and are fastened to similar collars on the top of the receiving hopper. The air from the fan divides among several bags, and filtering through the fabric, leaves the dust inside the tube. Most of this dust drops into the hopper below but there is some accumulation and it is necessary to shake the bags once or twice a day.

The arrangement of the bags is such as to leave an aisle between each



WET SEPARATOR

double row. Formerly, it was the practice to shake the bags by hand; a man, wearing a respirator, entered the bag house for the purpose. For some years past, however, we have used a device operated from the outside of the bag house, which does the work more effectively and without exposing the man.

The bag-shaking device is a wooden grill work, suspended horizontally from the ceiling of the bag room. There is a slat of the grill between each row of bags. A rod extends from the frame of the grillage through the wall of the room and connects to a lever on the outside. When the lever is worked back and forth, the slats of the grillage shake the rows of bags with which they are severally in contact.

There is another method in which the result is obtained by momentar-

ily reversing the fan action and collapsing the bags. To describe this method, in detail, would take more time than we have. Obviously the bag filter system cannot be used when the air, or gas, is moist, or when it carries chemicals destructive to cotton or woolen fabrics.

For many reasons a wet separator, if capable of removing practically one hundred per cent of the dust, would be ideal. The possibility of making a wet separator, which would answer the exacting requirements, came about through researches in an allied line, and I am very glad to say that for the past two months we have been operating a filter of this type with complete success. It handles the capacity of a thirty inch multivane fan and requires only four gallons of water per minute. The construction is simple and is less costly than a bag system. Wet or dry gas can be treated, and it is not affected by corrosive fumes, whether acid or alkali. If any of you are interested, it will be a pleasure to hear from you and to supply the details.

Thus far, we have been considering current practice in the manufacture of lead products. Lead and its compounds are probably more widely used in industry than any other metal. The comparative cost of lead is such that there has been constant pressure to find substitutes, in spite of which, the uses of lead are increasing rather than diminishing. It is therefore desirable that the sanitary conditions under which these products are used, be made as perfect as possible.

A large proportion of white lead and a steadily increasing proportion of red lead, are finished with linseed oil as a paste. In this form it is, of course, dustless and therefore entirely free from hazard. The one exception arises when painters sandpaper a painted surface. This is a hazard which can be entirely avoided, as Dr. Alice Hamilton pointed out in a paper before the Master Painters' convention in Denver. The remedy, in brief, is to moisten the sandpaper in a light mineral oil. This practice is not only safe but effects a substantial economy in time and does a better job; an illustration that safety pays.

Red lead, until a few years ago, was necessarily used in dry form by painters who mixed it on the job. The red lead of this character, if mixed in advance, would harden in the pail almost over night. Some two years of development in laboratory and factory produced commercially a red lead so free from the litharge which caused hardening that red lead and linseed oil paste is now being widely used. It does a better job and there are certain advantages which makes this safe form of red lead from ten to fifteen per cent cheaper to use.

Among the large users of white lead in the dry form are manufacturers of ready mixed paints. To avoid the need of handling this product dry, a steel package was designed of a size suited to the requirements of the mixed paint industry. Two large concerns have been taking their whole white lead requirements in this paste form for some years past. There is a substantial economy to them and to us, apart from the satisfaction of delivering the goods free from hazard.

In the nature of the case, dust control is a large factor with us, whereas with a user of lead products it is a small part of his factory

problem. We have had occasion to go into the subject extensively and have naturally accumulated experience. Mr. E. J. Cornish, President of the National Lead Company, authorizes me to say that the technical staff of the Company will, at all times, be free to confer with the representatives of any users of lead products for the purpose of bettering working conditions.

DISCUSSION

DR. S. DANA HUBBARD (Division of Industrial Hygiene): We have had considerable trouble with our batteries. You speak of a container; is that of a sufficiently small size for the small battery manufacturer to make use of?

MR. C. P. TOLMAN: Yes, that container holds five hundred pounds of dry white lead. It is perfectly straight on the inside so that it may be easily and completely emptied. The cover is held in position by a central bolt. The package can be sealed, and so goods of any character can be shipped in it, under guarantee.

That package can be easily rolled, and a pair of tongs is supplied for use with an overhead trolley. The package is opened on the floor, overhead trolley using the tongs takes it where wanted, and it is conveniently emptied by tilting.

DR. ALICE HAMILTON: I should like to say, in bearing out my testimony of the great changes which have taken place in the white lead industry, Mr. Tolman is an insider and I am an outsider. When I think of it as I knew it in 1909 and now, it doesn't seem like the same industry.

He spoke of dumps, but he has not spoken of dry pans and clearing those, as it used to be. I have seen men shoveling from a dry pan, climbing into it, where they couldn't stand upright. I have seen them in the dust collecting room shaking and beating the cotton bags to make the dust fall down. That was less than ten years ago. In some places there has been an enormous change in this industry; I do not believe any industry has changed so much.

With reference to the changes in hospital records: When I went into cities where white lead was manufactured, the white lead cases headed the lists. In Philadelphia they didn't call them lead cases—they were simply such and such. If you go into those cities now, you will find the white lead men have disappeared and you get cases like "soldering" and "can-sealers." There shouldn't be much poisoning from those occupations because they are not necessarily dangerous, but nobody has paid any attention to them and the danger is still there.

I want to approve strongly the attitude of the National Lead Company in emphasizing dust. Mr. Tolman has won my gratitude by not saying anything about the men's finger-nails. I have heard physicians and employers talking about the worker's finger-nails. I cannot see how his finger-nails do him any harm, unless he sucks his fingers all day long. I don't think he does that.

In Salt Lake City I was talking to a lead smelter, a very intelligent man, and he said, "You know, those men are very careless—I am telling

them they ought to scrub their nails." I saw them dumping a pot: it was inverted, the smoking red hot ore falling into a grate, and as the dust and fumes lifted a little, I could see the men shoveling and breaking up the bigger fragments—those were the men who were to protect themselves by scrubbing their nails. The poisoning from fingers is still in the minds of physicians and manufacturers. Remember that a man eats only three times a day. He doesn't put his fingers in his mouth and soak his fingers in his coffee or soup. It is the dust, as the National Lead Company has found, which is the principal obstacle to be overcome.

MR. C. P. TOLMAN: I should be glad to hear from anybody. I really am quite serious in my desire to have the representatives of some of the industries that use lead products get together. For example, we furnish white lead to potteries in the dry form in many cases. The first operation at the pottery is to mix it with water. We could more easily ship the lead as a wet paste which would be free from the dust hazard. There are, I believe, similar possibilities. Lead products are used in the rubber industry. I have never been in a rubber factory, but I have an idea that improvement would follow interchange of experiences.

CHAIRMAN FIESINGER: The next paper is the "Dangers in the Manufacture of Dyes," and I am sorry to state that Dr. L. C. Cone of the National Aniline and Chemical Company has been detained. He has, however, sent on an able substitute, Mr. F. W. Barker, Jr.

(Mr. F. W. Barker, Jr., read Dr. Cone's paper.)

DANGERS IN THE DYESTUFF INDUSTRY

DR. L. C. CONE, NATIONAL ANILINE AND CHEMICAL COMPANY, BUFFALO, N. Y.

The amount of danger in any industry is in inverse ratio to the knowledge and experience of the organization operating that industry. If a green crew, under the control of an inexperienced foreman, is employed in even so simple an operation as ice-cutting, there are bound to be accidents. The dyestuff industry of this country has been, in comparison with our older established industries, in the class of the above ice-cutting experiment. As a further complication added to inexperience has come the insistent demand for a large tonnage production of new products. These conditions have accentuated the dangers to such an extent that many serious accidents have resulted. Statistics gathered from our dyestuff and intermediates factories during the past five years would give a rather alarming picture of the risks of the business. There has been, however, on the part of the more stable companies engaged in the industry, no lack of appreciation of the nature of the risks involved. As a result of this appreciation of the dangers, constant progress is now being made in reducing the number and severity of accidents.

WAR-TIME CHEMICAL DEVELOPMENT

Before we forget the hectic experience of the past five years some chemical genius, with a power of description and a keen sense of humor,

should write the story of the war-time chemical development of this country. Many events in this development have the elements of sublimely ridiculous humor in them. One instance I have in mind where two college boys, without industrial experience, rented an old, abandoned, windowless brewery, with broken wooden floors, and a couple of rusty boilers. In this building they installed a makeshift aniline plant, and in spite of every handicap, made aniline and sold it at a profit. It took American ingenuity and grit to make this plant go, and perhaps it also required American inexperience. An experienced aniline operator would have foreseen too many dangers to have ever started the project. Statistics of accidents from that and similar plants could hardly be considered the normal risk of our business. The proprietors themselves were always blue about the lips, and many a night they were just able to struggle home, get into a tub of warm water, drink a glass of milk, take a dose of salts, and go to bed. Is it not a wonder that, with the large number of such plants scattered all over the country, built by inexperience, and operated in spite of all hygienic laws, that the list of fatal accidents has not been greater? Gradually however, we have been learning, partly by experience and partly by study, more about the risks of our business until today the hazards of the well-regulated dyestuff factory are little greater than the hazards of any mechanical plant containing a large and varied assortment of moving machinery.

The chemical risks of the industry are largely centered about the manufacture of intermediates. The dangers of aniline, nitro benzol, binitrobenzol, binitrotoluol, etc., have been so frequently discussed, and the methods used by companies like our own for minimizing the risks of these manufacturers so thoroughly described, that there is no need to go into this matter at this time.

Our company has never suffered a fatality from any of these poisons although we have had some very sick men. Under the conscientious watchfulness of Dr. Kessler, of our Marcus Hook plant, the number of such cases has become relatively small. I am certain that if any safety man desires further detailed information in regard to our methods of handling these cases, Dr. Kessler in response to an inquiry would be more than willing to acquaint him with our experience.

The experience of our Buffalo works is the most illuminating experience of any of our plants, because in that factory is concentrated practically every risk of the dyestuff industry. While we do not make aniline there we handle enormous quantities of the product under a very wide variety of conditions. We make and use large quantities of binitrobenzol, binitro chlorbenzol, and other poisonous products. In the first six months of 1918, as shown by the table given on page 460, our serious chemical accidents were 21 in number against 59 of a mechanical nature, or 26.2 per cent. The first six months of 1919 there were 13 severe chemical accidents against 36 severe mechanical accidents, or 26.5 per cent. These figures, taken from a report by Mr. Doepke, our safety engineer, show that even under the rather strenuous conditions of high production pre-

NATIONAL ANILINE AND CHEMICAL COMPANY
COMPARATIVE ACCIDENT REPORT, 1918-1919—FREQUENCY AND SEVERITY
1918 January-July 1919

No. Accidents Time lost	No. Days Lost	No. Minor Accidents	% Fre- quency	% Sever- ity	NATURE OF ACCIDENTS	No. Accidents Time lost	No. Days Lost	No. Minor Accidents	% Fre- quency	% Sever- ity
52	321	268	71.11	15.05	A—NON-CHEMICAL INJURIES	35	361	165	73.26	38.16
1	29	16	3.78	1.36	1. Traumatic Lesion: Head; Trunk;	.....	.....	13	4.76	.....
3	8	8	2.44	.38	Extremities.	.....	.....	11	4.03	.....
1	13	13	.89	.60	2. Burns.	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	Steam and water.	.....	.....	.....	.....	.....
2	33	9	2.44	1.55	Hot liquids.	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	Flames.	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	3. Electrocutions.	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	4. Eye Accidents; grinding; chips;	.....	.....	1	.37	38.06
.....	.....	.....	.....	.....	etc.	.....	.....	.....	.....	.....
59	404	304	80.66	18.94	B—CHEMICAL INJURIES	36	721	190	82.79	76.22
1	3	20	4.67	.14	1. Acid Burns.	1	48	7	2.93	5.03
.....	.....	16	3.56	.....	2. Alkali Burns.	1	2	10	4.03	.21
3	1,605	.....	.67	75.25	3. Explosion Burns; Color Flushes.	.....	.....	.....	.....	.....
3	11	2	1.11	.51	4. Fumes	.....	.....	.....	.....	.....
5	17	1	1.33	.80	Nitrous; Sundries.	6	64	1	2.56	6.77
1	8	.....	.22	.38	Nitro-Chlor-Benzol.	.....	.....	.....	.....	.....
1	4	.....	.22	.19	Nitro-Benzol.	1	2	.....	.37	.21
.....	.....	.....	.....	.....	Mela-Phonylenediamine.	2	12	.....	.73	1.26
1	55	.....	.22	2.58	Binetro-Benzol.	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	Aqua Ammonia.	2	97	.....	.73	10.25
2	15	2	.89	.70	Hydrogen Sulphide (H ₂ S)	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	5. Aniline Poisoning: Fumes and	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	Absorption.	.....	.....	.....	.....	.....
2	6	15	3.78	.28	6. Eye Accidents	.....	.....	8	2.93	.....
2	5	10	2.57	.23	Acids; Colors.	.....	.....	7	2.56	.....
.....	.....	.....	.....	.....	Alkalis.	.....	.....	.....	.....	.....
21	1,729	66	19.34	81.06		13	225	34	17.21	23.78
Total Non-Chemical.....	80.66	18.94	Total Non-Chemical.....	82.79	76.22	Total Non-Chemical.....	82.79	76.22		
Total Chemical.....	19.34	81.06	Total Chemical.....	17.21	23.78	Total Chemical.....	17.21	23.78		
Grand Total.....	100%	100%	Grand Total.....	100%	100%	Grand Total.....	100%	100%		

TIME LOST, JANUARY-JULY, 1919

	No. of Time-Lost Accidents	No. of Days Lost	No. of Minor Accidents	Total Hours Worked	Total Hours Lost	Safety Efficiency
Mechanical Department	18	203	90	749,343	1,624	99.78
Process Department	30	739	128	1,085,167	7,198	99.34
Miscellaneous	1	4	6	513,590	32	99.99
Total	49	946	224	2,348,100	8,854	99.62

vailing during these periods, and during the very unsatisfactory labor conditions of 1918, the mechanical accidents far surpassed the chemical accidents. A closer analysis of the preceding accident chart would show that the majority of these accidents are of the preventable type. Acid burns, alkali burns, fume poisoning and eye accidents can, by education and constant watchfulness, be reduced to a very low point. As trained safety men you are more familiar than I with the methods which are in use for bringing about these results.

Omitting further discussion in regard to these ordinary causes of chemical accidents I wish to call attention to what I consider to be the greatest hazard of the dyestuff industry today, at least from the stand-

THE EXPLOSION RISK

point of severity of results. This is the explosion risk. From this cause alone we suffered three fatalities in 1918. These fatalities occurred in one instance where a considerable quantity of explosive dye ignited and killed three men. Records of the dyestuff industry during the last two or three years especially, have been full of reports of similar accidents at other plants. The disastrous fire at the plant of the Atlantic Dyestuff Company in Nyack, N. Y., was caused by an explosion. According to the September 1 issue of the *Journal of Industrial and Engineering Chemistry* (page 893), there was recently another serious dyestuff explosion in Boston, Mass. Practically every dyestuff company in the country has had more or less experience along the same lines. This is a hazard which chemists and safety men must inform themselves about and which they must guard against more carefully. The greatest risks of explosions about dyestuff plants are three in number: Explosions of dyes and intermediates, explosions of pressure kettles, and explosions of vapors mixed with air.

The type of explosion which has caused our greatest loss is the explosion of dyes themselves. We have been prone to forget that dyes are organic compounds, some of them closely related to explosives. We have not accustomed ourselves to consider each new dye as a possible explosive but have gone ahead, powdering and grinding our products in blissful ignorance until an accident has called our attention to the dan-

ger. A dye widely used for khaki shades on wool during the war, was known as chrome yellow. This was made in very large quantities, dried, ground, packed, and shipped. It is doubtful if a single producer of this dye tested this material for its explosive properties before they began to produce it on a commercial scale, yet as I could quickly demonstrate to you by igniting a small portion of the dye, its quick burning properties render it more dangerous than many of our violent explosives. It is further doubtful if a single producer of this dye escaped the penalties of his failure to test the product. One large producer informed me that the total profits from his company's manufacture of this dye had been lost through disastrous fires and accidents. The same thing is true of another widely-used chrome dye, which is frequently known as metachrome brown. This product has been the cause of at least three disastrous explosions in different companies to my own knowledge. With these experiences in mind we shall be very remiss in our duties if we do not examine every new dye for its explosive properties. A general rule, well known to chemists who have dealt with explosives, indicates what classes of dyes are apt to develop explosive characteristics. This rule may be summed up very roughly as follows: "Be extremely critical toward dyes which are to be handled in the form of dry powders unless they are well supplied with sulphonic acid groups."

Even after the dye is given a clean bill of health by the chemist because of its composition, it would not be remiss to have the dye tested before drying and powdering. This is a service which the dye producers owe to their consumers as well as to their employees, for many dyes are mixed in mills and exposed to conditions which might, in a sensitive product, produce explosions.

With this danger of dye explosion eliminated, the next explosion risk which the chemical industry faces, is that of pressure kettles. Chemistry at high pressure has only begun its development in this country. Processes which have normally been considered impossible are gradually being carried out under conditions of high pressure. The best illustration of this is the Haber synthesis of ammonia from nitrogen and hydrogen. This reaction will not take place between the two gases under atmospheric pressure but when the two gases are brought together at very high pressure in the presence of a catalyst at elevated temperature, the two unite to a certain extent to form ammonia. With the growth of our American chemical industry, reactions of this type will be more and more largely introduced into our manufacturing plants. As they are introduced, the explosion hazard will become greater and greater, and the safety men must cooperate closely with the technical engineers to see that every possible precaution is taken against disastrous results to our workmen and to our plants. It has been rumored that the very important intermediate, paranitraniline, has been made commercially by only one process in this country because another process, which offers many advantages, has a great explosion risk connected with it owing to very high pressure. If the American dyestuff industry is to be permanently successful, it must not permit itself to be restrained because of high pressure explosion

risks. The control of this risk is primarily of course a technical engineering problem, but after the engineering lay-out is complete the safety man will find his opportunity to provide such appliances and such conditions as will give minimum destruction to life and property in case the engineering equipment ever fails.

The risks of explosion due to the ignition of mixtures and combustible vapors with air are already thoroughly appreciated by the technical and safety men. I only wish to call attention to the fundamental principles which must be followed in safety precautions to avoid explosions of this kind. While every effort to keep flames away from inflammable mixtures is commendable, these precautions alone will never entirely prevent ignition of explosive mixtures. Every effort must be concentrated on preventing the formation of such mixtures. Many disastrous explosions have occurred where every precaution has been taken to avoid the presence of all sources of fire. It is never possible entirely to do away with the chance formation of either frictional or electrical sparks. These are apt to be formed at most unexpected times, and at these times, if an explosive mixture of air and vapor is present, an unexplained disaster results. One of the most disastrous explosions I have ever witnessed, in which a large and well equipped plant was completely destroyed, was due to a chance frictional spark. In this particular case, every effort had been taken to avoid the proximity of flames to the combustible material, but a few simple precautions to prevent the formation of explosive mixtures had been overlooked.

As an illustration of the extreme difficulty of preventing ignition by chance sparks I will cite a case of my own observation where a large amount of toluene was stored in a glass enamelled steel tank. It never occurred to the operators that a glass enamelled steel tank is an ideal electrical condenser. The contents of the tank were not grounded in any way. A leak of toluene from the bottom valve soaked the floor under the tank; the workman in attempting to repair this leak, made connection between the contents of the tank and the floor through a wire in his hand; the toluene on the floor immediately became ignited. Quick-witted workmen threw a few shovels of snow, which happened to be convenient, over the burning toluene and succeeded in smothering the flame before it ignited the tank. All of the conditions for a disaster were there present. An examination of the conditions surrounding this flare caused us immediately to ground the contents of each storage tank through a large sized copper wire.

For handling problems of this kind the safety engineer must have a very clear appreciation of the fundamental principles of both physics and chemistry, and must further work in close touch with the technical men of his own organization. By such close cooperation and the careful study of each accident that occurs it will be gradually possible to eliminate the explosion risks of our industry.

CHAIRMAN FIESINGER; We are ready for the discussion of Dr. Cone's paper.

DISCUSSION

MR. L. A. DEBLOIS (E. I. du Pont de Nemours & Co.): I should like to ask the speaker whether it is his idea that in that accident he mentioned, the charge of static electricity on the contents of the tank came from the liquid in the tank or from outside?

MR. BARKER: We know that an anhydrous liquid in jet form is capable of producing static electricity—there have been fires from that cause. We know from our personal experience and experiments that the motion of any known conducting, dry material—wood-pulp, sawdust, flour, nitrate of soda, sulphur—will generate static electricity.

MR. D. F. CONKLIN: I should like to ask him how the company takes care of the reaction of the chemical—by personal control, or automatic means, or safety valves, or how?

MR. BARKER: It is done mostly by personal means. On all of our nitrifications we have duplicate thermometers—one recording thermometer and one indicating thermometer—and these thermometers are watched by the operators.

MR. CONKLIN: How many operators do you use?

MR. BARKER: That depends—perhaps three for each kettle. I think that is the safest way to do. One moment's inattention would prove fatal.

MR. DEBLOIS: It might be of interest to know that in the nitrating houses, where you have the worst possibilities, due to rapid rise of temperature of reaction, the nitration is hand controlled by a man who never leaves the stool and he has to be replaced by a helper. The shut-off cock on the glycerin is automatic. In other words, as soon as the man's hand is taken off the cock, the flow of glycerin stops.

MR. F. W. BARKER, JR.: The gentleman from the Goodyear Company asked about the treatment of aniline cases. Our medical department has had surprisingly good results with the treatment of aniline cases. The plugging tests have shown surprisingly good results in the course of five or six weeks after the man had been taken out of the process and taken away from the fumes.

MR. EDWARD M. COFFIN (Associated Industries of Massachusetts). I should like to ask for a bit of information regarding static electricity: What has been the best method of reducing that from belts?

MR. C. P. TOLMAN: The best method is to get rid of the belts.

MR. COFFIN: It was suggested to me that a chrome belt offered less hazard.

MR. TOLMAN: Don't use it. A cotton belt may be better.

DR. S. DANA HUBBARD: In the printing press work, particularly, in making color work, we have had trouble with spoiling paper. In the press of the "New York World" they have demagnetized, by a process of chroming—a secret process of chemical treatment—and they are printing at maximum speed. You can see these colored articles, one on top of another, and they do not smear.

MR. COFFIN: We met the same problem and got around it by grounding the shaft and treating the belt with a mixture of glycerin and water, which may be applied once a month—it doesn't have any deteriorating effect on the belt.

I have noted, with interest, in the dry cleansing establishment there is a serious hazard in the cleansing of silk gowns, particularly where there is metallic trimming, and I found one concern was overcoming that difficulty in grounding the contents by introducing a damp piece of linen.

CHAIRMAN FIESINGER: In connection with Dr. Cone's paper, Mr. Barker stated, I think, these statistics will be of interest.

MR. H. F. DOEPKE (National Aniline and Chemical Company): I shall read some figures from this chart and shall be pleased to answer any questions.

(Mr. Doepke read chart. See page 460.)

MR. L. A. DEBLOIS: I should like to ask whether the occupational diseases are included.

MR. DOEPKE: It does not include dermatitis. We had thirty-seven cases in 1918, as compared with twenty-two in 1919, and the average loss to benzoin dermatitis is two days. That is due to few men who have been negligent to the doctor's orders.

MR. DEBLOIS: That paper is extremely interesting because it shows how low the rate can be brought in the chemical plant. I should like to cite one instance in my own mind: With a group of one hundred and sixty men in aniline manufacture at our works, up till night before last they had gone within two days of a year without a major accident. I mean by a major accident, an accident that involves more than the day or shift on which the man is working. That shows how low you can go.

MR. DOEPKE: I have tried to take out an accident policy and in stating my profession I was refused a policy. I quoted this incident to the management and this is what they said:

"From our knowledge of the aniline by-product game as it is now played, we are inclined to look with disfavor upon any liability, or accident, or health risk in connection therewith. We have made a deep study of the chemical trades and we are well up-to-date on all the latest methods and products."

While the average American citizen may not boast of having indulged in deep studies of the chemical trades, we will share the views of the insurance company, just quoted, to the effect that our industry has an ill reputation, not only locally, but wherever man meets man. Focus your attention upon the graphic chart at the bottom of the experience sheet, and you will know why this reputation is as unfortunate as it is unfounded.

To substantiate Mr. DeBlois' statement, in 1918 we had two severe cases, resulting in fifteen days' loss and two minor cases, which totals 0.89 per cent in frequency and 0.7 per cent in severity.

As far as benzol dermatitis is concerned, our physician has made up a solution of grain alcohol, bi-chloride of mercury and epsom salts, and when applied to the workman, who was suffering with benzol dermatitis, and kept there, it guaranteed a cure in two days.

MR. F. W. BARKER, JR.: I might say the greatest stride we made at our plant was the installation of an efficient medical department. We have a physician on all the time during the day and he has as his assistant,

a technologist, who makes a business of taking blood counts and making urinalysis tests, and besides that he has a first-aid on, both day and night.

I want to emphasize the benefits derived from this technologist. We are able to make an examination once a month of every man connected with nitrol work and make a study of his blood and find out whether he is going backwards or forwards.

Adjournment.

FRIDAY MORNING SESSION

THE meeting was called to order at 9:40 A. M., Chairman Fiesinger presiding.

CHAIRMAN FIESINGER: No doubt some of you people know the Chemical Section sent a letter to each one of its members last year for suggested subjects for our program. This year we got so few replies, we thought this would be a very good time to pass slips around, and if you have any suggestions and would like to submit them for next year's program, they will be of great assistance to the program committee.

The first order of business this morning is the report of the Nominating Committee. Mr. S. H. Kershaw, the Chairman, will report.

REPORT OF NOMINATING COMMITTEE

MR. S. H. KERSHAW (Hercules Powder Company): Your Nominating Committee wishes to report the following nominations for the next term of office:

Mr. I. V. Kepner, Pennsylvania Salt Mfg. Co., Chairman.

Mr. S. H. Kershaw, Hercules Powder Co., Vice Chairman.

Mr. Henry F. Doepke, National Aniline & Chemical Co., Secretary.

(These men were elected.)

CHAIRMAN FIESINGER: The first paper on the program this morning is one which I know we are all very much interested in. We have heard so much about gas masks—I believe we are all at sea—we do not know what can be had, so this morning we have a man who has put a great deal of study on this subject. He has been doing research work for the gas defense of the Bureau of Mines, during the war, and also for the Chemical Warfare Service of the War Department. He was not in the production end but in research work, and since the close of the war he has taken up his duties again in the Massachusetts Institute of Technology. We are fortunate in having him with us this morning; I have great pleasure in introducing Dr. W. K. Lewis.

CONTROLLING FACTORS IN GAS MASK DESIGN

DR. W. K. LEWIS, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE

The introduction of the use of toxic gases during the war made necessary the development of suitable masks for protection against them.

In connection with this development, a large amount of research work was carried on and the research results were put into practice in the manufacture of millions of military masks. Furthermore, these masks were continually in process of improvement, so that by the end of the war extremely effective types had been evolved. From all of this work a large amount of information is available, which should be of the greatest value in solving the problems of protection against toxic gases encountered in the industries.

During the war toxic gases were encountered only when admixed with air. This article will therefore, be restricted to the discussion of masks designed to absorb toxic gases from air, i. e., masks functioning essentially as air filters or purifiers, leaving out of consideration oxygen helmets and similar devices intended to furnish an artificial air supply. It is, however, probable that the majority of problems arising in industrial practice require air purification alone, so that the military experience of the war should be immediately available for industrial use.

REQUIREMENTS FOR PROTECTION

A suitable mask for protection against toxic gases must meet the following requirements:

- (1) The chemical protection must be adequate, i. e., the toxic gas must be removed from the air so completely that any remaining traces are physiologically harmless.
- (2) The mask must be throughout mechanically tight so that all inhaled air is forced to pass through the absorbing medium.
- (3) The mask must be capable of easy, quick, and safe adjustment; if possible, adjustment should require little or no training of the wearer.
- (4) The mask should be comfortable in fit and operation.
- (5) The mask should be as small in size and weight as is compatible with other requirements.
- (6) Ruggedness in construction and perfection in mechanical details are of the utmost importance to insure satisfactory service.
- (7) The life of the mask should be as long as possible.

From the military point of view, the size and weight of the mask and the ruggedness of its construction are of extreme importance, and, furthermore, the chemical protection of the mask must be universal, i. e., the mask must absorb any toxic gas which it is possible for the enemy to utilize, including the lachrymatory gases. From the industrial point of view, size and weight are less important than in military use, so that the industrial mask will probably introduce improvements at the expense of increase in size. The industrial mask does not have to give universal protection and in this regard possesses a great advantage over the military mask. The industrial mask can be designed to give the maximum possible protection for the one gas against which it is to be employed.

CHEMICAL PROTECTION

Two types of chemical absorbents were developed during the war, namely, impregnated cloth and solid, granular absorbents contained in a suitable canister. The cloth masks were simple in construction and relatively comfortable to wear, but they lacked the advantage of universality in protection. On this account they were ultimately discarded for military use. For industrial use against gases which can be suitably absorbed in this way, they will probably offer the cheapest and most satisfactory protection.

The most important solid absorbents developed were soda lime and absorbent charcoal. Mixtures of these were employed in the military masks, and together these two absorbents, when properly manufactured and used, offer protection against all toxic gases except carbon monoxide. In the military mask it was necessary to use a mixture which would furnish the best average protection against all gases that might be encountered. In commercial practice, the granular filling would be chosen for the particular gas in question. For most acid gases soda lime is essential, but it often functions best when mixed with varying amounts of charcoal. Properly prepared charcoal absorbs gases very quickly, and acid gases are frequently taken up first by the charcoal and gradually released, then being transferred to the soda lime by which they are permanently absorbed.

Many of the more inert gases are not absorbed by soda lime and for such gases the canister should be filled with charcoal alone. Charcoal offers perfect protection against such gases as gasoline, benzol, aniline, carbon bisulphide, and the like. Since these gases are encountered almost always in mixture with air, there no longer remains an excuse for industrial poisoning from these gases when the individual exposed to them is aware of their presence in advance. For such gases, however, relatively large masks are desirable because the absorptive power of the charcoal for them is limited. The charcoal which has accomplished these remarkable results was developed by the Research Laboratories of the National Carbon Company and at Nela Park in this city, and is now being manufactured for industrial use.

MECHANICAL TIGHTNESS

The mechanism of gas leaks through the canister or other absorbing element is too complicated for discussion here. Protection against this type of leak must depend upon the proper design of the mask. The point of major importance to the user is the question of the fit of the mask to the individual wearer.

During the war three types of fit were developed. The first involved a seal around the neck and chest. This mask is necessarily restricted to one of impregnated cloth, the mask consisting of a sack fitted with goggles and preferably also with an exhalation tube, the sack being tucked down under the coat around the neck and shoulders. Such a mask is cheap, simple in construction, relatively comfortable, and well worth consideration for use in those industries where such an absorbent

is satisfactory. The second type of fit employed a face piece fitted over the forehead, down across the cheeks, and under the chin. Both the French and German masks were of this type, the French mask being constructed of absorbent cloth, and the German mask employing a canister. Toward the end of the war this country also developed a mask of this type. The impregnated cloth mask of this type is even more satisfactory than the sack type of mask wherever its use is allowable. The third fit developed involved the use of a mouthpiece in connection with a nose clip to insure breathing through the mouth only. In order to protect against lachrymatories, the military mask of necessity utilized this fit in connection with the second type, thus securing double protection against mechanical leaks. In many industries this second protection might be unnecessary.

Wherever a canister mask is necessary, one or both of the last two types of fit are essential.

ADJUSTMENT OF MASK TO WEARER

For safety and "fool-proof-ness," it is believed that the mouthpiece-nose clip type of fit is the best. Even this mask requires a certain amount of instruction of the wearer. The mouthpiece must be inserted and the nose must be closed in order to make the mask safe. The forehead-cheek fit requires some experience in adjustment but is safe when properly used.

COMFORT

The forehead-cheek fit is by far the most comfortable. Even in this type, to insure comfort in use requires great care in manufacture. The writer is convinced that for emergency use by operatives who are only occasionally exposed to danger, the mouthpiece-nose clip mask should be employed, for although exceedingly uncomfortable, the operative would not object to using it during an emergency. For long continued use at regular periods, this mask should not be considered. The forehead-cheek type of fit is so much more comfortable that an operative who is to wear a mask for any length of time should be trained in the use of this type.

Ease of breathing is a great factor in comfort. To get low resistance, the canister should be as large as possible, and of large section, but in the design of the canister these points must be balanced against weight and a proper ratio of length to section in order to insure protection.

SIZE AND WEIGHT

The military mask was small in order to keep from over-burdening the soldier. Even at that the military mask offered excessive protection because in the open air of the battlefield gas concentrations were extremely low. In buildings gas concentrations are likely to be very much higher and much larger masks will become necessary. It would seem that in the industries the mask size can be increased without undue disadvantage.

CONSTRUCTION

Ruggedness of construction should never be sacrificed to decrease in weight or size. Mechanical perfection in construction is of the greatest importance and can be guaranteed only by rigid inspection during manufacture. Low cost of the mask should never be secured by lessening the protection. The testing of the mask under service conditions is of the utmost importance to guarantee its satisfactory performance in emergency. This testing should be carried out by the industries themselves, because they alone are familiar with the actual conditions under which the mask must be employed.

DURABILITY

A mask should have a life exceeding the period of any emergency for which it can possibly be employed. This requires a relatively large mask. In this connection, one must keep in mind the point already made, that under industrial conditions gas concentration will be much higher than in military service.

The proper design of a gas mask is an extremely complicated problem, requiring the attention of experts trained at this work. Such experts, however, must work in close cooperation with the organizations using the mask, since otherwise the mask will not be properly correlated to the requirements. It is, fortunately, possible to secure expert advice in mask construction from the Bureau of Mines, since this organization has had years of experience in mask development and still retains on its staff many of those men most active in the development of the military mask during the war. No industry should choose a mask for protection against toxic gases without securing first the cooperation and advice of the staff of the Bureau of Mines.

DISCUSSION

MR. WALTER GREENWOOD (Carnegie Steel Company): We have to contend with carbon monoxide, but in some branches we have large quantities of dust, and in the allied industries, of the iron and steel industries, I see large quantities of dust that must be analogous to the substance which gave the nailers consumption.

In cleaning out a blast furnace, to get it ready for relighting, we have large quantities of dust; also in our slag plants. We found, at least in my experience, that all of these filtering masks which are put on the market are not suitable or satisfactory.

I would inquire if this French mask and other specimens that are exhibited here would be suitable for our industry to filter the dust? I do not think it is necessary to protect the eyes, but to take care to filter the air they inhale.

DR. W. K. LEWIS: With regard to the two questions: first, carbon monoxide, the Navy developed that during the war, but it is my understanding that the information with regard to that is "military information." I am sure the military department will release that and I am

sure carbon monoxide protection will be available very shortly. Second, with regard to dust protection against smoke; this was one of the important developments of the war. You noted these pads they were to remove smoke, practically dust particles. The particles which this mask faced were extremely fine. Coarser particles have also been removed. This filter has the disadvantage of having a high resistance. The French mask will take care of almost any dust conditions. When the dust gets serious, it will be necessary to find finer filtering media.

Mr. L. A. DeBlois: In the industries we are faced today with a great number of commercial firms that have put on the market army gas masks, or modifications of the army type of gas masks; otherwise, we have no real source of information as to what masks to use in our works, how long they may be used, or really any solution for the specific working problems.

Some of you have gases with which you are not familiar. You may have a fire and lose two or three men from inhalation of the fume. This brings on edema of the lungs—it is an acid fume poisoning proposition. There are no immediate ill effects of any serious nature, but a delayed attack of a serious nature, causing the men finally to succumb. Perhaps that problem put in writing to the manufacturer of gas masks might lead to an erroneous assumption of what took place.

It seems to me, and I think it is Dr. Lewis' opinion, we ought to have some agency of government, or perhaps a body of the National Safety Council, some agency in the country which could furnish more definite advice on gas mask protection in the industries.

Dr. W. K. Lewis: With regard to this suggestion of Mr. DeBlois, I feel very strongly that there should be some unprejudiced central organization to function in the choice of gas masks for the industries. The manufacturer of the mask, however good his intentions, is, of necessity, a somewhat prejudiced party. There is no manufacturer of gas masks in this country today who has the whole story, who turns out all types of masks, who has a staff adequate to meet the many problems that come up.

The testing of gas masks is of the utmost importance. It is worse to give a man a defective mask than it is to give him no mask at all, because that defective mask inspires in him a feeling of confidence which will lead him to go into places where, without a mask, he would never dream of going.

The testing of such masks, however, should be carried out not by the manufacturer, because, as I say, he is a prejudiced party, nor by the user, because he is not a gas mask expert. He has entirely too many other problems to solve to take the time to master the technique of gas mask production and testing. This testing should be carried out by some unprejudiced organization, who could be implicitly relied upon.

Mr. EDWARD M. COFFIN (Associated Industries of Massachusetts): Possibly the Underwriters Laboratories in Chicago, that have recently gone into safety work, in addition to the standardization of fire apparatus, would be interested.

MR. A. H. MASSEY (E. I. du Pont de Nemours & Co.): Recently I visited a small paint plant which our Company took over. They had a home-made facepiece, similar to the Tissot facepiece, with possibly three hundred feet of one-inch rubber hose, using a small hand pump for air. I was talking to the repair men who used that apparatus and they were very much pleased with it.

MR. H. F. DOEPKE: I should like to ask Mr. James whether he encountered the hazard of the rubber hose becoming twisted, cutting out the air supply?

MR. J. D. JAMES: We have never had a particle of trouble with our hose connection. The check valve that is connected with the canister there for filtering purposes, at the off end where we are receiving the fresh air, maintains a steady flow.

MR. IRA V. KEPNER: I would like to ask the size of the hose and kind you use.

MR. J. D. JAMES: Three-quarter inch rubber garden hose.

MR. A. H. MASSEY: The hose I spoke of was one inch wire wrapped. You cannot twist that hose.

MR. J. D. JAMES: I feared something of that sort would happen and had a man there in charge of that hose, because we did not want to smother the man. He saw that there is no twist in the hose.

MR. A. L. THOMPSON (E. I. du Pont de Nemours & Co.): I should like to ask if you have come in contact with two hundred and fifty foot hose, hasn't the man a pretty hard time with that weight? You will find that in many cases the operator is going to object to that lift and that helmet.

MR. J. D. JAMES: We have a belt around the man's waist and the hose is fastened on this belt with a rubber belt, and he has no weight whatever.

MR. C. E. RICE (The Dow Chemical Company): Twenty years ago we were interested in the bleach manufacture of lime. We designed a mask or hood to put on, something on the order of a bonnet, with a wire frame and inlets for air around the crown of head. Air was furnished under pressure. I should be glad to furnish you with any information you want on that.

MR. N. S. NOBLE (B. F. Goodrich Company): Relative to the hose to be used, I would suggest they use a large wire inserted, instead of wire wound, similar to a vacuum cleaner.

MR. J. H. BARNHOLT (E. I. du Pont de Nemours & Co.): Just two weeks ago I tried Mr. James' idea out personally in our naphthalene subliming chambers and camphor subliming chambers, and while we only had a half-inch, three-ply hose the fact remains it did not work. We finally compressed the line and supplied the employee with one pound air pressure and that has been perfectly satisfactory.

Do you think, Mr. James, the half-inch hose would cut off any noticeably adequate air supply, as compared with your three-quarter hose?

MR. J. D. JAMES: Yes, there is a great difference in friction. We haven't suffered any inconvenience whatever from the air.

DR. A. D. RISTEEN (The Travelers Insurance Company): Mr. Chairman,

Mr. James seems to be the text for this discussion and I would like to make the suggestion that the success or failure of his plan appears to me to depend upon the question of leakage around the face mask. He has evidently been very successful in preventing such leaks and when you can protect that leakage you have a fine mask: but some day may it not happen that there will be a leak around the mask and the man suffer from a dose of monoxide? The point I have in mind is, even though it does call for some additional apparatus, isn't it a good thing to have the man draw his air supply into his lungs from what I might call a plenum rather than a vacuum? Any leakage will be from the inside out and therefore the man will not be harmed, whereas if the friction in the intake pipe causes a slight vacuum, then if there is any leakage, it is bound to introduce carbon monoxide. I only make that suggestion to emphasize the extreme importance, as it seems to me, of being sure that the mask is tight to the face.

Dr. W. K. Lewis: There are two points that have been brought up upon which I think I can give you some information. During the war we did a large amount of experimental work, as we literally had millions of men exposed to gas, and a great many of those were gassed and we know the conditions under which they were gassed. We carried on thousands of experiments.

In the first place, I wish to reiterate my statement that for use against carbon monoxide under conditions where it is applicable, this extended hose method appeals to me as the best thing available. Why? Because, as I said before, when carbon monoxide is present, oxygen is likely to be absent. On the other hand, if you are drawing your air outside you are sure of no monoxide and you are sure of good air. However, if a man has to go up and down ladders, or travel around too much with this hose tied to his waist, he cannot do it. There are going to be some places where the carbon monoxide mask is going to be necessary.

Let us take naphthalene or camphor, both of which have been mentioned; I wouldn't think of using a hose if I was going to use the mask. What I would use is a canister mask equipped with proper charcoal, but the choice of that charcoal is the whole story and I would test that charcoal before I went into the atmosphere—I wouldn't accept charcoal from anybody.

This absorbent charcoal will absolutely, quantitatively, remove camphor, benzol, carbon bi-sulphide, any of these gases.

I wouldn't go into a tank car with a three-quarter inch wire hose tied to me, and I don't think you would, but I would be willing to go into a tank car with a mask which I knew would absorb all the benzol in the atmosphere.

Suppose that there is so much benzol that there is only five per cent of oxygen—a man cannot live on that. On the other hand, that oxygen is air when he sucks that in the benzol and his oxygen goes up to twenty-one per cent. The point is, each problem must be analyzed for itself and solved for itself.

With regard to hose resistance, you cannot have it too small, but a

properly designed Tissot facepiece will never leak enough, with any suction that a man can pull, to gas that man in a CO atmosphere, with the combustion of carbon with the oxygen in the air. Why, this Tissot mask will never leak one per cent of the air when it is properly fitted. If you have any doubts about that, employ the mouthpiece and nose-piece mask—he is safe, but uncomfortable. In a chlorin atmosphere, or a phosgene atmosphere, a Tissot mask always gives safety, if the mask is properly adjusted.

The necessity for expert advice as to the type of mask to be used in each individual case, after a careful study of the conditions under which it is to be employed, is the prime necessity for us to recognize.

On the western front we put gas masks into use, the leakage of one part of fifty millionths of which would have killed the soldier. The percentage of the gas leakage around the facepiece is negligible and yet there was a gas one part of fifty millionths of which was toxic, so you see that was much more dangerous. I don't wish you to misunderstand me; I know the danger of carbon monoxide, but it is only when the concentration is high. I would not want to wear an absorbent mask with fifteen per cent carbon monoxide because I wouldn't have enough oxygen left.

MR. I. A. PALMER (Mine Safety Appliances Company): We are working on the carbon monoxide mask; it would be of help to us if we could get an idea of the average percentages of monoxide that the various plants contend with.

MR. MCCARTHY: The average is fifteen per cent; it will vary according to the conditions that surround the furnace plant.

MR. PAUL F. WILLIAMS (E. I. du Pont de Nemours & Co.): I should like to ask Dr. Lewis how you would take care of the proposition where you have a phosgene cylinder and the bottom blows out, and you go in and stop up the leak?

DR. W. K. LEWIS: There would be no trouble in going into a phosgene concentration, provided there is any air in the room, a good absorber, and a large enough canister. In the face of such a risk as that, you ought to have a canister ten times the size of this. I will go into that room if you will give me a large enough canister with the present type of mask.

The Chairman asked me how I would protect myself against ammonia. Any acid solvent is effective against that; there are canisters offering such protection. The skin cannot stand the irritation of more than four per cent of ammonia. Any man going into four per cent of ammonia is driven out by the irritation of skin—it is impossible to send a man into that room.

With regard to dimming, that is a large question. There were two years of active research on that problem and a number of solutions of the dimming difficulty were found. Unfortunately, they were rather complicated, from a military point of view. I don't think I ought to go into those in detail. The solution employed by the army, up to the end of the war, was the use of a special soap mixture smeared on the inside of the glass to form an absorbed layer of water, causing the condensed water to run in a clean sheet. You know the mixture on a windshield

on an automobile which causes the rain to run down in a clean sheet and does not form in droplets—that was employed with the gas masks and it is satisfactory. From a military point of view, the protection ultimately breaks down and in order to renew the protection the mask must be removed and a fresh supply of soap supplied. From a military point of view, where a man used it twenty-four hours, that was serious; from an industrial point of view, you don't expect them to wear it over an hour and the best emulsifying agencies on the market will give protection for that length of time. Some of the mechanical appliances are very complicated. You will notice in this Tissot mask the inhaled air is brought up and directed over the eyepiece, so the eyepieces are always swept with air and kept clean. In a cold storage house that will dim, but not completely. In a cold storage house you will freeze over the outside rim, but we have never frozen over that hole in the center about the size of half a dime. Those are drastic conditions which you wouldn't find everywhere. Dimming is one of the most serious problems in gas mask construction.

MR. H. H. PORTER (Newport Chemical Works): Speaking of the dimming of the army gas mask: We have been using those masks with just the standard army filling for the last four or five months. We have been fortunate in that we have had no spills where we have had a heavy concentration. We have gas masks posted around in cabinets outside the buildings. We have a place to keep them and the men take care of them themselves. If a man wants to get a mask, he breaks the glass in the cabinet. We have a man who makes the rounds and if there has been a mask used, he goes over it and smears the lenses with this non-dimming compound and puts it back. We use the ordinary canister, and have had ammonia spills and sulphuric acid, benzol, and dinitrol trouble, all of which were moderate, but a man could not have gone under without proper protection and we have been very fortunate.

MR. C. M. FINCH (Aetna Life Insurance Company): I want to substantiate what Dr. Lewis said. I had the opportunity to sleep with a mask on the front for five hours. I can swear by it because it saves life. As far as the dimming effect is concerned, the eyepieces are made of celluloid: We used to make watch crystals out of them.

MR. D. F. HEATH (Goodyear Rubber Co., Akron, Ohio): In the Goodyear Company, for some time we had trouble from hydrogen sulphide fumes and when we made our masks we experimented in the chemical department and to this day we are using the standard army mask and we keep a duplicate canister for each mask. They are used two or three hours each day in the morning and afternoon, and at the end of each week the canisters are taken over and the duplicates are placed in and the canisters reloaded. We have never had a sickness and they have been very successful.

CHAIRMAN FIESINGER: The next paper is "Some Experience in Accident Prevention in the Dye Industry," by A. H. Massey.

SOME ACCIDENT EXPERIENCE IN THE DYE INDUSTRY

A. H. MASSEY, E. I. DU PONT DE NEMOURS AND COMPANY, WILMINGTON, DEL.

The dye industry is so extremely varied that the work of the safety man in one plant is very different in detail from that of the man in another or from the man in a general chemical plant. The dye industry and the general chemical industry overlap in so many points that to differentiate between them would be impossible. The fundamental problem; however, is the same—that of the prevention of accidents and the preservation of health. These subjects are so closely allied that they should be considered as one and the same. In many instances the health problem is a more serious one than that which we commonly term "accident prevention."

The hazards are as varied as the industry; to those common to moving machinery and the handling of materials are added hazards pertaining to explosive mixtures and compounds; vapors and dusts which may be deleterious, or actively poisonous; and the hazards of open containers, fragile containers, and especially containers under pressure in which are hot, corrosive or poisonous materials.

Let us consider first some of the more important matters relating to the prevention of accidents and the preservation of health through mechanical arrangement and equipment, by which is meant the elimination of unsafe conditions in manufacturing buildings and apparatus, by changes in their construction, or by the addition of special appliances, etc.

PROPER DESIGN OF FLOORS AND PLATFORMS

This is of special importance where hot, corrosive, or poisonous liquids are handled as there is always the possibility of a spill. In buildings with several stories, special attention should be paid to both the tightness and the drainage of the floors, otherwise a spill of this material on a floor with openings, or with holes or cracks in it is apt to run through upon men below. If the floor is tight but does not have drains provided and the liquid is allowed to lie on it, there is always the possibility of someone walking or even falling into it, which might result seriously in either case.

For example, dinitrobenzol was being handled in a wooden filter on the second floor of a building and there were operations on the ground floor which required a number of men to pass under the section occupied by the filter.

The filter became leaky and the floor under it, being of rough 2-inch plank, full of cracks, there was considerable trouble from cyanosis among the men in the other operations due to dinitrobenzol water dropping on them, until a tight floor with the proper arrangements for drainage was installed under the filter.

Another example: A dissolving tank about 4 feet deep and 6 feet in diameter into which solid caustic was dumped and filtered water added and heated by means of steam coils to obtain a very strong and pure

solution, was located on the second floor of a building about 5 feet from the elevator shaft. To obtain the desired solution the tank was filled to within approximately 15 inches of the top. Prior to the accident, caustic and water were in the tank and the operator turned steam into the heating coils and went to another part of the building.

A mechanic had lowered the elevator to the first floor and was on top of the elevator cage repairing the counterweights on one of the gates when the caustic solution boiled over. The floor was tight but a gutter or drain had not been provided around the dissolving tank. Consequently, the strong boiling caustic solution drained into the elevator shaft upon the mechanic. He was penned there with serious consequences.

The importance of all control equipment, such as main line valves, valve clusters, etc., which are not within reach of the floor, being provided with operating platforms, cannot be emphasized too strongly, as the accidents resulting from their absence are numerous and usually serious. These platforms should be properly protected with hand-rails and toe-boards, and special attention should be paid to the location of ladders or stairs leading to them. The details of this matter will be covered in the next paragraph.

PROPER ARRANGEMENT OF THE APPARATUS, LADDERS, STAIRWAYS, AND EMERGENCY EXITS IN MANUFACTURING BUILDINGS

Apparatus should be installed in the manufacturing building in such a way as to permit the most efficient method of operation with the least congestion. We too frequently find the chemical manufacturing building badly congested with boxes, barrels, and bags of the intermediates which go into the operations, or even with the finished or semi-finished products. This is the result of the building having been originally designed with insufficient floor space or of changes which have taken place in the operation. The crowding of chemical operations and apparatus into a building invariably results in unsafe and inefficient operating practices, also excessive handling of material by hand.

It is very necessary to study the natural and artificial lighting conditions in order to procure the best light at the operating stations and to eliminate dark corners and pockets. Where the light is poor it is impossible to make accurate readings of thermometers, hydrometers, and pressure gauges. Inaccurate readings tend toward non-uniformity in the product. In some operations this may give abnormal reactions resulting in foaming, excessive heat being generated, or gases being given off in excessive volume, any of which conditions might lead to very dangerous results. Moreover, there being a large amount of material handled in the building, good light tends toward proper storage and good housekeeping conditions.

Stairways and ladders should be located so as to afford the most convenient access to that part of the apparatus or building for which they are intended. This is especially true as regards routine attendance and oiling. If we are to expect the operators and oilers not to take short cuts, we must provide them with as direct routes as possible.

Permanent ladders should not be installed over floor openings, open

tanks, vats, or containers in which hot, corrosive, or poisonous material is handled. They should not be used in the immediate proximity of machinery, the moving parts of which, due to their nature or location, cannot be totally enclosed. Special attention should be given to the termination point of stairways and ladders to see that they do not abutt on blind railroad tracks or lead into tanks, pits, drains, or sumps, which can be left open, or against moving machinery into which men may walk or fall. Reaction vessels or containers in which hot, corrosive, or poisonous materials are handled or the overflow pipes and vent lines from same which may be expected or are known to boil over or overflow are often located over or alongside permanent ladders or stairways. This makes a very dangerous condition.

In a building or room where there is a possibility of a condition developing which would be a menace to the lives of the occupants, special attention should be given to the provision of emergency exits. These exits should be installed so as to give the most efficient exit from the building at a point where the menace will be least, but should, however, not only be accessible to operating stations but be, as far as possible, in location somewhat removed from the immediate danger. Such exits should be placed so as to be subject to the least possible danger of obstruction either inside or outside the building from normal or abnormal operating conditions.

PROPER PROTECTION OF PROCESS OR REACTION VESSELS AGAINST EXCESSIVE OR ABNORMAL PRESSURE

This subject is very broad and can be covered only in a general way.

By reaction or pressure vessels is meant vessels such as sulphonators, nitrators, thionators, autoclaves, hydrolizers, acidifying and neutralizing tubs, tanks, stills, reducers, evaporators and condensers, etc.. These vessels either operate at atmospheric pressure or above or below atmospheric pressure. Materials may be used in them which are either slightly or extremely corrosive, and which sublime or freeze at or above the normal atmospheric temperature. In this case the containers and lines connected with same should be heated artificially.

Reaction Vessels Which Operate at Atmospheric Pressure: Where the vessel is open to the atmosphere or has a loose cover over it, there are no precautions to be taken against excessive pressure.

Where the vessel has a tight cover but is vented through a pipe line which does not have a valve in it, it is necessary to have the vent line sufficiently large to take care of any gases that might be given off.

Where materials are used in the operation which sublime or freeze above normal atmospheric temperature, precautions should be taken to eliminate the possibility of the vent pipe becoming frozen up or plugged.

Where the vessel has a tight cover and is vented through a pipe line but has a valve in the line the same precautions should be taken as in the case just cited. Also there is the possibility of the valve being left closed while the reaction is carried on. This would defeat the purpose of the vent, and to overcome it a pressure relief system or safety valves should be installed or the operation should be given special supervision.

Where the vessel has a tight cover and is vented through a pipe line into a condenser or into a series of condensers and thence to the atmosphere, the same precautions should be taken as in the cases previously mentioned.

Vessels Operating Above Atmospheric Pressure: Where the pressure of the reaction is controlled by heating or cooling it with some medium such as steam, water, or oil, circulated through coils or a jacket on the reaction vessels, if the medium would give a violent reaction in case it should come in accidental contact with the material in process, then coils inside of the reaction vessel or a jacket on the vessel should never be used. The temperature should be controlled by coils on the outside of the vessel.

Where the reaction vessel is heated by direct gas, coal, or oil fire, and the material in process is inflammable or gives off inflammable vapors, careful inspections of the vessel should be made before charging to see that there are no leaks which would allow the inflammable material or gases to get into the fire box. Fire box explosions are quite frequent around gas- and oil-fired stills. A leak will develop in the bottom of the still or process vessel and vapor or gas will collect in the fire box. When the fire is lighted this accumulation ignites, sometimes with such violence as to blow the vessel off its setting and partly or completely wreck the furnace. A precaution against this is to have a steam jet installed in the furnace and blow the furnace out thoroughly with steam before lighting a fire.

Where the reaction is carried on under pressure the bottom of the vessel should not be exposed to heat sufficient to cause the metal to run, due to pressure inside, thus causing a breakdown of the walls and resulting in what might be termed an explosion.

Where the pressure is controlled by the reaction itself, and governed by the rate at which the ingredients are added, and by cooling or heating with coils, the same precautions as previously outlined should be taken. In this case, if the control is by the gradual addition of a liquid, which if introduced in quantity would greatly accelerate the reaction, double valve controls should be used rather than a single valve.

Safety Valves or Pressure Relief Systems: All pressure vessels should be equipped with relief systems. The rapidity of the reaction within the vessel and the size of the vessel of course should govern the size of the system. For example, a steam boiler or water system under pressure would not require the same size relief system as a chemical reaction of the same capacity and under the same pressure. A one-inch safety valve installed on a 1000 gallon reaction vessel used as sulphonator where the reaction is being carried around a 100 lb. pressure is ridiculous. Should the reaction get beyond control in such a case it is questionable whether a 3-inch or 4-inch system would take care of the gases given off.

No hard and fast rules can be given for the size or type of relief valves or systems that should be installed on reaction vessels. Each case should be given careful consideration and a system installed in accordance with the dictates of engineering principles and common sense.

After deciding the size of relief valve to be installed the next question is to determine the type to be used. It is very hard, in fact almost impossible, to get a pop valve to stand up where acid or caustic is used. There is always the question whether the valve should be lead, brass, or copper-lined, or of cast iron.

Tin discs bolted between flanges make a very satisfactory relief system in some cases. Then again where the pressure is quite low and the life of a valve is short, seals are sometimes used with good results.

The location of the relief valve should also be given consideration. If the material in process gives off vapors which sublime or freeze above the atmospheric temperature there is always the possibility of the valve leaking and vapors passing into the vent line, freezing, and causing the line to become plugged. The line may also become plugged between the reaction vessel and the valve from the same cause.

PROPER DESIGN, ARRANGEMENT AND LOCATION OF STORAGE HOUSES AND VESSELS

The details pertaining to this subject are so numerous and varied that time will permit but a brief survey of the subject and in a very general way, which will be done by citing a few examples and precautionary methods in connection with the storage of strong acid and caustic solutions, cyanides, metallic sodium, chlorates, picramates, and general explosives.

Where strong acid and caustic solutions are stored in carboys or drums the containers should be in good condition. They should not be piled and they should be isolated where possible. Where large tanks are used, whether on the ground level or elevated, they should be fenced off and proper warning signs posted.

Where cyanides are stored every precaution should be taken to keep acids away, for a spill of acid into sodium or potassium cyanide develops a very ugly condition, hydrocyanic gas being liberated.

In storing metallic sodium special care should be exercised to keep water away. Both the containers and the building should be dry and water-tight; signs should be posted warning of the dangers to be expected from water coming in contact with the sodium.

Chlorates, picramates, and general explosives are all very much in the same class. Isolation of the storage building in accordance with the standard codes, elimination of foreign matter, and careful handling of the materials themselves while in transportation are the most essential points to be considered. A few common sense precautionary methods and careful supervision are the best safety devices.

ACCIDENT PREVENTION BY EDUCATION AND SUPERVISION

Let us next consider some of the more important matters relating to the prevention of accidents and preservation of health by education and supervision.

I do not mean the dictionary term for supervision or superintending—which is care and oversight for the purpose of directing—but direction with a view to instructing or educating for the purpose of increasing at one and the same time quality, production, and efficiency.

Supervision of the Handling and Storage of Material: By handling material is meant the carrying by hand, trucking, and rolling of material in boxes, barrels, crates, carboys, etc. By the storage of material is meant the proper piling segregation, and housing. It is from this class of work that a large number of accidents occur and they can be prevented only by careful supervision.

Maintaining General Equipment and Safety Devices in Proper Operative Condition: Equipment and safety devices and appliances that are perfectly safe when in good repair may present very serious hazards when allowed to get in bad repair. A safety device that is not safe or not in operative condition is worse than no safety device. They can be kept in good repair only by supervision.

Pursuance of Safe Practices While Repairs Are Being Made: Details of repair work are as numerous and varied as the industry itself and repair men are subjected to conditions which are in no way comparable to normal operating conditions. Frequently very hazardous conditions develop which could in no way have been foreseen and many very serious accidents occur while repairs are being made. There are general precautions which if taken at all times would prevent a large number of the too frequent accidents to repair men.

Men working in tanks should always be provided with life lines and have one or more attendants on the outside of the tank.

Men working on pipe lines or in tanks or boilers where there are acid, hot water, or steam connections, should take the necessary precautions to prevent acid, caustic, hot water, or steam being blown through the line. This can be accomplished by the proper locking devices and by signs, or tags, or, if necessary by disconnecting or blanking off the line.

Men working on machinery should take the proper precautions against having the machinery started up unexpectedly. This also can be accomplished by the proper locking device and signs or tags.

There are also jobs where it is absolutely necessary that the repair man wear the approved type of gloves, goggles, and at times special clothing and masks or helmets.

The accident frequency of repair men is governed by the precautions taken which revert right back to proper supervision.

Enforcement of the Use of Protective Equipment: The superintendent or safety man may provide every known safety device but their usefulness and efficiency is only proportional to their use. It is the tendency of the workman to ignore and in some instances practically refuse to use practical safety appliances. This can only be overcome by patient education and by "lining up" the foremen.

Supervision of Employment: In all chemical plants there is a certain amount of heavy material to be handled. There are operations where the floors are wet or there is excessive humidity at times and some of the operations involve toxic or poisonous material.

The man who is naturally weak and has a tendency toward hernia should never be employed where he is required to do heavy lifting or handle heavy material.

The man who suffers from rheumatism should never be placed where there is excessive humidity nor should the man with kidney, heart, or lung trouble be placed where he will be subjected to poisons. These matters can be controlled only through supervision of employment which in chemical industry is a very important factor.

Developing Practical Operating Rules and the Proper Enforcement of Same: There are correct and incorrect methods of performing every operation, likewise a safe and an unsafe method. Therefore, it is essential that the correct methods should be set forth in the form of operating rules. These operating rules should include operating, safety, fire protection, sanitation, and maintenance practices, and should be made ironclad. Their value will be in proportion to their enforcement.

Educational Work: Though much could be said on this subject, it will be touched upon very briefly.

It is first necessary to have the man or men at the head of the organization thoroughly familiar, in sympathy with, and actively back of the safety work that is to be done. They should then definitely establish the motto that "the safe way is the only way" and through them should come the instruction, rules, and propaganda for the education of the men down the line.

Assuming that a large percentage of the accidents in industry are preventable, let us ask to what can we attribute them. In most cases they can be attributed to indifference, carelessness, oversight, ignorance or neglect on the part of someone. The responsibility for the accident in nearly every case can be placed upon the employer or the employee. Those for which the employer is responsible and a large percentage of those for which the employee is responsible could have been prevented by better mechanical arrangement and equipment or by education and supervision, as previously outlined. Here it might be interesting to compare the relative importance of these two branches of the work. A careful analysis of the two years' accident records of one of our large chemical plants, where very active educational accident prevention work was carried on but which was rather temporary in construction and not particularly well-guarded, showed that 12 per cent of the accidents could be charged to lack of guards, defective equipment, etc.—or prevented by mechanical arrangement and equipment. Twenty per cent was chargeable to lack of proper supervision and 53 per cent to negligence or lack of skill on the part of the injured for which the employer was really responsible, making a total of 73 per cent which could be reached through education and supervision. The remaining 15 per cent was chargeable to risk of employment.

CHAIRMAN FIESINGER: At nine o'clock this morning I received a telegram from Mr. Rippel, stating that due to the steel strike he would be unable to be with us.

Adjournment.

Construction Section

October 2 and 3, 1919

L. D. WOEDTKE, Chairman

Director of Safety, Fred T. Ley and Company, Springfield, Mass.

W. J. LYNCH, Vice-Chairman

Assistant to Vice-President, Thompson-Starrett Company, Chicago

EDWARD W. BUSH, Secretary

Civil Engineer, Aetna Casualty and Surety Company, Hartford, Conn.

THURSDAY MORNING SESSION

THE meeting was called to order at 9:45 A. M., Mr. L. D. Woedtke, presiding.

CHAIRMAN WOEDTKE: My report as chairman of the Construction Section is as follows:

REPORT OF CHAIRMAN

The Construction Section, as you are aware, was organized one year ago at the 1918 St. Louis Congress, and like all other sections its first year of existence has been accompanied with many problems involving membership, service to members, bulletins, publicity, program, etc.

In the coming year we shall be better equipped to continue and extend the work of our section through additional officers provided in our by-laws to be submitted to you later, as well as standing committees which will be appointed to undertake definite portions of the section's work which has hitherto fallen entirely upon your present three officers, the chairman, vice-chairman, and secretary, and the staff of the National Safety Council.

However, considerable progress has been made during the past year which you will note from the following data:

MEMBERSHIP

<i>Membership Oct. 1, 1918</i>	<i>Present Membership Oct. 1, 1919</i>
Construction Companies.....18	Construction Companies..... 29
Bridge Companies.....13	Bridge Companies..... 14
Structural Iron and Steel.....20	Structural Iron and Steel..... 24
Shipbuilding Companies.....38	Shipbuilding Companies..... 57
89	124
485	

You will note from these figures that we have secured thirty-five additional company members during the past year and that our present membership includes a total of 124 company members. This showing for a new section after but one year of existence speaks highly for itself, but this membership should be at least tripled during the coming year and it behooves all of us to interest our competitors and friends engaged in the construction industry of various lines, toward taking membership in the National Safety Council and in our section. You of course, appreciate that the greater our membership, the larger volume of income will be at our disposal for additional service to our members. Our goal should be to make our section so strong in members and financially that we may eventually be able to engage a permanent secretary for the personal service and benefit of our own section's members only.

BULLETINS

Bulletin service is of course a large factor in accident prevention work and education of our employees, and while many of the bulletins published by the National Safety Council are applicable because of their general nature for use of our members, we need continually to edit special Construction Section bulletins. The securing of material for these special bulletins has been left almost entirely to your three officers during the past year, with the assistance of the National Safety Council staff.

The Twenty-fourth Construction Section bulletin was distributed September 22. We have only one new bulletin left on hand and no more in sight at present: therefore, if we are to continue editing special Construction Section bulletins during the coming year, our members will have to send us some more material. Undoubtedly every one of you has some good bulletin material such as photographs or some specific experience in your work which could be illustrated and edited into bulletin form. If you will send us such material, we will do the work of putting it in shape.

Many of our special Construction Section bulletins during the past year were sent to members of the National Safety Council who are not allied with our section, and these special requests indicate value and approval of our work in this direction.

One of the most popular bulletins we have edited during the past year was Cn-11, "How Not to Build Scaffolds." Nearly a thousand extra copies of this bulletin have been sold in addition to the regular distribution. Other very popular bulletins were Cn-2, showing the incorrect piling of bricks; No. 14 quoting "Rules for Superintendents and Foremen"; and No. 15, "Don't Take Chances Needlessly." All of these bulletins sold over three hundred extra copies and there were seven others which sold over 150 copies outside of the regular distribution. This record extends only to August 1. and since that time there have been increased demands for many of our special bulletins.

Let me impress upon you once more the need of each and every mem-

ber sending us as much material and data as possible from which to edit and distribute special bulletins for our section.

PUBLICITY

We have striven continually during the past year to obtain as much good publicity as possible and several leading technical magazines of the construction world have given us space on various occasions, including "Engineering News Record," "Engineering and Contracting," and "Contracting." Our Secretary, Mr. Bush, will no doubt give you more specific information in this regard.

The National Safety Council staff now includes a director of publicity, Mr. Resnick, who is preparing some very good data for publication throughout the country in connection with the work of our section, and this will undoubtedly do us much good in the securing of new members and creating a keener interest in safety work in the construction field.

It is our intention to write and distribute an occasional news letter for our members during the coming year but to do this we will need material, experiences, data with regard to statistics and results obtained, from our members as well as the methods used, etc. Unless you forward us such information, we cannot, of course, create a News Letter from our imagination, as what we want to talk about in such letters is the experiences, methods, and results being obtained. Therefore, make it a point to send us promptly and as often as possible, such data as is at your command.

ADVANCE COPIES OF PAPERS

We had hoped to be able to distribute to our members in good season, advance copies of papers to be delivered at this year's Congress, but as we were able to secure only two papers in time for printing, we decided it would be better to let this matter go for this year; we will make every effort to provide for this need next year.

GENERAL

Your officers have undertaken to answer many inquiries and render special services to many of our members during the past year, with considerable success. There are, however, two or three problems yet unsolved which are being worked on and on which a special report will be made in a News Letter as soon as a definite result has been reached. For instance, the protecting of manilla ropes against the action of muriatic acid has engaged the writer continually during the past year and after locating compositions or products proposed by different concerns, arrangements have been made with the U. S. Bureau of Standards through the kindness of its director, Dr. Stratton, to make extensive tests in this connection.

The Bureau has been furnished with required lengths of various sizes of both new and used rope as well as an ample supply of the proposed composition and after tests have been made of both new and used rope, before and after being treated with the composition and before and after

being subjected to the acid and its fumes, the bureau will submit to us a complete report of its findings.

There has been considerable discussion and difference of opinion among our members as to the correct and most adequate method of recording accident statistics and data, and your chairman intends to provide twenty minutes to a half hour for a discussion of this matter at either today's or tomorrow's session when the subjects on our program have been disposed of.

It is our intention to keep the members of our section together as much as possible during this Congress and to that end the committee will provide the necessary space en-bloc for all of our members who intend to take in the Annual Banquet as well as the Frolic at the Winton Hotel.

Through the courtesy of the Builders Exchange, our members will at the conclusion of tomorrow's session adjourn in a body to the Cleveland Builders' Exchange, where a luncheon will be served and a suitable speaker for a brief address provided, followed with an inspection trip of some large construction jobs in operation, at which time demonstrations or illustrations of points or methods discussed today and tomorrow can be carried out.

Following this inspection trip, our members in a body will be conducted on a sight seeing tour of Cleveland and vicinity.

(A motion was made, seconded, and carried, to accept the report as read.)

CHAIRMAN WOEDTKE: With your permission I am going to introduce Mr. Edward A. Roberts, Secretary of the Builders' Exchange of Cleveland, to you and have him announce the program for tomorrow afternoon.

(Mr. Roberts made announcement concerning reception and inspection of building operations for Friday.)

CHAIRMAN WOEDTKE: On behalf of the Construction Section, Mr. Roberts, I would like to thank your Exchange for its courtesy and kindness and assure you that we appreciate it indeed.

(The secretary then made a brief informal report, which was accepted.

The Chairman appointed as Nominating Committee Mr. W. E. Kimberling of Pittsburgh; Mr. F. S. Robinson of Detroit; and Mr. Sidney J. Williams of Chicago.)

The Chairman of the By-Laws Committee reported as follows:

REPORT OF BY-LAWS COMMITTEE

Name

Section 1. This organization shall be known as the Construction Section of the National Safety Council.

Object

Section 2. The object of this section shall be to promote the science and practice of safety or other activities of the National Safety Council.

among those engaged or interested in, or affiliated with, the building and engineering construction field.

The Section shall at all times act in conjunction with or subservient to the National Safety Council.

Membership

Section 3. Membership shall include all members of the National Safety Council who are interested in the activities and purposes of this Section, and who shall signify to the Secretary of the National Safety Council, or to the Secretary of this Section, their desire to affiliate.

Officers and Executive Committee

Section 4. The officers of this Section shall be a Chairman, two Vice-Chairmen, the chairman of the Bulletin Committee and a Secretary who shall discharge the duties usual to such officers. These officers shall serve until the end of the annual congress of the National Safety Council, or until their successors are elected and have accepted the office. The officers shall act as an executive committee in charge of the affairs of the Section, and the assent of three shall be necessary for action.

Meetings

Section 5. There shall be an annual meeting of the members of the Section held during the period of the Congress of the National Safety Council, notice of the time and place of the meeting shall be posted at the information desk of said Congress. Other meetings of members may be held on due call and notice by the Executive Committee.

Election of Officers

Section 6. Nominations of officers shall be made by a Nominating Committee of three appointed by the Chairman of the Section, which committee shall report at the annual meeting its recommendations, which report shall be followed at said meeting by the election of officers for the ensuing year. At this meeting other nominations may be made by any members. The election shall be by plurality of ballots cast. Nominees should be selected, as far as practicable, to represent various branches of the construction field with appropriate geographic distribution.

Committees

Section 7. The Chairman shall appoint the chairman and members of a Bulletin Committee and such other committees as may be authorized by the Executive Committee or requested by the National Safety Council. The Chairman of the Section shall be a member of all committees of the Section except the Nominating Committee.

Amendments to By-Laws

Section 8. These by-laws may be amended at any meeting of this Section.

(The By-laws as read were adopted.)

CHAIRMAN WOEDTKE: It gives me pleasure to introduce to you, Mr. F. L. Hurlbutt, of E. I. du Pont de Nemours and Company.

IS ACCIDENT PREVENTION IN CONSTRUCTION A SOURCE OF PROFIT OR A HOBBY?

F. L. HURLBUTT, E. I. DU PONT DE NEMOURS AND COMPANY,
WILMINGTON, DEL.

The title of this paper would lead one to infer that serious doubts are entertained by some people as to the worth of accident prevention in the construction field. Certainly every safety engineer is aware of the almost limitless possibilities for accident prevention in this field. If any such persons do exist, I feel positive that they are numbered among those who have never made an honest attempt to try it out in their own work or those who have never seriously looked into the subject. It is to the latter that I trust this paper may open up a new field of thought and act as a stimulus toward the starting of accident prevention work in their own companies.

The writer proposes to treat this subject from the data and experience of the construction forces of the Du Pont Company which he represents, due primarily to the fact that the war has made such exacting inroads on the time of all in this organization that little opportunity has presented itself to get in touch with the activities of others in the same field. I trust therefore that you will pardon the continued reference to the Du Pont Companies' endeavors.

In the Du Pont Company, safety on construction work is divided into two distinct branches; namely, home office and field work, each of which is in such close contact with the other as to benefit by the other's experience and ideas.

WORK OF HOME OFFICE BRANCH

The work of the home office branch covers cooperation with the design division of the Engineering Department in the initial stages of all contemplated construction work and later with the drafting-room forces when actual drawings are being prepared. Close contact with the design division is absolutely necessary in order to get preliminary data on manufacturing processes involved in which there may be industrial poisoning hazards, the necessity for ventilating systems, the possibility of explosive hazards necessitating proper barricading and separation of buildings and quick escapes for operatives; in short, all such important points as require special investigation and decision before judicious recommendations can be made to the drafting-room forces. By conference with members of the design division all these points are threshed out and decisions reached, so that no delay is experienced when the work has gotten on the drafting boards. Too great stress can not be laid on the importance of carefully reviewing all projects for safety in the de-

sign or formulative stage. This is particularly true when construction work is to be done for such highly specialized industries as the chemical, steel, and explosive branches. At this stage the incorporation of the necessary safety and health features can be included at about one-third the cost of doing them than as additional work after the job is completed. Furthermore they can never be done as satisfactorily or made as effective when done afterwards due to the layout of apparatus, equipment, stairs, and elevators within the buildings. One member of the safety office is detailed to the drafting room to check drawings for safety and to advise the draftsmen on the application of the safety standards where complicated situations arise or where unusual conditions make deviation from the standards necessary.

The review of the contemplated work and the check in the drafting room are in the main to cover structural plans and layouts of equipment for safety and not the mere noting of locations for safety devices which is primarily a field job. To insure the inclusion of this work in the finished job a formal note is placed on every drawing stating that all equipment is to be guarded in accordance with the standards, thereby giving the field engineer authority to carry out this work and at the same time freeing the drawings from a mass of notes and sketches of machine guards.

The actual installation of safeguards and safety devices by the field engineering forces in the case of large undertakings is supervised by the safety engineer assigned to that particular construction job and in the case of small jobs by trips by members of the home safety office.

FIELD SAFETY WORK

This brings us to a consideration of the second phase or actual field safety work. On all projects requiring a field force of 500 men and upward it has been found not only desirable but essential to include on the engineering staff a safety department, the personnel of which must be varied as conditions dictate, from a single man to as many as eight men devoting their full time to safety, supplemented, if necessary, by an injury clerk and accident investigators with adequate clerical and stenographic help to maintain full and accurate records of all injuries. Such a department as this last may seem unnecessarily large but I want to assure you that on our two largest construction jobs where such departments were maintained, the members were about the busiest individuals on the ground. Not only must physical inspections be made of the work under erection, the unloading and piling of vast quantities of materials, inspections made of railways, cranes, tool rooms, and what not, but educational safety for the field forces must be carried out, accidents investigated in order that preventative measures may be applied and full data surrounding the accident secured. Thorough accident investigation has proven of enormous value and is one of the most important duties of all our safety departments. As in all professions, an accurate determination of causation will generally bring to light the proper remedy.

Up to this point I have dwelt at considerable length on our manner of

working safety into a job from its inception in the home office until it has reached the field, and I have briefly outlined to you the kind of an organization by which we carry out safety work in the field. I now want to show you how the carrying on of safety work through complete field organizations has justified itself and what enormous dividends it has returned in actual cases.

SAFETY ORGANIZATION FOR LARGE CONSTRUCTION PROJECT

In the early part of 1918 the Company undertook its largest construction project; namely, the complete design and erection of a smokeless powder plant for the United States Government. Some idea of the magnitude of the undertaking may be gained from the fact that an average working force of 25,000 men was maintained. Like all war projects this was a rush job and had to be carried out in the face of the very serious labor shortage and consequent high labor turnover that existed at that time.

At the outset the question arose as to how safety and injury work should be handled. Two courses presented themselves. First, to carry liability insurance with an outside company and waive any further responsibility in the matter, or second, to carry our own insurance and organize a complete safety department to carry on accident prevention work. The former scheme might have been adopted in view of the difficulty of getting good safety men on short notice at that time, but the excellent results attained on our other big jobs completed prior to this country going to war justified our pursuing the latter course. As a result a safety department consisting of a safety engineer, an assistant safety engineer, seven inspectors, a personal injury clerk and assistant, two accident investigators, and five stenographers was organized. As in the case of all successful safety work the resident engineer gave the department his unqualified support and "put safety on the map" from the start by stating his stand at the weekly staff meetings and seeing to it that his division engineers were carrying out their share of the responsibility of accident prevention. This he was able to do through the daily accident reports forwarded him by the safety department. The policy of carrying out safety work through the organization rather than allowing the safety department to do it all was the basic principle followed. Meetings of the division engineers and their assistants were always attended by a member of the safety department who showed the results accomplished and brought up points to be rectified. Again, foremen's meetings were held in the various divisions at which the division engineers put the proposition of safe working conditions for the men and accident prevention squarely up to the foremen. And right here let me digress for a moment to emphasize the importance of the foreman in any accident prevention work no matter whether it is an operating or construction job. Only when your foremen are whole-souledly behind the safety movement which you are pushing will you effect permanent accident reduction. These men are the most important factors in your campaign and the bulk of your efforts should be directed to

wards winning them to your ideas. You look to them for the desired speed of the work and for its quality; why then should you not look to them for the safety of the workmen entrusted to them? But to return to our subject. Without going into too great detail on the methods followed by the safety department suffice it to say that the department, in addition to the educational work carried on through engineers' and foremen's meetings made daily physical inspections of the work, posted thousands of bulletins and superintended the installation of over 3,500 safeguards for mechanical equipment.

The injury department through its investigators investigated every accident and submitted complete reports on them. The result was that the number of court cases resulting from injury was very, very small.

This is a phase of safety work on construction in non-compensation states which, if carried out effectively, pays a handsome return. If all accidents are reported and immediately investigated and the injured brought to the hospital for treatment, the likelihood of the cases being taken to court is greatly minimized. It only takes about one or two court cases where a verdict is rendered in favor of the plaintiff, to pay the entire cost of a safety department on a fair-sized job.

Some of you will say that it must have cost a good deal of money to maintain such a large organization. It did, but remember, too, that this was a big job. Now let me show you the results accomplished.

On March 23, shortly after the start of construction activity, the safety engineer arrived on the job and began building up his organization which had by the latter part of April assumed working proportions. By this time the department had started an effective, organized safety campaign with the following results. During March and April, the period of organization for the department, the "lost-time rate" expressed in days had steadily increased until it stood at 2.27 days lost per man per year. By May 31, one month after safety activities had been prosecuted in earnest, this figure was reduced to 1.28, the next month saw it lowered to .744, the following month it stood still, but the next month saw a further reduction to .684, then came a drop to .351. In the next thirty days we find the only upward trend in our curve, when the figure went up from .351 to .441, really an excellent figure in itself. But again, with the last month of activity, we find the downward tendency resumed with the result that the lowest figure of all was attained; namely, .216. Reflect for a moment what this means. In the seven months of the safety department's activities the lost-time rate had been reduced from 2.27 to .216, a 90 per cent reduction which is truly a remarkable record, when you consider that it was made in the face of a very high labor turnover and with a working force almost entirely new to the Company. The total frequency rate calculated on the annual basis after the federal practice was 58.9. The fatality frequency rate calculated on the same basis was 1.0.

In order to show what this really means to those who are unfamiliar with accident statistics, let me use another illustration. When this gigantic project was first conceived a rate was quoted the Company for

carrying liability insurance on all the construction employees. Using this rate the cost of insurance against injuries, both fatal and non-fatal to the Company would have been \$452,752.00 as against the actual cost of \$66,161.00: which includes hospital costs, doctor's salaries etc. a saving of \$386,651.00. Deduct from this the cost of maintaining the safety department, \$50,000, and we have a net saving of \$336,651. On the construction of a large shell-loading plant where similar safety efforts were carried out by the Company though not on quite as large a scale equally impressive figures are available. Here the success of the safety work resulted in the actual cost of injuries being but \$5,733.00 which includes hospital costs and doctors' salaries, as against a figure of \$103,545, had we chosen to carry liability insurance with an outside firm. This gives a saving of \$97,812 from which the cost of maintaining the safety department, \$10,500, must be deducted giving a net saving of \$87,312. Here the total frequency rate was 47.8 and the fatality frequency rate was zero. Please understand that the figures quoted are meant in no way to deprecate the practice of carrying liability insurance. Most assuredly such a policy is a meritorious one on small and good-size contracts, but when an undertaking assumes such gigantic proportions as did the construction of the Government powder plant just mentioned, one is faced with a proposition which could never be as satisfactorily met by any outside agency as by a department which is a part of and co-ordinating with the contractor's own organization.

To digress a moment from monetary savings, let me relate an interesting accident prevention story that occurred in connection with the powder plant construction and one which carried good evidence of whether real safety work pays on construction. In May, 1916, during a temporary lapse in construction activities in his particular line, one of our best construction engineers was made safety engineer on one of our largest plants, where an average operating force of 12,000 men and a construction force of 700 men was then being maintained. For two years he acted in this capacity and became a real convert to the safety cause. When construction work was started on the Government powder plant, this individual was made a Division Engineer in charge of the "Miscellaneous Division" which comprised a force of from 2,500-2,800 men. This was exactly the opening he wanted—an opportunity to practice as an engineer on construction what he for two years had been preaching to other construction engineers. Were his preachings vindicated? His record will answer that question. From March 16, 1918, to Sept. 1, 1918, his working force of 2,500-2,800 men had but one major injury.

To many of you such examples as I have cited may seem to be of such an unusual character and the work carried on under such abnormal conditions that it is not fair to use the results obtained therefrom in arriving at a decision whether safety work pays on construction. To allay any such doubts let me tell you of the accident prevention work and safety campaign with the excellent results attained which has been carried on during our construction of a large chemical plant these past eight months.

FOREMEN RESPONSIBLE FOR SAFETY WORK

This construction was under the direction of a resident engineer with ten assistant engineers on his staff. The average number of full time workers employed, using the Federal basis of calculation, for the first eight months of the year was 692. Directly under the resident engineer was a field safety engineer with an assistant and one man acting as an accident investigator, clerk and stenographer. In outlining the safety campaign it was decided to try two schemes, both of which were new to us on construction work. These schemes differed only in application, the basic thought behind both being to hold the foremen and general foremen responsible for carrying on the safety work with the safety department functioning in a stimulating and advisory capacity to the engineering organization and foremen.

The construction was divided into two divisions, which, for convenience in explanation, we shall designate as "A" and "B".

In Division "A" there were scheduled foremen's safety meetings twice a month for the various crafts, each meeting being presided over by the general foreman of that particular craft and attended by the safety engineer solely in an advisory capacity. This division had a safety committee made up of its seven general foremen, one of whom was appointed permanent chairman and another secretary by the division engineer. The personnel of the committee was not rotated. Every other Saturday afternoon from one until three o'clock they made a safety inspection of the construction work in their division and submitted a written report of their findings to the division engineer with a copy to the safety engineer.

In Division "B" there were scheduled weekly safety meetings of the foremen and general foremen of all crafts in this division presided over by one of their own number and having a secretary appointed by the division engineer. This division had three safety committees of three men each—each man serving six weeks, with one man being dropped every two weeks and a new member appointed by the committee chairman who was elected by ballot. These committees made inspections every two weeks of the construction work in this division and submitted written reports of their findings to the division engineer.

THE SAFETY HOUR

After the two schemes had been tried out for five months it was seen that the first or meetings of crafts was not as successful as the second in which the foremen and general foremen of all crafts met together. This was attributed to the fact that each meeting was too small, there being only six to ten foremen at a meeting and also because the competitive spirit shown at the meetings of the various crafts was entirely lacking. As a result a reorganization covering the entire construction was effected along the lines of the second scheme wherein the foremen and general foremen of all crafts held a safety meeting at a regular hour on the same day of each week. This particular time every week came to be known on the job as the "safety hour."

The procedure followed at these meetings is of interest.

1. Roll call—(attendance averages 90 per cent; 10 per cent absent due solely to rush work).
2. Reading of minutes of last meeting—(copies go to Resident Engineer and Home Safety Office).
3. Safety Committee Chairman reads inspection report which is followed by open discussion.
4. Chairman asks for any suggestions.
5. Safety Engineer gives brief talk on current accident news; and the length of time which the various crafts have gone without accident.
6. Frequently an injured man is brought in to the meeting to tell in his own words how he was injured.
7. Every third meeting a speaker from the outside is secured to give a short talk on some particularly interesting phase of safety work.

The safety engineer always made it a point to give assistance to the Chairman outside of meetings so that he could keep them going smoothly and in the proper channels. The safety engineer's stenographer recorded the minutes and acted as Secretary under the new scheme. At all these meetings the safety engineer kept himself in the background as much as possible, but he was ready, should discussions lag or subjects be found wanting, to start something new and keep the meeting alive. In all the meetings held he had occasion but once to take the initiative. The great virtue of these foremen's safety meetings was to give safety work a serious place in the workmen's eyes.

Although the safety committees submitted written reports of their findings at the next meeting and copies went to the resident engineer it was their endeavor to take up on the spot with the foreman affected—not with the men—all points needing correction. In the majority of cases this was possible, because on construction work a foreman is generally to be found near his men. Of prime importance was the follow-up of the committees' reports subsequent to the meeting at which they were presented and prior to the next meeting at which the status of the recommendations was always given. Nothing will kill a safety committee's interest more quickly than to see no action taken on its recommendations. The safety engineer made this follow-up and went directly to the division engineers, when necessary, to see that the recommendations were carried out. When a recommendation was turned in which it was impracticable to carry out, the safety engineer had the division engineer come to the next meeting and state frankly why it could not be done. Frequently this resulted in some excellent discussions.

You need have no fear of construction safety committees swamping you with a lot of impossible suggestions bearing on structural changes. On the contrary you will find that their recommendations bear chiefly on safe working conditions as applied to ladders, scaffolds, shoring, walkways, tools, and equipment. In this respect, we have found our construction safety committees far more practical than those used on operations. But let me caution you in dealing with your committees to be absolutely frank and always acknowledge their suggestions with honest

reasons, if you find it necessary to turn any of them down. We have also found that the men appreciate a designating mark for their service on the committee, so we give them a safety committee emblem.

Again on this job the effectiveness of the safety work was shown in the difference between the actual costs including compensation, plant hospital maintenance, doctor's salaries, and the cost of maintaining the safety department, amounting to \$8,695 for seven months as against the premium of \$16,768 which we would have had to pay on employees' liability insurance carried outside—a net saving of \$8,073 for the period. An average annual frequency rate of 100.1 and an average annual severity rate of .50 calculated on the Federal basis was maintained for the first eight months of the work. I regret that the September figures are not yet available.

In concluding this paper I want to add just one more fact vindicating the worth of safety work on construction. During the year 1918 our injury records for the entire construction branch of the Company were lower than those of any one of the four operating branches where safety work was prosecuted just as diligently as on construction.

Gentlemen, the accident prevention field in construction is practically a virgin one, and if you will but take the time to investigate what has been accomplished by those companies who have undertaken activity in this field, you will be fully convinced of its worth.

DISCUSSION

CHAIRMAN WOEDTKE: Gentlemen, I do not believe there is any doubt now in the minds of any of those present, if there was any in the beginning, that accident prevention is not a hobby but is a source of profit and something well worth while. Mr. Hurlbutt has covered that field in a splendid manner.

MR. F. A. DAVIDSON (Westinghouse, Church, Kerr, and Company): Mr. Hurlbutt spoke of ladders and scaffolding and the different tools you work with. Do you follow the old methods or do your engineers plan other ladders and other scaffolding different from what you used formerly?

MR. HURLBUTT: We have improved on our early construction work. We came to the conclusion before the war, before the United States got in it, that the only way to handle the ladder situation successfully was to prohibit the manufacture and use of home-made ladders on the job, and to purchase ladders from the outside. But that doesn't solve the difficulty. One of our construction engineers bought through a local concern a number of outside company ladders all of which came up to our own specifications so far as rungs, stringers, etc. went, but when the ladders were delivered it was found that practically all the stock in the stringers was cross grain stock. As a result, of six ladders bought as a test, four broke in three weeks on the job.

In short, if you are going to buy outside ladders and not make your own, buy the best. We can prove to you from our own figures that to buy the best ladders is cheaper to say nothing of the safety involved.

MR. A. E. DAVIDSON (Chesebro-Whitman Co.): Do you use what is called the cleat ladder, or slat ladder?

MR. HURLBUTT: We haven't bought any cleat ladders from outside manufacturers.

MR. J. L. NAYLOR (Manitoba Bureau of Labor, Winnipeg): Frequently in our construction work, for the main ladders on a building they will construct big double ladders. The upright is commonly made of two by six, or two by eight, or even heavier, and the cross slats are usually made of two by four material. Do you ever use that?

MR. HURLBUTT: Perhaps I should have qualified my statement when I said we purchased outside ladders. On some jobs we have done just what you said. On the ladder going up the scaffolding we have used two by six, and in some cases used three stringers. In some cases we have notched the rungs into the stringers, and in some cases put a strip between the rungs on the stringer.

MR. A. E. DAVIDSON: I would like to ask Mr. Hurlbutt if, in his work, they have tried workmen's committees.

MR. HURLBUTT: As I told you in the case of this chemical plant, which I gave figures on, we didn't use workmen's committees but we used foremen committees, the idea being in our safety work to try to work through the organization and not at the men, exactly the same way you work through the organization for your desired quality, and your speed. In other words make safety a part of your undertaking, not a separate distinct phase.

CHAIRMAN WOEDTKE: The next speaker has a topic which is most interesting to all of us, especially to those of us who have been trying to get safety on the map in the construction field. You hear it said sometimes that it isn't much of a trick for a big contractor to put safety on the map in his organization, it is a good thing for him to do from a dollars and cents viewpoint, or to reduce rates. The medium sized or small contractor will often say, "That stuff is too deep for me."

What we want to get over and get over thoroughly, and it is going to be some task and it will need every one of us to get it over, is to convince the little fellow, or the medium sized contractor, that there is a place for him in that field. Mr. Rutherford, who will talk on that subject, is a local builder in Cleveland, a gentleman who has come in contact with all kinds and types of contractors and who is well qualified to cover this subject.

IMPORTANCE TO THE CONTRACTOR OF PREVENTING MINOR ACCIDENTS

GEORGE A. RUTHERFORD, PRESIDENT, THE GEORGE A. RUTHERFORD COMPANY,
CLEVELAND, OHIO

Safety authorities tell us that 80 per cent of accidents are caused by carelessness. To prevent carelessness it is necessary to promote caution and vigilance. This being admittedly the case it should be the purpose

of any discussion of the subject to suggest ways and means by which carelessness may be reduced and caution and vigilance increased.

As you understand, this paper is to deal with the minor class of accidents rather than with the larger and as many persons may think the more important class. This fact should not cause any one to presume, however, that the study of smaller injuries is of minor importance. Just as in the realm of disease many ills at first regarded as unworthy of even passing notice, if neglected may lead to very serious developments, so in the handling of accident cases the experienced adjuster of claims recognizes that no injury however slight can be overlooked either from the standpoint of the injured person or of the one responsible under the law for safeguarding employees. In a recent report of the Ohio Industrial Commission the statement is made that cases of fractured skull resulting in permanent total disabilities are not infrequently diagnosed as scalp wounds. The same report says that fully half of the recorded cases of fractured vertebrae were treated as "sprains" or "bruises" for weeks or months before the X-Ray revealed the true nature of the injuries. To be more comprehensive, the report declares "Few cases of either permanent total disability or permanent impairment of members were recognized as such within eighteen months after the date of the accident."

The importance of paying attention to the smaller accidents is further emphasized in the broadening scope of most state compensation laws in manifesting greater liberality toward the injured person. Formerly compensation was rarely paid, for instance, for the impairment of one eye because it is seldom possible to prove direct lessening of earning ability by the impaired vision of one eye. However at the last session of the Ohio legislature the law was amended to grant compensation under this condition. Still further argument for using every precaution to avoid even seemingly trivial accidents is found in the extension of the merit-rating system by the Industrial Commission of Ohio so as to provide for a return in the form of a credit premium of ten dollars of every one hundred dollars a subscriber may save the state fund below the ratio of the basic compensation allowance and credit premium factor prescribed for his operations. This has the effect of establishing a preferred plus rating for every industrial risk that is able to produce a preferred plus experience. This new plan becomes operative against expirations occurring on and after January 1, 1920, and will apply retroactively for the preceding six months insurance period. Thus a more direct financial incentive than heretofore is brought into play as an inducement for employers to cooperate with the fund.

As for the classification of accidents of all kinds it is significant to observe from a recent Ohio report that of a total of 359 cases, 220 were of fractures, indicating the comparative frequency of this kind of accidents. Among the other large factors in the claims considered by the State Commission were the loss of eyes or the loss of fingers or toes. While no statistics are at present available to show which particular industry is chargeable with these unfortunate mishaps it is certain that the building industry is responsible for a considerable share.

PREVENTION MEASURES ON BUILDING WORKS

It is difficult to produce anything that is new in accident prevention. About the best that can be done is to reiterate well-known methods and perhaps by repetition keep them constantly before the public with resulting emphasis. In brief I would recommend the following as prevention measures on building work:

First: A closer contact by contractors with their men with a view to personal education in safety rules. Impress upon superintendents and foremen their responsibility for the safety of those who labor for them, the necessity of warning them of danger and also to impress upon them the necessity for scrupulous care in handling appliances and tools.

Second: A periodical inspection by the contractor or his superintendent of daily used appliances—such as ladders, ropes, tackle, hoists, mixers, and other machinery.

Third: The insistence upon keeping all jobs free from debris, which is one of the greatest causes of small accidents.

Fourth: Making it compulsory that all openings in floors be immediately provided with railings; that all staging, especially where bricklayers and masons are working, should be provided with toe-boards or screens to prevent falling of brick and other material.

Fifth: The display of "Safety First" signs on every building, printed in foreign languages as well as English. These signs in addition to being a constant reminder to workmen, would also serve a like purpose to the employer.

Sixth: The distribution, at frequent intervals, of circulars or small cards to be inserted in workmen's pay envelopes. Various brief exhortations may thus be taken without offense. To use every effort, not only to avoid accidents themselves, but to assist others in doing so. This latter may be done by the prompt reporting of any defect in or about a building that may lead to an accident. How often do men continue to be in danger after they fear something may happen until it actually does happen and then declare "I was afraid of that all the time" or "I told you so."

There is no doubt need of an awakening of interest in this very important matter. May it not be that employers are being lulled into a sense of security by the fact that come what may the state or the liability companies will take care of their troubles. Those who take this position should remember that financial compensation for an accident is only poor recompense at best and that the element of human sympathy and interest in the welfare of employees are factors that should not be overlooked. From a purely selfish standpoint this is the better policy as injuries may not only weaken the employer's ability to achieve his greatest success but a business reason is apparent in the reduction of premiums if his experience is found worthy of such recognition.

GROUP ORGANIZATION FOR SAFETY

It probably is not possible for those in the building trades to deal with the subject as well as employers having all their employees under one

roof with first-aid and welfare department well established, and it obviously is not possible for the average contractor to employ a safety engineer, but in all cities of any size there are associations of employers in the building trades and it would be practicable and possible for these groups of employers to provide a safety department in charge of an expert safety engineer who would be a member of the National Safety Council, and whose duty it would be to gather and disseminate information on safety matters among members of the association, to provide for periodical inspection of jobs including machinery and equipment, to make reports and recommendations directly to the members, to provide posters, safety signs, etc., in fact to do for the group of contractors what the safety engineer of a large contracting company does for his corporation.

I am told by one safety engineer, who is present at this meeting and who represents a large contracting firm, that in three years his company has by these methods, improved their rating in three states with the liability companies to such an extent as to result in a saving of 33 per cent in premiums paid last year. If the safety engineer for one company can accomplish this, why is it not possible for a group of contractors to obtain similar benefits in a financial way, and at the same time prevent much human suffering.

DISCUSSION

MR. F. A. DAVIDSON: Mr. Rutherford tackled one of the real problems in the latter part of his paper, and I have been thinking it over and I almost think he has solved it. The small contractor can not employ a safety engineer, but a group of them in a town can have one.

MR. HURLBUTT: I would like to ask Mr. Rutherford whether the cost of carrying on safety work has kept you from going into safety work to any extent, or whether it is because the majority of the builders are ignorant of its possibilities.

MR. RUTHERFORD: I don't feel that the matter of safety work has been brought to the attention of contractors in this locality at all. I have been in touch with most of the builders' organizations and I have never heard of the Safety Council myself, only occasionally through the papers, and didn't know there was such a thing as a Construction Section, but I think it would be of great interest and importance to the contractors.

CHAIRMAN WOEDTKE: One thing I can say that would help you out in this matter. I am not a safety engineer at all—that term is too much abused; I prefer to call myself Director of Safety. We don't have any safety engineers but we do make the insurance companies who cover us, inspect the work. All the insurance companies have high class safety organizations. They study this game all the time and it is to their monetary advantage to help you reduce accidents.

I have inspectors from the insurance companies inspect our jobs once a month, and on large jobs, twice a month. I take his recommendations and send a copy right back to the superintendent, giving him forty-eight hours to carry out those recommendations or advise me specifically where they are impractical. Ninety-nine times out of a hundred he carries them out, very rarely does he say that it can't or should not be done. You

gentlemen want to remember that you don't need hire a man for that purpose, every one of you have some bright young fellow in your office, or your field, who can take this safety work on too. Don't get discouraged and think you have to hire safety men. Out of the four thousand firm members of the National Safety Council, I don't suppose over five per cent have safety engineers.

MR. S. E. RICHARDSON (Department of Labor and Industry): My work is investigating accidents throughout the western part of Pennsylvania. Have you a code or standard in the State of Ohio for digging deep ditches, and things of that nature? We have had a lot of accidents from that very cause in Pennsylvania.

MR. RUTHERFORD: I think it is up to the contractor. Of course, we have the factory inspector and that is about the only inspection that has come to my attention. They come to the shop and see that the machinery is provided with all the necessary guards; I have never seen them inspecting out in the field on mixers or hoists.

MR. RICHARDSON: I had a very bad case at Neville Island, Pittsburgh. Two young colored fellows were sent down eighteen feet into a ditch that was being dug for a sewer. They were sent down with curbing, one two by ten every six feet. Those boys were buried alive in there and were in that hole five hours before they could get them out. Falling material is another thing that we have had a lot of trouble with. We have a state standard passed by the Industrial Board but we haven't got it working yet the way it should be.

CHAIRMAN WOEPKE: I am now going to introduce to you Mr. C. M. Talbert.

PROTECTING THE PUBLIC AGAINST ACCIDENTS ON NEW BUILDINGS

C. M. TALBERT, DIRECTOR, DEPARTMENT OF STREETS AND SEWERS,
— St. Louis, Mo. —

I have found with several years of experience that contractors are a fairminded group of men, and that they are willing to coöperate if given a fair chance. The contractor after all is a man who has about as much humanitarianism as any of us and is perfectly willing to do anything if he can be shown it is the proper thing to do and not unreasonable. I have found, too, that the difficulties we have are with the small contractor, the large contractor gives the least trouble we have in carrying out suggestions for the protection of the public.

In getting up this paper I had first in mind how many accidents had happened. I have two men who are almost constantly on the down town streets. It is a peculiar situation in St. Louis; our police force is not a city force, but a state organization. Consequently the handling of traffic and the protection of the public in handling materials, and protection of every type is not done by the Department of Police but by the department that has charge of the highways. I asked these two men in charge of this district to first ascertain how many accidents had happened in

the last two years. The first report that came in said there had been no accidents. I thought surely within the past several years there must have been somewhere a record of the accidents which occurred on building construction. So, I asked them to consult the coroner's office, and different places, and make a list of all the accidents which were fatal. Very much to my surprise and still more to my gratification I found there had been no accidents, during those several years. There have been a number of accidents in outlying districts, places we didn't look for them, places where we had not been giving care and supervision we thought necessary. We found then that the down town district had no accidents of any type but there had been quite a few suits against the city and against contractors outside this district. Why they occur in one place and don't in another I will try to show you.

In the wrecking of buildings, construction of buildings and excavations adjacent to public highways, excavations including conduits, sewer mains, sidewalk construction, etc., I found that the accidents that might happen to the public were of the following general nature: Falling of material overhead; dropping of material being hoisted; stepping into unprotected openings; stepping on nails, glass, etc.; and for the pedestrian, collision of pedestrians when passageway is narrow; collision with supporting columns:—those, so far as I was able to tabulate, comprise almost entirely those things to which the public is liable. Now we have governing those things but one Ordinance I have been able to find, and that is the ordinance that requires canopies protecting the sidewalks to be erected for buildings more than four stories high and I don't believe I have been able to use that ordinance in the past five years.

In other words our protection to the public is not a matter of law but common sense application of those things that both the contractor and those responsible deem proper and advisable.

I am going to have these slides run through as rapidly as possible. These are taken from our photographs which were meant to illustrate the suits brought against the city. Most of them will not need an explanation.

SLIDES ILLUSTRATING SUITS BROUGHT AGAINST THE CITY

This particular one is hardly representative of the conditions. The rough looking canopy in front is meant to show the protection that was placed there to keep water from off the walk, not so much as a matter of safety but as a matter of convenience so the dirty water would not fall on the people.

Another common cause of trouble is placing the building materials in the street and leaving them unguarded. The small rack at the right hand is meant to hold a lantern. No accident occurred at that point and it is merely given as an example of building material on the street.

Bear in mind that these first are not considered satisfactory. It is our endeavor to keep all advertising off the side. If a man puts up a proper type of protection and the type of protection we think is best, we allow him to put his name on it.

CHAIRMAN WOEDTKE: What are those bulletins?

MR. TALBERT: Those were theatrical bulletins, and had to be removed or further permits would be refused. If the contractor has been difficult to control, the next time he doesn't get any permit.

CHAIRMAN. WOEDTKE: Would you refuse any safety bulletins, if that is the most advantageous point?

MR. TALBERT: We would go just a little bit further and make it obligatory, bearing in mind it wasn't an advertisement. We don't want the town to become littered with billboards to make it look like a circus, and we ask the contractor to cooperate with us and we meet him very frankly, and we feel to our mutual advantage.

That one readily shows its own story. The bricks were piled too high and not straight, some boys climbed up on the pile and were injured, and they had a damage suit against the city and the contractor. If that had been a down town district, we would have had an inspector to see that the brick were piled in rows.

This next one is an accident where the person tripped over a board projecting from the building. More careful supervision of the placing of the building material would have been the proper thing, to keep the passageway open. That board caused a combined damage suit against the city and contractor.

This is another almost identical with the first, in which the old brick were piled insecurely, some boys climbed on them, they collapsed, and I believe it resulted in a broken leg.

In that one, the office building was satisfactory, but the sign question again came up and we had the entire office building removed and took away the contractor's privilege of any use of the highway. This was done in case it should be brought into court.

There is one which pretty well tells its own story; building materials scattered along the sidewalk, boards insecurely placed. I don't recall whether or not that resulted in a damage suit but I believe it did. These photographs resulted in practically all cases, in throwing the blame on the contractor.

That is the down town district in which the conditions seemed to justify the stopping of all sidewalk traffic. The construction demanded a tower on the sidewalk. We never ask the contractor to meet impossible conditions but we ask him to place towers and pile material inside the building, if it can be done without extraordinary expense. If it can't be done we will close the walk, and we see he takes the precautions that we think he should.

There is an example of construction work in the down town district in which it was absolutely necessary to place the office building structure on the sidewalk space. We elevated it to make the pedestrian passageway.

There is a matter which you are all familiar with; I consider that unsafely guarded because there is but one red lantern on the outmost projection. The next time he came in for a building permit no further permit would be given until we were satisfied he would take reasonable care of his material on the highway.

There is an example of what I mentioned a while ago when I said

the proper coöperation with the contractor would permit us to allow him to place his name on the boards. That canopy was put up in the best shape and he availed himself of quite a good deal of storage space by putting in complete plans to the city, showing joists, girders, columns. We examine the plans and then issue a permit to load it up to so much per square foot. I consider that to our mutual benefit and with absolute protection to the public.

Here is another example of an enclosure. There is nothing particularly interesting about that, it is an excavation which we required to be protected by a high board fence. An open gate in a place like that is an invitation to the public to stop, look, and listen. If they would do that as much on railroad tracks as they do on buildings under construction there wouldn't be so many accidents.

That picture is an excavation in an outlying district. I have seen several examples here in Cleveland where excavations went to the curb line—we require them to provide a pedestrian way in the street.

This is a down town district. The interesting point is that at the top they were raising that building one story and we allowed the contractor to put a protection at the top floor.

There is a building which was wrecked recently in which we found it necessary to close the sidewalk during the wrecking of the upper stories. It is merely typical of some of the down town conditions. When we had to wreck an old building in a retail district we found it necessary to close the sidewalk during the time it was coming down to the second story until all the material was out of the building line.

There is a pedestrian way over a very deep excavation that was over a combined sewer and railroad track and is merely protecting the public on that type of construction work.

Now those, as I say, are merely meant as examples of the every day condition that we meet and, to my mind, emphasize that the public can be taken care of whatever the circumstances may be. If you have the proper coöperation of the contractor and the public, and these things can be done without unreasonable cost to the contractor, I think it is a good investment for him because it relieves him of a great deal of responsibility. If we give these things fair thought and consideration and can present a fair plan, it is much easier to defend a case in court on the part of both the city and the contractor. I was only able to ascertain one action in the down town district. One lady tripped where the nails had been allowed to work up and the case was settled for ten dollars, I believe.

CHAIRMAN WOEDTKE: Bulletin No. 8 of the Construction Section that was sent out sometime during the past year illustrates some of those things that Mr. Talbert has discussed.

Is there anything you want to ask?

DISCUSSION

MR. J. L. NAYLOR (Manitoba Bureau of Labor, Winnipeg): I would like to ask Mr. Talbert what means he takes for protection of the public

against falling of the booms on boom derricks. Do you fence off the street to a distance equal to the radius of the boom when in a horizontal position?

MR. TALBERT: We do one of two things. If there is any element of danger of falling material or falling booms, we ask them to do their hoisting within a specified time and during that time we put officers at the street intersections and stop traffic. That is the only way to do it. We give them an hour in the forenoon and an hour in the afternoon.

MR. NAYLOR: Suppose it is a question of laying heavy stone where one hour would not be sufficient to do very much.

MR. TALBERT: We have figured that the dead weight of the stone would be enough to break the fall of any load taken up, and we have practically daily inspection of the hoisting rigging itself. But if there is any unusual thing, iron columns, or anything like that, then we stop traffic during that time. In other words we would much rather cause inconvenience to the public during any limited time than to take a chance on some one being injured. We even stop street cars; it would be a calamity if one of those beams should fall on a street car.

MR. A. E. DAVIDSON: Is there any law governing sidewalk bridges?

MR. TALBERT: When buildings are over four stories in height they must put a canopy over the sidewalk.

MR. DAVIDSON: Until a few years ago in the city of New York, they worked as you did in St. Louis, then Mr. Rudolph Miller came in and sent out specifications and plans of bridges that are put up now in every place they are needed and the public is protected. The contractor has a fine place for storage and in my opinion it pays the contractor and it certainly is much safer for the public.

MR. TALBERT: I think you must take into consideration the use the public have of the walks. I know of a case in which a man erected an eight story building at a corner where on one side there was considerable pedestrian traffic, and on the other side there wasn't much. In that case we closed the street, which was comparatively narrow. In other words, there is no reason why the public who used that street should have a canopy on the busy street and leave it off on the other, so we closed the busy street and let them use the side street on the theory that it would cost four or five hundred dollars to erect the canopy. In those matters it is cooperation and common sense rather than carrying out the ordinance. The ordinance to my mind should be held as a club, however, if necessary to make them do it. I have told them repeatedly that whatever their difficulty is we will help them out.

CHAIRMAN WOEDTKE: Mr. S. C. Hill, of the Engineering News Record, has been a very kind and good friend of this baby section. He came out to St. Louis last year and sat through our two sessions and has given up valuable time in coming here, and I will ask him to say something to us.—Mr. Hill.

NEED FOR PUBLICITY WORK

MR. C. S. HILL: Mr Chairman, I will take a very few minutes because you have business much more important. I have watched the growth

of this Section very carefully. The great thing that you need today is publicity in the sense of informing contractors of the country that there is this section in this association. The technical papers can do something in aiding you to get that publicity, but it strikes me that there should be some arrangement made by which the section can circularize. The contractors of the country can be sent this matter in the way of letters or short circulars telling what the purpose of the organization is. It has been mentioned several times here this morning by men who have spoken, especially the contractor from Cleveland, that he didn't know there was such a thing. I find in traveling around the country that there are hundreds of contractors that don't know there is such a thing and there is something I think that the section should do to spread that information and knowledge. Just what it is I am not prepared to say. The technical papers can do a certain amount of it, but the technical paper is not interested so much in that particular thing as it is in telling the new things. And after they have told the new ones they haven't very much space for repeating the things and it is repetition that is necessary.

I hope that sometime during the year the directors of the section will consider that problem and see if they can't get some scheme for advertising the association to the contractor.

CHAIRMAN WOEDTKE: Now, getting down to the round-table, just forget that you have any dignity, or any formal objection to getting into a red hot argument, and let us find where we are on this matter. If you have a problem that you want to get over, or something that seems to be bothering you, just speak it out.

MR. JOHN B. MORGAN (William B. Pollock Company): In regard to fixed ladders, I understand from some of the remarks here it is compulsory in the State of Ohio to have an enclosure around vertical and portable ladders. How about stack ladders and overhead ladders?

MR. HURLBUTT: We don't enclose stack ladders; I understand, however, it is compulsory in the State of Ohio to do so. At the present time we enclose the majority of ladders of thirty feet in height. We enclose all of our ladders on hoists, the same on coal bunkers.

MR. MORGAN: We ship all over the country and our highest State standard will not pass in Pennsylvania or Massachusetts and we are up against a proposition there.

CHAIRMAN WOEDTKE: We take the stiffest requirements we can find and we have our boilers meet that.

MR. NAYLOR: In Manitoba we have a very brief code governing the safety of employees and the general public. Excavations of over five feet in depth must be shored up but the shoring must meet the judgment of the inspector. Sidewalks must be protected by a fence if the building is within seven feet of the sidewalk line, board fence six feet high. If the building is within three feet of the sidewalk our regulations call for a covered canopy. We have periodical inspection by our Bureau of all buildings of any consequence.

STANDARD CODE FOR CONSTRUCTION WORK

MR. BUSH: I have endeavored during the last few months to collect the codes of all the states, and I find that only a few of them have very much along the line of construction work—Pennsylvania, Massachusetts, Wisconsin, California, and some of the other states. It seems to me there is a very great need for the State Commissions to get together on a joint committee, possibly acting with the Bureau of Standards of the National Government, before this state and that state and the other state get up codes which will vary so, and have one standard code gotten up for construction work, just the same as they have a standard code for the electrical construction for this country. The best mind and best talent prepared that code and as soon as it was gotten out was accepted as a standard.

MR. NAYLOR: I have a recent experience on bulletins. I was inspecting a building job in Winnipeg and I took one of the bulletins of the National Safety Council in regard to derricks, it gave some statistics of accidents. I went on the job and saw the subforeman and he had it tacked up. As I was leaving the premises I met the superintendent and called his attention to the bulletin and he immediately became very sarcastic and said, "That sort of thing is all bosh, that makes men afraid and when a man is afraid he is unsafe." Of course, I don't agree with his point of view.

I know from our personal experience we have had a good many accidents of men injured through falling beams. I think hoisting engineers should be licensed. In the case I speak of a man came along and represented himself as an experienced hoisting engineer. He was given a very brief tryout by the foreman and seemed to get along all right but it developed afterwards he didn't have the necessary experience; he lost his head and fumbled the levers, letting the beam fall, killing two men.

MR. DAVIDSON: We heard the statements upstairs this morning that the propaganda among men had almost reached its climax and it wasn't necessary any more. That might be true among other sections but it isn't true in our section; our bulletins are brand new and a good idea.

CHAIRMAN WORDTKE: Which in your mind is the lesser of two evils, to incur the displeasure of the boss on the job because he doesn't like the idea of a bulletin, or doesn't like the idea of any one showing him anything, or, to pass him by and post your bulletins and try to educate your labor? The foreman perhaps doesn't need any education about that beam, but he is only one unit, he isn't the body politic. I think you can resolve it down to that, which is the lesser of two evils, to offend a foreman or to let the workmen go by uneducated. Bulletins have been decided in every industry as being one of the most simple and best vehicles of educating the employees in accident prevention, in fact bulletins are nothing new, all houses use posters of some kind to advertise theatrical performances, and the United States Government used them all through the war.

MR. NAYLOR: I think there was just a shadow of reason in the position he took. For instance, if a man is walking on a steel beam and you

shout to him "Look out"—it will make him conscious he is in danger. I think you will probably add to the danger but in most cases it is a mere shadow of reason because under ordinary circumstances to explain to a man where danger lies is a different thing altogether from getting him excited and making him afraid. I think you hit the motive of that man when you suggested he didn't want any one coming around there introducing anything he didn't originally think of. He wanted to be the king bee, and didn't like to be told anything.

MR. DRESSER: I think possibly the superintendent was peeved. Personally, if I had to deal with such a man I would get rid of him.

FRIDAY MORNING SESSION

THE meeting was called to order at 9:45 A. M., Mr. L. D. Woedtke presiding.

CHAIRMAN WOEDTKE: The first speaker this morning is a gentleman who is well qualified to discuss the subject of his paper, "Safety in Steel Erection." Colonel Gibbs has been known for many years to be a leader in his own field. Steel erection is one of the vital factors in construction; it presents many problems and there is altogether too little attention given to steel erection these times. Mr. Gibbs has gone to considerable trouble to get his paper together, especially in view of the fact that he was serving Uncle Sam a short time ago. It is with decided pleasure that I introduce to you Colonel E. A. Gibbs.

SAFETY IN STEEL ERECTION

COL. E. A. GIBBS, THE MCCLINTIC-MARSHALL COMPANY, PITTSBURGH, PA.

Steel erection, presents in general, the same problems regarding safety encountered in other field construction work.

Like other outside construction work, it is done under more different conditions than shop work, for the reason that the conditions are varied and continually changing, while in the shop many conditions affecting accidents are fixed. The weather plays a much more important part in the field than in the shop. The force of workmen is much less stable in the field than in the shop. With the field force constantly changing, it is much more difficult to educate the men to safety and to avoid getting men who are unsafe on the work.

There are, however, certain differences between steel erection and general construction: the loads are generally much heavier and handled under more varying conditions at a greater distance from the ground. There is an element of risk in every lift. While the derrick may have been tested throughout and proven safe, an accident may be caused by a bridgeman making one careless hitch on a load of beams.

The appliances for erecting steelwork have been developed and increased greatly during the past twenty years and erection is relatively

much more safe. Nevertheless, many new difficulties have arisen. The average weight of pieces to be handled has greatly increased while certain limiting features have remained unchanged, such as track clearances and gage. A girder may increase in weight but the derrick car that handles it must run on and be supported by the same track as previously. This increased weight has had one benefit. Heavy members cannot be juggled and handled in any manner that the foreman desires. The equipment can be designed to handle these in only a few ways and the foreman must be governed accordingly. Therefore, the work is likely done as the design of the equipment contemplates and with corresponding safety.

Accidents are divided into two classes: real and preventable. Real accidents are those which occur through no neglect on the part of the workmen or the employer which could reasonably be expected to be foreseen and prevented. Preventable accidents are those which could have been avoided, had either the men or those in authority over them exercised the proper amount of vigilance. It is conceded that well over half of all accidents are preventable and the proportion is probably higher.

We are, of course, concerned with both classes of accidents but particularly with those that can be prevented. There is no question about the desirability of preventing accidents. The problem is how to accomplish it.

PREVENTABLE ACCIDENTS

Preventable accidents may be divided into three classes:

1. Accidents due to workmen themselves by reason of being physically incapacitated: ignorant, inexperienced, intemperate, careless or reckless, acting the fool, or actual disobedience.
2. Accidents due to foremen:
 - Improper selection of men placed in charge of work or doing the work.
 - Inadequate instruction to workmen.
 - Putting men or allowing them to go into dangerous places unnecessarily.
 - Lack of vigilance and orderliness on the work.
 - Failure to investigate questions of safety made by workmen.
3. Accidents due to superiors: by reason of improper selection of foremen, safeguards, equipment for doing the work and instructions regarding its use.

It is believed that the greatest difficulty is with the men themselves. Construction companies long ago recognized the necessity of having proper equipment, and that phase of the situation is in relatively good shape.

The foreman, while still skeptical as to the value of certain expedients for safety, can be educated more easily as they form a small class, and as their tenure of employment depends on the results they produce it isn't hard to impress them with the effect of accidents on their work.

It isn't so easy to get them to enforce safety methods. The conditions on a job are changing rapidly and the foreman is crowded to make time. He cannot do everything and naturally devotes his time to things that speed the work and affect the direct cost. Only constant pressure on the question of safety, and using every accident to point out the neglect of foremen or men will bring results.

The workmen are by nature and training a daring class of men and instinctively feel that their courage and skill is questioned when they are asked to comply with many of the expedients for safety. However, they can and must be educated to take proper precautions to protect themselves and their fellow-workmen. Bulletins, notices, and placards of various kinds containing written and illustrated cautions and effects of neglect are very good. Our company, in 1910, issued a book to its foremen containing instructions and cautions for the prevention of accidents. We also started at that time to post a bulletin with certain of the most common faults of workmen and how to avoid them. A small copy of this bulletin is handed to each bridgeman whom we employ. It contains, several short paragraphs, as follows:

HOW TO AVOID COMMON FAULTS OF WORKMEN

Don't Be Reckless. More accidents occur through recklessness than any other cause. Don't walk on rods. Don't ride a load. Don't ride on a locomotive crane.

Don't Be Careless. Look where you step, and be sure that on what you step is safe and secure. Don't step on ends of loose plank. Don't start to slide down a line unless you are sure the ends are fastened.

Be Orderly. Do whatever you do in an orderly, careful manner. Pile material so that it cannot roll, fall, tumble, or be blown over. Don't let tools or equipment such as bolts, nuts, drift pins, blocks, dolly bars, etc., lie around so that they can be knocked off the work or so that anyone can fall over them.

Unfit Condition. Don't go to work if you have been drinking or do not feel well. If you are lame or have any defect in hearing or eyesight you should not work at this business, as by so doing you endanger your own and fellow workmen's lives. If you are inexperienced in, or unsuited for the work to be done, don't undertake it.

Be Vigilant! Watch What You are Doing. Don't stand or work under a load. Don't go in the bight of a line nor stand in front of a snatch block. Don't work on or about a crane runway when the crane is in use unless there is a stop between you and the crane.

Don't Use Unfit Tools. Be sure the tools and equipment you use are in good working order. If they are not, don't use them.

DON'T WORK WITH MEN WHO DON'T OBSERVE THESE RULES.

The first requirement for safety in erection is to have the proper equipment. Foremen and workmen cannot be expected to take the necessary precaution if they are not provided with proper equipment

in first-class condition. And it is not enough to provide first-class equipment. It must be kept in good condition by constant attention on the job and by overhauling at the completion of the job if necessary.

PRINCIPLES OBSERVED REGARDING EQUIPMENT

Some of the principles observed by our company regarding equipment are:

1. Use no wooden travellers or derricks, except very light derricks and jinnywinks.
2. All castings in erection equipment carrying any strain to be made of steel. We make all of our sheaves for cable blocks, except small blocks for $\frac{5}{8}$ -inch cable, of steel. All castings when bending strains are encountered are made of vanadium steel. Vanadium insures a more uniform casting and tends to eliminate blow holes.
3. Forgings of importance such as the headblock of a derrick car are made of nickel steel.
4. Use the very best manila lines.
5. Use cable slings, instead of chains. Very important.
6. Automatic brake in addition to mechanical brake on all electric hoists.

In the erection of ordinary work the equipment provided, if it is of the best quality, is amply strong for the purpose. It simply requires proper handling and reasonable care.

For the heavier classes of work, heavy and frequently special equipment must be used. This equipment requires good designing and the best materials. Good designing implies a thorough knowledge of how the equipment is to be used, and the provision for all reasonable uses to which it may be put. It is the duty of the foreman, after being properly instructed, to see that the equipment is put to no uses for which it was not intended unless necessary, and then only after proper investigation by an engineer.

Erection equipment should be so designed as to make all stresses as determinate as possible. Even then the many positions in which a load can and will be handled will produce more varied strains and conditions than occur in bridges or other permanently fixed structures. Be sure that all stresses and combinations of stresses are fully cared for. Then, not only make the main members strong enough but pay especial attention to details. Most failures in erection equipment are primarily due to poor details. Booms, with light lacing or lacing improperly detailed are common. Poor detailing often produces very great bending stresses that are ignored.

Erection equipment should be most carefully inspected during its manufacture and test reports required for steel castings, all alloy metals, and steel cables. The assembling and erection of a traveler or heavy derrick should be carefully done to insure that no stresses are introduced by improper alignment. This is extremely important. Booms and traveller hoists should be tested with gradually increasing loads before

using them to full capacity. While in use they should be inspected frequently to see that no weaknesses have developed through wear or other means, and that the equipment is working as designed.

Instructions should be issued as to just how equipment on heavy work is to be used and nothing left to chance. A movement of a very short distance in the setting of a traveler or in the radius of a heavy boom may be perfectly safe as far as the equipment itself is concerned, but may endanger the falsework or the permanent structure.

In the erection of falsework, great care and an accurate knowledge of conditions is necessary. Timber should be carefully inspected and none but of good quality used. In case mudsills are used, examine the soil carefully and provide sufficient mudsills to support the load with ample safety.

The matter of bracing the falsework bents themselves, their connection by bracing and struts, and the fastening of the end bents to the piers or abutments so as to prevent any longitudinal movement of falsework, are all points where too much care cannot be exercised.

CAUTIONS TO BE OBSERVED IN STEEL ERECTION

Following are some cautions that if followed will prevent many of the accidents in steel erection:

1. Select the proper man for the particular task in hand.
2. Do not order men to work in unnecessarily dangerous places, and be on the alert to see that they do not run unnecessary risks of their own volition.
3. Do not allow the men to work on corrugated iron roofs or steel when there is a coating of ice thereon.
4. Walking on rods, riding loads or locomotive cranes, sliding down lines without inspecting the fastening, standing in the bight of a line or in front of a gate block, are all unnecessary risks and should not be permitted.
5. Do not permit men to work about crane runways without placing an effective stop between the men and the traveling crane, and see that the electric wires are properly insulated.
6. Require the rivet boss to inspect carefully all riveting scaffolds. Improperly hung scaffolds have caused many serious accidents. Only the best material should be employed. Clear spruce is the best.
7. Pipe used as needle beams should not be spliced.
8. All scaffold plank should have a stop bolt about 6 inches from each end to prevent it from slipping off the needle beam and if the scaffold is inclined it should have cleats nailed on the plank. All scaffold material should be tested for twice the load it is expected to carry. Even this care will not suffice unless the men are careful. This was demonstrated in a case where a riveting gang used their scaffold as a brace for an air backup. The scaffold—amply strong for its purpose—broke under this sudden additional load and the men fell into the river.

9. On high bridge work, scaffolds should be provided with a railing. This is a requirement by law in some states.
10. Piling of material must be carefully watched, particularly with heavy work. Scaffolds should be simply heavy and level, and the piles not too heavy. Poor piling of material is responsible for a large number of accidents.
11. When it is necessary for men to work above other men, put up a danger sign calling attention to the fact that men are working overhead.
12. Keeping small tools in condition will avoid many accidents.
13. Wearing of goggles while chipping is a necessary precaution but one the men dislike to follow.
14. In the use of cable slings, inspect them frequently and keep them properly oiled, and in handling heavy loads pad the sharp corners to prevent cutting the cable.

DISCUSSION

MR. J. E. GRIFFITH (Du Pont Company): Do you use annealed chains? Can you properly anneal a chain on the job?

COL. GIBBS: We do not use them, but my opinion is that it doesn't make a good job.

MR. GRIFFITH: Are the cards you hand out to your men printed in different languages?

COL. GIBBS: No, because practically all bridge men are Americans. Rarely if ever do you have a foreigner on bridge work who can't read or write English.

MR. GRIFFITH: What is your experience with men falling from high altitudes, on steel erection?

COL. GIBBS: A man rarely if ever falls from a high altitude because if he is at all shaky up there he wouldn't go up, or if he starts to go up the foreman can almost always tell whether he is used to high altitudes, whether he goes up a column or on top. Of course, a man might be taken with a dizzy spell, but that has never occurred with us. We have had a few men killed by recklessness at high altitudes.

MR. NAYLOR: About engineers, for hoisting, do you have them? Much depends on the engineer.

COL. GIBBS: We find it is absolutely necessary.

MR. RICHARDSON: We have a large blue and white enameled sign on both sides—WARNING—STAY OFF THE CRANE—and they are instructed to watch them very carefully. We have had two accidents in the past few years. It is just like riding a freight train—you have got to keep them off. These accidents that happened were mostly in big plants. I would recommend that when moving the crane down the yard they remove the step and the handle at the rear end, and put a step and handle at the end where the men get up to the locomotive.

COL. GIBBS: That would probably be all right for a shop crane, but our cranes go over a railroad and have to stand Interstate Commerce rules, and are detailed down to an inch.

MR. CORBUSIER (California): I would like to ask about the qualifications when a man comes to you for a highway job, what qualifications do you require, and have you any method of procedure? I mean working aloft.

COL. GIBBS: The first thing is to find out how much experience he has had. As soon as a man starts up a column you can tell whether he is a bridge man or not—that is up to the foreman. He can generally tell, and a man who is afraid to go up in the air will not generally try to. There is no real test that I can think of. There is no way of telling whether a man is going to be dizzy when he gets up there. I don't think it is possible to give a satisfactory physical examination for a thing of that sort.

MR. CORBUSIER: There is no physical examination that has been shown as satisfactory.

MR. W. G. McDERMOTT (Bethlehem Shipbuilding Corporation): Have you any specific statistics in regard to examination and testing of cables?

COL. GIBBS: It is examined whenever it is brought into the tool house—they look it over very carefully; and it is examined frequently on the job. We don't keep a record on the job, we do in the tool house.

CHAIRMAN WOEDTKE: One question Mr. Gibbs raised struck me very forcibly, and that is his company has got to the point where they don't use chains, they have adopted cable slings. That is a mighty important departure as I view it. I would like to ask the question, does he consider the use of chains safe for light work, or prefer the use of cable swings exclusively?

COL. GIBBS: I think I would keep on the job five-eighths and three-quarter chains. There are some cases where a load isn't a factor, where the chain is more convenient to use than a cable, especially where you have a light load which sometimes a cable isn't convenient to handle. If it were not for that, I would abandon them altogether. Any place where the use of the strength of the sling is a factor I would use a cable.

CHAIRMAN WOEDTKE: The next speaker, Gentlemen, is to discuss for you a subject which, while it may not seem one to interest the ordinary contractor, certainly has so much in common with the contracting practice and procedure that undoubtedly there are many things which the speaker may say which will affect your business.

During the war hundreds of ship building corporations throughout the land engaged in building ships for Uncle Sam. In our country, of course, the ship building industry prior to the war had faded into almost nothing. When we got into the war and ships had to be built with crews of green men, that entailed a tremendous problem from the safety viewpoint. Mr. Bonsib, the speaker, handled that end of the game with remarkable success throughout the war period until after the armistice when they shut down a great many shipyards.

RESULTS OF SAFETY WORK IN SHIPBUILDING AND HOW THEY WERE OBTAINED

ROY S. BONSHIE, DIRECTOR, INDUSTRIAL BUREAU TANNERS' COUNCIL OF THE
U. S. A., FORMERLY WITH EMERGENCY FLEET CORPORATION,
SOUTHERN PACIFIC DISTRICT

The building of ships is a contract job, therefore contractors are interested in it. It has been sometime since I was in the ship building game; of course, during the war I was quite active.

I can't give you much information about the organization because I haven't had time to prepare a paper. What I shall say will be simply the results of my own experience on the Pacific Coast. As you probably know, some of the best records in both the reduction of accidents and also the building of ships were made out there. For convenience in handling the gigantic problem that the Shipping Board was under, the United States was divided into eleven districts. In each district a safety engineer was appointed. This man had supervision of all accident prevention activities in both shipbuilding plants and machinery plants in the Southern Pacific district. We hadn't only steel construction but also wood and concrete.

Before this work was started, bookkeepers, ribbon clerks, and men from all lines of activities absolutely foreign to construction work flocked to the shipyards from patriotic motives, and probably other motives. They didn't know any more about building a ship than I did about medicine. Where a man is ignorant he is going to get hurt. I am told that on the Pacific Coast before the Safety work started that there were from one to two men killed every day in the whole district; that throughout the country there was enough lost time from accidents to build twenty 3,500-ton ships. After the safety work started I am pleased to say that fully eighty-five per cent of the injuries causing lost time were eliminated and the fatalities almost disappeared.

This work was accomplished through personal visits to the managements. On the Pacific Coast at the time we first started our work only two of the plants had safety engineers. That is, I wouldn't say safety engineers because one of them wasn't an engineer but a practical man who was looking after safety work. The other was an insurance man who was a very clever man and did excellent work. Our big idea was to sell accident prevention to the managements. They came back at us and said, "We haven't got time to fool with that sort of junk. We are building ships." But it didn't take long to show them it was to their interest to keep the men on the job. They finally became interested and I am pleased to say that most of the companies in the Southern Pacific District at the close of the work had men delegated to accident prevention work exclusively.

The Emergency Fleet Corporation gave general instructions to the safety engineers which I haven't the time to go into, but the big detail of just how the work was accomplished depended upon the man who was

in charge of the work. Each man was allowed to follow the method which he was naturally best fitted to carry out.

In my own case, my method was, after getting the management interested, to talk to the men during the noon hour. I found that very effective. The big trouble in accident prevention work in talking to men is first going on to great spurts of oratory and pounding the air, and after the safety man is through pounding the air nothing has been accomplished. You want, in talking to men, to show them where they lose by getting hurt. We are so constituted that if we lose by doing a certain thing we are not apt to do it. I would tell them that while here was compensation, there was no compensation that would compensate for the loss of wages, to say nothing of the pain and suffering and worry they caused their folks, and during the war it was their patriotic duty to be on the job and stay on the job. That seemed to get them more or less.

ILLUSTRATED REPORTS BY PHOTOGRAPHS

Then following our visit we made written reports along with recommendations showing what we had done and calling the attention of the management to the hazards and telling them how they could be remedied. In my case I illustrated this report by photographs. It took me two weeks to get pictures of the shipyards. I had to see everybody from the Secretary of the Navy to the night watchman, and carried about ten letters of introduction and every time I started taking pictures there was a regular letter reading contest. But I found the pictures showed more than you could write in two or three thousand words, and the beauty of this was that I would catch the man doing something, report him and they would call him in and he would say, "Why no, the man is mistaken, it wasn't me." Then I would feel like a darn fool. But when I had the photographs I would say, "Is that your picture?" He would say, "Well, I guess I did do that."

I found that the way to maintain interest after getting the interest aroused was to issue what I called a Safety Paper. It was issued every time I got a chance to write one, at which time I called attention to the various things that would be of help. This was illustrated by photographs or blue prints. I finally succeeded in getting some of the yards to print plant papers. I am a strong believer in employees' publications. All those who attended the luncheon yesterday were shown absolutely why it paid to have employees' publications because it not only builds that spirit of "our plant"—when you get a bunch of men talking about "our plant," you have got it—it also gives you a chance to put over certain things you want to put over. In those plant papers I ran a series

FABLES IN SLANG

of so called Fables in Slang. The way I murdered the English language was a sin but the men knew what I was talking about and they read them, because after the issue of the publication when I would go to the yards they would speak to me about it. One was called, "Dousing the Glims of a Wise Guy" in which I attempted to show the folly of not

wearing goggles for chippers and caulkers and holders on underneath the hulls. One of my methods was to walk up to a man and ask him if he knew what it was to be blind; of course, he would say, "No," and I would tell him, "Just hold your eyes shut for a minute." I would wait about ten seconds and say, "Now, isn't that a helluva sensation? How would you like to be that way all your life? If you don't wear your goggles, some day you are going to get something in your eye and you are going to be in the sidewalk tin cup holding class. Now wouldn't you look pretty on the sidewalk with a tin cup?" You notice I didn't tell him to wear goggles. If I had said, "you wear goggles"—he would have said, "Like hell I will." But if you show the reason for wearing goggles then they will wear them in spite of the inconvenience. They are inconvenient, but you should be careful all you men who have the goggle problem, to see that the goggles are fitted to the man's eyes, that they aren't any more uncomfortable than is necessary. You can make them comfortable if you make them fit the man's physiognomy, and also get the type that fits the work. In some places they are all the same kind, not any more adapted to the work than the glasses I am wearing. Also be very careful to see that the plane of the lenses is exactly parallel because unless they are, you have oblique refraction, resulting in headaches. I am going to take the liberty of suggesting that Mr. Corbusier of California tell his method of getting them to wear goggles—it is a peach.

Another article was "The Bolt That Went Wrong" in which I attempted to show the danger of allowing loose bolts and nuts and things like that to lie around on the staging: "The Land of Never Thought"—showing how accidents are caused by people not stopping to think: "A New Year's Reverie"—the reverie of a man who hasn't been careful; "The Awakening of Big Bill." in which I attempted to show that when a man got hurt it hurt the foreman. The poor old foreman is jumped on by everybody—the manager, the safety engineer, the insurance man, and everybody in the plant. That is the wrong method; I have found the best way to get at the foreman is this—"Now look, Bill, you are responsible for a certain amount of production, you have got to get this hull in the water, haven't you?" "Yes." "Well, when you have a man hurt you are deprived of his help, aren't you? Now, Bill, isn't it better to watch that man, keep him on the job, than it is to let him get hurt and try to get a green hand? Lord knows we have enough green hands already." He saw the point. By talking to the foreman and showing it is to his selfish interest to safeguard his men, he is going to look at it in a different light instead of thinking it is just an extra burden on him.

BIG HAZARDS IN SHIPBUILDING

The big hazards in ship building are falling, rolling, and flying objects, and improper staging. It is one of the hardest fights to get people to see the importance of proper staging in ship building, especially during the rush of war. I have been on a lot of ships where I have found one plank with a bunch of men working on it and every time a man wanted to get

down he had to crawl around the people on the plank. It was a waste of time. We recommended a staging of three planks and found that to work very well. Then it was hard to get the men, especially the bolters up, to quit leaving bolts and nuts on the staging; instead of picking them out of the bag one at a time they would dump the whole thing on the staging and then would keep running back and forth. They couldn't see it was not only dangerous but inefficient. Most safety practices are efficient measures. We were finally able to get them to see that to be a dangerous practice and we provided boxes and did away with the bag.

Sprung wrenches cause a lot of trouble until we got the management to see the importance of examining the wrenches. Another common trouble, especially in the wood yards, was cuts, stepping on nails and spikes. About the only way to handle the nail problem was to get the men together and show them the nail, then ask them what it would do if anybody should step on it. That was a very elementary and foolish thing but it is effective. Then remark that you know of an instance where a man stepped on a nail and he is in the graveyard. Now don't say, "Why don't you bend the nail down?" Call their attention to the result of the thing and you will find it works. One company in southern California devoted ten minutes a week to this particular subject. The whole force was turned loose to bend down all nails and as a result the punctured nail wounds dropped about ninety-eight per cent. It was a good practice and a few of the other companies followed it. That was made a regular weekly practice you have to keep hammering at the nails and also at the people all the time to get them to see the importance of not only other people's safety but their own. If you show the workmen where safety helps the pay envelope, he is going to be interested in it. If you try to show him it is his duty, that he is his brother's keeper, he hasn't time to listen.

Another big hazard was the ladders. That was one of the hardest fights, to get the companies to build proper ladders and also to see that they were used properly.

Uncovered switches was a big hazard. It was almost impossible to get the management to see that the uncovered switch on construction jobs is an evil. They excuse themselves by saying it is only temporary. It is a well known fact that sixty volts will kill a man unless he is in good condition. It is not only an accident hazard, it is a fire hazard. It wouldn't take much to provide a lined asbestos box and there is no excuse for leaving the uncovered switch on construction jobs.

Another common practice that you will find on ship building jobs is riding on loads, especially those being raised by cranes. The only way I see to stop that is just to lay the man off the second time he does it, if he isn't laid off by the Higher Power, because there have been a lot of people killed and injured by the foolish practice of riding on loads. It can be stopped, it has been stopped. I can't think of any yard on the Pacific Coast where, after three months of our work, I saw any people riding on our cranes, and I have a large number of photographs taken previous to that, of men riding on the loads.

CHAIRMAN WOEDTKE: There are a number of ship building men here, I know, and we put Mr. Bonsib on our program for your benefit. We can very well devote ten or fifteen minutes to discussion for the benefit of the ship building men or men interested in those problems. It is quite plain to me that ninety-eight per cent of the hazards discussed by Mr. Bonsib are common to all contractors.

DISCUSSION

MR. CORBUSIER: Mr. Bonsib spoke about the ignorance in the yards; that is what we have to contend with principally. Men come into the hospital. You say, "What is your name?" "4123." "Where do you live?" "Mr. May." (That is his foreman.) "Married?" "Bolter up." (Laughter.) One of our future board of directors. (Laughter.)

The little stunt that Mr. Bonsib spoke about was in the matter of wearing goggles. I said to Mr. May one day, the foreman of the riveters, "Why don't you make that man wear his goggles?" "You can't, he hasn't got sense enough to wear them, all he can do is drive rivets. I don't want to fire him because he is one of the best riveters I have." I said, "I bet I can make him wear his goggles." "I'll bet you can't." "I bet you ten dollars by tomorrow noon that man will be wearing his goggles." He took me up. I had a little brown glass eye and I walked up to this man who wasn't wearing his goggles and I looked down at him and he looked up at me and finally he quit his work and said, "What sir?" I said, "You understand glass eye?" (He nodded his head.) "Fine. But, you got blue eye, this is brown. Haven't any blue eyes, can't get them—account of war—I want to see what size you wear"—and I measured his eye. (Laughter.) I said, "One blue eye, six and seven-eighths. Well, I will try and get it for you." He said, "I don't want a glass eye." "Well, you will get it because every man driving rivets like that in one month, two months, never more than two months, he comes to the hospital with steel in his eye. For one piece of steel in the eye, glass eye—brown eye, goodbye." (Laughter.) That afternoon after lunch that man drew a pair of goggles. I took Mr. May out and said, "Give me my ten dollars." He said, "My God, how did you do it?" I got the ten. (Laughter.)

That was one of the stunts I did in making a good riveter wear his goggles. Afterwards I went around and told him there were certain places he didn't have to wear them, that it wasn't so dangerous where he was working, but underneath and on the side he must wear them. I got that man to wear them all the time; consequently all the foreigners around there wore them.

The nail stunt: I found a nail sticking up. I put up a piece of red flannel, put up a sign—STEP ON THIS NAIL AND THEN GO TO THE HOSPITAL. There were no more nails around.

SAFETY GUARDS

MR. BONSI: There was one thing I forgot to mention in my talk and that is, the question of committees on construction jobs. It is almost

impossible to have a safety committee, due to the shifting of your personnel. Mr. C. W. Hill, of the Moore Ship Building Company, originated the plan of organizing what he called Safety Guards. It is one of the best methods that I know of in handling safety work on ship building or any other construction job and I am sure if you will write to Mr. Hill he will be glad to give you the details. He would pick out the more intelligent men, watch them, see which one showed a tendency to be careful, and then he would have the superintendent ask that man to come to the safety office and he would proceed to give him a great speech, about what a great honor was to be bestowed on him, they wanted to make him a safety guard. He would say, "Now I don't want you to take this job, I want you to think it over, but I want to give you this button and these rules and if you think you are able to handle this work, let me know."

Mr. Walsh here had charge of the Southern Gulf District and he will tell you also, that the safety guard is the solution of your getting the workmen interested in the job. I haven't told Mr. Hill, I'm far enough away now that he can't hurt me, but I'm sure he would be glad to give you any information he can. C. W. Hill, Safety Engineer, Moore Ship Building Company, Oakland, California.

MR. THOMAS A. WALSH (Merchants Ship Building Company): I was fortunate enough to have charge of the Gulf District, and most of our success was put over by the foreman and the men in the yard. We made our surveys, as Mr. Bonfib said, and after our surveys we held meetings every two weeks in the various yards. After that we took it more on a production basis; we went to the managers and showed them where they were losing money on accidents and showed where the Government was losing tonnage each month. We set the yards on a competitive status, and a copy of that report was sent to the manager of each yard. That report was brought up before the foremen's meetings and read to them. After getting the yards on a competitive basis we got the various hulls and shops on a competitive basis, and we were successful in getting around the problem. All the time we were resting on the foremen and the men in the yards. It wasn't due to any individual, it was coöperation. If every one of the foremen wasn't on the job we fell down; if the manager wasn't on the job we went down.

We had one case where the general manager said it couldn't be done. All I asked him was, if he would let me take hold of the thing I would go to it. We called a meeting of the foremen and showed just where their help was needed. The result was, inside of four months their accident frequency rate came down thirty-five per cent. About six to ten per cent of the accidents were results of shop trouble, mechanical detail; the balance of them were outside, poor stages, ladders, piling of material, etc.

CHAIRMAN WOEDTKE: The next speaker is one whom you should be keenly interested in, not only because of his own personality but because of the fact that he is representing the largest association of construction firms in this country, the Associated General Contractors of

America. We have succeeded in getting Mr. F. C. Dresser of the Austin Company of Cleveland to deliver a paper this morning on "Coöperating on Safety," which is well worth your time and consideration and is valuable in that when he speaks he is representing an association of thousands of contractors throughout the country.

COÖPERATING ON SAFETY

F. J. C. DRESSER, THE AUSTIN COMPANY, CLEVELAND, OHIO
(Representing Associated General Contractors of America)

It is only in recent years that any discussions whatsoever have been had in reference to the hazards of building construction, and aside from statistics issued by the several insurance companies, no organized effort has been made by the contractors generally to exchange ideas toward the elimination of accidents. However, the present day finds that several of our larger contracting organizations include a so-called Bureau of Safety, and their results have shown a remarkable reduction in the number of accidents, as well as an immense saving of lost time and money.

In order to develop a proper safety campaign for the particular job in hand, an analysis is necessary, for the work itself is suggestive of the major portion, or rather kind of possible accidents you will be obliged to combat. I do not mean to say that you can immediately eliminate all accidents, but certainly a study of former accidents on a similar piece of work will help greatly in a reduction of accidents on future work. To just such work, namely, analysis and issuance of instructions, is a safety bureau dedicated.

Of course, there are and always will be special pieces of work that must be accomplished which are different from any former, but I still maintain that the same fundamentals apply and that an analysis still can be made and preventive measures applied.

To follow this discussion briefly, and to support the former statement that the work in hand will suggest possible accidents, it is evident that the sewer or grading contractor, for instance, can, by a series of test holes, determine the character of soil he is obliged to excavate, and plan his working methods accordingly. Such procedure will tell him quickly what he must provide in the way of equipment and protective measures, and has the further advantage of not catching him unawares as far as unforeseen ground conditions are concerned.

The present day of multiple-story buildings, when radical changes in their construction methods are being employed, finds us facing the source of the greatest number of accidents, as is attested by the high insurance rates. Usually the public comes in for consideration, as far as safety methods are concerned, and in fact no other class of structure requires more consistent planning or forethought as regards accident prevention, unless it be in tunnel or subway work as installed in our larger cities. For this work it is plain that proper and substantial equipment must be provided, that possesses a good, safe factor; the sidewalks and streets must be covered; riding loads and in hoists must be forbidden; stairways

and ladders must be liberally provided; mechanical safeguards installed; rapidly moving load lines and signal cords boxed or otherwise protected; safety belts and scaffolds provided; and even a man's clothing must receive attention, for many a man has lost a hand by reason of his wearing a gauntlet glove, and others have lost arms and life because of a loose sleeve or glove which dangled into revolving drums, or shafting, or which were caught by a broken strand in a cable.

Heavy foundation work requires the same care in accident prevention study, both in bridge and in building work.

Pile driving is another hazardous piece of work, where moving timbers and lines are responsible for many avoidable accidents.

Wrecking and underpinning are other sources of accidents, and more numerous undoubtedly than should be because they do not receive the attention of an engineer as regards a plan, or in other words, the average wrecking contractor does not have a staff or an engineer in his service to make calculations before doing work. As a result, defective material is often used and insufficient underpinning installed, causing accidents, of course.

Heavy rock excavation requires care in handling dynamite, and precaution against flying rock and destruction of property.

Industrial building work is the source of possibly the greatest variety of accidents, but usually not as disastrous to life and limb as the previously mentioned classes of work.

An analytical study in the direction of safety, no matter what the class of work, will certainly produce results if undertaken with the same spirit that a construction engineer plans his layout and schedule.

EMPLOYEES

In a large measure the application of safety methods depends on the employee. The more intelligent, the less liable is he to accident. In this respect, the ironworker or steel erector is possibly the most versatile in that he thinks of the possibilities of things happening in connection with the work in hand, and is not so easily caught unaware. The brickmason and carpenter are usually on more substantial footing and inasmuch as their work is usually more regular, do not have occasion to give "possible happenings" much thought. No other mechanic requires good judgment more than the hoisting engineer, especially be he engaged on multiple-story building work or heavy bridge construction. The common laborer, however, requires more watching than the trade mechanics, and in this respect much depends on the intelligence of the foreman who directs his movements. All workmen, however, can be schooled in safety methods as has been demonstrated by leading contracting companies that have safety bureaus. For instance, Fred T. Ley and Company began this work in 1915, and their reduction in accident rate per 1,000 employees for 1916 was 25 per cent, and in 1917 was 55 per cent, which is indeed encouraging.

CHARACTER OF ACCIDENTS

Our records, from a recent piece of construction, which involved steel erection, heavy concrete, brick work, and grading, also trackwork, show,

from a total of 242 accidents, that: 73 employees sustained bruised fingers from handling material, 37 employees sustained punctured feet from nails, 11 employees sustained cuts on head from falling material, 7 employees sustained sprained ankles, slipping and misstepping, 7 employees sustained cuts on hands, and the balance were minor injuries. This work comprised the erection of a large engine terminal, and this record conforms in the average to the class of accidents which we must safeguard against in the course of our regular industrial building construction.

I find in comparison with figures as derived by other concerns, that the accidents in the main are similar in character, but the percentages vary, due undoubtedly to the character of the work in hand.

The greatest number of accidents, we find, come during the handling of material, and are confined to hand injuries; second in number come injuries to feet from protruding nails; third, employees falling, by reason of misstepping or stumbling over strewn material, causing sprained or broken ankles, broken arms or legs; fourth, falling material, causing cuts about the body and broken limbs. These are the four main causes as we find them, and it is natural, therefore, that preventive measures be provided in the order named.

I believe it goes without question that a job properly planned, and scheduled whereby one phase of the work closely follows the other, where material is received and handled in the same order and where orderliness prevails throughout, is rewarded by the least number of accidents.

Receiving and storing of material is a study in itself, for naturally the best position must be selected for hoists, and also for storage. One should be near the other to avoid rehandling and increased costs, and minimum handling also reduces the possibility of accidents, as is plain. But often they are far apart, causing long runways to be built and arranged, in and out, around or through a building, as the case may be, creating a state of disorder and interfering with the other divisions of the work. The ideal, of course, is one where, for instance, structural steel can be placed from car to position, eliminating rehandling in field; and on large operations where space is available, this can often be done with steel as well as other material, if hoists and material tracks or roads are given some attention as to layout and position before work is started in the field. The main object is to eliminate distance, for work is really distance versus resistance, as the definition goes, and the further application of all possible mechanical means to handle material from cars or wagon to position is another factor which results in a great reduction of accidents.

Our second consideration being given to nails, we find that orderliness in handling of lumber containing protruding nails, eliminates foot punctures by the score. Plank or forms of this character should be stacked with nails down and not be allowed to be strewn all over the job. In order to re-use the plank or board, the carpenter must drive the nails back, and their removal as soon as the plank or brace is taken down is undoubtedly the best practice. As regards concrete form lumber that has been stripped, if it has no further use in the building as fabricated, it should be stacked and nails removed by the cleaning gang, if there is one, as soon as possible to make it available for other use, for certainly the

re-use of lumber these days is economy, and a carpenter usually will take a new piece rather than stop to remove nails. In a multiple-story concrete building, forms are usually stripped and immediately placed in position for the next floor, and the same applies to braces, so that the immediate removal or driving back of nails is necessary and foot punctures are made less possible than on the ordinary timber or house job. Elimination of strewn lumber will reduce nail accidents and its reclamation should be taken in hand at once in order to make it fit for re-use, which in itself will cause a saving in the final lumber bill.

To avoid employees falling, railings should be erected on staging and scaffolds; runways of sufficient width provided; and material generally should not be strewn promiscuously about the job. Openings should be covered or railed and good stable ladders built. Climbing up or down hoist towers should be forbidden, and all moving lines boxed so as to avoid tripping. Working aisles should be kept clear of waste and surplus material.

To avoid falling material, storage of the same should be confined to the interior aisles, and scaffolds provided with a sideboard to prevent brick especially from going over the edge.

In discharging debris, closed-in chutes should be installed, wheeling runways to be of sufficient width and overloading of wheel-barrows forbidden, especially when bricks are being moved.

Naturally the safety movement must begin with the management itself, and if contractors generally will review the results obtained by those contractors who maintain Safety Bureaus, they will readily see that it is a paying branch of the organization. The gratifying results obtained by Fred T. Ley and Company, of which Mr. L. D. Woedtke is Director of Safety, have already been mentioned. Inasmuch as the work covers a period of only three years, they are indicative of the immense amount of good work that can be done in accident prevention in general contracting, as propaganda of this kind is really in its infancy in this field.

The next step for an organization to undertake is the addition of a Safety Bureau, under whose direction the work is carried on. The first consideration must be given to the field organization itself, meaning the engineers, superintendents and in fact the entire rank and file, for coöperation must exist; and foremen generally must see that the safety rules are observed.

As a further matter of coöperation, the construction department should turn over to the safety man a complete schedule of the job in hand, showing the progress expected, this being the first step. Second, a set of safety rules should be issued applying to the work or particular job in hand, which are set up after due analysis of the conditions which are to be met. The third is, of course, the enforcement and application of these safety rules.

First of all, any job employing 125 men or more, dependent, of course, on character of the work and location, should have a first aid attendant and small field hospital. We find it pays decidedly by eliminating lost time.

Second, the job organization should appreciate thoroughly the mean-

ing of this safety work and they will in the end discover that lower unit costs will result from the observance of the safety rules.

EDUCATE THE WORKMEN

To educate the workmen themselves can be done in different ways, and first of all, I believe, he should be taught to observe safety rules provided as a precaution against the first or possibly the second classifications, which are most liable to happen. His education in this respect should be gradual or progressive as the work goes on, and his foreman, of course, should see that the rules are observed.

Descriptive photographs are an immense help in avoiding accidents and educational work, and should be in keeping with the class of work in hand.

Periodical bulletins help greatly, as do also signs which should be of such size and meaning as can be understood by all. A sign that can be read only a few feet distant is not of much use; it should be readable at a considerable distance—the farther the better.

Another idea is to have progressive signs, or those which move forward with the work, cautioning what in particular may result from the work in hand at that time. These signs should be right on the job and not posted on the office door, which may be a mile away from the job.

These are, of course, just the means by which the idea can be conveyed, and various methods can be adopted as results may suggest; the same to be chosen by the Safety Director himself. In addition, safety meetings should be held on the job by the foremen and a plan of action or procedure decided upon before particular pieces of work are undertaken, also work covered should be reviewed, ideas exchanged, and the work encouraged in every way. In this way, the best methods can be secured.

EQUIPMENT

Needless to say, the equipment for the particular job in hand should receive the same careful attention, first to be assured that it possesses the necessary safety factors to handle the work generally, and that it is in good repair at all times, and receives the necessary periodical inspection while on the work as well.

On all our work, for instance, we carry boiler insurance; the boilers receive periodical inspection by the insurance company and, of course, must conform to the state laws.

Around the plant generally, guards should be built which will eliminate the possibility of employees coming in contact with the moving parts and lines, and the same consideration must be given to hoists and hoist lines. To operate plants efficiently requires good mechanics, and a contractor, who maintains a staff of experienced operators in connection with his organization has done much toward the application of safe methods, for the accident, as a rule, happens to the green man, no matter whether he be mechanic, laborer, or machine operator, and it is necessary to observe such men very carefully, until such time as some experience has been gained.

Safety rules further will establish under what conditions a machine is to be operated and how, and will also establish signal codes to be observed, for very often the operator cannot see the other end of the line or the top of the hoist, as the case may be.

At any rate, common sense application tells us that above all else you must have experienced machine operators, and none other should be permitted to be employed, yet many times you will find some man out of the gang running a machine, the principles of which are entirely foreign to his understanding.

The whole work, however, as regards both employees and equipment is to be reviewed and inspected by the Safety Engineer, who will suggest precautions and safety rules that are to go hand in hand with the working methods decided upon for the handling of the job. This is further beneficial inasmuch as a man from general headquarters sees many things that a man on the job does not deem important.

Generally speaking, this subject is one that is becoming more important each year, and the increasing obligation to cooperate with safety is plain, considering the fact that in 1917, in our United States, 300,000 men were disabled and 3,000,000 minor accidents occurred in our industrial army.

It means work and a general adoption of the policy of accident prevention wherever man is employed in industrial work.

To this end, it is gratifying that the contractors generally are becoming more interested, for certainly it is a work that is worthy of the fullest recognition, and we hope to record with the National Safety Council next year a remarkable improvement in our work.

DISCUSSION

MR. HURLBUTT: One of our safety engineers brought in some rather interesting figures that bear out a point in Mr. Dresser's paper. We are doing a construction job in the State of Michigan where we are using in the neighborhood of four thousand men. The contract called for a thousand houses in four months, with a bonus for time saved, necessarily increasing the accident hazard. As a result of having a complete first aid hospital on the job, immediately following an injury the man was taken to the hospital, and as a result we have had only two serious accidents from nail punctures—which shows the worth of medical attention to do away with the possibility of infection.

CHAIRMAN WOEDTKE: If there is no further discussion of Mr. Dresser's paper, before getting into the round table discussion I would like to have you listen to the report of the Nominating Committee if they are ready.

REPORT OF NOMINATING COMMITTEE

MR. KIMBERLING (Pittsburgh Construction Company): The Nominating Committee recommends for officers of the Construction Section of the National Safety Council the following:

Chairman, L. D. Woedtke—Fred T. Ley Company, Springfield, Massachusetts.

Vice Chairman, W. F. Austin—W. E. Wood Company, Detroit, Michigan.

Vice Chairman, F. L. Hurlbutt—E. I. du Pont de Nemours and Company, Delaware.

Secretary, Edward W. Bush—Aetna Casualty Company, Hartford, Connecticut.

Chairman of Bulletin Committee, J. H. Schults, Jas. Stewart Company, Inc., New York City.

(The report was adopted and the Secretary was instructed to cast a unanimous ballot for those nominated.)

The Chairman then appointed standing committees on Membership and on Standardization and Statistics for the coming year.)

CHAIRMAN WOEDTKE: With that business out of the way we will proceed to the round-table discussion.

ROUND-TABLE DISCUSSION

MR. COFFEY: You spoke about slings and chains and cables. What is the practice here in regard to lumber? Some of our men say manila rope is better than the cable, from a safety standpoint I mean.

MR. DRESSER: We use the cable sling, except that on light loads—such as thirty or forty pieces of two by six, twenty feet long—we use rope.

MR. COFFEY: That is what they say, that the rope is more pliable and grips the lumber better and you won't have any falling out.

MR. DRESSER: It doesn't, that is true.

CHAIRMAN WOEDTKE: Rope will bite better. Some people, if they don't want to damage the timber, use a canvas shield or a piece of soft wood. Those are common practices.

MR. DRESSER: On big jobs we have made a cradle with a chain binder.

MR. GRIFFITH: In regard to cleat ladders, I would like to tell a little story. I saw a foreman directing some work and a man was putting up a home made ladder. I didn't say anything to the foreman but just looked at the ladder and he immediately told the man to go to the tool room and get a round rung ladder. The home-made ladder is all right, it may be just as safe as any other ladder, but the next fellow who comes along and uses it may get hurt. The Du Pont Company insists that home-made ladders shall not be made on the job, and if they are made by small, yet we try to do away with them entirely.

some contracting firms they will probably be made of any kind of lumber not inspected properly. Although the percentage of accidents is very

CHAIRMAN WOEDTKE: A year ago the problem of testing manila rope was raised at our round-table. It is a pretty thorny one, and it hasn't been solved yet. Manila ropes have been subjected to considerable damage through the action of muriatic acid and its fumes. During the past year I have taken that matter up with a number of different people, including a number of college presidents who I thought might use the material in a thesis and have something definite worked out.

There are two tangible methods, one of them being to treat the rope by brushing, painting, or soaking with a chemical compound which will

resist muriatic acid and its fumes. The other seems to be the well known mixture of wax and castor oil which is difficult to apply. We got to the point where we have furnished the United States Bureau of Standards with the required quantities in lengths of various sized ropes, both in new rope and used rope, and they are working on the test to the end that we may have a scientific and definite report of what a proposed chemical compound will do. That report will be ready soon and will be sent to the members of our Section in a news letter.

If you have any other method in mind other than treating the rope by soaking it or brushing it with a compound, or by the use of a combination of castor oil and wax, let us know now what it is, because the Bureau will go through any tests you desire and which we will submit to them.

Mr. Williams of the National Safety Council has come in, and I would like to call on him. He was instrumental in getting this section formed a year ago and then wished it on me to keep it going.

MR. WILLIAMS: It certainly did my heart good to see the crowd you had here yesterday. There was only one thing the matter—we made the mistake of not having the Construction Section build a hotel especially for the convention. We got the largest hotel here, and there are but few cities in the United States that have more hotel room. We will try next year to have better accommodations if we can possibly get them.

We have been giving you every two weeks a Construction Section Bulletin dealing particularly with construction hazards. It has been somewhat of an effort to get material for those bulletins and I beg of you to send us what material you can in order to keep this service going. You are going to have a Chairman of the Bulletin Committee this year, but it isn't fair to have him do it all himself.

Our general series of bulletins that go to all our members contain a good many things applicable to construction work, so don't think for a minute the special construction bulletins are the only ones you are supposed to use. For example, we used in the general series the picture Mr. Woedtke sent in, on the danger of using tools with mushroom heads—something that is found not only in construction but other lines.

One of the most valuable features of National Safety Council membership is the fact that we have in Chicago the most complete collection of information on accident prevention problems in the world. Every year we get about three thousand letters asking for information on this or that particular problem, just like this one of protecting ropes and ladders. When we answer those questions we dig up every thing we can and even go out and ask people we think might be able to help us. In many cases if you have some particular problem that confronts you in your work, if you will write us just exactly what the situation is we will find that somebody else has had that same problem some other time, some other place, and has succeeded in solving it, and we will pass it on to you.

MR. PARISH: The men who are looking for safety devices don't know where to get them or what to get and they welcome that information even in the form of an advertisement.

MR. WILLIAMS: If you write to us asking what kind of a guard to use in a particular situation on a circular saw, for instance, we, of course, can't recommend you a particular guard that so and so is manufacturing. We have to be impartial on that, but, we will send you, if you should ask for such information, advertising circulars of all the people that are making that kind of a guard and then if we thought we ought to recommend some guard that was home-made that wasn't on the market, we would give you information about that. In other words we will send full information about commercial guards to any one who asks for it. We have a large supply of advertising literature in our library.

MR. DAVIDSON: A little point has been worrying me in connection with the compiling of statistics—what shall we do with subcontractors and their men? In compiling our records do we regard the subcontractor as of our own organization for the time being? I have tried to devise a scheme for putting jobs on a competitive basis, and I send out to all the jobs each month and to all the superintendents, whether they have jobs at that particular time or not, the record for the preceding month with the jobs rated, the best job standing at the head of the list and so on down. If a superintendent has had an accident on that job which occurred in the subcontractor's gang, he comes back at me pretty hard.

CHAIRMAN WOENTKE: I have found it is impractical in every way to include in your own data, especially if you are going to use it for competitive or comparison purposes, anything except accidents which occurred to your own men. The subcontractor has no more relation to your superintendent on the job than if he were a thousand miles away; he has his own problems, directs his own work, and if his men are injured that has nothing to do with your job superintendent.

MR. J. J. COFFEY: We have some statistics for 1916, 1917, and 1918. The Compensation Law went into effect January 1, 1916. Through the cooperation of the Department of Labor and Industry and the various plants with safety engineers, the accidents have been reduced from 252,000 lost time accidents in 1916, to 223,000 lost time accidents in 1917. It was reduced in 1918, to 180,000 lost time accidents. Now our records, which Mr. Walker, Chief of our Bureau has with him, show that there are about 89,000 reported accidents for the first nine months of this year. All this reduction doesn't come about through the safeguards which we are putting on the various machines because they will only cut down your accidents twenty-five per cent. if it does that. But this reduction was brought about, three-fourths of it, by the work of your men, safety engineers. Any of you can cut it down sixty or seventy-five per cent by your safety campaign.

Pennsylvania some two or three years ago, got out a ladder code and if any of you men want a copy of the Pennsylvania ladder code write to John H. Walker, Chief of the Bureau of Inspection, Department of Labor and Industry, Harrisburg, Pa.

CHAIRMAN WOENTKE: We are hoping that by the time 1920 comes around we can have everybody on the same statistical basis, because if

one fellow uses one method, and another some other method, they are not comparable.

The National Safety Council and the United States Government have been trying to standardize methods, which you might modify to suit your own industry, and would still be in line so it would be comparable to everybody. If anybody has anything in the room here in the way of actual statistics or a formula for recording them I wish you would announce it so the stenographer can take the name.

MR. HARP: I would be perfectly willing to get you any statistics for the next year you want.

Mr. F. Marshall Harp
The Employers Mutual Insurance Company of New York
502 D. S. Morgan Building
Buffalo, New York

MR. E. W. CALLEN: Our report will be ready for publication soon.

Mr. E. W. Callen
Building Inspector
Wisconsin Industrial Commission
Madison, Wisconsin

MR. ROBINSON: We would be glad to send any information we could.

Mr. F. S. Robinson
General Builders' Association
Detroit, Michigan.

CHAIRMAN WOEDTKE: When we come together next year I think we shall have a big attendance. I think you will admit the discussions and papers we have had yesterday and today have been excellent. As soon as possible the proceedings of the National Safety Council will be printed and bound and distributed. If it happens in your firm you are engaged with, that a big boss gets the mail that comes from the National Safety Council, tell him when that book comes in you want it because in it will be the reproduction of the papers and the discussions given here, and it may help you.

I urge you to try and get this safety idea over in the construction field. Send us in your experience and photographs that look good to you; we will work them into a news letter and we will try to keep you together in spirit as you have been here in body. Don't think your officers can continue this Section and make a whirlwind out of it without your help, because your officers have a job to take care of the same as you have.

I am glad we had such a good showing here today and yesterday and it certainly is indicative of increased interest among contractors. I want to thank every one of you for your time and courtesy, especially the speakers and those who took part in the discussions.

(A vote of thanks was then given to the Chairman for his services after which the meeting adjourned.)

Electric Railway Section

October 2 and 3, 1919

H. B. ADAMS, Chairman

Safety Supervisor, Aurora, Elgin and Chicago Railroad Company,
Aurora, Ill.

JOHN H. COX, Secretary

The Cleveland Railway Company, Cleveland, Ohio

THURSDAY MORNING SESSION

THE meeting was called to order at 9:45 A. M., Chairman H. B. Adams presiding. Chairman Adams read his report.

REPORT OF CHAIRMAN

Officers: At the 1918 meeting of this Section, Mr. H. B. Potter of Boston, Mass., was elected Secretary. It was impossible for Mr. Potter to accept the position, and your chairman appointed Mr. John H. Cox of Cleveland, Ohio, to fill the vacancy—Mr. Cox is here and right on the job.

Soon after the Annual meeting the following appointments were made:
Chairman Membership Committee, D. E. Parsons, East St. Louis & Suburban Railway Company, East St. Louis, Ill.

Chairman Program Committee, R. N. Hemming, Fort Wayne & Northern Indiana Traction Co., Fort Wayne, Ind.

Chairman Bulletin Committee, H. W. Clapp, Columbus Railway, Power & Light Company, Columbus, Ohio.

Mr. Clapp had been the very efficient chairman of the Bulletin Committee for more than two years but, owing to his acceptance of the vice-presidency of another traction company, the duties and responsibilities of his new position prevented him from continuing as Chairman of the Committee and his resignation was accepted. Mr. John H. Mallon, The Metropolitan West Side Elevated Railway Company, Chicago, accepted the appointment as Chairman of the Bulletin Committee to fill the vacancy.

Bulletins: During the year you have received each week a bulletin particularly designed to call attention to Electric Railway Hazards, to

gether with the weekly letters from the National Safety Council Headquarters, and various general bulletins covering many phases of safety work.

News Letters: Beginning December, 1918, monthly News-Letters were sent to all members of the section.

These letters were intended to encourage you in the noble work of accident prevention and many of the items and suggestions were furnished by energetic safety workers within our organization. Most of these letters contained an enclosure of some form of safety literature which was in use by certain companies.

We wish heartily to thank the several members who have assisted in these letters by their contributions.

Rule Books: In July we requested the members to send in a copy of their Rule Books, with the idea of appointing a committee of expert operating men to examine the different Rules and draft a set of Standard Rules. A copy of such draft to be sent to every member for criticism and suggestions, the committee later to revise the draft and prepare a set of Standard Rules to present to the Section at the Annual Congress for adoption. Members were slow or indifferent in sending in their books, only eleven having been received up to this time. The response was so limited and the time so short that the work could not be completed in time for this session and no committee was appointed.

Membership: At the 1918 Annual Congress the Electric Railway Section was composed of 129 Electric Railway companies, operating 13,564,474 miles of main line track.

During the past year 22 memberships have been cancelled and 12 new members have been added. This shows a net decrease of 10 in the number of members while the decrease in mileage has been 427.

We now have 119 member companies operating 13,137.23 miles of main line track.

In the face of the extraordinary financial and operating conditions affecting Electric Railways throughout the country it is a matter of great satisfaction that this Section has suffered so slight a decrease in its membership.

Safety Campaigns: During the year several of our member companies have put over special campaigns for prevention of accidents and in each and every one of them the results have been highly gratifying.

National Headquarters:—During the year we have received several requests from members for help in special safety problems on their particular properties and the entire staff of the National Safety Council Headquarters have freely assisted in helping to solve these problems.

I wish to express my thanks to the entire office force and especially to Mr. C. W. Price, General Manager, and Mr. F. M. Rosseland, Safety Engineer, for their great interest in the welfare of the section and the valuable help given to your Chairman.

Publicity: It is gratifying indeed to note the generosity of the trade papers in giving space to accident-prevention work, especially the activities of the Electric Railway Section in the publication of news which is of great importance to members. I am thinking par-

ticularly of "The Electric Railway Journal," "Electric Traction," and "Safety Engineering." Reporting new developments, progress and results of organized safety work in the columns of these progressive and influential periodicals is of definite value to them and to the safety movement.

In Conclusion: I also wish to extend my thanks to the officers and chairmen of committees for their courtesies to me and for the work they have done for the Section in their respective positions.

Let us now look forward with the firm determination to make the coming year a banner year in the prevention of accidents and the constructive reorganization of our beloved nation by the persistent and systematic conservation of life and limb among our immediate associates.

Our thanks are due to Mr. R. N. Hemming, Chairman of the Program Committee, who has had almost sole charge of the preparation of this excellent program. The Committees have no special reports to make as the points that they have been working on have been covered by the report of your Chairman.

Next in order is the appointment of a Nominating Committee. I will appoint Mr. W. F. Weh, Mr. John H. Mallon and Mr. R. E. McDougall. This Nominating Committee is to present names for the offices of Chairman, Vice-Chairman, and Secretary tomorrow morning at 9:30. The first paper on our program, "The Human Factor in Safe Operation and Maintenance of Rolling Stock," is a subject in which we all ought to be deeply interested. Mr. F. R. Phillips, Superintendent of Equipment, Pittsburgh Railways Company, Pittsburgh, Pa., will now deliver that paper.

THE HUMAN FACTOR IN THE SAFE OPERATION AND MAINTENANCE OF ROLLING STOCK

F. R. PHILLIPS, SUPERINTENDENT OF EQUIPMENT, PITTSBURGH RAILWAYS
COMPANY, PITTSBURGH, PA.

The Human Factor in whatsoever relationship it may be considered, is the most important question now before the minds of the people of all nations.

Dissatisfaction with the present order of things is rampant. It manifests itself in many ways, but rarely survives cold, clear light of reasoning. Nevertheless the minds of all the people are yearning for a "something", which seems to be lacking in our social and political structure, a remedy for which, economists and other students of the problem have so far failed to provide.

It is not our purpose at this time to engage in an academic discussion of this most perplexing situation. It may well be left to minds better equipped and developed than that of the writer. It is mentioned here and at this time merely for the purpose of directing your attention to the fact that when considering the question of the human factor in its relationship to the safe operation and maintenance of rolling stock, we

have to reckon with a new force of which we have little positive knowledge.

A Superintendent of the Motive Power Department of an electric railway, if he would attain the full measure of success, must be, in addition to his other duties, a thorough student of human nature. It is not enough that his plant and equipment be provided with the most effective safety devices, nor is it enough that his system of inspection and supervision be the last word in the art. He must know men—must know their weak and strong points and be able in some measure to define their various moods.

Be your safety equipment and organization ever so efficient, or your campaign of education in accident prevention, ever so complete, one dissatisfied employee (and in these days there are many such) or one, who because of outside environment, worry and ill health, or because of home and family conditions, which for the time being throws him out of joint with the existing conditions, may in an unguarded moment, through act of commission or omission, be the means of a holocaust or shambles.

While I strongly advocate the use of the most effective safety devices and urge a comprehensive, thorough, and continued educational campaign through the medium of shop talks, committee activities, scare-heads and bulletin boards, I am convinced that the ultimate may be reached only through a personal appeal to individual employees.

THE PERSONAL APPEAL

A personal appeal, however, to be effective, must be clothed with sincerity and earnestness of purpose. We must neither preach, patronize nor command. Moreover, if a personal appeal to an individual is to be productive of the greatest good, we must first establish the right to make such an appeal. The mere fact of your being the superior officer does not give you that right. How, then, shall we establish that right?

At this time of the golden harvest when the sower is reaping his reward, may we not with profit look to our farmer friend and his method. When he desires to secure the greatest result from his effort, does he take the seed haphazardly and plant it with no thought than since he is the owner of the seed and soil, therefore, by right of ownership and superiority to seed and soil, success must come. Hardly. He adopts more practicable and sane methods.

He first chooses the field which gives the greatest promise and is best adapted to the particular crop under consideration. He plows and plows deep, and in a certain way, and at a certain time. He discs, harrows, and drags the soil, until it is mellow and sweet. In other words, he carefully prepares the seed bed. Furthermore, the seed is chosen after much thought and experiment before planting. Then he cultivates again and again, and in the fullness of time, his efforts are rewarded, we are told, an hundred fold. The plant endures through hail and wind and storm. Sometimes his efforts fail, but rarely.

If we are to be successful in our relationships with men, we must eschew subterfuge and insincerity, and without other purpose than mutual good meet them on their own plane. Cultivate their acquaintance until we know them and know them by their first name. Know their families,

their associates, and home surroundings—their hopes, joys and sorrows. In other words, there must first be prepared the seed bed of mutual understanding. Judgment and due regard for the other's welfare and viewpoint must be exercised in planting the seed of desire, and the growing plant must be nurtured and cultivated until it blossoms forth into the maturity of accomplishment. Then my friends, may the winds and storms of demagogism, bolshevism, and all the other isms of social unrest come, a relationship founded upon such mutual confidence and respect will weather the storm.

Perhaps the importance which a personal appeal to the individual occupies in safety work may best be emphasized by reference to the results of observations made by the writer during the pre-war period. A personal examination into the underlying causes of a large number of accidents of major and minor degree covering a period of several months, showed that over 93 per cent were the result of man failure and less than 7 per cent to equipment failure. In practically all of the accidents charged to equipment, there were evidences of lack of proper care on the part of some individual. I can recall but two or three cases directly chargeable to defective material. One, a broken brake rod—one, a frozen air brake, and—one, a defective axle, which developed in the gear fit. The accidents under observation included collisions, derailments, controller burnouts, and others of a similar nature.

EFFICIENCY OF SAFETY EQUIPMENT

With respect to accidents to employees in the shops and car houses, you will pardon me if I mention the fact that the Bureau of Factory Inspection of the Department of Labor and Industry of the State in which our property is located, has made my company the object of special commendation because of the completeness and efficiency of our safety equipment. Moreover, we make the most of the literature and bulletins issued by the National Safety Council. You will find them conspicuously posted in prominent places throughout the shops, car houses, sub-stations, and at all places where our men congregate. At our weekly staff meetings and monthly round-table conferences, safety discussions are a permanent item on the program. Without this equipment and these activities, we would feel delinquent in our duty. Nevertheless, we hold to the statement that the personal appeal is productive of more efficacious results than all of the others. If I were required to relinquish all but one of the prime requisites of safety promulgation, I should cling to the personal appeal to the individual. Let me illustrate:

The great majority of plant accidents are, incipient local infections due to slight cuts and bruises, and minor accidents resulting from neglect to use goggles to protect the eyes when grinding or chipping, or when cutting rivets or bolts. Accidents, which are extremely simple in their nature and easily avoidable, and I may say here that all of our plants are equipped with first-aid kits, in charge of one or more men trained in first-aid methods. At our principal shop a first-aid department is maintained in charge of a capable, experienced graduate nurse, and, at our main office, which is centrally located with respect to the whole sys-

cisms must be of a constructive nature and should never be allowed to become ill natured or show jealousy or be in the nature of a "knock." These criticisms or suggestions should be made to the official to whom the employee reports and should then be referred until it reaches the general superintendent or general manager, to be taken up by him with the head of the department about which the criticism was made. They should never be made directly by the employee of one department to an employee of another. This latter method always engenders ill feeling.

All employees should be impressed with the thought that all suggestions should be of a constructive nature and that they are all made and *must* be made for the general good of the company and that personalities must never enter into any of them. Probably the most effective method of promoting a feeling of friendliness and co-operation between departments is that of having periodical meetings of men—not only heads of departments but the rank and file as well. This gives a chance for discussion of individual problems and helpful suggestions and is always productive of good results. On a large property these meetings have to be in sections but the results are the same. The Safety First Organization, of course, has such meetings, but all organizations should have them, whether they are called Safety First or something else.

The personality of the general officers and heads of departments has much to do with the question of a harmonious working of the organization. If these men cannot make the employees feel that they belong to a happy family, each one working toward a common end, there will be constant friction. An official does not have to lose his self respect, or power to have effective discipline, to have the good will and respect of his employees. Any company is fortunate that has officials who can command the respect and good will of every employee under them.

I have spoken, in a general way, of the principles necessary for a smooth-working organization and have probably not kept close to the text of my subject. However, the details of the work of coördination between transportation and equipment departments will work out themselves if the main thought is worked out successfully, and that thought is encompassed in just one word—*harmony*.

CHAIRMAN ADAMS: The subject is now open for discussion.

DISCUSSION

MR. V. J. WALTZ (General Claim Agent, Toledo Railways and Light Company, Toledo, Ohio): I should like to inquire of Mr. Jeffries, or of any other member of the Section, whether they have had any difficulties in securing the attendance of the employees from the different barns and shops at safety meetings. In Toledo, we have had a great deal of difficulty in getting attendance from our four sectional barns. In fact, it dwindled down so that we discontinued our meetings last year, but we intend to resume this Fall and continue through the Winter, and I would like to know the best method of securing attendance.

MR. JEFFRIES: Our men are scattered over a large portion of the state and it is harder to get them together because some have to travel quite

a distance to get to the place of meeting. We don't have any set dates for the meetings. We get them together whenever we think the proper time has arrived and we do not get them together in large numbers because that is impracticable. The most good, I think, comes from having a general, heart-to-heart talk instead of a set program at these meetings.

MR. R. N. HEMMING (Supt. of Transportation, Ft. Wayne and Northern Indiana Traction Co., Ft. Wayne, Ind.): If the organization gets too big, when you attempt to solve minor details you lose out. It has been our experience that by smaller groups we have accomplished more, in less time, and with more pep. However, in dealing with the trainmen, it has been my policy to hold two meetings, one to catch the early men and the other to catch the late men. We cover everything with short talks and give the men some statistics as to the number of our accidents, the money loss, and the character of the accidents. We follow this up with a talk on precaution.

We have sifted the organization down from seventy-two to fifteen. The old organization of seventy-two was so large, that we were going around in a circle. By bringing it down to smaller groups we have accomplished greater results. That is manifested somewhat in the reduction of the cost of accidents. Last year this cost was 3.4 per cent of the gross receipts and this year, from January to June, inclusive, it was 1.6 per cent of the gross receipts. We feel that is a creditable showing. Another plan that we use—it is in practice on many other properties—is that of charging up the accident to the man responsible for it, whether he be a conductor, or motorman, or other employee. He is also given a report showing how much money he has cost the Company through accidents, and it certainly brings about better results.

When this man feels that he is not getting enough money, we reverse the proposition. We show him how much, as an individual, he is costing the Company. He becomes a more careful man because he then realizes that he is robbing the Treasury and thus his own pocketbook.

MR. JEFFRIES: We have found a very effective method of keeping our men in line on the Safety proposition by having appointed, some years ago, a first-class man who was well liked by all the trainmen—he is an old timer himself—as a traveling trainman. He travels over some part of the road every day and criticizes unsafe practices in such a way that the men don't take any offense. That, I think, does perhaps more good than occasional meetings. I am quite sure it saves us a good deal of money.

MR. HEMMING: I would like to hear from others here on experiences with traveling trainmen or safety engineers. I haven't attempted that myself, but have given it some thought as to its practicality.

MR. G. G. HELLMUTT (Chicago, North Shore & Milwaukee Railroad, Chicago, Ill.): My road since 1916 has been under the supervision of the Bureau of Safety, which sends a man, experienced in safety work, to all our meetings. We have shop meetings, electrical meetings, and trainmen's meetings and we get all the men. We have day sessions and night sessions for the trainmen. One of the greatest difficulties in getting the men in is the fact that we bring them in on their own time mostly. We

are able to do that by putting it up to the head of each department to bring his men in and he, in turn, puts it up to the foreman. Having gotten a particular meeting going, we let the men introduce their own topics as far as they wish. The meetings never lack life.

By bringing the meetings down to individual groups we can keep our fingers on the men who are interested in the welfare of the road. We did have for some time, and doubtless will have again, general meetings. We would rent a big dining room at a good hotel and our president would attend the meetings. We would bring all the men in who could come and have a good dinner, smokes, entertainment and Safety talks. That created a great deal of good will. The speed of our cars has been increased very materially, and speed is a big factor in accidents. Yet we have reduced accidents, I can safely say, between fifty and seventy-five per cent. That shows what can be done. We have been without a serious collision since 1917.

Under the receivership we passed through many communities having heavy automobile traffic and no gates. All our crossings were grade crossings and we used to have many auto accidents. This year we have not had a single serious auto accident, partly due to the installation of gates and partly to the carefulness that the safety campaign has brought about among the men. I am strong for gates, first as a means of avoiding accidents and, secondly and largely, a means of cultivating good will among the towns through which the road passes.

HOW TO ATTRACT ROAD MEN TO SAFETY MEETINGS

MR. HOMER J. HODSON (Safety and Fire Inspector, East St. Louis Ry. Co., East St. Louis, Ill.): A gentleman here asked a question that has never been answered and I am very much interested in it: How to attract employees to the safety meeting, especially, the road men. I find it much easier to get the shopmen together than the platform men. You can get a vaudeville act or two—I am trying it now—at the noon hour. By this means it is easy enough to get the workmen together and then bring in about ten minutes of safety work. I am also organizing a glee club in the office force and once a month to sing for the men in the shops. That gives us a chance to get them together and to get in just a few minutes' work on safety.

Another thing that proved successful was a general entertainment by the office force of the Alton District for the shop and platform employees and their families. This brought the two organizations together. Mr. Sawyer, our President, dropped in. It was such a wonderful meeting the workmen are calling for others like it. Within the last six months I have shaken hands with every man on the job. I go out and call him by name.

I would like to ask Mr. Jeffries what his idea of a safety committee is. How do you pick your committees? Do you have a committee in each shop, on each division, or a general committee?

MR. JEFFRIES: We have no regular safety organization. We simply get together informally whenever we can.

MR. HODSON: We have a regular safety organization. Our men elect their own secretary and appoint their own officials from each of their smaller safety organizations. We get out bulletins to our trainmen through the Department of Transportation when we want them to come in to safety meetings, and we get out notices through the master mechanics to our shopmen.

LAURA M. ROADIFER (Philadelphia Rapid Transit Co., Philadelphia, Pa.): We have recently tried motion pictures to arouse the interest of the men at our barns and it proved most successful. I produced a small amateur motion picture reel on safety. The response was so great that we have now installed a permanent motion picture equipment and at various times invite the men from other barns to these entertainments. I suggested that they produce their own motion pictures on Safety and a remarkable number of responses have come in.

MR. C. L. TURNER (H. L. Doherty & Co., 60 Wall St., New York City): I would like to ask any of the members present if they have had any experience with paying men for the time which they spend at the safety meetings. We pay our men during their time in the instruction school and it seems to me that this safety game is largely one of instruction to the men for their benefit and for our benefit.

MR. SAMUEL H. REID (Bureau of Safety, Chicago, Ill.): We have had no extensive experience in paying men for the time spent at safety meetings, but our experience has not yet led us to believe that any hard and fast rule can be made along that line. I think that is to be determined largely by local conditions. In several places we found it almost impossible to get the men together on their own time and in such places the meetings were held on the company's time and the company's expense.

A THOROUGHLY ORGANIZED SAFETY DEPARTMENT

I want to say a word further about this organization that one of the members just spoke of. I think the Chicago, North Shore and Milwaukee Railroad has the most thoroughly organized safety department that I know anything about. There are four general departments: The Transportation, the Mechanical, the Maintenance of Way, and the Electrical. On that property there are approximately six hundred employees and those are all organized in the Safety Leagues according to their departments.

In the Transportation Department there are five separate Leagues, each League having its own officers who are elected for one year. All meetings of the Transportation Department are held on the men's time and they are not paid for it.

The Mechanical Department meetings are held usually at the noon hour. Some are held in the evening, but those are held partly on the company's time and partly on the time of the men.

The Electrical Department is divided into two Leagues. They meet once a month in the evening and the men are not paid for the time they spend at the safety meetings. This has been tried out for more than three years and we have had very little trouble in keeping up the

interest among the men. I think the attendance at such meetings depends largely upon the man in immediate charge of the department.

In order to make the men feel that they had some real part in it, they were invited to make suggestions. It was realized from the beginning that the workmen knew more about the conditions and causes of accidents than anybody else. Sometimes their suggestions were passed upon in a formal way and occasionally a recommendation submitted by a member would be voted down. If it was adopted by the Safety League, it then went to the Central Safety Committee, which consists of the nineteen Department heads. The details of the work of that Committee are delegated to an Executive Committee of four members. The man who makes a recommendation is informed as to why it was turned down and, therefore, doesn't feel badly about it. We have found that method very successful.

We have received 1,786 recommendations from the men and it is safe to say that 1,100 of these have been carried out. Occasionally we have a moving picture but it is not made the main thing. The thing that is emphasized most is safety. The moving pictures, cigars, and things of that sort are considered a side issue. Occasionally, we have a meeting of the men and their families. That has proven to be a good thing.

The Central Safety Committee has a dinner occasionally at which the officers of the Safety Leagues are brought in contact with the higher officials of the Company and are made to appreciate the dignity and the importance of the safety work.

MR. PHILLIPS: Mr. Chairman, I think Mr. Hodson struck the keynote of the whole situation when he said that in the last six months he was shaking hands with every man on the job. I think that is the foundation of all success in any movement which involves the men or the employees of the departments of the company. He also made some remark about the success of some of the meetings for which the employees were largely responsible. In other words, they were the moving factor in the meeting. No superintendent or manager, nor a group of superintendents or managers, can force workmen to come to the meetings. You might force them with a police department but it would do you no good when you got them there, so why have the meeting. You must get the support and the interest of the men first.

We had an experience of that kind shortly before the war. We thought it would be a good thing to have a picnic in the mechanical department of the railway. After long pleading with officials of the company, I secured enough money to pay all the expenses of the picnic and it was the poorest picnic that I ever attended. The next year the boys had a picnic and it was their picnic; they paid all of the expenses. There were 4,000 people there.

I might offer some encouragement to the young lady from Philadelphia with respect to the display of moving pictures. Our company has five reels of accidents. As a matter of fact, all of the accidents were fakes but they illustrated all the kinds and characters of accidents that we have ever experienced in all their various phases. You would be surprised at the interest that was created among the workmen although the

pictures were not taken for that purpose. We took them to educate the public and we had better results in educating our own employees than we did the public.

CHANGE THE PROGRAM

CHAIRMAN ADAMS: I believe that in order to keep up interest among the employees we should continually change the program. We can't follow a set plan from year to year or even from month to month now. By having little meetings like this, where we find out what the other fellow is doing, we are enabled to go back to our plants with new ideas and new inspiration. That is one of the greatest benefits of the National Safety Council's annual congress. I attended a meeting of the Chicago, Milwaukee, North Shore Railroad and their president was there and made a heart-to-heart talk to those boys. I don't think he exceeded five minutes but he gave them to understand that he, the directors and the stockholders of that company were with the men for the prevention of accidents and the saving of their lives and their limbs, as well as the friends of the claim department of the company.

I believe that one of the first requisites of successful safety work is that our presidents and directors must have the safety thought in their own minds. It is up to some of us underlings to get to those men and teach them the principles and full meaning of safety. The National Safety Headquarters in Chicago has a large number of stereopticon slides, movie films and even phonograph records, on accident prevention. What they have in the National Headquarters are yours and mine and I believe that if you people who need films or slides, will get in touch with the general office they will be glad to act as an exchange for you. You can get the other fellow's films and he may want your films. The National Safety Council is rendering such service daily. I want to call your attention right here to the part that we, as railway men, should take in the Public Safety Section. We traction people are the ones who naturally benefit most financially from the prevention of street and home accidents. I understand that about seventy or eighty per cent of the accidents throughout the country are home and street accidents.

Thus far, America has not done very much towards educating the public along the prevention of home and street accidents but this Congress is going to put Public Safety on the map. We will now hear Mr. C. P. Proctor.

WHY DOES NOT EVERY ELECTRIC RAILWAY HAVE A SAFETY ORGANIZATION?

C. B. PROCTOR, CLAIM AGENT, MEMPHIS STREET RAILWAY, MEMPHIS, TENN.

It seems strange that it should be thought necessary at this time to discuss the above subject, because it is remarkable that any electric railway should now be without a safety organization. The more thought we give to the value of such an organization, the greater difficulty in understanding why one is not maintained by every electric railway.

To my mind there can be but one fundamental reason for such failure

and that arises from a failure to understand its purposes. In view of this fact, it is wise to inquire what a safety organization is and, of equal importance, what it is not.

THE IDEAL SAFETY ORGANIZATION

The ideal safety organization is composed of a select body of men representing every department of the railway; men of intelligence; men whose ambition it is to render to the patrons of their railway, safe and courteous service; men who do their utmost by example and influence to develop in themselves and associates a high state of efficiency; men who practice the Golden Rule, and endeavor to persuade their fellow workmen to do likewise; men who teach safety by precept and example, first, last and all the time; men who are loyal to their country, their fellow employees and their Company; men who so act because it is right and are actuated by the desire to bring happiness instead of sorrow, to prevent, instead of cause, pain and suffering; at the same time realizing that such conduct redounds to the pecuniary benefit of themselves and their company.

The safety organization is most emphatically not a collection of spies. It tries to down no one, but to elevate all. It wants to get no man's job, but aims to help him keep it and improve both the man and the job. It purposes to interfere with no one's rightful prerogatives, but hopes to better the service by pertinent suggestion. It intends in no way to interfere with the administration of discipline; nor is it to be used as a disciplinary measure. It tries to accomplish nothing through compulsion, but endeavors to get results from education and appeal to the higher principles that are implanted in all. In it there is no room for personal malice, no place for the backbiter or the disorganizer. Its purpose is not to disorganize or breed strife, but to unite and promote harmony. The successful safety organization must have the hearty support of both the management and the organized employees.

The foregoing briefly outlines the ground plan of a hundred per cent efficient safety organization. It is admitted that we rarely reach the hundred per cent mark, but it has been proven beyond cavil that with the assistance of a live safety organization, accidents with their attendant loss in human life, in pain and suffering and in cold dollars and cents, can be reduced fully fifty per cent.

MISCONCEPTION OF USES AND PURPOSES OF THE SAFETY ORGANIZATION

When we consider what the electric railways are facing today it seems incredible that the management or organized employees of any electric railway should fail to avail themselves of such a valuable adjunct. Such failure can only come from a complete misconception of the uses and purposes of the safety organization on the part of either the management, the employees, or both. It is, I believe, fear of its misuse that prevents the universal adoption of the safety organization.

If a personal reference may be pardoned, I had the pleasure of serving as chairman of a safety organization from January, 1913, to December, 1918, at which time circumstances beyond our control made it necessary

to suspend, for a time, its operation. We are now working out the details of a reorganization and expect to have them completed in the near future.

From experience we have learned what can be accomplished with the aid of the safety organization. It is not a panacea. As before stated, it in no way interferes with the administration of discipline, nor does it operate to any man's hurt, but it does provide a medium for the getting together of officials and employees on a friendly basis. It does promote harmony and co-operation and it certainly aids materially in reducing to the minimum risks of operation and cost of maintenance.

I would respectfully suggest to those, if there are any such, who are opposed to the safety organization, that they study the question carefully and inform themselves fully as to its proper function. If this is done opposition will be supplanted by enthusiastic support.

CHAIRMAN ADAMS: The subject is now open for discussion.

DISCUSSION

MR. HEMMING: I don't think it would be amiss at this time, for me, as Chairman of this Program Committee, to knit together the purpose of these three subjects as presented this morning. They might be summed up in this manner: The first subject, "The Human Factor in Safe Operation and Maintenance of Rolling Stock."

Having recently held the position of superintendent of motive power, having a large property operating, both city and interurban, and being active in the safety work, I saw the likelihood of failures in the Mechanical Department. Likewise, through that safety organization did I see the co-operation between the Transportation and the Mechanical Departments. From that we pass on to, "Why Does Not Every Electric Railway Have a Safety Organization?"

I communicated with electric railway companies affiliated with the National Safety Council and endeavored to interest them in this safety movement in order that we might make this section one of the biggest sections in the National Safety Council. I received replies from various companies to the effect that they could not get the Mechanical Department and the Transportation Department together. There was a friction that engendered enmity between the two departments in these companies and they finally concluded to disband their safety organization. To me it appeared that there was something wrong up at the top.

As Mr. Hodson and Mr. Phillips said, get right down under the heart of the individual and say, "How are you today, Tom, Dick, and Harry." Stick your hand out and ask about their families and then switch the subject over and say, "Well, what are you doing for safety today?" Have a little heart-to-heart talk with a man along that line and he will open his heart and tell you some of the difficulties—the difficulties you want to find.

Men, in analyzing the thing from time to time, I have found one obstacle and that was the fact that we were trying to cure all of the ills by mechanical devices. Mechanical devices are no better than the

human factors behind them. It is the human factor we have to deal with and if that fails, your mechanical devices fail. We might take as an object lesson the block signal down the line, conducted ever so scientifically, operating on one hundred proper tests ever so successfully, yet something happens and it gets out of order. The man who was in charge of that equipment failed to inspect properly or to repair it and the device throws the wrong signal. Thus we have the failure of the human factor. Mechanical devices will, in many cases, prevent accidents, but as I said before, they are not a curative.

The first thing you have to do before you can accomplish results is to sweep the trash from in front of your own door.

We tell the men that if anything on their cars or along the railway is defective mechanically, or otherwise unsafe, we want them to report it. We started on that basis and it proved very successful. When the first accident happened, the man, when questioned as to how the accident occurred, replied, "Why, the brakes failed." I said, "Did you turn in a defect card?"

"No. I told the fellow out at the shop it was bad," he said.

"Whom did you tell?"

"Well, I told some fellow out there."

Now right there, men, is where the two departments began to clash. The trainman said he reported the defect and the shopman said he didn't. We have one man's word against the other.

A defect report should have been made. The motorman's excuse of brake failure didn't go; it will not go in court nor before the Railroad Commission. It was worn out years ago.

We now require the filling out of defect cards in triplicate. One comes to my office, one to the Superintendent of Motive Power, and the other remains on the car until it is shopped and no matter how many times you change trainmen on that car, the defect cards are made out. If we expect to master the subject at hand, it behooves every one of us to get busy with our neighboring properties and our friends who are in the railroad business to become members of this association so that we can do things on a bigger scale and master this traffic situation; otherwise, I don't see how we are going to do it.

COMPELLED TO VIOLATE THE LAW TO MAINTAIN SATISFACTORY SCHEDULE

In conclusion I want to say that we have in this Congress another section known as the Public Safety Section. These two sections have so much in common in the prevention of accidents that we should have a joint session. Through the medium of the two organizations we should be able to bring about legislation that will materially help both the Public Safety and the Electric Railway Sections. There is one thing I want to call your attention to in that respect, and that is this: All over the country we have ordinances saying that you shall not operate your car over eight miles an hour and yet if you were to reduce your maximum speed to eight miles an hour, you would have the greatest howl that ever came from your citizens. In order to maintain a schedule satisfactory to the public, we are compelled to violate the law every

second and to operate probably in the neighborhood of twenty to thirty miles an hour maximum. If we are compelled to give the public fast service, then we should be permitted to operate a schedule without violating the law.

MR. JOHN H. MALLON (Safety Engineer, Chicago, Ill.); It seems to me that coöperation in safety work on an electric railway should come from the top; that is, the example should be set by the heads of departments. Some years ago I worked under a general manager who had been with a steam railroad and his idea of railroading was to keep the various departments fighting all the time so that they couldn't get together to frame up something. He was working, we now realize, against himself. The real big success of our organization is due to the character of our officials. Some three or four years ago our President, Mr. Budd, called in the heads of the departments and instructed them that in disciplining the men of whom they were in charge, the greatest patience was to be shown. "Don't suspend a man on slight provocation; don't impose a hardship upon his family," is our rule. We have gotten wonderful results. I met our president last Monday when he came back from his vacation. He was in a hurry but when he saw me he let the elevator go, came back and said, "Hello, Jack, how are you feeling?" That is the spirit that is all through our organization. You can't set yourself on a pinnacle because you are a step above the other fellow. That day has gone. When the boys began to return from the war, the president of our company said to me, "I want to see any of those boys who come back. I want to say hello and to shake hands with them."

He would say to them, "How do you feel? Do you need any money? If you do, Jack will fix you up."

If they needed any money I would give them advance pay until they had an opportunity to get settled again.

I think the most effective way of getting real safety results is for the man who observes a violation of safety rules to tell the man at the time that he has done wrong. Strange to say, few of us have the nerve to do it. Instead, we go to the office and write a letter to some one else to tell him about it.

CHAIRMAN ADAMS: Now, Gentlemen, you know that we have been told by the medical men that we ought always to leave the table just a little bit hungry. Now we have a lot of good things left to eat in this Electric Railway Section and we could continue at this meeting with a great deal of benefit to all of us, but the time has come that we must stop. We will now take a recess until 9:30 tomorrow morning.

Adjournment—11:45 A. M.

FRIDAY MORNING SESSION

THE meeting was called to order at 9:40 A. M., Chairman H. B. Adams, presiding.

CHAIRMAN ADAMS: Mr. McDougall will present the report of the Nominating Committee.

proper standards to be recommended; or which will lead to the appointment of some existing organization for the same purpose. One such organization, and the one which is probably the most logical of those which could be considered at the present time for this work, is the American Electric Railway Association, or possibly a committee appointed by and working under the auspices of this association. I believe that the most advisable means would be the forming of a committee with, if possible, the recognition and support of the Federal Government for the express purpose of nationalizing and standardizing accident prevention. It may develop that this committee would work in connection with the U. S. Bureau of Standards, as was the case in the preparation of the National Electric Safety Code.

The methods of establishing the proper standards of accident prevention, and of nationalizing these standards when accepted, is the problem which is probably the most difficult of those connected with this entire question. You might say this matter is disposed of with the appointment of the commission or organization to carry on this work—but was it? Are we to appoint a body to carry on this work and then sit back with the feeling that the matter is now out of our hands? I think not. The fact that this is the most important step toward our ultimate goal should spur us on to an active interest and part in the outlining or suggesting of plans for the guidance of this newly formed commission, or for the carrying out of a new work of a present existing organization.

A THOROUGH INVESTIGATION THE FIRST DUTY

The first duty of this commission would be to conduct a thorough investigation of the best and most practical ideas and methods which are now in practice, and which have been proven to be of value in reducing accidents. Let this investigation include an exhaustive survey of modern accident prevention methods with a view to gleaning from the whole the best and most efficient means which are now employed. The action taken from this point on will be governed largely by the results of this investigation. It will undoubtedly develop that the need for education which is not now fully appreciated will be emphasized. I can truthfully say, without fear of contradiction, that the city and interurban lines in Indiana and Kentucky with which I am connected were, so far as I know, the first electric railways to carry on safety work in the thoroughly organized manner that has in the last ten years been so productive of good results and extended to so many public utility companies. This plan lays emphasis upon the educational feature of safety work, and includes in proper groups every employee of the company.

My opinion is that the branch of the work which is most needed by the majority of companies is that which has to do with proper organization, instruction, and education of employees, as the specifications for equipment, station installation, etc., is at present standardized to a great extent. The support or cooperation of the companies to be affected by such a plan will in a large measure determine its success. The most capable commission obtainable may draft the most efficient, practical, and modern

methods of accident prevention, yet unless these methods are endorsed and applied by the companies for whose benefit they are intended the value and results of the entire undertaking will be negligible. The necessary steps should be taken by this commission to insure the proper cooperation of the utilities concerned.

Let us suppose that the need for nationalizing and standardizing accident prevention has been fully appreciated; that the proper organization has been appointed, or a competent commission established for the purpose of conducting the necessary investigation and setting of standards; that this body has completed its work in an efficient and satisfactory manner; that the support of the companies concerned has been assured: What is now to be expected as a result of this progress, and just what are the benefits which may be looked for? Any advance statement as to the results to be attained by the electric railway business as a whole must necessarily be speculative in character. Those who have had experience with accident-prevention work on individual properties know that the results are very definite and encouraging. One of the traction companies with which I am connected, and which operates city and interur-

REDUCTION IN NUMBER AND COST OF ACCIDENTS

ban lines, reduced their accidents 75 per cent, and their accident costs 80 per cent since the safety work was first organized. Another interurban electric railway in Illinois, conducting their safety work upon the same plan, and under the direction of the same Bureau, reduced their accident costs \$57,000, or 62 per cent in one year. The reduction in number and cost of accidents occurring in connection with the operation of the street railways of the country under a standardized plan of accident prevention would be a certainty. The amount of this reduction cannot be estimated with any degree of accuracy.

There is one class of electric railway company which would derive a special benefit from this plan. This class includes those smaller lines that feel (and many of them are justified in the feeling) that they cannot afford to employ a safety engineer. These companies would have the opportunity of adopting accepted methods which have been tried out and found to be practical and effective, and would have uniform outline of the safety plans which could be followed and carried out by their present organization.

MR. HARRY REID: I had intended to follow this paper by giving you a brief outline of just how safety work is carried on on our property but inasmuch as Mr. Scott, Mr. Mallon, and Mr. Samuel H. Reid, and others connected with the Bureau of Safety, of Chicago, and men who are working under that Bureau gave such a detailed description of how the work was carried on, yesterday, I hardly think it necessary to take your time.

We have a safety manager on our properties for Kentucky and Indiana, Mr. James Harmon, who is present at this meeting. All the employees are organized in separate groups and each group has its president, vice-president, secretary, and treasurer.

CHAIRMAN ADAMS: The subject is now open for discussion.

DISCUSSION

MR. HEMMING: The paper is very comprehensive, yet I believe there is room for discussion that will bring out many points on this thing and lay emphasis on the necessity of nationalizing and standardizing. That can be done, to my mind, in a very effective manner through the various electric railway associations scattered throughout the United States.

There is the New England Railway, the Illinois Railway, the Central Electric Railway, and many other kindred organizations that, in so far as I know, do not have any safety organizations.

I don't know, as I said yesterday, of any organization that should give more acute attention to safety work than the electric railway properties.

I would like to hear some discussion on this from the other corners of the globe. I believe every one of these papers ought to be entered into very thoroughly.

MR. B. D. HASKINS (Claim Agent, Chattanooga Railway & Light Co., Chattanooga, Tenn.): I think that we have missed, in this discussion, one point that is very vital, that is, the educational phase of conducting the safety work. We all agree that it is a good thing and that every company ought to engage in it, but no one has gone into the details, and it is the details that I think we want. A gentleman, yesterday, Mr. Reid I believe it was, touched lightly on the details of his organization, and the chairman of our program committee intimated that his property also had a fixed program, but no one has given us any light on what they think the best procedure after the safety organization has been established.

I want to tell you of my way of operating and then I would like to hear others here give their methods. We begin with the highest officials of our company, the general manager, the assistant general manager, the superintendent, the assistant superintendent, the inspectors, and then we have the committeemen from all of the different branches of the property. I, as a Claim Agent, am permanent Chairman. We change our committeemen every six months. We find that in the course of six months we have inspired them with the work sufficiently to turn them loose and take up some one else.

We call for suggestions, for instance, and when a man makes a suggestion it is numbered. The name of the man making the suggestion is carried in the minutes and when the suggestion is disposed of, it is shown in the minutes so that its author can keep track of what has become of his ideas. We have reduced our accidents. The cost in the Claim Department last year was \$108,000 and this year \$50,600.

MR. SCOTT: It is difficult to give the details of the safety education of the trainmen so as to cover all conditions, but I will pick out a medium-sized road and explain as best I can what is done there to answer your question.

Instead of having intermediate committees, as you seem to have, we

have a large central committee on safety, composed of the various operating heads and the chairmanship is delegated to the highest official available so as to give that committee a standing. In the case I have in mind, the assistant to the president is chairman of the safety committee. That committee meets after the meetings of trainmen so that it can pass upon anything that came up in the trainmen's meeting.

The men are organized in groups with reference to the hours of employment and with reference to their duties. The shopmen are organized separately from the trainmen. The officers for the employees' groups are changed every year, but the members of the Central Committee continue their office without interruption unless there is a change in the organization. At the employees' meetings, suggestions are received verbally. For instance, a man gets up and says, "I think it would be a good idea if we would standardize the location of the whistle signal", or something of that sort, and then the question is thoroughly discussed. If a majority of trainmen present believe that this is a good thing, that recommendation is transmitted to this Central Committee to be acted upon. If a majority is opposed to that recommendation, it goes no further than that particular meeting and that discussion. Here is an important thought. In every instance, the group is advised of any unfavorable action on any of their recommendations by the Committee and the reason is given for it. If the group makes a recommendation that requires the expenditure of a lot of money, and the committee decides that they can't afford to put it into operation at this time, they frankly say so. The recommendations that come from these groups of trainmen to the Central Committee are very carefully tabulated by a secretary and given a serial number. All recommendations that are not complied with are kept alive on a sheet and at each meeting of this Central Committee all of the back recommendations that haven't been acted on definitely are considered.

As to the education of trainmen, that is done through the group meetings. It is considered rather important that the superintendent of transportation and the trainmaster attend the group meetings. Their influence helps to maintain the interest of the employees and they are there to answer questions. We make it a point to have at these meetings, if possible, a talk upon some particular phase of the operation. We have some outside safety man come in occasionally to make a few remarks. Does that answer the question?

MR. HASKINS: That is very good. I appreciate it very much.

We have, perhaps, an advantage over a larger property in that we have between 500 and 600 employees. We don't have a Central Committee because I insist on the general manager and all the other officials being right there in the meeting to thrash these things out. We have two committee meetings a month, lasting one hour only. We have a meeting once a month for all the employees and at that meeting there is a general discussion on anything that any one wants to talk about. Our effort is to educate the men and have them educate us.

CHAIRMAN ADAMS: I see by our slips of attendance that we have here a Mr. Wilson, of the Northern Ohio Traction & Light Company, of

Massillon, Ohio, with the title of motorman and conductor instructor. I would like to have Mr. Wilson give us a few ideas along this line.

MR. HUGH WILSON (Northern Ohio Traction & Light Co., Massillon, Ohio): The position that I now hold is a new one entirely to me and I came here to learn. Perhaps later on I may have more to say.

CHAIRMAN ADAMS: We will be glad to hear from you, Mr. Wilson, and we wish you success in your work along that line.

MR. HARRY REID: May I suggest appointment of a Committee to take up with the several electrical railway associations this matter of standardizing accident prevention as suggested by Mr. Hemming and then if the committee from this section of the Council is successful in getting the electric railway associations interested in this work of standardizing, that they might go to the American Electric Railway Association and get a committee appointed there. Then perhaps in the course of a couple of years we will get this national movement on foot. I would like to make such a motion.

MR. SCOTT: I want to second that motion.

AMERICAN ELECTRIC RAILWAY ASSOCIATION

CHAIRMAN ADAMS: I know that the headquarters of the National Safety Council in Chicago are making every effort to bring the American Electric Railway Association into connection with the Electric Railway Section of the National Safety Council and the American Electric Railway Association has asked for recognition by this section. Of course that association should get in touch with this section and I believe this kind of a suggestion coming from us will help to bring about an affiliation for the good of accident prevention between the National Safety Council and the Electric Railway Association and if you will put the gist of your motion to me in a few words, I will be glad to entertain it.

MR. REID: The motion is that this section of the National Safety Council appoint a Committee to confer with the several district electric railway associations affiliated with the American Railway Association with the view of getting their interest into a nationalization and standardization of accident prevention as applied to the electric railway industry.

MR. McDUGALL: As I understand Mr. Reid's motion it is that the committee be appointed from the various district or state associations. Am I right, Mr. Reid?

MR. REID: I think, Mr. McDougall, that if the Chair saw fit that it might be well to select on this Committee men from the several associations. For instance, from the Central Electric Railway Association, I would suggest Mr. Hemming. There may be a man in the New England Association who is affiliated with this body and these district associations are all more or less affiliated with the American Association. If the local association, for instance, the Central Electric Railway Association would take enough interest in this thing to get a standard and then this Committee would go to the American Electric Railway Association with the backing of all these local associations, I believe that we would get started in the right direction.

MR. McDUGALL: If I may be permitted, before that motion is put, I would make the suggestion that the committee be appointed at this time.

MR. REID: I don't think it can be done. I don't think we can go to the American Electric Railway Association and get enough interest there to have them pass it back down the line.

MR. McDUGALL: I might say this, Mr. Reid, that the Electric Railway Association will meet next week at Atlantic City and this is one of the things that is to come up. I think I can promise you that a committee will be appointed sometime during the next week and it would be a good thing if this association could appoint a committee to meet with that committee sometime during the coming year and then be ready to report at the next year's congress.

MR. SCOTT: I have represented Mr. Budd on accident prevention committees on several occasions and I believe that Mr. Reid's idea in bringing this to their attention would be a very strong force to get what we want.

MR. HEMMING: I have had quite a bit of experience in association work and particularly with those mentioned, the Central Electric and the American. I have had considerable to do with engineering some of these problems through and I agree absolutely with Mr. Reid that the place for this to start is here, then through the avenues of the other associations and then up to the American. It is like trying to build a roof on the house before you build the foundation, and I know that you are going to get quicker results by taking it from here on up than you will by attempting to take it through the American Association on down.

Now I don't say this to criticize either Association but I know that it will work quicker the other way because the American Association is so large in its scope that it takes anywhere from two to three years to get a problem through.

CHAIRMAN ADAMS: Gentlemen, you all understand the motion and the object of it. I will put that motion.

The motion as stated by Mr. Reid was seconded and carried.

CHAIRMAN ADAMS: The appointment of that committee, I believe, ought to rest with the incoming chairman and he can have between now and 11:45 to decide upon the members for that committee.

Next we have our dear friend, Mr. McDougall, of Rochester, N. Y. He has something to tell us about "Electric Railway Hazards—Causes, Effects and Remedies."

ELECTRIC RAILWAY HAZARDS — CAUSES, EFFECTS AND REMEDIES

R. E. McDUGALL, CLAIM AGENT, NEW YORK STATE RAILWAYS,
ROCHESTER, N. Y.

There is no business where there are so many possibilities for accidents as that of running an electric railway, nor any business where there may be so many different classes of injuries, both to employees and the public. Criss-crossing cities, towns, and country as traction

lines do, with the possibility of injury not only to employees and passengers but to pedestrians and the general public as well, it is not surprising that traction men are interested in accident prevention—and not only interested to the extent of spending their money and time in this work, but are firm believers in the good that can be accomplished by education along safety lines.

Under the head of "Hazards" on electric railways we have three main classes of accidents, viz.:

1. Accidents to employees
2. Accidents to passengers
3. Accidents to pedestrians and others using streets and highways

ACCIDENTS TO EMPLOYEES—CAUSES, EFFECTS, AND REMEDIES

Electric railway employees may be injured in many ways, such as: wagons; falls in our houses and repair shops; being run over by equipment; blood poisoning; being struck by falling objects; collisions between cars and vehicles; eye injuries from flying particles; falls from cars, falls into excavations, etc.

Investigation of accidents similar to above show a part of them are caused by defective equipment or conditions over which the employee has no control, but the most of them are chargeable either to carelessness on the part of the injured employee, his co-employee, or foreman, or the failure to make and enforce safety rules.

An employee's accident record quickly demonstrates who is the careless and chance-taking man and this record will be of value in helping to make employees more careful. An employee known to be reckless or willing to take chances in regard to his own safety or that of a co-worker, is dangerous on any property. In the selection of employees some thought should be given to this phase of a man's character.

Very often failure by the injured employee or his foreman to give proper care and attention to slight injuries results seriously and is followed by infection and blood poisoning, and may be the cause of losing a limb and often a life. The old saw, "A stitch in time saves nine" certainly holds good in this connection. A small first-aid kit with disinfectants and bandages should be procured and kept where easily accessible, and the foreman and men should be impressed with the necessity for giving minor injuries attention.

Sometimes it is the small things that lead to the most serious accidents. One of the most distressing cases of this kind that has come under my observation recently, was due to a car on the road with a faulty trolley retriever which could have been repaired in five minutes time. A line tower truck was standing near where the car in question had to pass; two men were on the tower and the wind swung the trolley rope so that it caught the top of the tower, throwing the men to the pavement, badly injuring both and probably permanently injuring one; as a result, two men were laid up for months, one perhaps for life, with a cost to the company of several thousand dollars. I might recite a number of instances of this kind, but if you will give some attention to

a study of the conditions which lead up to most of this kind of accidents, you will find it is the little things and careless acts that pave the way to bad accidents.

ACCIDENTS TO PASSENGERS—CAUSE, EFFECTS, AND REMEDIES

Traction managers and accident adjusters have found that the public believes it is the easiest thing possible to receive a serious injury on a street car; negligence lawyers are also active in propagating this idea. As a matter of fact, when you consider the number of passengers carried yearly by traction companies, with the possibility for accidents, the percentage killed or seriously injured is not nearly so high as in industrial plants.

There are of course, a great many ways by which passengers can be and are injured. Investigation shows the three most prominent causes to be:

- (a) Improper operation of car by employees
- (b) Run down condition of equipment, track, etc.
- (c) Carelessness on the part of injured person
- (a) Improper operation of car on part of employee often causes:
 - Collisions
 - Derailments
 - Premature starting, thereby throwing passengers in cars, or while boarding and alighting
 - Collisions with other vehicles at street intersections
 - Striking passengers who have alighted from cars going in opposite directions, etc.

We are all familiar with this type of operation and its results. The human element is the big factor in causing and preventing accidents. Motormen and conductors are as willing as the rest of us to do their share and the big thing is to secure their cooperation. Here, in particular, the record of trainmen is of value. If it is found that a trainman is making an undesirable record for himself the use of an itemized record in pointing out the number of accidents he has been responsible for and what they are costing the company in dollars and cents, will be of great assistance in educating that particular employee. Personal education of each employee along accident prevention lines will prove a big investment for the traction company that is willing to spend the money to do it.

It can afford high class men to do this work properly, and find at the end of a number of years that its accidents have decreased in number and have cost less. This will be the only comparison of any value that can be made, for the reason that if an accident has not happened you cannot satisfy anyone that you have prevented it.

- (b) A high standard of maintenance with reference to equipment, track, loading platforms and other portions of the property that the public comes in contact with has much to do with preventing accidents. You do not have to be told that when your tracks are not in good shape you are going to have more derailments and collisions with cars; that

when equipment does not work properly you are going to throw more people daily in and off the cars. Money spent on upkeep means less accidents and reduced expenditures.

Holes and depressions in the pavement or at points where cars stop to take on and off passengers are a very common cause of accidents, often serious. Cooperation between the municipality and the company will prevent many accidents of this nature and at a comparatively small cost. A close watch of the conditions will save both much more money than the cost of proper upkeep.

Sometimes it pays to make conditions fool-proof. As an illustration: On the property I am connected with, for some years prior to 1913 every summer we had from five to ten cases of broken arms due to passengers, when windows were up, resting their arms on the window sill and projecting between the iron bars, which were about four inches apart on some of our equipment. The breaks were caused by coming in contact with other cars in curves, trees, sides of bridges, or other vehicles. It was costing us anywhere from two to five thousand dollars a year fighting these cases in court or adjusting the injured party's claims. In 1913 and 1914 at an expense of about four thousand dollars we added enough bars and screens to the sides of the cars so that it was impossible for a passenger to get his or her arm outside the car, and we have had but one accident of the kind since.

For years all the warnings of railway operators and the many examples of injuries due to getting on and off moving cars had no effect on the public; it was not until folding steps and doors came into common use that any reduction could be made of the class of accidents known as "Boarding and Alighting." The closing door and folding step are not necessary to the transportation of passengers, but today you cannot find a manager or operator who would say they are not worth much more than they cost in the money saved his company so far as accidents are concerned.

(c) I believe I am safe in the assertion that one-half of the accidents occurring to passengers on street cars are caused by the passengers' own carelessness or contributory negligence. They will get on or off a moving car if permitted, and invariably when doing so face the wrong way. Without looking they will step from a car directly in front of a moving auto or other vehicle. They will do a thousand and one things that are risky. Many women's shoes and skirts cause nasty falls resulting in broken bones or sprains that lay them up for weeks. Tight skirts and high heels cause more women to be thrown than the operation of the car. Passengers will jump off a car, cross directly behind it, and onto the track in front of a car going in the opposite direction without looking or paying the least attention to what they are doing.

ACCIDENTS TO PEDESTRIANS AND OTHERS—CAUSE, EFFECT, AND REMEDIES

The accidents that the public (not including patrons) are involved in come within the following classifications:

- (a) Pedestrians struck by cars

- (b) Pedestrians falling into excavations, over defective track, material left in street, hit by falling poles and wires

- (c) Occupants of vehicles in collision with cars

(a) Many of the individuals struck by cars are children playing in streets and their injury is due to thoughtlessness more than anything else. They will chase a ball onto car tracks without a thought of a car; they will catch a ride on the rear of a wagon or truck and drop off in front of an approaching car; they will ride a sled or a bicycle down an incline across tracks, never giving a thought to the possibility of injury. Their elders also get hit for the same reason. They do not think, and rely on others to look out for their safety. Intoxication is quite a factor in this type of accident, particularly on interurban lines.

While the motormen at times are responsible for injuries to pedestrians, the majority of them are chargeable to the injured party. They could be avoided generally by the use of a little judgment or common sense. Some individuals will hurry to cross ahead of a car and then stop and watch it go by; they will step from the curb between two automobiles or pass behind one car directly into the side or in front of one going in the opposite direction.

(b) Most accidents under this head are caused by employees leaving materials and excavations improperly guarded and lighted. Fortunately at the present time most municipalities have ordinances requiring proper guarding and lighting, and in the event of neglect or oversight on the part of employees their attention is soon called to it by the police.

(c) The increase in the number of motor vehicles in the past few years has resulted in an enormous increase in accidents between them and electric railway cars, and a long list of killed and injured. The most serious occur at grade crossings familiar to the auto drivers and with every opportunity to see and know of the approaching car or train traveling at high speed. Early this summer in a three weeks period, fifteen people were killed in three accidents of this type, within a radius of fifty miles of Rochester. One car was being driven by a girl of seventeen who was learning to operate the machine, one was being driven by a boy of fourteen, and the third was driven by a man who could see an express train approaching him at right angles and deliberately tried to beat the train to the crossing. Notwithstanding the fact that you read of this kind of fatality in every paper you pick up, it seems to and will continue as long as high powered automobiles are permitted to be operated by irresponsible or reckless drivers. Signs, warnings or signals will not prevent these accidents occurring; the careful, prudent driver will not take such a chance.

In order to reduce the number of street accidents the main thing necessary is education—education that will teach everyone (be he employee, passenger, pedestrian or auto driver) what it is that leads to accidents and how they can be avoided; particularly education of the young child and the school boy and girl regarding the value of life

and limb, the wastefulness of unnecessary haste and neglect; education of the men and women by the passing and strict enforcement of reasonable ordinances; and education of the drunken driver and persistent chance-taker by a straight jail sentence.

CHAIRMAN ADAMS:—The paper is now open for discussion.

DISCUSSION

MR. HEMMING: I just want to say that Mr. McDougall is from Rochester where they carried on the most extensive safety campaign for six months. I believe Mr. McDougall can give us some very valuable information.

MR. MCDUGALL: I don't know that I can give you very many details except to tell you in a general way what was done in Rochester.

Rochester is a city of about 300,000 people. We are running a street car system with about 400 cars during rush hours. The National Safety Council first organized in Rochester a small Local Safety Council. I believe it was in 1914. That Safety Council was affiliated with a Safety Committee of our former Chamber of Commerce. It was made up of representatives of big industrial plants, public utilities, and some professional men. The Council specialized on industrial accident prevention until March, 1918. At that time, through the efforts of Mr. Cameron and Mr. Price, we launched a public safety campaign. A great deal of publicity was given through the newspapers. Much work was done in the schools. The policemen made a special effort on the enforcement of ordinances, particularly among automobile drivers. Dangerous corners as far as possible were cleaned up. There were some five or six sub-committees under the General Accident Prevention Committee.

The result was that our report at the end of the year (I may not be absolutely right on this) showed fatal accidents in Rochester had decreased sixteen per cent and up to July, 1919, as compared up to July, 1918, showed a further decrease of eighteen per cent over 1918. These figures were taken from the coroners' records.

As far as our street railway is concerned, our accidents in 1917 were 842 and in 1918, 685. Fatal accidents have decreased, on our street railway, about eighteen per cent.

CHAIRMAN ADAMS: Has any one else anything to say on this subject?

MR. MALLON: I don't think that real results can be obtained by a railway company in reducing accidents to passengers and pedestrians until you get the cooperation of the community through which you operate. I want to state some of my experiences along that line.

COÖPERATION OF COMMUNITY NEEDED

In Cook County, in the City of Chicago several years ago, there was inaugurated a safety organization known as the County and City Safety Organization. It was fathered by Coroner Peter Hoffman for a considerable time, in fact, up until the present. It was known somewhat as a political organization. However, beneficial results were obtained. On a

great many accidents, such as we in the railroad industry are familiar with, the coroner would select members of this organization to act as jurors, and I presume I have acted as a juror for fifty or more inquests. Recommendations were made by the jurors, and strange to say they were never acted upon; that was as far as they ever got and I think the reason why they never got any further was due to the fact that there wasn't enough pressure behind the organization. In other words, it was not big enough.

I was at the inquest in a case where a motorman of the surface lines of Chicago ran into an ice cream wagon. One of the men on the wagon who was riding on the rear end was knocked off and killed. On that jury there was a Bolshevik, as far as street car operation is concerned, and he wanted to hang the motorman. He was one of many who felt that the corporation had lots of money and all the jurors should do was hold the company entirely responsible so that the widow would have this means of getting money out of the company in a law suit.

Another case that came to my attention was that of a slight, frail lady who was driving an electric car along Forty-Seventh street. When I saw the woman at the inquest I felt she ought to be in a hospital. This car got away from her, she ran over a six inch curb, struck a baby carriage that was standing outside of a grocery store with a baby in it, and killed the baby.

We made the recommendation at that time that no person should be permitted to drive a car without first taking an examination the same as any chauffeur. Nothing was heard of the recommendation.

I understand that there is a movement on foot in Chicago to get the support of the Association of Commerce behind this organization of which we are members. Now a body of men of that kind backing up an institution like ours can accomplish a great deal. I think that is the only logical solution, to get the biggest men, or the biggest organization in the municipality to cooperate with you.

CHAIRMAN ADAMS: It is time to close the discussion on this paper. Next we have the subject "Safety Before and After the War."

We all know what we went through during the war, and in these days of reconstruction the electric railways have an important duty to perform. We will now listen to a paper by Mr. Schneider, of Cleveland.

SAFETY BEFORE AND AFTER THE WAR

E. F. SCHNEIDER, GENERAL MANAGER, CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY COMPANY, CLEVELAND, OHIO

It was with the greatest reluctance that I finally consented to write a paper upon the above, and I have found the subject has become a more intricate one for me to discuss than I expected or anticipated, on account of conditions having changed so materially; it being impossible to arrive at a satisfactory conclusion.

After the armistice was signed it was very natural indeed to look for-

ward to a rapid return to more nearly normal conditions in the labor world. We certainly anticipated a lowering of prices on food stuffs and on necessities, and after the smoke had cleared away, after the strife and struggle were over, after our boys began to come home, and by reason of our wonderful achievements, a general feeling of complacency and satisfaction was with good reason confidently hoped for and looked forward to—but alas, none of these things came to pass. Labor is scarce, much more arrogant in its demands, and a great deal harder to handle. Contracts with labor unions have been broken with impunity, invariably, I believe, against the advice and orders of their national officers. Prices of food stuffs and necessities have not been lessened, but have really advanced. The general feeling of unrest has been greatly intensified. There seems to be an almost universal sentiment, regardless of consequences, which either openly avows or covertly insinuates a “I am going to get mine while the getting is good” policy.

I find it impossible, therefore, to make the analysis which, upon the acceptance of the invitation to speak upon the subject, I expected to make. I will, however, confine myself to the conditions as I have found them and believe them to exist.

I have gathered statistics upon this question from all over the United States and Canada in my efforts to present this subject correctly, having written two hundred and ninety letters to that number of railway companies, and received one hundred and fifteen responses.

My replies cover 17,565 miles of city and interurban electric railroads.

Statistics are usually such dry lies that I hesitate to use them. You can prove anything you want to with statistics. You know the schoolboy compared lie as an adjective, i. e., lie, damn lie, statistics.

I will, therefore, curtail the use of them as much as possible and have you assume that I am telling you the truth, even though my figures are comparatively few.

There is perhaps more to be said regarding safety before the war, and safety during the war, than there is to be said of safety after the war. As a general proposition the question of safety, so far as the application of the fundamental principles as usually understood is concerned, reached its highest state of perfection before we entered the war.

TO MAKE THINGS FOOL-PROOF

The use of well-known safety devices and appliances, the installation of block signal systems, the display of cautionary signs, the use of moving pictures—all these and other methods had a tendency to carry the propaganda of SAFETY FIRST, or the prevention of accidents, to the most successful conclusion known up to that time. The great idea has been to make things as “fool-proof” as possible; my understanding being that these methods, it is estimated, have reduced the accident account some eight per cent in our industrial world. That, of course, makes it worth while. I naturally do not wish to deprecate the use of any device which will eliminate accidents. I do, however, wish to take this opportunity to protest against the abstract proposition which we seem to be

striving for, i. e., to make things fool-proof. This is a common expression. I do not think we should have fools working for us in responsible positions, handling intricate machinery which requires safety appliances, even if apparently made fool-proof. We should not try to make automatons out of intelligent employees. We should not hire wooden men or cigar signs for skilled workers. We need men who are honest, industrious, painstaking, and careful. The best safety device known is a careful man.

Before we entered the war we did not have that strained and intense feeling which was so marked and prevalent everywhere after war was declared.

The employee who had a son who was of draft age, or one who had enlisted, was of necessity on the anxious seat all the time. The irregularity of the mails and oft-times the negligence of the soldier boy in not writing to his parents, and the waiting for reliable news, all had a tendency to distract the sensitive and over-wrought nerves of a father, who as a natural consequence, would not be in as good condition to carry on his work as he would be in normal times.

SHORTAGE OF MEN DURING THE WAR

The shortage of men on account of those entering the service of the Government, either as soldiers or marines, and on account of those employed in industries which were held essential to the winning of the war, made a vast difference in the working personnel of street and interurban railways. It also made a big difference as to the attitude of the men toward the company employing them. They realized they could get a job any time and were not slow in letting you know it. It became necessary in order to keep the lines filled, to break all former precedents and rules. The turnover was large. An applicant was not questioned closely, his recommendations were not scrutinized, the age limit was not recognized. Young men of eighteen years of age were hired as conductors. Older men, as high as fifty years of age, were installed as motormen. Coupling this disadvantage of disregarding the age limit with the inexperience of the younger man and the inability of the older man readily to adapt himself to the work, caused a condition which gave those who were responsible very grave concern. It was simply impossible to get efficiency out of either class of these men. They were willing enough, perhaps owing to the lure of higher wages than they had been able to get, but they were not dependable—the one was too young to learn, the other was too old to learn.

Those who applied and were of a proper age, were as a rule undesirable men—floaters and men who drank, perhaps periodically—at any rate there was a constant turnover, men leaving on the slightest provocation. There was no attempt to enforce anything like the ordinary and regular discipline. It was largely a matter of standing it as long as one could and then firing a few, all of which, of course, tended toward the demoralization of your forces in all branches and departments. This would seem as though the officials in charge were letting the men run the road, and I confess it came mighty near being true. As an illustration of the attitude of men regarding discipline: One of our superintendents in disci-

plining a trainman for an offense said to him, "You will have to serve ten days." He came right back saying, "Oh you go to hell", and turned in.

EMPLOYMENT OF WOMEN AS CONDUCTORS

There was a moderate amount of relief from this state of affairs, however, in a few cities, brought about by the employment of women as conductors on city lines. There was considerable comment and a great deal of discussion regarding the morality and efficiency of women who would hire out as conductors on a street car line. We who have had for years to deal with the morality of men engaged in similar service, know that morally there would be no reason why a woman would not be as much of a lady in the capacity of a street car conductor, as a man would be a gentleman under exactly the same circumstances. Personally, I confess that after watching the operation of street cars by women as conductors, and also from reports gathered by those who employed them, I am convinced that they conducted themselves as ladies at all times, and took care of their part of the business carefully, intelligently, politely, and with fewer accidents than men. Whether after years of service women conductors would have maintained their efficiency or not, I do not pretend to say, but they certainly made a good record as far as they were able to go. One street railway president asserted that the men themselves were largely to blame for women going onto the cars as conductors, inasmuch as by insisting upon stools and other so-called comforts, they had made a ladies' job of it.

After the war the widespread and pernicious doctrines of the old world, such as I. W. W., bolshevism, socialism, anarchism, and other fanatical isms which are used in order to delude the unsophisticated laboring man into the belief that the millenium is near at hand, put that almost uncontrollable and irresponsible unrest in our midst, the flame bursting forth from the smothered fire here in Cleveland on May Day, showing really the underlying feeling and sentiment which was only waiting for an opportune time to make itself felt, but which, thanks to the better element of our citizens, was so suddenly squelched and put down. This is but one example of what happened in many places.

The results of my investigation would tend to show that there was a slight improvement after the war. The combined mileage of 17,565 miles gave a total of accidents in 1916 as 153,878, in 1917 as 167,806, in 1918 as 144,554, in 6 months of 1919 as 64,108 or at the rate of 128,216 for the whole year, which would show a decrease from the figures of 1916 for the first half of 1919. Whether the whole year of 1919 would show this improvement is of course very problematical. You will also note a slight improvement in 1918 over 1917. The difference in either case is certainly not due to any improvement in the personnel of the employees.

In order to give a clearer insight into the general conditions, I have selected a few individual cases.

One road writes:

"I feel that the increase in accidents, particularly during the war period, was brought about largely by our being compelled to hire young boys and old men. In fact, since the war has closed, we are getting

things straightened out and the accident situation is improving wonderfully."

Another road writes:

"I attribute the decrease of accidents to passengers to the work of our school, where attendance is compulsory on the part of our employees, together with the operating changes indicated above. I might add that I also feel that we will make a better showing when some solution is reached which will end the labor unrest, and the company can get the cooperation of its trainmen as a body."

Another:

"We noticed no marked difference in the number of accidents occurring during the period when some of our more experienced men were in the army and had to be replaced by less experienced men."

Another:

"You will note that if the ratio for the remaining five months of 1919 holds the same as during the first seven months of 1919, the year 1919 will show the greatest number of accidents during any of the three years, due we believe to the large number of young men who have returned after service in the army and who are reckless and indifferent to such small risk as being injured by electrical cars."

Another:

"I enclose herewith another sheet marked 'B', showing for the year 1919, the labor turnover. From that you will note that 243 men left our employ and 304 new men were taken into service. This in itself added greatly to our burden and prevented us from obtaining as pleasing a result as I am sure we would have obtained had we been able to wage our campaign under normal conditions."

Another:

ACCIDENTS REDUCED IN SPITE OF TURNOVER

"During the period of the war, we were of necessity obliged to hire large numbers of inexperienced men and lowered our age limit of conductors from 21 to 18 years, and raised our age limit of motormen from 45 to 50 years. In spite of this factor (inexperienced men) you will note that the accidents for 1918 were materially reduced compared with the previous year. While this may seem unusual, yet I believe, the practice of this company in having the Claim Department instruct new men before entering upon their duties, as well as the care used by the Transportation Department in breaking in new men, impressing them with the necessity of unusual care, were primarily the reasons that the number of accidents were reduced, together with the work done by our Safety Boards in our various Divisions."

Another:

"During the year 1918 on account of war conditions we were obliged to hire a number of younger men, some of them not of full age, losing a number of our experienced men on account of the wage attraction of the munition plants located in our community. This materially increased the number of our accidents, and especially I think in the collisions with vehicles. This year we have been able to dispense with the class of employees referred to, and have been able to get a more reliable class of

men and a material improvement would seem to be indicated by the number of accidents for the first six months of 1919."

Another:

"You ask whether there were any unusual conditions. We have been adversely affected by shortage of labor, with its consequent impairment of efficiency, on account of the great industrial activity which has been most acute in this vicinity, due to the European War. For the last two years we were further demoralized through this Country's entry.

We first employed women as conductorettes, in April, 1918, and have had as many as 235 out of the total platform force of 4,000, but I do not think this materially affected the situation.

	Public Accidents	Employees Injured
1916	50.65 per million passengers carried	1,671
1917	52.42 per million passengers carried	1,675
1918	57.27 per million passengers carried	1,495
1919 (6 mo.).....	49.14 per million passengers carried	674

INEXPERIENCED EMPLOYEES MORE LIABLE TO ACCIDENT

Another:

"In connection with the third paragraph of your letter in which you ask if any unusual conditions obtained in 1918; The records show that the increased accident frequency in 1918 was due to the extensive war activities on Long Island in that year which caused an unprecedented congestion both on the railroad and on the public highways. Another important factor in the accident experience was the employment of inexperienced men and women, in which connection it may be stated that 16 per cent of all employees killed and injured on the ——— Railroad in 1918 had been in the service less than one month, while 37 per cent of the killed and 39 per cent of the injured had been in the service less than six months."

Another:

"There seems to be some unknown force or influence working among the working class of men for the last three or four years that has been bad. They are careless and indifferent, and seem to have no interest in their work. Every one of the accidents on this report was absolutely caused by the negligence and carelessness of employees. None caused by failure of the working of any parts of the equipment."

Another:

"I do not think the war has had a particle of effect upon the men. The strict discipline in the Army does not apply to civil life. In civil life, men are free agents, and they are governed in their actions by their natures. If they are prone by nature to be careful and faithful in the performance of their duties, we may have little trouble with them, but if on the other hand they are prone to be negligent and selfish, having no patience with other people, we will always be in trouble with them.

Having all this in my mind, I am fully aware of the fact that we can never relax for one moment our efforts to improve our men by careful training and constant admonition.

Though we have increased wages, the prices the men have to pay for

the necessities of life, leave them in about the same condition financially as before the war on a lower scale of wages.

We cannot, therefore, claim that we have done more than meet the changed conditions, nor can we ever make any substantial improvement until they realize that their efforts to hold in place incompetent men is the real cause of this disability on the part of the Public Utilities to pay a higher scale of wages.

About all I can see that you can learn from the above is that down here in the Southland we are just as rotten as in any other part of the U. S. and that year after year our accidents run about the same in number and cost."

Another:

"The total accidents per 100,000 revenue passengers, excluding transfer and pass passengers, for the years in question are as follows:

1916	7.5
1917	9.6
1918	9.2
1919	8.5 ¹

The number of accidents per 100 employees, taking number of employees as on last day of period, is as follows:

1916	20
1917	26
1918	28
1919	12 ¹

The unusual conditions which affected our figures given above, were, first—a strike of employees in September, 1917, which necessitated the training of almost an entirely new platform and shop force which materially affected the number of accidents during the latter part of 1918: second—the shortage of good labor which existed during 1918 and necessitated the employment of inferior labor and had no doubt a marked effect in increasing the number of accidents."

Another:

	Passengers Injured	Employees Injured	Passengers Carried
1916	5428	2443	335,752,271
1917	5978	2951	338,265,376
1918	3579	2334	297,764,544
1919 (6 mo.)	1645	885	163,024,951

Another:

ACCIDENTS	
Passengers and Employees	
1916	190
1917	158
1918	154
1919 (6 mo.)	109

¹1919 figures given on yearly basis obtained by multiplying accidents for the first six months by two.

Another:

"Personally I prefer middle aged men, rather than young men, as our experience is that they are as a rule more careful than younger men.

If you had asked with reference to passenger suits, I could make quite a lengthy report, as we now have about twenty imaginary passenger personal injury suits pending in the _____ County Courts."

One-man cars are largely a result of conditions brought on by the war. Wherever used they have materially decreased the number of accidents.

A great many roads were compelled to cut down their mileage in order to reduce operating expenses during and after the war. This would of course cut down the hazard in proportion.

INCREASED NUMBER OF AUTOMOBILES INCREASE NUMBER OF ACCIDENTS

The great increase in the number of automobiles has, however, correspondingly increased the number and severity of automobile accidents.

There are many ways to be progressive but one is sufficient if along proper lines. What are the proper lines to prevent accidents? We do not have advantage of sufficient regulatory laws, but even if we had they would mitigate only in a small degree. We have the benefit of safety boards, safety appliances, warning signs, etc., which is a great help as far as it goes, but they do not prevent the majority of railroad accidents. The day is past when men can be driven by the old bull-dog method. We have never gotten the benefit from rigid discipline as ordinarily enforced, one reason being, the new man employed is just as liable to err as the one discharged, and the men remaining do not profit by the example set.

The principle of SAFETY WEEK extended through the whole year is perhaps the only solution. To bring forcefully to the mind of every employee the moral obligation resting upon him to preserve human life and human limb, inculcate that by continuous education, relying upon the fact that all men have that within them which will naturally keep from harming those entrusted to their care and those who come within their zone of danger.

By our individual effort and by our combined efforts let us make today a safer day than yesterday, and tomorrow a safer day than today.

There is but one temple in the whole universe and that is the body of man. The duty we owe ourselves is to preserve this most sacred temple of the universe. The duty we owe our fellow man is to help him preserve this most sacred temple.

DISCUSSION

CHAIRMAN ADAMS: We certainly appreciate the efforts Mr. Schneider has put forth. Just think of the number of letters that he has written and received, the tabulation of these statistics, and of boiling it down into such an article as he has given us here today. I think he is entitled to our thanks.

If I remember, Mr. Schneider said he was successful in getting 115 replies from 290 letters he wrote asking for statistics. He was a great

deal more successful in writing to strangers and people not affiliated with this organization than your chairman was in writing to his personal friends who are members of this association for a few little statistics on one point.

You will remember, I asked each company to let me know simply the total number of accidents from August 31, 1917, to 1918 and 1919. I got one lone reply. Now just think, out of 129 people in this organization, only one of them sent in their report and I will not tell you who that was because it really didn't come up to what I thought because he really had an increase in accidents in that year. As for our own Company, we have 170 miles of track and we came within one of decreasing the rate one per mile.

MISS ROADIFER: Mr. Chairman, I don't want to impose on your time, particularly since Mr. Schneider's paper was so splendid, but I feel almost duty bound to give my opinion.

We began creeping in with the safety organization among the school children. After one season of work of that kind we went to the Superintendent of Public Schools and asked him if in six months time we could show a material decrease in accidents to children of school age, whether he would permit us to come into the schools and through the medium of story telling get the story across. Of course, any man that has a heart with regard to humanity could not help but grant us that permission. During the first year we decreased accidents fourteen per cent.

JUNIOR SAFETY COUNCIL

After a while organizations were started, such as the Junior Safety Council. In Philadelphia we won recognition from the members of the Chamber of Commerce and they gave us permission to met in their assembly rooms once a month to discuss ways and means by which we might make Philadelphia a healthier and safer city.

The Junior Safety Council, made up of school children, demanded coöperation from the Chamber of Commerce. The appeal from the children was so strong that after several attempts they gave us coöperation. A committee composed of school children put up safety signs for us. Of course, after the Department of Public Safety gave the children their support, the mayor of the city and the Police Department had to follow it.

After four years' work, we showed a deduction of thirty-seven and one-half per cent in fatalities to children of school age and a general decrease to pedestrians, for through the children the safety lessons are taken into the homes.

If you don't have the support of the community through which you operate do not let that make you hesitate in starting a safety campaign, and I know that the first year you will find that your Claim Department alone will save enough to repay you.

CHAIRMAN ADAMS: I thank you very much, Miss Roadifer.

You see Miss Roadifer has just given us another inspiration to get behind this educational movement among the young people and the children in the schools. These people will have to take our places in not

very many years. You know they begin to work in responsible positions earlier now than they used to when we were boys, and we must start them along the right road.

MISS ROADIFER: It was this safety movement, this humanitarian movement that helped to make Philadelphia realize that after all the president of the company was sincere when he expressed his endeavor to improve the service and I am sure that was one of the things that helped put it over in Philadelphia.

MR. HEMMING: Pardon me for taking the floor again. I am not going to trouble you to read all of this but I am going to leave it on the table that you may see it. It is quite interesting. The title is "Classified Accident Report and Traffic Survey of the Transportation Department." This is a six months' report, up to June inclusive.

You may find these statistics interesting for the reason that they are divided up in this manner, though it is not new.

CLASSIFIED ACCIDENT REPORT

We record the time of day the accident occurred, the age of the motorman or the conductor concerned in the accident, period of employment,—company service, sex injured, line or division on which accident occurred, day of week, type of car, zone in which the accident occurred, weather and track conditions.

This division is made for psychological reasons.

First of all, it is important for your men to know, likewise the public, at what time of day the greatest number of accidents occur.

I have addressed a large number of school children on various occasions and I asked them, in their opinion, at what time of day the greatest number of accidents occur. It was surprising to know how much interest they took in what I had to say. I received all kinds of answers except the right one. Their answers were mainly "noon". I asked them why they thought that noon was the most dangerous period. They said, "because there are more people on the streets, more traffic and congestion."

I showed them that they were wrong. The greatest number of accidents occurred, according to United States statistics, between ten and eleven o'clock in the morning, and three and four o'clock in the afternoon, and seven and ten o'clock in the evening. We find that statistics on our own property bears that out.

The age of the motorman and conductor is another important factor. We find that accidents run higher for the young man. The older man seems to have settled down to a more conservative and common sense way of doing things. We find an almost equal ratio of accidents in regard to sex. The day of the week is another interesting thing. We find that Saturday is the most hazardous day; though that is a little bit contrary to United States statistics. Our report shows these accidents: Monday, 73; Tuesday, 92; Wednesday, 75; Thursday, 96; Friday, 85; Saturday, 127, and Sunday, 61.

The type of car is something we are all interested in. Our investiga-

tion bears out what Mr. Schneider said, that the one-man car has fewer accidents than the other type of car. It is strange to say that even in the case of the pay-as-you-enter, muzzle-loader, and near-side type they have more accidents than the one-man car and yet there are two men on the other cars. It is a splendid argument to use in your community where they are opposed to the one-man car.

We have divided all our cities out into zones. I asked the children where they thought the greatest number of accidents occur.

"Why right down there by the court house," was almost a universal response.

I said, "No, that is where you have the least. The greatest number of your accidents occur in Zone 'C'".

I wanted to bring before them the thought that when they were near the outskirts of the city they should be most careful, because there is where the automobile and even our own trainmen take the opportunity for gaining headway as the traffic is less congested. There were 130 accidents in Zone "C", the next to that was Zone "E", but right down in the heart of the city in each one of these places there were only 75.

Weather conditions show that the greatest number of accidents occur during fair weather and the greatest number on dry tracks rather than on slippery tracks. There were 560 on dry tracks and 180 on slippery tracks.

I want to leave this thought with you, we have to go back to that old Biblical saying, "A little child shall lead them."

CHAIRMAN ADAMS: Has any one else anything to say on this paper? If not, I want to thank you for the interest you have taken in safety work during the past year; for your courtesies throughout the year, and for the honor you conferred upon me by electing me as your chairman a year ago. I thought at the time it was a mistake and I feel yet that it was not a success, but in any event I have given my heartfelt interest to the work of the Association and this special section.

The safety movement, as represented by the National Safety Council, has been close to my heart for six years. I have been a member of the Council for six years and have attended every one of its annual conferences and I expect to continue as long as I can.

It now gives me great pleasure to announce that Mr. Hemming, a man whom you all know, was the prime mover in the preparation of our program this year. This year's electric railway program has been far ahead of anything we have ever had before, and the same is true all through the Congress.

The movement for safety is constantly gaining interest. It is like the snowball, the farther it rolls, the greater it grows.

This Electric Railway Section is growing, growing in spite of the fact that we lost 427 miles out of a mileage of 13,000. The last year has been one of the most strenuous years the electric railways ever had to contend with. The days of reconstruction have started and the electric railway business is one of the important businesses of this nation. You gentlemen are the ones who have to reconstruct that whole structure of operation

and the safety work will have to be started all over again in a way, with the knowledge and the experience that we have already as a basis.

I am proud to know that we have such a man as Mr. R. N. Hemming, Superintendent of Transportation, Ft. Wayne & Northern Indiana Traction Company, Ft. Wayne, Indiana, to take the place as Chairman of this section. Mr. Hemming will you now accept the Chair?

(Mr. Hemming took the Chair.)

MR. WALTZ: I move you that this section, at this time, give a rising vote of thanks to Mr. Adams for his services during the past year.

(A rising vote of thanks was given Mr. Adams.)

CHAIRMAN HEMMING: I thank you, Gentlemen, for this honor you have conferred upon me and if I can do half as well as the out-going Chairman I think I shall feel very happy. We have a lot of work ahead of us this year, especially with the nationalizing and standardizing proposition and I am sorry I am not able to give you the names of the committeemen of the various associations who will have to try to get this proposition through. I will have to announce that Committee later. I want all you men to take back home with you this one thought: If your company is not spending enough money, in your opinion, for the prevention of accidents: if your company feels that it is not worth while to get into the National Safety Council, or if you have a neighboring property that has the same attitude, take this thought with you: It is a matter of advertising in the prevention of accidents and it is a matter of advertising to get business. If you will spend a lot of money to get special traffic to put money into the treasury, why not spend some money to keep it in there after you get it there? That is the stuff that counts.

Employees' Benefit Association Session

October 3 and 4, 1919.

F. H. ELAM, Chairman
American Steel Foundries Company, Chicago, Ill.

FRIDAY MORNING SESSION

THE meeting was called to order at 10:10 A. M. by Mr. F. H. Elam, Chairman.

CHAIRMAN ELAM: It is now past the hour for the meeting to convene, and we shall begin in the hopes that the gentlemen who are on the program and who have not indicated their presence will arrive later. We will ask the first of our speakers, Mr. Joseph N. Redfern, to discuss the best form of management of employees' benefit organizations and associations.

BEST FORM OF MANAGEMENT

JOSEPH N. REDFERN, SUPERINTENDENT, RELIEF, SURGICAL AND EMPLOYMENT DEPARTMENTS, CHICAGO, BURLINGTON, AND QUINCY RAILROAD, CHICAGO

The best form of management, as I think we all feel, is that which will insure to the employee the benefits which he or his family expects to derive. We can have that assurance only by the guarantee of an employer whose financial position is such that it will make the employee feel that the benefits will unquestionably be paid; and in making that statement in the few words I have to say, possibly I shall touch on some of the subjects to be discussed later, although I don't intend to.

Taking the case of the railroad with which I am connected, and, of course, with which I am most familiar, the form of management is this:

The employees elect one-half of the members of what we call the Advisory Board, which is an executive committee. The railroad company selects the other half, generally officers of the company, and an officer of the company acts as chairman. That gives the company seven representatives on the committee and six to the employees. Once in a while someone questions the advisability of the company having a majority, but, as a matter of fact, it is very rare that the full representation of the company is present at any meeting of this committee while it is extremely exceptional, on the other hand, that any of the employees' representatives should be absent; so that, practically, the employees have a majority. But it is necessary that the company have a majority vote to prevent any

amendment being made without the consent of the company, because of the guarantee of the company to pay benefits.

When we established our relief department, in 1889, we followed the plan of the Pennsylvania Railroad. The company agreed to pay any deficit created in any three year period. At the end of the first three year period we had a deficit of something like \$26,000, which the company charged off to itself and started the first of January, 1892, with a clean sheet. Again at the end of the next three years there was another deficiency of some \$18,000, which the company again wiped out. Since that time there has been no cash deficiency.

We went on and accumulated a considerable cash balance, so large that it was thought we should do something with it. The question of increasing the benefits was taken up. I put the matter before the Advisory Committee as to whether they would agree to do away with the three year period and simply have a guarantee to pay benefits. The position of the employees' representatives was that they didn't care one way or the other, all they wanted to know was that if they died their beneficiaries would get the money, and as long as the benefits were paid, they didn't care whether there was any deficiency or not. The value of a guarantee is most important.

We all know that the insurance companies are governed by the laws of the state, so the people that pay premiums or make contributions will be protected. In order to secure and to hold a considerable number of employees the most important thing is to have a guarantee that the benefits will be paid. During the epidemic of influenza last year—I don't know what your experiences were—we ran behind some \$200,000. Ordinarily that would be enough to frighten the average benefit association or fraternal insurance organization, but our employees didn't care anything about it. There was the Burlington Railroad back of them, a big corporation, and they knew the matter of money would be taken care of and that all the benefits would be paid. There was a guarantee back of it, and that is the crux of the matter. That guarantee on the behalf of the employee, with the balance of power in the hands of the employer for his financial protection, is what makes all the difference.

FEW CASES APPEALED

A word as to how our plan worked out. We have had 385,000 cases of disability since we started thirty years ago. Under our rules, an employee who is not satisfied has the right to appeal to the superintendent of the Relief Department and from him to the Advisory Committee, whose answer is final. A question came up recently as to how many appeals we have had. We went over the records and found that there have been seventy-two appeals in the thirty years that we have been doing business.

In other words, the cases of dissatisfied members have been so rare that only one man out of fifty-three hundred has found it necessary or advisable to appeal from the decision of the superintendent. In saying that, I don't mean that every one was satisfied; but the superintendent was able to convince them that they received all their contract called for.

Now that brings me to this point: To whom should the superintendent report? Under our rules the superintendent reports to the president of

the railroad company, except in such matters as are under the control of the Advisory Committee.

The thing is, in making your selection, to get some one who will stand between the corporation on the one hand and the employees on the other. There ought not to be any real differences of opinion, because what inures to the benefit of the employee's welfare must necessarily inure to the corporation itself.

My time is almost up. I want to impress these two thoughts upon your minds. The first is that the management shall rest jointly between the corporation and the employees; and, secondly, that the officers be as nearly independent as possible so they can act in a fair and impartial manner in any question that comes up.

DISCUSSION

MR. THOMAS D. LAW (Safety Engineer, Oneida Community, Ltd., Oneida, N. Y.): I would like to ask Mr. Redfern a question. What are the benefits paid to the members of his association, and what are the dues received from the members?

MR. REDFERN: In the first place, the corporation pays all the expenses of management and carries on the work, so that the employees are relieved of all expenses and details. If there is not enough money to pay the benefits the company advances what is necessary. The total contributions from employees run from 75 cents a month to \$2.25 a month, which covers disability benefits of 50 cents to \$2.50, and death benefits of \$300 to \$6,000. The death insurance rate is \$12 per \$1,000 per annum. A man in the lowest class contributes 75 cents a month, or \$9 a year. Arbitrarily we apply 45 cents of that for disability and 30 cents for death benefit of \$300.

After three years of service, and after one year's membership, an employee who leaves the service for any reason whatsoever is entitled to continue his death benefit insurance but not the disability. We have in the neighborhood of \$1,500,000 insurance which we carry for former employees, and which is continued at the old rate. These men realize the value of this insurance.

MR. C. T. DEARBORN (Dennison Manufacturing Company, Framingham, Mass.): Will you kindly repeat what the benefits are?

MR. REDFERN: The contribution is 75 cents a month for the lowest class. There are five classes, each class carries with it a death benefit of \$300 and members of each class have the privilege of carrying extra death benefits. The first class has \$300 death benefit, and the fifth class has \$1,500 death benefit. The total additional benefits must not exceed three times the death benefit of their class.

A man in the first class can take three additional death benefits. They cost him 30 cents each. This allows him to carry an additional total death benefit of \$900. Now, that goes on up proportionately, so that the man in the fifth class could take fifteen additional death benefits, making a total of twenty death benefits. His rate would be \$8.25 a month, but of that \$2.25 would be for disability protection, and \$6 per month, or \$72 per year would be for the death benefits.

The railroad relief work is a different kind of work from that in other industrial lines. We have in some respects very heavy casualties, and our employees are scattered over many thousands of miles of railroad. The problems in industrial plants differ also.

MR. CHAPMAN (International Harvester Company, Chicago): I would like to ask a question as to the death benefit feature of your association. Do you find that when your employees leave the service of your company they continue their membership for death benefit only?

MR. REDFERN: In some localities we find that more men are disposed to keep up their death benefit after leaving the service, than in others; the only way we can account for it is that in some of the old communities where conditions are more settled, the question of insurance is a little more pronounced. As a rule, the young people don't care much about it; it is only those of mature years, and, as a rule, those of mature years don't leave the service. The territory through which the Burlington runs is getting to be an older territory, and we don't have the great change that we used to have twenty-five or thirty years ago.

There isn't, on the part of the rank and file, an inclination to give as much attention to the matter as there is on the part of the officers. I don't know whether it is due to the superior intelligence of the officers, but I think they realize more clearly the cheapness of it. We have today scattered around among the different railroads of the United States a great many of our former officers and men who hold our insurance. The fact that they keep up their insurance is the best proof of its stability and value and cheapness.

DR. S. WATSON FOX (American Engineering Company, Philadelphia): I would like to ask you, Mr. Redfern, about the physical examination. Do you make a physical examination of all applicants for insurance and disability relief, and are there any cases where the man is not accepted at all?

MR. REDFERN: Doctor, our medical examiners act in a two-fold capacity. For many years it has been a rule of the Burlington road, that no one should be employed, except unskilled labor, who could not pass a satisfactory physical examination. That same examination covered admission to the relief benefit. Occasionally we accept a man for employment that we do not accept for insurance. But generally speaking that examination is the same as a life insurance company requires, or, rather, serves the same purpose.

We do make exceptions. For instance, a man is accepted for employment if he has a rupture which is protected by a truss and does not interfere in the performance of his duties. We have had people come into the service with such things, say: as an ankylosed finger, if it did not interfere with the performance of their duties. In those cases we would make out a release exempting them from paying the benefit dues.

DR. FOX: Who pays for that physical examination?

MR. REDFERN: That is part of the expense that is borne by the railroad company. The employees are not taxed a cent for the examination or anything of that kind. It is part of the contribution of the railroad toward carrying the benefit relief work, equivalent to the same contribu-

tion that the employees make. Take accident insurance, for instance. You will find that from fifty to sixty per cent goes as expenses of management. If the railroad did not contribute all the work, it would double the cost of the insurance. By going outside and buying the same insurance the men would have to pay double, and if they didn't want to do that, the benefit would have to be cut in two.

MR. T. H. JONES (Walworth Manufacturing Company, Kewanee, Ill.): Do you pay in full or make allotments to the beneficiaries until the amount of the benefit is paid out?

MR. REDFERN: We pay in full. I think it is the best policy. It has been my experience that most women know how to handle money better than men.

MR. F. F. OGDEN (Hooker Electro Chemical Company, Niagara Falls, N. Y.): My experience has been that the state, the insurance commissioners, or other authorities, require people doing an insurance business to put aside a cash balance or reserve. How long must an individual be in your employ before he is able to join?

MR. REDFERN: The contract is made between the corporation and the employees. He applies for membership, and on behalf of the railroad I accept it and issue him a certificate of membership. It makes a contract enforceable at law, but it is not an insurance contract, and is subject to no state laws governing insurance. No state has attempted to class us under the insurance laws. Two or three times the question has come up. I have in mind a case that came up not many years ago, State of Ohio vs. Pennsylvania Railroad Company. It was decided by the Supreme Court of Ohio that it was within the province of the Pennsylvania Railroad Company to make contracts with its employees in the course of its business.

We do not go outside of our business, and so we make no reports to any insurance commissioner, to any state body, or to any one. Several other courts have taken practically the same position that Ohio has taken.

At the time the man is employed the question of the benefit association is taken up with him. Scattered, as we are, over nearly ten thousand miles of railroad, we have a provision whereby a man makes a preliminary application. That protects him against accident from the time he signs it until he has had an opportunity to be examined by the doctor; so, from the time he signs that paper he is protected against accident, and from the time he is examined he is protected against both sickness and accident.

It used to be the plan to keep a man in the service a month or more before we acted upon his application. But some of the employees who were more or less green would get hurt during the interval.

MR. OGDEN: I believe the speaker misunderstood my reason for asking that question. I do not care whether it is within the province of the corporations to insure their employees without state supervision. My reason for asking that is this. The insurance companies must conform to the laws of the state within which they operate. Just because you are able to pay your men the benefits and reliefs at the present time is no indication that your company is going to be in as good a financial

condition five years from now. How do you know your company isn't going to go bankrupt, and your employees who have been contributing for fifteen or twenty years get nothing, because you are not able to pay.

Now, for these reasons, if you are going to make an enforceable contract you will have to do as any of the insurance companies do. You will have to put up security, so that in the event of your company becoming financially embarrassed those employees will not suffer.

MR. REDFERN: We have \$22,000,000 or \$23,000,000 of insurance on our employees; maybe it is nearer \$25,000,000 now and it would seem absurd for a corporation with a surplus of nearly \$100,000,000 to be obliged to put up security. The position of the courts is that should a large corporation like the Burlington go into the hands of the receivers, the relief and benefit funds would be the first funds to be protected and would be set aside to cover such liabilities.

MR. JONES: Mr. Redfern, within what time do the benefits begin?

MR. REDFERN: The sickness benefit starts after six days, and in case of accident the benefit begins immediately.

MR. E. F. VARNUM (Commonwealth Steel Company, Granite City, Ill.): I would like to ask in regard to accidents in your plant; would a man get anything from the benefit association, covering an accident in your plant?

MR. REDFERN: In states which have the workmen's compensation act you are always required to pay the compensation prescribed. Generally speaking, in railroad work, our cases of accidents fall under the federal act rather than under state acts. The line is not quite clear between the interstate and intrastate; but where a man, working for a steam railroad, is injured, through an instrumentality of interstate commerce his case falls under the federal act. In the shops themselves we have both kinds of cases; but, answering your question directly: In Illinois there is a state compensation act; the man gets the compensation and he gets the relief benefit, if he is a member of the relief benefit association.

MR. B. L. ODLE (Flint Vehicle Factories Mutual Benefit Association): I would like to ask how you conduct your investigation in regard to accidents, and also whether or not there is any medical aid given.

MR. REDFERN: Every employing officer is provided with a form to report the deaths of members of the relief fund either by sickness or injury. One copy of that form goes to our medical examiner and another goes to the central office. The medical examiner calls upon the disabled person, makes a report to our office, and at the end of the month makes up a claim for benefit. That is certified by the employing officer. When the disability terminates, he issues a form certifying to his physical condition and that he is able to work.

Our men are not allowed to resume work without the certificate of a doctor, and in that way our medical examiners see the men but do not attend them, although as a matter of fact our medical examiners do give a great deal of advice to employees; but if the case is at all serious, the patient is supposed to have his own family physician.

In the case of an accident, the Relief Department contract provides for the payment of surgical attention, and that includes not only the

surgical treatment but also hospital care during the time necessary. In June, 1903, a man fell off a car and his back was broken. He has had to have an attendant, and this has cost the relief fund \$30,000. He drew for one year \$1.50 a day. He has drawn since then the benefits of 75 cents a day and \$125 a month for his care, and he gets a great deal out of life. Occasionally I get a letter from him. When things are going wrong and troubles popping up, all we need is a letter from this fellow, who never gets out of bed, and it cheers us up considerably. He is the most cheerful man I have ever known.

MR. JONES: I corroborate that statement of Mr. Redfern. I met that young man about ten years ago and had a nice visit with him. He has a very sunny disposition.

DR. FOX: Mr. Redfern stated that the medical examiners rendered medical attention in the cases of accidents, that is, shop accidents, but not on the road.

MR. REDFERN: The railroad has a staff of surgeons to attend accident cases. Some of our medical examiners do a little of the work when they can. We have four or five hundred surgeons.

MR. T. H. PLATT (Endicott-Johnson Sick Relief Association, Johnson City, N. Y.): I would like to ask Mr. Redfern whether the rate has been sufficient to meet the requirements of the present time.

MR. REDFERN: No, sir: We don't insure any one over forty-five years old. We had a higher rate for those over forty-five, and that didn't pay. The rate is not sufficient from an actuarial standpoint.

In the war risk insurance, I saw a list the other day on which I think the lowest rate of war risk insurance scheduled was for a boy of sixteen.

CHAIRMAN ELAM: I am sure that this discussion has been very profitable as indicated by the interest that has been taken. We have been fortunate in having Mr. Redfern speak to this section and to lead the discussion because there is no one who can speak with greater authority than he.

Interest in the employees' benefit associations seems to be growing from year to year and we find that there are many associations that we do not know about, that is, that the National Safety Council does not know about. If we can get the names of all of them located in the country and can collect the experiences and the methods on which they do business, it will be certainly very helpful in the propagation of the association's beneficial work.

ARE EMPLOYERS' CONTRIBUTIONS ADVISABLE?

As Dr. Geier is not present, it might be profitable for us to discuss informally the fundamental things in connection with Dr. Geier's address on "Are Employers' Contributions Advisable?" Mr. Redfern could possibly lead the discussion, and possibly be followed by Mr. Chapman. I think we can get a great deal out of the subject. Will you give us your opinion, Mr. Redfern?

MR. REDFERN: Mr. Chairman, as I have indicated before, I believe the employers and employees, as we generally term them, ought to go along hand in hand.

Speaking about the class of men with whom I have come in contact,

I know of no word more objectionable to the average man than the term "welfare". If a man comes in and asks what we are doing in the welfare line, we tell him we are not doing anything of the kind. It is to the interest of every company to have its employees contented for the purpose of having them do better work. Money that the employer spends along that line comes back to him many times over, and the money that the employer gives doesn't amount to so much as the spirit and the manner with which it is given. Our experience has been that the best way is for the employer to carry on the expenses of the plan and not have the employee feel that the officers are spending money at his expense.

CHAIRMAN ELAM: Mr. Chapman, have you anything to tell us on this subject?

MR. CHAPMAN: The whole idea is along those lines. The International Harvester Company made it a part of the rules and regulations that they would make a contribution if seventy-five per cent of the shop employees belonged to the benefit association, and that annually the company would donate \$50,000 to the fund, the understanding being that \$50,000 is for expenses only. The benefit association of the Harvester Company has received from the company each year for ten years \$50,000, which represents a half million in the benefit fund.

In a personal way, I have had members come into my office and discuss it, and invariably they have touched upon the company's contribution as one of the good things. I think all employers who organize a benefit association for their employees should make a donation to the fund to be used in paying the expenses of that association. Our regulations say that the contributions of the members shall not be used for paying expenses but shall be paid solely for the benefits.

I agree with Mr. Redfern that the tendency of employees is to get wrong impressions if advances are made to the employees along the line of trying to give them something that they have not earned, and I have seen cases where that has led to a point where the employees try to see if they can't get a little bit more out of the employer.

MR. CHANDLER: If the employer can confine his contributions to the administration expense, that is a good plan.

Our organization had been running twenty-five years on the basis that the officers must absolutely keep their hands off. There should be no Paternalism—absolutely none. But it developed in these twenty-five years that they needed advice from men who had a little more experience. At the end of the twenty-fifth year it was decided that the organization should have the benefit of the experience of such men as had more experience in the financial and business world, so the by-laws were revised.

Prior to that time the members had been electing shop men—sometimes foremen—to serve as secretary of the association. The dues were collected through the payroll, but the secretary was about the only man who was expected to secure members, and the men busy in the factory had too little opportunity to carry on that part of the work, the result being that the membership represented a very small percentage of the total number of employees.

It seemed clear that the secretary of the association should be some one

whose duties permitted enough freedom that they might circulate among the employees, particularly the new ones, and who, when occasion demanded, should be able to visit the homes of those who were drawing benefits.

There was in the office a young man especially qualified to serve as secretary. However, he was a salaried man and if the company should suggest that he be made secretary some doubting Thomas might start a rumor to the effect that the company was trying to dominate the association.

When the revision of the laws was up we told this man, "Now, Luke, you are the logical man for this job, but the men must choose you. You take an interest in the organization and help them in the work." He stood out prominently and when the time came to choose a man to head the work they said they wished they could have Luke. We all took the reverse attitude, but he stood out so prominently that he was the choice. If we had said that we wanted Luke put in there as secretary, the men might have taken a different attitude toward him. Now they think he is the greatest thing that ever walked.

We pay the expenses. The employees have no idea how much it costs us; we don't want them to know, and we don't want them to calculate how much it costs the Dodge Manufacturing Company.

CHAIRMAN ELAM: May I ask how you collect your contributions?

MR. CHANDLER: That is all done through the pay roll. As an illustration, we bought a factory in New York a couple of years ago. It had been the practice of their association to have the financial secretary collect dues from each man. The result was that a lot of them were behind in their dues from time to time and there was a scrap on all the time. When we took the plant over we suggested that if they were willing, we would be satisfied to do the deducting of the dues and of course it suits them all right.

MR. M. R. MARSHALL (National Lamp Works, Nela Park, Cleveland): May I ask how many employees there are in your organization?

MR. CHANDLER: Membership in the organization is voluntary and includes about 80 per cent of our employees.

MR. MARSHALL: We have about 3,500 employees out of which 1,000 are members of the benefit associations. I wonder if that number is large enough to justify the hiring of a secretary to handle the work. I wonder if there would be enough work for a secretary to devote all his time to the interest of the members.

DUTIES OF RELIEF ASSOCIATION SECRETARY

MR. CHANDLER: In our case, we use our Relief Association, as we call it, for a number of activities. If there is something on like the sale of Liberty Bonds or something along that line, the Relief Association handles it. For instance, we have a Thrift Club. We conceived the idea four or five years ago that the men ought to have some organized incentive for saving money, so we organized the Thrift Club. We said, "Here is a thing the Relief Association can handle." During the war a lot of such work was done through the Relief Association secretary. On the other hand, the secretary has to do the work of getting new employees to join.

\$36,000 in cash, and the company donation the equivalent of \$86,000, for twenty-nine thousand members. We operate sixteen plants in the United States and Canada.

CHAIRMAN ELAM: I don't think there is any question that the contributions through services that have been given by the employer are of the greatest aid, and if that aid were withdrawn, many of the associations would have to go out of business, raise their dues, or decrease their benefits.

MR. JOHN L. MASTERS (Pres., Relief Association, Warren City Tank & Boiler Co., Warren, Ohio): We have an association that we formed two years ago this month. We have about 400 members at the present time. We have a fund now of \$18,000. We pay our secretary \$120 a year. We have within a very short time secured all of our employees as members of the association.

MR. CHAPMAN: How much do you pay into the benefit, may I ask?

MR. MASTERS: A dollar a month for thirteen successive months. Death benefits, \$400 for a married man and \$225 for a single man.

MR. V. R. CURRIE (Houston, Texas): I would like to know, if, in cases where the employees themselves conduct the association, it is due to a lack of confidence that they sometimes fail. That has been our own experience. The employees themselves started such an association, but they did not succeed. There seemed to be a lack of confidence in the association, and we later took charge of it, reorganized it, and put it on a 50-50 basis. As manager of the association, I frequently find that there is a lack of trust on the part of some of the members and some of the employees that are not interested. I wanted to know whether there has been any similar feeling experienced by you and what you have done to stop it. It is something that should be taken into consideration at this time. Of course, we understand human nature has many foibles, and a great many persons are suspicious of anything, but these associations must be popular. They must be like Caesar's wife, above suspicion, and I find it is one of the hardest things to inject into our association a spirit of confidence that will keep down the outcroppings of suspicion. A statement like this is frequently made: "I wonder what the company is doing with that money and where it goes. Where do we get off in this thing?"

MR. JONES: Not only are those people suspicious of the company's officers, but they are also suspicious of the officers of the association; even those who are liked by the men themselves are subjected to suspicion. Our company, when I first came with it, was an independent concern. Some of the members of the organization made the statement that the officers appropriated the funds from the treasury, at that time, notwithstanding the fact that we made regular reports. The truth of the matter was that we invested them in common stock, where they are still standing.

COMPANY CONTRIBUTES ENTIRE AMOUNT OF BENEFIT AND INSURANCE

CHAIRMAN ELAM: Might I ask if there is any one present representing a concern which contributes the whole amount of the benefit and insurance, and in which the employees do not contribute any money?

MR. CHANDLER: I understand that Sears-Roebuck have been the only corporation doing that.

MR. CHAPMAN: The American Telephone and Telegraph Company does it. I think they have set aside \$3,000,000 for the purpose.

CHAIRMAN ELAM: There seems to be a drift towards this method of handling the matter. There are a good many things drifting in that direction nowadays, and I suppose the employees' benefit associations will have to go through the same process. There seems to be a getting away from that old established rule that anything that is worth something to you should cost you something; and it is one of the many things that I expect most of us are studying at the present time.

Reference was made to Sears-Roebuck & Company. I don't believe that I shall be violating a confidence in speaking of their experience. They have had an association, run by the company, with which the employees who belonged to it were supposed to be satisfied and which they were supposed to be joining voluntarily and wishing to keep up. Later on, they found that the members were not satisfied and the association was discontinued.

SATURDAY MORNING SESSION

THE meeting was called to order at 10:00 a. m. by the Chairman, Mr. F. H. Elam.

CHAIRMAN ELAM: We are going to deviate from the regular program this morning, because one of the gentlemen we expected is absent, and we are desirous of having the help of Mr. F. S. Crum of the Prudential Insurance Company, in formulating the report of the Committee on Statistics. Mr. Crum has an engagement at 11:00 o'clock, and we have decided to ask him to discuss the subject of statistics at this time.

I will read the report of the Committee on Statistics. This is simply a tentative report, and was compiled by your Committee with the thought that it would be a foundation upon which to build up and reconstruct a new statistical chart.

REPORT OF COMMITTEE ON STATISTICS

Employees' benefit associations seem to be growing in interest all over the country, and those who are at the head of, or conducting, such associations are asking for information regarding the different plans. Now, we find that the association idea could be greatly advanced by a more uniform method of collecting statistics, and by giving these inquirers the information they want, we could help the association cause in many ways. We are seeking to decide on some form of record that will be useful and that can be kept by ordinary associations. It is suggested that such a record should include the following data:

STATISTICAL DATA RELATIVE TO EMPLOYEES' BENEFIT ASSOCIATIONS

1. Records to be kept on basis of ages of members
2. Age of members to be indicated as of nearest birthday
3. Record of sex
4. Record of nationality

5. Record of outside insurance other than E. B. A. carried by member
6. Record of insurance other than E. B. A. carried by deceased members, as shown by information on claim papers
7. Records of sickness disability and accident disability to be kept separate
8. Record of number of days sickness disability one to seven days, per year
9. Record of number of days sickness disability beyond seven days, per year
10. Record of number of days accident disability one to seven days, per year
11. Record of number of days accident disability beyond seven days, per year
12. Record number of days sickness per member, per year
13. Record number of days accident per member, per year
14. Percentage of disabled members receiving benefits to total membership, per year
15. Record of sickness and accident experience by ages, per year
16. Record of sickness and accident experience by nationality, per year
17. Number of cases and days duration of each disease causing disability
18. Number of deaths caused by each disease

CHAIRMAN ELAM: Now I am going to ask Mr. Crum to lead the discussion in regard to what this report and this tabulation should consist of, and why. Mr. Crum is Assistant Statistician of the Prudential Life Insurance Company, and knows more about the subject than most of us.

MR. F. S. CRUM (The Prudential Insurance Company of America, Newark, N. J.): This, as I look at it, is one of the really big things in this conference. They say safety education leads: prevention of accidents is second, and you are not worse than third.

As we look at it, we are interested in sickness experience and accident experience not merely from the standpoint of insurance, but also from the standpoint of public health. We have been attempting for a quarter of a century to get this information from every possible source, from both the living and the dead. We have even gone so far as to go into cemeteries, and get vital statistics in such sections of the country as have no registration.

Nine-tenths of the work of our department is for public purposes, and if I do say it, the information is used more by outside organizations and individuals than by our own company, though our company does make considerable use of them, that is, these statistics and figures.

Now, as I look at it, this particular experience of employees' benefit associations gives sources of valuable information, which, when compiled, will give us the best, most accurate, and most complete sickness experience anywhere in this country. We should study all sorts of classifications, but the important thing is to have your blank form for reporting individual accidents as complete as possible. After that is done you then have your mine of information, which can be used either by yourself or outside sources, which possibly have better machinery for tabulating the

facts than you have. For it is the mechanical method that puts this information into shape to be used.

You have there a mine of information which will also be a good guide if your fundamental blank is correct and perfect.

Now, as I take it, this outline which Mr. Elam has just read is a blank form and tabulations from such form, but I want to insist again to have the blank complete so that you will have it right. On your original put the classifications, and they will have no limit if your blank is what it ought to be. Now to the blank form you should carry the essentials. You won't need any blank for the age. You should have the "sex" first, because it is the logical first classification; but the sex should always be recorded with age, and the age on your blank form should be the exact age. You can group your age classification any way you want to after that. The member's age should be given as the year nearest his birthday; that is, if he is twenty-one years and four months, his age would be given as twenty-one years. The record of nationality would include the race or color as well as nationality. It is important to have the race. That is the fundamental classification of personal injury and sickness.

I think the items covering insurance are sufficient to begin with. The records of sickness disability and accident disability should, of course, be kept separate. Now, on your original blank form you would have the exact number of disabilities. If you have that on your original blank you can tabulate with greater detail. If at all possible, for your own purposes, and to get a really large experience, either for industry or state, it is trebly important to know what percentage of the total disability cases is under one day, two days, and so on. Then your classifications beyond that should be considerably more.

There should be a classification in your tabulation of sickness disability running into the second week, third, and so on up to the fourth, and then one month, three months, seven and nine months to a year to eighteen months. You should be able to divide your blank for disability in much more detail, and if you have the exact information on every blank form, that can easily be done. The same holds true for accident items under No. 10. That would take care of items No. 11, No. 12, and No. 13.

The ratio of disabled members receiving benefits would be stated not as a percentage (i. e., per 100), but rather in figures per 1,000.

Under No. 16 you should again have race or color as well as nationality.

No. 17 is taken care of by the criticism above. The number of deaths by each disease should not be left out. Your regular blank form should indicate the number of deaths. It would be very interesting, also, to have the number of days given from the time the illness starts, or at least from the time of the discovery of the illness, to the time of death. Let me explain why that is important. The Interstate Commerce Commission uses a method, and I think it is a very poor one. In railroad accidents, if the insured person lives thirteen hours and dies, it is still tabulated as death from disease. For illustration: A man is run over by a train and loses both legs, and lives longer than twelve hours and dies.

That is an illustration of the importance of keeping information in that way. You know the date of injury; and, also in the reports of sick-

ness it would be a simple matter to put on each report the period between the date on which the illness began and the date of death.

These are all important points. Another thing I want to mention that is extremely important is that the members of these organizations should get together and standardize their original blank report card, or sheet, or whatever it is they use. It is extremely important to use the same items. It is extremely important for these reasons: Very frequently, and more now than ever before, those seeking this information will want to combine. Secondly, the signal subject before the country today is the subject of health insurance. It would be extremely valuable to know just what exactly the facts are, and you people will have the finest experience in the country to offer if you can get together and make your blank reporting form uniform and otherwise standardize it.

If you will do that, you will not only make your own information to be used for your own purposes, but it will be much more valuable, because you can then compare it; but, as I said before, you will have to make the body of your blanks uniform.

CHAIRMAN ELAM: Mr. Crum, there will no doubt be some questions that some of those present would like to ask you.

I understand that one of the things that is being taken up is the classification of each individual disease. Not infrequently we have one disease that will run into another. Do you classify them as compound disease, or disability?

CLASSIFICATION OF DISEASE

MR. CRUM: By all means use the dual classification. That is now being used by my office, and is being practiced to a considerable extent. You should have your primary cause, and you should have your secondary cause. Take the recent influenza epidemic. If we had had that dual classification then, it would have been of tremendous value. It is known as the Budapest classification, worked out by Dr. Karris of Budapest, and valuable classifications can be had from the Census Bureau at Washington. They issue a pocket index that will give you such information, and I am sure that the Census Bureau would be glad to supply you all with a copy of that classification.

MR. CHAPMAN: That is especially true of cases of bronchitis and also tuberculosis.

CHAIRMAN ELAM: Are there any questions regarding this statement that Mr. Crum has brought to our attention?

MR. CHANDLER: I think the question of this dual classification is a very interesting one, and I would like to look into it.

MR. CRUM: You mean the Budapest classification? If you will give me your name and address I will be very glad to send you a copy of it.

CHAIRMAN ELAM: Is that what is known as the International list of diseases?

MR. CRUM: Yes, it is a part of it.

DR. FOX: Will they furnish a complete classification? I would also like to ask regarding the cause of disease. Take a concrete example: Suppose a man be injured, and he loses a lot of blood and afterwards develops pneumonia due to that injury and dies from pneumonia. If you

write out a death certificate with accident as the cause, it will not be accepted; you are expected to report pneumonia as the cause. If a man dies from pneumonia caused by the injury, I should think it would be proper to give pneumonia as the cause.

MR. CRUM: I think I can answer that question. The theory is that the man probably would not have died from pneumonia if it had not been for is decreased resistance to disease due to the accident, and in some of those cases you can't possibly say whether the man would have died from pneumonia if the accident had not taken place; but in the great majority of such cases, the man would not have died if he did not have his resistance and vitality reduced.

CHAIRMAN ELAM: Yes, the primary cause is the injury.

MR. CRUM: That is generally the present ruling.

MR. CHAPMAN: Along that line, take the case of a man who dies from septicemia after his hand has been injured. The classification of it is listed as septicemia, a disease; contributory cause, injury to hand. That is the method used:

MR. CHAPMAN: Have you a card that could be used in a tabulating machine suitable for the purpose?

MR. CRUM: Our card would not be of any use to you, except as regards deaths. As regards disability from disease, of course, we don't sell sickness insurance. The Travelers would have such a card, or any of the large disability insurance companies.

MR. CHAPMAN: Do you know whether any of the leading fraternal orders use them?

MR. CRUM: I don't think they do. Probably the Brotherhood of Locomotive Engineers and Firemen is the only organization of that kind using it.

MR. CHAPMAN: What I meant was a chart that we could use as a guide.

MR. CRUM: Well, you might get that from the Travelers or the Aetna.

CHAIRMAN ELAM: Has any one else anything to offer on the question how the reporting of statistics might be improved? I want to say that while this tabulation idea looks formidable, I do not believe that it will have the terrors under actual working conditions that it might seem to have in theory. For instance, when we specify here a record of the number of days of sickness under seven, and those over seven, that is simply an arbitrary division that has been adopted because of the associations that have a waiting period of seven days.

If you can get a report of men who lay off for a day and then recover, it may be worth while keeping such records, and more so for periods ranging from two to six days. If enough associations keep such records, the data will have value.

MR. JONES: Unless a man is off during the whole waiting period, there are many of us who never know he isn't at work.

CHAIRMAN ELAM: We understand this is one of the difficulties that associations have to contend with, as well as the employment departments in these plants. The only suggestion I can offer is that if such information of the man's absence does come to hand, it will be worth while to use it. In our association, for instance, every sickness that has been reported, irrespective of the fact that it doesn't run into the waiting period, is recorded. If you have a man who is sick three days this month,

and three months later he is sick four or five days and then comes up later with a sick spell, maybe, of ten days, you have a history that would indicate that his health is failing and he is not going to be nearly the man next year that he has been in the years that have gone by. It can be readily seen that there are many ways that such records can be used by your associations. Keeping a record of sicknesses and deaths and the reporting of them is a problem which all employers have to contend with, and it is especially a problem with an employer whose workmen live in widely scattered localities. I know of a factory with employees living over a radius of fifty miles, and you can readily see that such a concern is greatly handicapped in attempting to find out why its employees are not at work.

THE SICK COMMITTEE

MR. MASTERS: This matter that you are speaking of is particularly interesting to me. We have attempted to keep track of disabled or sick employees. We have cards which we give our employees, and which are returned in case of sickness or disability to the secretary of our association, who is supposed to notify the employment department, but we found we couldn't depend upon that. So, as soon as a man reports, or is reported to the secretary, a card is at once issued by the secretary to a member or two or three members of the Sick Committee. There are three of them, and they appoint twelve others as an auxiliary sick committee to serve in the different geographical sections of the town, or surrounding country; that is, the factory district is divided into four sections. There is a member of the committee in each section, and the injured must get in touch with that man.

We have been doing this for nearly a year, and we have found that it works better than any other system we have ever tried.

MR. CHANDLER: One thought that comes to me is that while it is sometimes possible to hear from a good number of the employees as to why they are off, the information as to what is the matter with them is rather unreliable. We have been sending our nurses to round up these men and find out why they are off. It is very difficult to get any reliable data on their cases. At the same time, for all those cases we do get data on, we have a blank and fill it out with the information, provided we know it is correct. There are a great many cases that are not reported. For instance, we would have relatively few reported cases of absences, of one, two, or three days.

I make a motion, Mr. Chairman, that the Committee on Statistics be continued, either with the present members, or with a different committee which the incoming chairman may select.

MR. CHAPMAN: I would like to offer an amendment to that motion. That the committee that is to be appointed or continued use its best efforts to obtain from health insurance organizations, or leading fraternal orders, or health insurance companies who operate the combined health and accident policies, samples of the record cards that are used in compiling the statistics on which they base their computations and reports, and that the committee then get together and draft a suitable form for benefit associations.

MR. CRUM: I want to say, Mr. Chairman, I happen to be the chairman of a sub-committee of accident statistics (public accidents), and we are doing exactly that same thing. We are doing it in every city where we can get it over, and that is exactly what you want to do. We have got a stiff job and we are going to take care of it.

While I am about it, I will say that the waiting period ought to go on every blank.

MR. ODLE: Will we have to wait until the convention next year, before we get the report of this committee? It seems to me that if it is of so much importance, that after the Statistical Committee has acted, it might be possible for the national office to print such forms and send them to the different members. Whether that is a possibility or not, I don't know, but it seems to me that the Statistical Committee should so inquire.

MR. CHANDLER: Mr. Chairman, if this body here this morning would be willing to give that committee power to act, it could make up such a form and have it issued to the members through the Bulletin of the National Safety Council.

CHAIRMAN ELAM: The amended motion has been moved and seconded: are you ready for the question? We will then take a vote on the amended motion and resolution combined, as you have heard it.

(The above amended motion and resolution were unanimously accepted.)

CHAIRMAN ELAM: I think that closes the subject. The next subject that comes up is that of Benefits to Ex-Employees, the discussion to be led by Mr. W. L. Chandler.

BENEFITS TO EX-EMPLOYEES

W. L. CHANDLER, ASSISTANT SECRETARY AND TREASURER,
DODGE MANUFACTURING COMPANY, MISHAWAKA, IND.

In a research including six hundred associations we only found two cases where the associations became insolvent to the extent that they had to disband or quit doing business, and it was very interesting to know why that happened. In one case it was very clear that it was the fault of the corporation. It had lost all interest in the association, and it gradually petered down due to the fact that no one was trying to get members.

The other case was where one-third of the members were not employed in the corporation: they were ex-employees, but that one-third of the membership received two-thirds of all the benefits paid, and that explains why it became insolvent. A number of corporations have large benefit associations which permit ex-employees to maintain death benefits. In fact, most of those which do retain ex-employees as members are permitting the carrying of death benefits only; but here is the thing that seems to me to be alarming.

Statistics of benefit associations show that 6.7 per 1,000 is the average death rate of about 250,000 members, which is a pretty fair basis for figuring your benefits, while I understand the death rate of the country is about double that. That shows that the death rates in the memberships of the benefit associations is only half of the normal death rate of the country.

Benefit associations, therefore, profit from the fact that their members cease to be employees prior to the time of their death, because ceasing to be employees means ceasing to be members of the benefit associations. Therefore, those death losses are not assumed by the associations.

It would be very desirable to continue those death benefits; that is humanitarian. I am not arguing that I believe in abandoning these benefits, because I don't. But it is a fact, nevertheless, that those associations that permit the carrying of the death benefits after the employee leaves their service are approaching insolvency.

We must look that fact squarely in the face, and first find out whether or not those employees should be allowed to retain their benefits. Then if they are, how can they be carried without endangering the solvency of the association? I think the members of any association, if the matter was put to them properly, could be brought to see that the cost of carrying those benefits must be made up in the dues paid by those ex-employees.

It has been stated many times that employees' benefit associations need very little reserve because of the fact that the employees cease to be employees prior to the time of their death in such a large number of cases. But if we are going to change our rules to include those members, who become ex-employees? Then we will approach very closely, if not entirely, to the death rates of the country, and we get into the same line of business that life insurance companies are in, and we must have the same reserves, we must have ample reserves.

In other words, if you must be great enough to carry the losses which are going to come later on, you must provide for them. We are now, in some ways, like the fraternal orders. They have been working along those lines in former years, and many of them are working along these lines now; but they have found that their rates must be ample enough to take care of the losses caused by the deaths of the old members, and large enough to give them a reserve for this purpose.

In leading this discussion, I realize that my function is merely to start the ball rolling, and I hope that before we leave the subject, we may be able to arrive at some definite conclusion, so we may know how best to prevent the insolvency of associations that want to carry on the humanitarian work of taking care of the employee who has been with the concern for years. We wish to grant those employees really what they ought to get.

MR. H. A. THOMPSON (Union Switch & Signal Company, Swissvale, Pa.): The Westinghouse Air Brake Company had been running our plant for some years before we bought it. They were running the benefit association for two years previous to the time that we took it over. They increased the benefit, didn't increase the dues, and they went under. Before we took hold of it, they raised the dues, and I think there was something like \$484.00 in the treasury. The company thought the old men who had been paying for some years should be permitted to carry their benefits.

CHAIRMAN ELAM: Then you feel that the contributions made by these old members are going to pay for the increased death benefit liabilities?

MR. THOMPSON: By making them pay a little more, when the employees wish to carry it out, on the year's balance. These ex-employees were permitted to carry their benefits after they left, but the rate was raised a little. I think they were allowed to carry only one class of benefits.

CHAIRMAN ELAM: That is for sickness alone, isn't it? You have no death benefit.

MR. THOMPSON: We have a death benefit of \$150 for outside members, and a much larger benefit for the members.

CHAIRMAN ELAM: Then the old employee, or the superannuated man, would come in under it as being carried for a death benefit or a disability. Mr. Chapman, what have you to say?

MR. CHAPMAN: The proposition of retaining the members leaving the service of the company and permitting them to carry a membership thereafter for the death benefit only, held by them during the time they were active members of the association, is one point which has given the trustees of our association considerable concern.

Originally, when the committee drafted our regulations, which were put in force in September, 1908, regardless of his age or physical condition, a man was entitled to a membership without physical examination. We took them in at the rate of one thousand a day for the first nine days, and the highest age was seventy-eight. We took them in with all kinds of ailments that had not caused disability up to that time.

Very shortly thereafter we had men disabled from different causes, and we began paying right off the bat. The committee took this view, with reference to allowing members who left the service to continue their membership for death benefit only: that, in joining the association, a good many of the men who were between the ages of twenty-one and thirty-five were then probably carrying insurance in various other organizations that paid sick and death benefits; that, in joining our association, which we knew by actual comparison paid more in benefits for the contributions—I use the word "contributions" because we don't allude to premiums or policies or anything of that nature that is used by insurance companies—they might give up some membership that they were then carrying; that they might continue thus for a period of several years, at the end of which period their membership would automatically terminate; and, that, thereafter, they may continue their membership for the death benefit only, if they want to carry it, but not to exceed the death benefit held by them. Now, that ranges from \$400 up to \$2,000. That cost them, when we started out, at the rate of 10 cents per \$100 per month; in other words, \$12 per \$1,000 per annum.

At the end of two years I showed the Board of Trustees whither they were drifting, and that nearly every member of the association drawing benefits for 52 weeks was afflicted with an incurable disease. We were rapidly going into the hole, so we raised the rate. We couldn't do more than to double it, because of the old-aged man, the man who was sitting around the house or out in the yard, not able to do anything in the line of work to increase his income; it would be a great hardship to him if we increased it more than double.

That rate applies irrespective of age or physical condition, so we are

now carrying a death-benefit-only membership of 800 members with a liability of over \$1,000,000.

Now, the other class of employees, members who are shrewd, take death-benefit-only classification. They are the employees who, for one cause or another, leave the service of the company to go with some other concern, for other causes, continue the death benefit. The percentage of members of this classification who allow their benefits to lapse is considerable.

We adhere very strictly to the regulations with reference to termination of membership on failure to pay contributions within the time limit. That is our safeguard in that matter, and at the last meeting of the Board of Trustees of the association, there was an amendment made to the effect that if the contributions were not paid on the date due, membership lapsed and could not be reinstated. To limit further that class of memberships, we have changed the rule, so that a five-year membership is essential instead of three.

When we changed it from one year to three years, we immediately reduced the number of applications. It was cut fifty per cent and now with the five-year period we are going to decrease it another fifty per cent. It is only the old-time boys who are going to be eligible to that class of membership. Our statistics show a great reduction in the liability and as time goes on it is going to be diminished still more.

There is one other subject that Mr. Chandler did not dwell upon, and that is the payment of disability benefits to employees who had left the service of the company, and who reported disability after they left the service. In our experience we have had a large number of cases where the members claim they were disabled thirty to sixty days after membership had lapsed, due to their having left the service either as the result of sickness or accident. The claim has been made that the man was sick at the time he quit service. We have had no end of trouble in getting away with those cases. In fact, we have had several suits against the association, and in one case we carried it to the Supreme Court of Illinois and won the decision. That decision is now cited by a great many fraternal orders which are subject to the same kind of claims. It was a test case, and at my earnest solicitation our legal department carried the case up. It cost us some money, but that has saved us a good bit since in enabling us to maintain our cause against imposition and attempted fraud.

CHAIRMAN ELAM: We will proceed to the next subject, "Selling the New Employee."

SELLING THE NEW EMPLOYEE

F. E. CHAPMAN, SUPERINTENDENT, EMPLOYEES' MUTUAL BENEFIT ASSOCIATION, INTERNATIONAL HARVESTER COMPANY, CHICAGO.

I want to state, in the first place, that membership in the benefit association of our company is not compulsory. It is optional with the new employee. He is informed that the employees of the company maintain a benefit association, of which about eighty per cent of the employees of

the company are members. Our plan is not what is called a class plan. A great many of the benefit associations throughout the country, and especially the smaller ones, are operated on the class plan, that is, after payment of a specified amount of dues, the member is put in a particular class; if he pays a little more, he is put in another class and so on and so forth. The class plan permits of a change of classification as wage or salary increases. That is constantly happening, and necessitates changing the classification of the men. If a man's earnings are reduced, he is reduced to a lower class unless there is a provision which permits him to retain the last classification.

The Harvester Company plan is called the per cent plan. The member employed in the factories pays on the basis of his earnings of two thousand dollars per annum and under. He pays into the association on the basis of wages or salary earned and benefit is figured in the same way. If the man is earning \$1,500 a year, he pays on \$1,500. If he dies, his beneficiaries draw \$1,500. If he becomes disabled and his disability runs for a period of 52 weeks, he draws \$750. He pays for that at the rate of one and a half per cent of his earnings. They do not, under any circumstances, draw benefits on account of accidents which arise out of and in the course of employment, which would bring them under any state workman's compensation law. We handle only accidents outside the shop, and those which do not arise out of and in the course of employment. There are many such accidents that do not come under the industrial compensation laws.

We considered, at one time, a change that was suggested by members, through the elected Board of Trustees—that we switch over from the per cent plan to the class plan. When that matter had been up for discussion, we were convinced that the only equitable basis was the per cent plan and for that reason our regulations have never been changed.

EXPLAIN FULLY THE ADVANTAGES OF MEMBERSHIP

Now, to get back to employment and members. Before a new employee is sent to work, he is told what the benefits of the association are, what it costs him, how the money is paid into the association (i. e., it is taken out of his pay by the pay roll department), the amount to be indicated on the pay envelope. He is also fully informed of the amount of the benefits, the nature of them, the special benefit for the loss of hands and feet, and the death benefits due to sickness or accident. He is asked to join the association. If he is a foreigner, he generally replies, "I don't want it. I belong to the National Polish Alliance," or "I belong to the Modern Woodmen" or some other organization. We have a list of so-called health organizations. They have no capital, they have no surpluses they are fly-by-night, so to speak. Then, if he belongs to anything that we do not consider a responsible organization, we ask him how much he gets and what guarantees he has if he becomes disabled, and how much his beneficiaries would get. Generally he can't tell you anything about it. Some solicitor called around and gave him a fine story and he signed the application. We tell him, "Here is the Harvester Company, with its millions back of its benefit association. There is a signed agreement by

which you are protected. We have the money with which to pay the benefits and there has never been a time when there wasn't ample funds for all purposes." If at any time any state insurance commission wishes to investigate us we have something to show that we are not going busted.

We explain the plan to the man in detail, if there is time. Sometimes the employment department is rushed and can't go into details and he is sent out to his department to be put to work. After he has been there two or three weeks, if he stays that long in these days of rapid turnover, his foreman or his time-keeper, or some employee of the company, goes to him and says, "Well, John, what do you think of joining the benefit association? You remember we talked to you about it and at that time you didn't want to sign up." Sometimes he will say, "I am still of the same opinion. I have all I want to carry." That interview is ended, and later on he is solicited again. It is just the old story of finally getting him in by keeping after him. Now, in a great many instances we are unable to close with him, and we simply let him go to work. We can't force it on him. He can't say he had to join or get out. It has been claimed by labor leaders, as an argument against employers maintaining associations, that employees were forced to join. This can't be said of the Harvester Company.

HOW TO GET FOREMAN TO HELP

There is a spirit of rivalry between departments. The superintendent calls a foreman and he says "Mr. Jones, you have a thousand men in your foundry and the time cards show that only 60 per cent of them are members. Here is a list of those who are not members. See what you can do." In that way a canvass is made in each department, and through that medium the next month the list shows the department has increased its membership. The foremen are kept advised of the progress of the different departments. If one foreman sees another department getting ahead of him, he says, "I am not going to let anybody get ahead of me." In this way they keep up their membership right along through a spirit of rivalry.

Also, a good time to get them in is when they get a raise. When a man gets a raise, an application is handed to him, and he is invited to join.

Physical examination is required for membership in the benefit association. If the employee has been in the service for some time before he indicates a desire to join, he is subject to a re-examination.

Is there anything else, Mr. Elam, that you would like to have me touch upon?

CHAIRMAN ELAM: I don't think of anything at the present time.

MR. ALBRECHT: It seems to me that if the foreigners who belong to the Polish Alliance and such organizations could be gotten to join the benefit associations, it would be a great step toward their Americanization, and that there is great power behind the benefit associations. The foreigners should be gotten away from those foreign organizations if they are going to be Americanized.

MR. CHAPMAN: I am very glad you mentioned that. The Harvester Company is doing an Americanization work among its foreign employees.

As you probably know, the Harvester Company has an Industrial Relations Department where there is workman's representation in the management, in the conduct of the shop matters and on other things in general. Each plant has a works council. Where there is a preponderance of foreign nationality we have started a campaign through the works council and through intelligent foreigners to show these people what it means to belong to a good organization.

We built up a surplus that enabled us to go through the influenza epidemic. We have had a net loss of \$63,000, approximately, but we didn't have to sell a Liberty Bond or any other security to pay off our obligations.

MR. JONES: One of the obstacles we find in getting members among foreign workmen is the fact that if a member of their organization dies the rest of the members voluntarily donate a dollar, which is the death benefit that they pay. And, of course, where there are several hundred members, they receive a larger benefit than we are able to pay from the dues we can collect from our members. I have had that thrown into my face several times as an inducement for these members. They retain their membership in the foreign organizations.

MR. CURRIE: I would like to ask, Mr. Chairman, if they have a time limit or a specified time after which an employee can join the association. I believe it is the experience of all present, as it is with our company, that the turnover is so rapid that the men are continually coming and going.

MR. CHAPMAN: The only trouble we have is the volume of work that is required to act on the applications. The turnover of labor makes a big lot of work. There is a short waiting period for membership to become effective. For instance, a man passes the physical examination for membership. The plant sends the application in. It generally reaches my office not later than three days after it is sent, and it is acted on generally the day it is received. We make all of our memberships become effective on the first day of the succeeding pay period. There is no way of telling how long the new employee is going to stay. He may be gone before we can act on his application. We have a system whereby we are immediately notified of the employee leaving the service who has made an application and no action is taken on that. I aim to get that application acted on and the certificate in the hands of the man on the first day of the following pay period. Does that answer your question?

CHAIRMAN ELAM: Mr. Chapman, do you ever have a criticism of the association's rules in regard to this necessary waiting period?

MR. CHAPMAN: Oh, yes, and our answer is that we reserve the right to examine the application and ascertain if the man was ever a former member of the association.

CHAIRMAN ELAM: I have had quite a number of cases of that kind in our association, and they come along with the plea that in ordinary life, the insurance company makes your policy effective the date of the application and the employees benefit associations should do the same thing. But there is little to that. I am in favor of this waiting period. It gives us a chance to do our advance work in an orderly manner and sometimes gives us a check where somebody has slipped.

MR. CHAPMAN: The value of a waiting period lies in the fact that, as

you have stated, a check of the man's previous record can be made. We find there is a large percentage of the employees who leave the service and come back within two or three months. They have gone somewhere else, and come back and want either their old job back or one just as good. We have had cases where new employees have made application for membership, taken sick, and died before the day on which their membership was designated to become effective, and there has always been the howl that we are holding out on them, from widows especially. The man goes home and tells his wife he joined the Harvester Company's benefit association, and if he dies she will get so much, equivalent to one year's average wages.

We will say the employee made his application on Monday, and he wasn't feeling well but he didn't disclose that to the medical examiner. We don't stick a thermometer down his throat and take his temperature unless there is something about the man's appearance which indicates everything is not right, then his temperature is taken and he is given a thorough going-over. In 1909, we had our first case of that kind and it resulted in a lawsuit. It was contended that this man became disabled and his death subsequently followed. We told the dependents that he was not a member and that he hadn't paid any dues. They took the case to court and lost, of course. But to forestall that in the future, we amended our application. We have a book of rules and a copy of it is given to every member when he joins the association. If he can't read English and can read Polish, we give him a copy translated. If he speaks Polish, Greek, Italian, Lithuanian, or German, we give him a copy that he can read. We print it in nine foreign languages that are used in our shops now.

There is no argument about it. If he can't understand it we say "Here is an English copy: get somebody who can understand it and have him interpret it to you."

MR. THOMPSON: I agree with Mr. Chapman that to get a man into the relief association the first day on which he is in the employ of the company is a good step. In our company we feel that the benefits derived from this association will be a benefit for him. When a man comes in and wants to argue, (but there is only one out of about 620 who does that) we first explain the system, and if he doesn't join, we mark his card "non compos mentis" and send him out.

ELECTION OF OFFICERS

The Nominating Committee, consisting of Mr. Chandler, Mr. Eaton, and Mr. Chapman, reported the recommendation that Mr. Joseph N. Redfern be elected as Chairman of the Employees' Benefit Association group, and that he appoint such committees as he may deem necessary to assist him in conducting the work of this group during the coming year.

This report was adopted and Mr. Redfern unanimously elected.

Employees' Publications Round-Table Discussion

October 2, 1919

E. A. WANNER, Chairman

Assistant Editor, "Jeffrey Service," Jeffrey Manufacturing Company,
Columbus, Ohio

THE meeting was called to order at 1:15 o'clock, Mr. E. A. Wanner, Assistant Editor, "Jeffrey Service", Jeffrey Manufacturing Company, Columbus, Ohio, presiding.

CHAIRMAN WANNER: I am sure that this large turnout is gratifying to all of you people who are interested in employees' publications because it shows how important these are becoming. I am sure we are going to have so many people who will want to speak today that there will be some disappointment because our time is so short.

After each speaker we will allow, say, three or four minutes for discussion. Please bear in mind that we have no time to wait, so if you have anything to say, get up immediately and say it. Let this be, if I may call it such, a "pop-corn" meeting. When a speaker sits down, jump up and say what you have to say, because there will be a lot of suggestions presented and a lot of questions asked.

"What Benefits Should a Corporation Expect to Derive from an Employees' Publication?" — I have asked Mr. H. H. Matthieson, Safety Engineer of the Crown Willamette Paper Company, Portland, Oregon, to speak a few minutes on this topic, and while he is speaking, if you find any questions you would like to ask in regard to this subject, please be preparing them so that we can put a lot of pep into the meeting.

WHAT BENEFITS SHOULD A CORPORATION EXPECT TO DERIVE FROM AN EMPLOYEES' PUBLICATION?

H. H. MATTHIESON, SAFETY DIRECTOR, CROWN WILLAMETTE
PAPER COMPANY, PORTLAND, OREGON

There are many types of house organs and house newspapers published to-day, and while we are talking about house organs, I want to differ-

entiate the various types and deal entirely with the house organ for the employees.

By way of introduction, I might say that some house organs deal with methods of advertising and selling goods to the public. A second type is published for the stockholders, to keep them in touch with what is going on. Another is the employees' publication, published for and by and with the employees—for the individual man, for his own benefit, for his home, his family, and his children.

As I said a moment ago, there are house organs and house organs; they are of many shapes and forms and varieties. Some show great care and attention and expense in compilation; others do not. Sometimes I think it would be better if some of them were not printed because they are a waste of good printer's ink, time, and money. However, we are all striving to reach the individual workman through these papers.

What benefit can we derive from it? Of what benefit is it to the company? Is the employees' publication merely a fad or is it worth while?

Before going on to that discussion, permit me to digress a moment again. One thing to take into account is the amount of money one wishes to spend upon the house organ. That determines its character, but no matter what the expense is, give it good printing. Good printing is the cheapest printing there is. Nothing is more distasteful than a paper gotten up in poor form and poorly printed.

Now then, what are the benefits to be derived from these publications?

First, one can present in the right way the policies of the company and the information that one wishes to pass out to the employees. I know that those of you who heard the speeches yesterday afternoon thought they were very impressive. I enjoyed every word of them, but last night when I went to my room, I read the printed copies of these addresses. That gave me a chance to study them.

Around the plant employees hear talk of safety work, service and welfare work—rumors that float about. No one has the inside information about it. The plant paper can put that information across with authority, and do it authentically.

Second, the plant organ promotes harmony and a clearer understanding. One can promote harmony, set forth the policy of the company, and enlighten the employees about problems of management more satisfactorily through this paper than through spoken information, rumors, or what not.

Third, it gets close to the home. I always size up a publication that I am trying to work on by counting the number of copies I can find thrown away after the edition is distributed. I think that is a good method to ascertain whether the publication is worth anything or not. If you hand your copies out at the gate and then when you are through, find half of them on the ground, thrown aside, you have failed in your efforts. But if those publications go home where they should go, where the man can take time to read them over and the children can read them over, you are getting in touch with that most vital part of society—the home. And that develops plant family spirit. I like the idea of a

plant's talking about the A, B, C family. I like the idea of talking about our plant family and trying to consider our organization as one big family with the president or manager at the head, and the rest as members of that family. Your plant organ can develop that spirit more than any other thing.

I like to put in at least one article touching upon the minor technical side of the work carried on in the plant. You will be surprised to learn how little the families and, in fact, some of the workmen themselves, know about the great organization to which they belong and what it is trying to produce.

In the paper industry I had that brought home to me very clearly not long ago. I was in our San Francisco office and we were running a series of publications telling how paper is made, from the tree to the finished product. One of the stenographers said to me, "I never realized before just how paper was made. I have never been near the mills." There were a great many other people in our mills who did not know what the departments other than their own were doing.

The paper is an advantage in an educational way, and I might say the most important thing it will accomplish for the company is to develop a "pull together" spirit. I like "pull together" better than "co-operation". I think the latter term is overworked. I remember when I was a boy I was in a logging camp. Two oxen were hitched to a log. One of the oxen lay down and wouldn't work. The other was straining himself in a futile effort trying to pull the log. Finally the driver got the first ox up, and then the other one, which had been doing the work, lay down. Well, it took a great deal of talking and, as is customary in logging camps, a great deal of strong language to get those two oxen to pull together. The same is true in our industry today. We need more of this "pull together" spirit, and this "pull together" spirit can be developed through the plant organ, if it is presented in the right way, better than by any other method.

CHAIRMAN WANNER: Now, let's have some direct questions or suggestions, but make them snappy.

MR. SCHNEIDER (Goodrich Rubber Company): I would like to ask what the best method of distributing these papers is, because this question has just recently been brought up. We feel that every employee should read these publications and they must, therefore, be properly distributed.

CHAIRMAN WANNER: I might speak for a firm of several thousand men. Possibly 3,000 of our employees receive the publication. We have two gates that the men use in leaving the plant, and we have our messenger boys there—three at each gate—to pass out copies to the men as they leave the plant.

We did try at one time to have them piled up on a box so that the men could help themselves, but there is one bad feature connected with this plan: sometimes the men get the papers before the hour for quitting and, consequently, they are tempted to read them during working hours. Brown will have his paper and the men in his department will gather about him to see what the reports are; this tends to break up the dis-

cipline in the department. We found that in distributing the papers when the men were leaving the plant, we were following the better plan. That, of course, will take care only of an organization of a few thousand men. Where 10,000 men are employed, the question might be somewhat difficult.

MR. ASHE (General Electric Company, Pittsfield): We have 6,500 employees. We have been publishing a works bulletin for six years. We distribute the paper by first being absolutely sure every month that it comes out on the first of the month. It is distributed in the different factories as the men go home, and of more than 400,000 distributed, we have found only twenty-two that have been thrown away.

CHAIRMAN WANNER: That is a very good record.

MR. REESE (Firestone Company): We have approximately 40,000 papers to give out weekly. We have tried two methods. First, we sent slips to the various departments asking how many papers were wanted. After we got this information we sent the required number and obtained a written receipt in return. That plan didn't work. It might have worked if we had not thought of a better one. We found the papers blowing about the department, so we got a magazine rack similar to those found in a Y. M. C. A. or railroad station, consisting possibly of twenty-five sections. Then the men and women in going out on Friday afternoon take their papers from this rack. I think very few take them when going into the plant. We find that the papers handled in this way do reach the homes.

MR. MEACHAM (Goulds Manufacturing Company): We print about 1,200 papers every week and distribute them by giving them to the foremen and making them responsible for the distribution among the men in their departments.

There is one phase of this benefit that employers may gain that I want to speak of, and that relates to safety work. I have been very much surprised to see, in the great number of employees' publications that come to my desk every month, that comparatively little space is devoted to discussion of safety work.

When we started our paper last April, I was told that I might have a column in each issue for an article on safety. A column consists of 888 words. Believe me, I know it makes the safety engineer scratch gravel to fill a column every week! It not only gives your men good, reliable information on accident prevention in the various departments, but it is a mighty good thing to develop your safety engineer.

CHAIRMAN WANNER: Mr. Ashe said he issued the plant organ on the first of the month. I think the better plan is to issue it on the last Saturday of each month. When the paper is given out on Saturday, the men have Saturday afternoon and Sunday in which to read it over. We have a great many men who work nights, and when we gave it out in the evening, they would read the paper instead of watching the machines.

MR. MOREY (Commonwealth Steel Company): I have heard that Procter & Gamble Co. sells its paper.

MR. WINGFIELD (Procter & Gamble Co.): We publish a monthly magazine consisting of forty-eight to sixty-four pages, which we sell to the employees at a nominal price: five cents a copy for the regular issue, and ten cents for the big issues, such as the Christmas number. These are sold at the pay line by the office boys and by girls from the different departments.

We do this not to make the publication self-sustaining or to make money, but merely to keep our magazine out of the hand-bill class. It costs a great deal more than five cents a copy to print this paper. We charge this nominal price only to make sure that the men will take the papers home and not pave the streets with them. The charge is made because of its effect in getting the men to appreciate the magazine.

MR. PERRY (Eastman Kodak Company): How many employees has your firm.

MR. WINGFIELD: Three thousand employees. The publication is for the home plant at Cincinnati. The Ivory town has about eight hundred, of which two hundred are English-speaking.

MR. MOREY: What percentage of the workmen buys the paper?

MR. WINGFIELD: Fifty per cent buy it at the home plant. The percentage in the other plants is smaller.

CHAIRMAN WANNER: The next topic, "What Can Employees' Publications Do to Promote Industrial Good Will?" will be discussed by Mr. Myron J. Jones, of The Sherwin-Williams Company.

WHAT CAN EMPLOYEES' PUBLICATIONS DO TO PROMOTE INDUSTRIAL GOOD WILL?

MYRON J. JONES, DIRECTOR OF PERSONNEL, SHERWIN-WILLIAMS COMPANY, CLEVELAND, OHIO

My only right to speak on this subject is that the Sherwin-Williams Company, which I have the pleasure of representing here today, has had a house organ for twenty-eight years, and it has, therefore, had a little experience in the value of it.

I am bound to say that the company has made its own progress by buying the good will of the public through advertising, as we all know who know what the "Cover the Earth" proposition means, and we figure that if it is worth while to spend \$500,000 a year in getting the good will of the public for our goods, it is worth something to get the good will of the people in the making of our goods and in the selling of them. In the progress of the company's effort along these lines, I am very glad to say today that from the standpoint of experience we think the "Chameleon", which happens to be the name of our publication, has been absolutely worth while. The present managing editor of "Printer's Ink" was the editor of the "Chameleon" up to last November.

I say that the house organ is no better than the people who make it and the stuff that goes into it. The stuff has to come from the concern

about whom it is published. In other words, if you have nothing to talk about, you have nothing of interest to the employees.

In the six good points laid down by the previous speaker, I think he has given the answer to what a publication may do to promote industrial good will. If it does those things, it promotes industrial good will, whatever that is.

After all, I believe industrial good will must get back to the home. Following all the other human interests named, when you have a publication that can help sell the proposition of Procter & Gamble, or the Eastman Kodak, or Goodrich or Goodyear or Sherwin-Williams, or anything else to the man's family—the mother, sister and younger children—that is, in my judgment, a criterion of the worth of it.

This gentleman (pointing to the chairman) who edits this paper (holding up a copy of "Jeffrey Service") has set the pace for a lot of us. The "Jeffrey Service" is one of the good ones. I say this to you not because the assistant editor is here, but because the editor and manager is a man I have long known and admired, and who started with the Sherwin-Williams people but who found something better than paint and varnish to take up his employment.

I am going to tell you the secret of this thing is the fact that it gets back to the fundamental element, the human interest in the family.

In conclusion, if the corporations of the United States are justified in spending millions of dollars annually in getting the good will of the public for their products, by the same theory they are justified in spending good money—spending it well through good people, qualified and experienced to do it—to gather news, put it out, and thus promote the good will of the employees toward that company, toward its products, toward its service, toward all that makes it worth being in existence at all.

The plant organ is no better than the company's program of putting excellent brains into it. I was delighted the other day when a firm from Rochester came to Cleveland and offered the now munificent salary of \$5,000 for such a person. I hope they got him. There is a fellow here who looks as if he might fill the job, and he represents the company.

MR. PERRY (Eastman Kodak Company): They are still looking.

MR. JONES: I happen to be the director of personnel of our company, so I am interested in employment. I gave them the name of a likely young man. The Plain Dealer immediately raised his salary and he is still writing "Labor" in the Plain Dealer, although he didn't write the article in today's paper. Of all the lopsided propositions that ever came through, that is one—the failure to interpret a session on employee representation.

Gentlemen, let's make our plant publications for the employees on the level with the best that can be done. The best is none too good, and I will say the good is enemy of the best. You have got to have the best, at least the better to prepare your plant organ.

If there are any questions about this publication that you would like to ask, I will be glad to answer them. Our editor is here today, but he is

not very familiar with the work as yet. As I told you, "Printer's Ink" took our editor, but we are glad he is doing a good job.

MR. DRAPER (American Multigraph): I spent some years in the newspaper business, and I found that one cardinal principle is: They don't want to read it. Since I have gone into the house organ business, it has been even more impressed on me. On checking up distribution, if your pay roll clerk addresses a copy to each individual, you find out, first, what employees do not read the house organ; you have the very fine criticism in reply to "Why do you throw these away?"

CHAIRMAN WANNER: The next speaker is going to give you some information that will partly explain a statement just made, viz., that some house organs do not hold enough interest to get the men to read them.

Now, I think that Mr. Sayler, our next speaker, will tell you what kind of news to put into your house organ, and will tell you the kind that your men are willing to read. Mr. Austin C. Sayler of the O. S. Hubbell Printing Company will speak on "What Kind of Material Is Needed to Make the Plant Periodical a Success?" I might add that Mr. Sayler has had a good bit of experience along this line and he knows whereof he speaks.

WHAT KIND OF MATERIAL IS NEEDED TO MAKE THE PLANT PERIODICAL A SUCCESS?

AUSTIN C. SAYLER, THE HOUSE OF HUBBELL, O. S. HUBBELL COMPANY,
CLEVELAND, OHIO

The subject is very broad and it is pretty hard to keep to it because there are so many phases which govern the contents of a trade paper.

The trade paper certainly must contain sincerity and individuality. Every plant has its individual problems, and every item, every line, in that house organ should apply directly or nearly so.

It is hard to find, in reading a hundred house organs a month that come across my desk, why a lot are printed. They apparently don't have a policy. Now, without a policy you have no way of gauging whether your house organ is a success or not. The mere fact that you are printing shop news isn't going to repay you for the effort and money that you are putting into it. The house organ should have a policy or a reason for being, something that will make the man understand that he is a reason for the success of the organization as a whole.

I have made a list of what I believe a house organ should contain. Now, it should contain matter that will accomplish the big purpose, as I see it, of every real house organ. One of the purposes, to my mind, is to create loyalty to the company. To create that loyalty you have to give the men reasons why they are working for the best company that there is in existence. You want to tell the men, for instance, about concerts; getting in the community affairs; dances; picnics; baseball games; bowling; music, if you have a band or orchestra; the hospital in the plant, or arrangements at the near-by hospital; visiting nurse; insurance;

benefit association; restaurant; store; a clean place to work; well-lighted; nothing in the aisles to stumble over; convenient location of the plant; transportation; steady work and good pay.

Reproduce and expatiate your national advertising if you are doing any. Explain the bigness of the Company. Articles along those lines will automatically create a loyalty to the company.

Another reason for the house organ is to stimulate interest in the work and pride in the quality of the product. Articles on the following subjects will create this feeling: the quality of the product you manufacture; suggest prizes for bettering them; and then your representatives' sales talks—what the customer wants and expects and what he thinks of our products: tell him why our product is the best; the ultimate use of the product; why used and how used; the necessities of being perfect; what an imperfect article means to the sales department; show the cost of materials generally, not minutely; what it means if a man spoils a part, the delays, the reorder of material in small quantities to replace it; how delays affect sales; quality talks.

I heard this statement the other day from a man who is an authority. He says "Quality talks will automatically produce quantity." I believe that is true.

Another reason for a house organ is to foster initiative. Inspirational articles: how a mechanic by an idea made some money; suggest giving remuneration for suggestions about improving the machine, the location of the machine, the method of operation, or the method of handling material.

Another reason is to create a spirit of coöperation between departments. Show how slowing up affects other departments. Show how imperfect parts stop production. Give concrete examples. There is no use talking about what they are doing in other cities. Confine all your articles directly to your own problem.

Create a spirit of coöperation between factory and office. Personal stories about executives, if interesting, are good. Have articles on the troubles of your executives because if you show the workmen that the men in the front office have real troubles their own personal little troubles aren't going to look quite so large. Give articles on the necessities of a closer coöperation.

Another reason for a house organ is to create a friendly spirit among the employees. Tell *all* the news to *all* the employees regularly. I don't believe in Procter and Gamble's scheme of selling unless you have a hundred per cent distribution. If not, you are going to lose some place. If I can't make the house organ interesting enough for every man to take it home, I haven't accomplished fifty per cent of what I started out to do. I want every man in the plant to read the house organ. Give production records: department news; new employees; new equipment; men who have been advanced and why; small group snapshots; stories of employees; illness; vacations among hour help, not the office (the man in the factory would say, "He gets paid for it"); new automobiles; pianos.

victrolas, etc., in the homes; original verse and cartoons (and, don't let them put something over on you there); new homes.

Another reason for a house organ is to teach Americanization and the benefits of naturalization: short historical sketches; opportunities in this country; advantages under our form of government; comparisons with other forms of government; short biographies of successful men; serial articles on naturalization. There is one house organ that ran the best naturalization story I have read. There are very few editors who can write the kind of article that Jack Patterson of the Hydraulic Pressed Steel Company has written. It is quite a proposition. He had to go through it himself and he knows. If there is anybody who wants good material on naturalization, he should get the series that appeared in the Hydraulic Press. You can't do any better. I believe if you had the space to run a question box on naturalization, it would be a good thing, but be sure of your subject.

Another reason for a shop paper is to foster desire to save money and own a home. Give examples of what employees have done, preferably the lower salaried ones. Show table of what small savings amount to; W. S. S. propaganda; articles about men carrying money in belt, or money hidden at home; being robbed; show the advantages of putting the money in savings banks.

Another reason for shop papers is to describe safety in the plant and home; being members of the National Safety Council, you will, of course, get good material from this source, but, better still, give concrete examples, if you have had any accidents in your own plant.

Here is one of the most important reasons: Create desire of the wife to want her husband to work for you and want her son to follow his father. Publish articles on why he should work here; why this is the best place to work; articles descriptive of community affairs; social affairs; about your visiting nurse; about your insurance (give concrete examples).

I know a company that, when an employee dies, makes a complete investigation of what becomes of the money that is derived from his insurance. They tell that in their house organ and it has a good effect on the wives and other employees. It is a concrete example.

Some house organs use this and others haven't the space: Home Economics. Our friend, the White Automobile Company, make quite a section of suggestions by wives of employees, none other. Don't take a clipping out of a daily newspaper for a recipe, but if you have a real, honest-to-goodness thing that one of the wives did, put it into the house organ.

I read an article the other day of a man criticizing house organs. He said that he had seen several hundred of them, but that apparently there wasn't a woman in the whole outfit who had ever made anything unusual. I believe it is true. I see a great many, and I don't see where a woman has suggested a single thing to help the man or other employees in the plant. If you have the room, give them these recipes on cooking, general health notes, care of the children, etc.

Here is another thing: the most interesting thing in the house organ and that which we need to make it an interesting carrier is a Want—For Sale—Exchange column. You would be surprised to learn of the number of things the employee has that he wants to get rid of. That made the success of the New York Evening Telegram. About the time they were slipping, they started an exchange column and it ran into four pages. That is what the men like. If they can't get their names in the paper any other way, they will have something for sale.

Another reason is to create desire in the man on the outside to work for this company. I know a house organ that was so effective in this that the day after its first issue was distributed, they had eleven men from other factories apply for jobs. One of them said, "I didn't know before that you had such a hell of a good place to work in." And, at that, this place wasn't so much better to work in, but the house organ made them believe that it was. That is just another reason for a house organ.

CHAIRMAN WANNER: Mr. Sayler has crammed a whole lot of things into his talk, I am sure, and if you remember just half of those, you will have a lot to carry away with you—and don't forget what he said about the recipes.

The next topic is "How to Obtain News Items for a Plant Publication." Mr. C. H. Wilson is going to speak on that. Mr. Wilson is the Safety Engineer for the Utah Copper Company. Mr. Wilson has the floor.

HOW TO OBTAIN NEWS ITEMS FOR A PLANT PUBLICATION

C. H. WILSON, SAFETY ENGINEER, UTAH COPPER COMPANY,
SALT LAKE CITY, UTAH

It is not difficult to obtain news items for a plant publication if you can get your company to devote some kind of prize. The company that I have the honor to represent gives three prizes for each issue, and through that method we have been able to interest practically everyone inside of the plants. We employ 6,000 men at our works, and the prizes consist of \$10 for the first prize, \$5 for the second, and a safety first honor button for the third.

We have made it a point not to issue our safety first honor button indiscriminately. Everyone who obtained one of these buttons had to win it. We have eighty-two in circulation at the present time, and each one of those eighty-two men who are wearing those buttons has either contributed an article to the plant periodical or has rendered some valuable service to promote safety by offering a safety suggestion or by preventing some one from getting hurt.

Now, the method of obtaining the news items: if you can get your plant management to set aside an appropriation of that kind, I should say it is quite easy. We will assume that the men in charge of your management, if they have attempted to issue a publication, must have a

large enough force to make your magazine worth while, and that you have a number of departments. At our works we have selected in each department a representative who has been solicited by the editor and by the general superintendent of the plant to collect news for his department and send it in to the editor. So far we have had very good success with that campaign. We are attempting at the present time to go a little farther. We are trying to raise the prize from \$10 to \$25 and make the second prize \$15 and the third \$10 instead of the safety first button.

Our plant periodical may not cover the same things that you men all have in mind. Our publication is strictly a safety periodical, and the matter that goes into our publication is controlled by the Safety Department. There are no others that pass censorship.

I have found that the only satisfactory way to collect news (and we have tried a great many different methods) is to call upon some particular man in each department, and to get the general superintendent or your general manager to follow that request up with a personal appeal of his own. We have tried to make it plain to the men that the periodical is theirs. It is the employees' magazine. The company pays for it. What goes into that periodical is strictly up to the employees.

Adjournment.

Health Service Section

October 3 and 4, 1919

Dr. CHARLES A. LAUFFER, Chairman
Medical Director, Westinghouse Electric and Manufacturing Company,
East Pittsburgh, Pa.

F. H. ELAM, Vice-Chairman
American Steel Foundries, Chicago

Dr. C. D. SELBY, Secretary
Formerly, Consulting Hygienist, U. S. Public Health Service,
Washington, D. C.

FRIDAY MORNING SESSION

CHAIRMAN LAUFFER: The deliberations of the Health Service Section will proceed according to program. Your Chairman has been invited by the home office of the National Safety Council to prepare a paper, which will constitute the report of the Chairman. The Secretary having no report to make, and there being no committees to report, we will proceed to items of new business.

Attention has been called to the fact that in the safety lessons prepared for public schools by Dr. Payne of St. Louis, where resuscitation is referred to, the discarded method is recommended. The Prone Pressure method has been quite universally adopted; it is approved and used by the National Electric Light Association, the Bureau of Mines, Safety and Sanitary Commissions of industries employing upwards of five million men; the Army, the Navy, the Life-Guards, the Red Cross, the Y. M. C. A., the Boy Scouts—all are swinging around to the practically unanimous acceptance of the Prone Pressure method.

(Motion was made, seconded, and unanimously carried, recommending that the Prone Pressure method be described in the text-books prepared for schools.)

The names of those appointed on the Nominating Committee are: Dr. H. L. Davis, Chairman. Dr. E. R. Hayhurst. Dr. C. E. Ford. These three gentlemen will please get together and deliberate on the matter and report to the section at 9:30 tomorrow morning.

SECRETARY SELBY: We will now proceed to the scientific program of the morning. I have the very great honor of introducing the first speaker, who is our Chairman. Dr. C. A. Lauffer will speak upon "Industrial Health Hazards."

INDUSTRIAL HEALTH HAZARDS

DR. CHARLES A. LAUFFER, MEDICAL DIRECTOR, RELIEF DEPARTMENT, WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, EAST PITTSBURGH, PA.

The human dynamo generates a fixed quota of energy. If speeded up, it stands a determinable overload with immunity; if given rest periods, kept in repair, and properly sustained, the human dynamo will last three score years and ten, probably longer. The overloaded dynamo develops heat, in consequence of which wear and tear is greatly accelerated; if temperature readings show that the dynamo heats up too much, an early breakdown can be definitely predicted. The same applies to the human dynamo in which physical defects and psychic maladjustments, as well as speeding up, overloading, and shortened rest periods, develop "heat," known as fatigue.

Modern industrial developments, collecting vast multitudes of men and women in industrial establishments, bring to the forefront the problem of health hazards. The vast exodus from rural to urban life, during the past generation, forcing into indoor occupation, individuals whose ancestors for generations lived out of doors, has further emphasized the problem of health hazards.

A study of these problems is vital to the employee; health, long life, and happiness are involved. It is fundamental to the employer; increased production; diminished labor turnover; contented ranks of healthy, happy, veteran employees—all tending to increased profits.

The employee asks for himself, and his sons: Is it a safe industry in which to seek employment? Is there any special liability of incurring a trade disease? Or of suffering early impairment in health? In short, what are the health hazards of this and that industry?

INDUSTRIAL HEALTH HAZARDS OF EMPLOYEES

I. The industrial health hazards of the employees may be grouped as arising from:—

1. Poisons, dusts, fumes, gases.
2. Heat, humidity, ventilation.
3. Lighting.
4. Crowding.
5. Fire peril.
6. Association with diseased employees.

The Harvard Chart gives a readily accessible grouping of the industrial poisons; a consideration of all of them would be out of place in this connection. Lead, arsenic, and mercury cause definite toxic effects, when absorbed by workers in these metals. The most used poison is lead. Not every employee who handles a paint brush, however, gets lead colic; some

paints are innocent of lead, yet employees, who have never touched lead, will bring in diagnoses of "lead poisoning," merely because an attending physician knows they are painters. Lead storage in the tissues may ensue when lead is carelessly handled, yet lead poisoning is practically unknown in large plants handling hundreds of tons of lead every year. The extent of industrial lead poisoning, we know, is much less than some reports would have us believe. Employees who cannot be taught to wash their hands before eating, and who never clean their finger nails, nor care for their teeth, are particularly liable to lead poisoning. Lead cannot be eaten with immunity, within or without the industries, but with individual coöperation, plus careful industrial supervision, the lead hazard can be mitigated. Precautions in handling lead reduce, almost remove, the health hazard from this source. Individuals who have once developed toxic lead symptoms should be given other employment, as the poison is accumulative, and is never entirely eliminated, hence relapses readily occur, making permanent transfers to other lines of work necessary.

Persons having a tendency to eczema, or furunculosis, may develop a skin rash from the solvents employed in removing varnish, shellac, and various insulation dope. Cutting oils, recovered by centrifuge methods, provoke skin infections; forced filtration through successive layers of filter paper removes minute metallic spicules, and filters out bacterial flora, that affect the skin. Cutting compounds are often culture media for pathogenic bacteria, and may require sterilization,—by heat, chemical, and filtration methods. Minute burns from flying hot chips; abrasions by metallic spicules in dirty cotton waste,—used in rubbing hands and arms—rough scrub-brushes or caustic soaps, may provoke such dermatitis. Every industry has its own problem, or succession of problems, in this line. Persons manifesting such susceptibility should be transferred to other lines of work; some individuals can work in chemicals for months without developing trade dermatoses, while others develop such trouble quickly. When 150 employees are subjected to the identical exposure, and only three develop industrial dermatoses, the factor of personal susceptibility is suggested. Attention to the toilet—thorough, careful cleansing of the skin—tends to reduce industrial dermatoses.

Dusts and fumes are drawn out of their source, in the well-equipped modern factory, so that the factory atmosphere is, or can be made, relatively clean. There is justifiable grounds for pride, where a wholesome factory atmosphere is maintained. The competition between factories, to make working conditions the best possible, has not yet been over-worked, and can be promoted to the mutual advantage of both employee and employer. It is up to the initiative of employers, coöperating with architects, ventilating, heating and lighting engineers, and employees' committees, to make working conditions safe from the health standpoint.

Pulmonary tuberculosis should be mentioned, in its relation to dust and fumes. Dusts in themselves are not infectious. Dusty air is not salubrious, but with the dust evil minimized, as in modern industries, there are few occupations that can be condemned as unfit for healthy men.

We are told that guinea pigs, kept in cement mills, develop no calcinosis, and employees seldom do. While the controversy over cement

dust still rages, its dangers are less excessive than some have imagined. The dust menace in other trades is, in comparison, relatively negligible. Coal miners develop more or less anthracosis; iron workers may develop siderosis. Marble cutters formerly developed calcicosis, which health hazard is now much reduced by suction devices for the removal of dust at its source. The inhalation of foreign particles,—such as coal, iron, stone, textile fibres, animal hairs and furs, grain dust,—gives rise to pigmentation of the lungs. This pigmentation in itself is of no consequence and everybody has it to some extent.

Dusts are mostly filtered out in the nose; if the dusts reach the bronchial tubes, they are caught in the bronchial cellular cilia, and coughed up, being expectorated with the bronchial secretions. It is contended that none of the dust reaches the alveoli. Particles that reach the peribronchial lymph-nodes, and the mediastinal lymph-nodes, penetrate through lymph channels from the bronchi.

Pulmonary pigmentation, and lymph-node infiltration, is not dangerous, until tubercle bacilli have been implanted. Where has this or that victim of pulmonary tuberculosis acquired his disease? There is no definite period of incubation for pulmonary tuberculosis. So much time elapses between the exposure to the tuberculous infection, and the frank incidence of the disease, that the real source of infection may have passed unobserved. The tubercular area can be walled off for many years, lying dormant all that time, but finally there may occur a dissemination from the old focus of infection. Some observers go as far as to say that the primary tubercular invasion occurs before the fifteenth year, before tissue immunity is established, and that the tubercular manifestations of later life are but recurrences of the earlier tuberculosis.

A survey of pulmonary tuberculosis in a textile industry, in which dust inhalation was the alleged cause of the disease, demonstrated that 85 per cent of the cases investigated showed a tuberculous near relative, or other immediate household source of infection. The remaining 15 per cent had a more remote source of tubercle bacilli infection, not revealed in this casual survey. The modern consensus of opinion has declared organic dust harmless; there is, consequently, no tuberculosis hazard from the textile industries. A study of pulmonary tuberculosis incidence on the basis of occupation, as afforded by the great sanitarium at Cresson, Mount Alto, and Hamburg, Pennsylvania, conclusively demonstrates that no occupation is exempt; the great white plague can be fastened on no single industry, nor group of industries.

The classes of employees that recruit the tuberculosis army are chiefly those that have relapses of old tuberculosis; those with tuberculous wives; those living in houses, infected with tubercle bacilli; those that have in other ways been exposed to the insidious, slow-acting infection.

Associating at work, or anywhere else, with persons having active pulmonary tuberculosis is a menace to health. Non-tuberculous employees should be spared the hazard incident to working near employees, who are coughing and spitting, in the active stages of pulmonary tuberculosis. Health service measures within the industries prevent their employment, and endeavor to isolate employees suffering from active pulmonary

tuberculosis and other communicable diseases. As no such supervision is exerted over the home life, street cars, theatres, etc., it follows, that the factory environment is relatively free from the peril of tuberculosis, and other communicable diseases.

Tuberculous individuals often gravitate to industries where the jobs are light, and the work within their ability. In the quiescent stage of their diseases, these men should be employed. Moreover, many employees work indoors that should work outdoors. The high incident of pulmonary tuberculosis attributed to certain industries requires appreciative consideration, as an industry is scarcely responsible for an injudicious choice of occupation on the part of an employee, suffering from, or predisposed to, pulmonary tuberculosis.

Tuberculosis is a house disease; indoor life is largely responsible. It cannot be fairly classed as a trade disease. The purely industrial diseases are but a fraction of a per cent of the sum total of industrial morbidity; they are but a drop in the bucket. The preventable diseases, non-industrial in source, loom large in comparison. Teeth and tonsils, "coughs and colds" cause a hundred times as much sickness in the general industries as do the industrial poisons.

The segregation and isolation of persons with "colds" is considered good practice, as "colds" are "catching." "Coughs" and "colds," moreover, are communicated by crowding together in factories, and susceptibility to such infections is heightened by poor ventilation, drafts, overheating, neglect of humidity control. These problems of engineering, successfully solved, make the factory atmosphere safe, and minister to the health and comfort of all parties concerned.

INDUSTRIAL HEALTH HAZARDS OF EMPLOYERS

II. The industrial health hazards of the employers may be grouped as:

1. Decreased production; machines lie idle; sick employees are irregular, discouraged, lack "pep."
2. Excessive labor turnover, due to ill health, unfitness for jobs assigned, prevalence of epidemic and infectious diseases.
3. Increased accident compensation expenditures, due to sickness masquerading as injuries. Cases arise daily, where conditions are pathological, but trauma is alleged; or in which a minor trauma has provoked a prolonged period of disability or an unusual degree of permanent impairment follows injuries, not in consequence of the gravity of the injury, but owing to intercurrent disease, or the previously impaired vitality of the traumatized individual.

The government employs only healthy men for the fighting line, whose ability to recover from wounds is 100 per cent plus. The industries necessarily employ many aged and feeble men, suffering from latent diseases and infirmities, having enfeebled powers of resistance, and incurring delayed recoveries, when injured. The industries are consequently entitled to sympathetic consideration, in the vast economic problem evoked by injury plus sickness. A term of disability may start as an industrial accident, the trauma being admitted, yet the period of dis-

ability is prolonged indefinitely by complicating sickness, due to latent disease, activated by the trauma, or is prolonged by sickness arising from other causes, or from preëxisting diseases, unrelated to the trauma sustained. Fully "fifty-seven varieties" of sickness are presented as industrial accidents in entering compensation claims. Among these may be mentioned tuberculosis; syphilis—in various disguises; rheumatism—teeth, tonsils, gonorrhoea,—each contributing their quota. These latent diseases, and others, are readily activated by trauma.

REMEDIES SUGGESTED

III. Since these health hazards face the industrial manager, what can be done about it? How can they be avoided? Measures to this end are:—

1. *Industrial Health Clinics.* group diagnoses; health service measures; repairing defects; reclaiming those disabled by diseases, as well as those crippled, and fitting them into selected positions in the industries; health education.
2. *Legalized releases for defects that cause abnormally long periods of accident disability.* Hernia, varicocoele, varicose veins, healed tubercular foci in joints, lungs, etc., valvular heart defects, eye defects, amputations, etc., should be charted, and an employer not made financially responsible for defects and diseases arising from causes unrelated to the employment, nor for aggravations of the same.
3. *Obligatory Post Mortems.* When the cause of death is in dispute, the report of the post mortem should terminate the controversy. So many deaths, occurring from pathological causes, but reported as arising from accidental injuries, received in the course of employment, make post mortems essential, if justice is to be done all parties.
4. *Federal Health Charts.* Transient employees lose a day, undergoing the physical examination that precedes their employment. A Federal health chart, renewed annually, valid everywhere, would be invaluable for the transient worker, as well as for the continuous worker, who remains loyally by his employer year after year. The onus of the physical examination should be removed from the industries. Proper placement in industry requires the truth about physical defects. The truth, concealed, works the greatest health hazard to the prospective employee.

An annual health inspection by the staff of a Diagnostic Clinic, for every citizen between 18 and 55 could be achieved under federal supervision. The surgeon general's office could establish in every community a Federal "Good Health" station, emphasizing diagnosis, and could recommend such remediable measures as the health maintenance of every citizen of draft age requires, both for industrial service, and for war. The early correction of defects is desirable; the early recognition of incipient diseases leads to successful treatment.

Annual reëxaminations would constitute a splendid follow-up system,

to ascertain whether recommendations made as to teeth, tonsils, hernia, varicocele, etc.; diet, exercise, etc.; had been followed out.

Nation-wide federal health service, devoting its energies to diagnosis, would not interfere with existing agencies for the treatment of medical and surgical cases, hence would not in any manner antagonize practitioners of medicine, existing sanatoria, and hospitals. A federal educational propaganda for good health, however, could rapidly reduce the percentage of remediable defectives in the nation, by thus recommending, and so arousing public opinion as to enforce remediable measures in the incipient stages of defects and disabilities.

Federal health charts, with photos, finger prints, and complete data of physical findings, would aid employment agents in rapidly placing men in the industries, so that they would stay placed; health charts would not debar worthy men from the industries, but would facilitate in so placing them that their defects, and morbid tendencies, would militate least against them.

The proposed health charts could be the means of tabulating the availability of men for military service, hence would serve the exigencies of war preparedness, when men of draft age are again called out; they would likewise serve the industrial purposes of peace.

The day may be near, or remote, when a United States cabinet officer presides over a Department of Health; or when the Surgeon General of the Army is represented by a personnel as numerous and as widely distributed, as that of the Postmaster General. Federal Health Charts, however, and the Universal Diagnostic Clinic service, which would make such charts possible, are, however, devoutly to be desired; and until obtained, physical examination must be conducted within the industries, as at present, in a fragmentary and incomplete manner,—or extended, if possible; if conducted with the frantic haste that too often has characterized these examinations in the past, the same indifferent valuation will adhere to this service as heretofore.

IV. Employees encounter health hazards apart from industrial service, that revert back, affecting their industrial life. Such health hazards may be grouped as:

1. *Inherited Tendencies:* bad or indifferent physical and mental endowment.
2. *Family Problems.* Unhappy home life menaces industrial safety and health.
3. *Financial Problems.* Worry over bad investments, high cost of living, wife's or children's extravagance, or other matters, may induce more fatigue than the day's work.
4. *Social Life.* Employee may belong to too many things, and be too popular, losing too much sleep. An employee's occupation may have less to do with his health, and his continued industrial efficiency, than the way he spends his evenings.
5. *House Problems.* Individual houses are desirable, afford every family its own home, in sewered towns with paved streets. Crowded tenements and boarding houses contribute to health impairment.

6. *Community Health.* The acute infectious diseases encountered in the industries of any community are a reflection of the diseases then prevalent in that community. Measles, mumps, typhoid fever, scarlet fever, influenza, grip, "colds," bronchitis, pneumonia, smallpox are encountered. Isolated cases of these diseases, sometimes endemics, or epidemics, occurring in industrial plants, are traceable to community sources of infection.
7. *Neglect of Personal Hygiene.*
 - (a). *Neglected teeth.* The neglect of teeth among industrial workers is appalling. Putrescent stumps, dental abscesses, pyorrhoæa, and incomplete dentures are common; money is spent more cheerfully for most everything else than for dental prophylaxis and dental repairs. The teeth constitute the first line of defense in conserving the digestion; swallowing food swarming with myriads of bacteria from putrescent teeth causes indigestion. No man would buy a horse that has lost its teeth. "Life is digestion"; our strength and energy come from our food, yet some men are so unreasonable as to attribute their ill-health and impaired strength to their work, while neglecting their teeth, thus denying their bodies the rejuvenation that comes from wholesome food, thoroughly masticated, and thereby properly prepared for assimilation.
 - (b). *Diseased tonsils.* Tonsillar infections, both locally and by referred manifestations, cause much loss of time in the industries. The alleged injuries, in which there are no visible nor palpable evidences of trauma, such as alleged sprained back (lumbago), alleged sprains of shoulder, elbow, wrist, ankle, as well as the several types of arthritis, rheumatism, and neuritis, have the tonsils as possible portals of entry for the infection.
 - (c). *The venereal peril.* All three venereal diseases, in their infectious stages, should bar employees from industry. Stricture and other complications cause lost time years after the gonorrhoeal infection has been forgotten. The bone injuries of old syphilitics, with case reports; syphilitic leg ulcers also masquerading as injuries; gummata and sinuses, presenting long terms of disability, arising from slight injuries; and serious results in mild eye injuries, if recorded in detail, would attest the excessive liability to injury, and the poor recoveries registered by syphilitic patients in the industries. Wasserman tests, as a routine hospital measure, are in order.
 - (d). *Physical defects,* such as hernia, eye strain, etc., known to exist, yet repair and corrective measures are postponed.
 - (e). Constipation, woefully neglected.
 - (f). Neglect of home sanitation, ventilation, etc.
 - (g). Balanced diet, unobserved.
 - (h). Deficient sleep.

Most men before thirty are second-raters, or third-raters; physical defects exist, and morbid processes are implanted from early life, frequently before the industrial age. Physical examinations in the public schools are often farcical; many remediable defects are overlooked, those encountered are merely reported to parents who infrequently act upon such suggestions. Consequently, the industries receive multitudes of second-raters, who develop into third-raters, who, had their defects been corrected early and had their mode of life been more hygienic, could give a better account of themselves.

An employee spends only 8 or 9 hours in industrial service; in his home life, community, and social life, during the other 15 or 16 hours of the day, he likewise incurs health hazards. The superior lighting, heating, and ventilating systems installed in many modern factories make these industrial plants more hygienic from a public health standpoint than the homes, movie theatres, and churches, many of which are more crowded and worse ventilated. To be consistent, homes, boarding houses, hotels, theatres, clubs, etc., in which employees spend more hours than in the factory, should be scrutinized and inspected as industrial plants now are, in probing sources of health impairment, and routes of infection from communicable diseases.

The industrial sick rate is augmented by a variety of physical defects, most of which are remediable, and those that cannot be cured can be adequately relieved to enable employees to keep at work, if they so elect. A man must be reasonably healthy to be an efficient worker. A small maladjustment, a minor neglect, will sometimes lead to serious complications. An employee with a toothache, whose attention is thus distracted, will give more thought to his tooth than to his job. An ingrown toe-nail is preventable; through neglect or improper treatment, it may cause lost time. Elementary hygiene, and the proverbial "stitch in time", must be observed, if a man in industry, or out of it, is to maintain his health and efficiency.

While there are industrial health hazards, and while the zeal in discovering and eliminating them is commendable, the facts remain that the purely industrial diseases are very rare in the general industries; that preventable, non-industrial ailments are the preponderating cause of sickness disability and health impairment.

INTERRELATION OF SICKNESS AND ACCIDENT DISABILITY

The daily contact with industrial disability, both sickness and accident, brings one in touch with their intimate interrelation. Septic absorption from such foci as teeth, tonsils, prostate, accessory nasal sinuses, peribronchial lymph nodes, etc., cause much of the disability improperly labeled as injury; patients like to be told that their occupation does not suit them, that their work disagrees with them, but they may resent it if told that their teeth need repair, that their tonsils should be removed, that correcting lenses should be worn for their failing vision, or that arch supports are required.

This leads to the question of industrial fatigue. If a man works hard enough and long enough he will naturally get tired. Industrial fatigue

may not be excessive, but the fatigue from other sources, combined with the industrial fatigue, may prove detrimental to an employee. For a man to be fair with himself and with his job, he must ascertain to what extent his job is tiring him out, and to what extent his fatigue arises from emotional causes (as domestic affairs, financial cares, worry, etc.); from septic absorption (as teeth, tonsils, prostate, etc.); from physical defects (as eye-strain, impaired hearing, flat footedness, hernia, etc.); from latent diseases (as incipient tuberculosis, etc.); from acute infections (as grip, nasal catarrh, bronchitis, etc.); from improper diet; from unhygienic home conditions; from loss of sleep; and from other potent factors that may enter into the equation, in the accurate estimation of his total fatigue.

A worker who is constantly fatigued from any cause, or any combination of causes, will lose time now and then from sheer exhaustion. The fatigued worker is more susceptible to infectious diseases, from which he makes a retarded recovery; he becomes more stupid, and because less alert, he more readily meets with accidental injury, from which he recovers slowly, since he has impaired vitality, and we have injury plus sickness to deal with.

THE INDUSTRIAL CLINIC

There being this interrelation of sickness and accident disability, constituting the twilight zone of sickness and injury, it naturally reverts to the Industrial Clinic to find out the sources of fatigue, to evaluate the factors that contribute to the fatigue total, and to facilitate the recovery of the individual, in the manner indicated by the findings of the inquiry.

There arise specialties in industrial practice, when an Industrial Diagnostic Clinic is organized; specialization is needed, employing diversified talent and training, such as required on a hospital staff. Beginnings of the Industrial Diagnostic Clinic are observed at many places; the scope of specialties now covered are: (1) Operative surgery, clean; (2) Septic surgery; it is ill-advised to allow the doctor who treats boils, and infected wounds, to care for fresh injuries, or redress clean cases; (3) Physical diagnosis—special reference to heart and lungs (4) X-ray service, developing into an ever larger field; (5) Dental service; (6) Pathologist, for sputum, urine, blood, Wasserman examinations, tissue staining, vaccines, etc.; (7) Oculist—injuries and diseases of the eye, and optical service. In addition to these special lines of medical and surgical service, the Works Dispensary, as occasion demands, consults with orthopedic and general surgeons, internists, alienists, neurologists, dermatologists, oculists, ear, nose, and throat specialists, endeavoring to establish correct diagnoses, and cooperate in every legitimate way with the best available agencies for speedily restoring the disabled to health and to industry. Where the plant employs but few industrial physicians, group diagnoses, the collective findings of a diagnostic clinic, may be accessible elsewhere. The multiplication of such centers, within and without the industries, in the interest of health conservation, is much to be desired.

COMMUNITY HEALTH

The Coördination of industrial and municipal health activities, as in Akron, Ohio, offers a solution of the problem of controlling epidemic diseases. With the community health problems solved, the industries will be spared the absenteeism from this cause, and the slackened production incident thereto. The works dispensary can become an out-station of the City Department of Health, with test tubes for throat cultures, so that suspicious throats may be swabbed when the patients are sent home, and no delay be encountered in getting reports on findings to attending physicians.

SOCIAL SERVICE WORK

The control of industrial health hazards is entirely up to the initiative of the industrial management. Health engineering experts—consulting physicians—specializing in the reduction of the health hazards are being employed by the industries, in conjunction with engineers in associated lines, to reduce these hazards.

Educational effort from within the industries strives to stimulate the initiative of employees into foresightedness along health lines. To what extent the industries can enter into community activities without becoming paternalistic is a debated question which we will not discuss. Model house building enterprises—helping employees acquire their own homes—building and loan associations, banking, stores and restaurants on the no-profit basis, clubs, social centers, playgrounds, hotels for employees, industrial and technical schools, apprentice courses with technical schooling, athletics, bands, and glee clubs are among the forms of community enterprise fostered by many of the larger industries, and which have the endorsement and approval of employees.

The new spirit abroad recognizes participation in industry as in the nature of a social service; constructive good-will,—based on mutual confidence, and real justice,—alone can operate effectively to solve the problems to which industry gives rise. In the trinity of production, Capital, Labor, and the Community must unselfishly coördinate their common functions of serving one another.

There are Health Hazards within the industries, that industrial initiative should control; within the communities, that the coördination of industrial and community health service can control; and within the scope of the individual, there are health hazards which require his personal initiative to combat successfully. With such coördinated efforts, the human dynamo will generate energy uninterruptedly; the worker, secure in the enjoyment of a fair share of the rewards of toil, can live to a ripe and honored old age.

DISCUSSION

SECRETARY SELBY: This very comprehensive paper is now open for discussion. There are many features which will bear emphasis. I desire to call your attention to the point Dr. Lauffer made in regard to federalized physical examination—the centralization within the Federal Government of the power for the physical examination.

DR. E. R. HAYHURST (State Dept. of Health, Columbus, Ohio): *Fatigue*: I think a distinction should be made between the term "fatigue" and what is usually meant, "strain." Fatigue is the person's feeling, the symptomatic feeling, "tiredness". Objectively, fatigue is shown by inaccuracies in execution and less aptitude to work.

Usually, correctly used, the term should be "strain." Persons can be severely strained and show no signs or symptoms of fatigue because they have an emotional factor there that is stimulating them to the point of covering up this show. Interest, in itself, hides "fatigue."

Tuberculosis in Industry: I don't agree with the speaker at all in the relation of work to tuberculosis. His conclusions do not agree with the vast amount of evidence to the contrary. In Great Britain, in Bristol in particular, studies have been made to show workers in certain lines of industries who were not in those industries previous to the war, immediately ran a high tuberculosis rate. People living in those same vicinities who did not go into the industries did not run a high tuberculosis rate.

In our office we have from insurance companies statistical charts showing findings of tuberculosis industries. In brass workers (15 to 24 years old) for instance, 72 per cent of the deaths are produced by tuberculosis. Is that the usual tuberculosis prevalence in people from fifteen to twenty-four years of age?

In the United States Census, figures for 1910, the latest we have, painters run twice the tuberculosis that carpenters do.

The National Industrial Conference Board which has been working on, and studying the conditions among silk workers, wool workers, and others, say that taking into consideration that housing and recreation have an immense influence, there is still something inherent in the industry that they cannot find that makes this disease greater in the wool working industry than other things outside can account for.

Federalized Physical Examination: This has been advocated by the American Federation of Labor. Samuel Gompers went on record in favor of some such scheme in connection with the Public Employment Bureau. Criticisms have come from industrial managers who fear a man might be able to get any sort of a record made for him in a given bureau. Until the time comes when people are willing to stand behind the Federal Government and believe in its doings and findings, we are going to have to contend with that piece of sophistry. We should get these physical examinations made not as a burden upon industry, but as upon the public—the Government.

Personal Hygiene: Personal hygiene means that people should learn how to protect their health. It is much more important than industrial hygiene. The Public Health Association is creating a section on Personal Hygiene, beginning this year, with a meeting in New Orleans. "Every man his own health officer" should be the slogan to further a great deal of health preservation and maximum health.

Frequency of Industrial Ailments: Let me say this: Deaths due to industrial sickness are very rare according to statistics I can get together. Specific occupational diseases are rare, although a great deal more fre-

quent than death. Sicknesses, partly due to industry are numerous, while health complaint—headaches, coughs, constipation, backaches, etc., in connection with industry,—practically everybody has these complaints.

DR. ALEXANDER HAMILTON (American Radiator Co., Buffalo, New York): I want to ask a question in regard to the physical examination. In view of what we hear so much about now, the labor unrest, is this an opportune time for a company that has not had physical examinations to introduce them? I would like an explanation on that.

SECRETARY SELBY: Dr. Hayhurst, will you respond to that, please?

DR. HAYHURST: Well, yes and no. If you can show that it is not for selective purpose, for ~~scrapping~~ a lot of men. If you can show that you are going to place men except for certain prototypical reasons (communicable diseases or epilepsy, etc.) that you won't place a man who is blind, if you can't safely do so; that there are such types that you cannot use at all in your plant; but that you will place every other man that you possibly can, then you will get away with it.

DR. HAMILTON: What do you say to blocking men with varicella, varicose veins, and hernia.

DR. HAYHURST: I would place them. The ~~special~~ ~~drugs~~ ~~has~~ been laid upon these defects.

DR. J. S. KLOSER (Chairman Washington State Safety Board, Olympia, Wash.):

I would like to answer that question because in my department I am brought very closely in relation to the labor union and the employee element of the state. There has been and is in all of the laboring groups throughout this country, a decided opposition to physical examination of men for industrial employment. We are rather loath to push that subject within our state although we feel the importance of it, and at this time are endeavoring to promote an educational program within the state to get the employee element of the state in the frame of mind that they, themselves, are going to demand it.

The mistake has been made, where physical examination in industry obtains, of making that examination, to a large extent, for selection and elimination of men from industry. That should not be considered for one moment excepting where the applicant is a person affected with a communicable disease that will be dangerous to his fellow-employee.

But there is the point: Do not examine a man physically for elimination. Do not examine a man physically for the purpose of trying to fit him to a job so much as trying to fit that job to the man. You catch the distinction, don't you? A man to give his best service to his employer must be happy, if you please, in his work and if that man is not happy in his work he does not give all that is expected of him. An examination that is held for that purpose is fraught with good results. The State of Washington takes this stand on hernia: They give full and complete medical services to their injured workmen without limit of time and expense. We give every man in the industry in the State of Washington full and complete treatment to the point of his recovery, regardless of what that period may be. We operate on hernias, on men who are

going into new employment, at state expense, that is, regarding their medical services. We do not operate at state expense regarding time lost. We do not pay that. Our rule is this: Where a man reports hernia, he must prove, in order to obtain time lost, that his hernia was coincident with his employment at that moment and accompanied by pain. That is very easy for any man to establish and if he establishes that, then the State of Washington operates it and pays him time lost during the period of his disability.

DR. F. E. SCHUBMEHL (General Electric Company, West Lynn, Mass.): In regard to the last speaker's remarks about the objection on the part of employees: We have examined 13,000 employees each year, for a little over four years, and there has never been an objection except in twelve cases. Those twelve cases had good reasons for objecting to being examined. The objection to physical examination does not come from the employees, it comes from the agitators.

DR. A. M. HARVEY (Crane Company, Chicago): I quite agree with the last speaker in examining employees for a period of about fifteen years. How about suiting the job to the man: Here's the position: It's open to a man and he is selected by your employment office and he goes through your examination. That man is going to be used on a height and he has epilepsy. How are you going to suit that job to that man? You've got the one job. Isn't that the process of elimination? You are going to eliminate that man from that job and you are going to do it rightfully.

DR. C. M. HARPSTER (Doherty Company, Toledo, Ohio): About five years ago I tried to get our companies to adopt the examination. This paper has gone into the discussion of the merits of physical examination, so I will say a few words. I want to agree with the last speaker. We have been using physical examinations for about three years and the method of the examination, I think, is important. If you put an examiner to work from eight o'clock in the morning until six o'clock at night, I say the examination records and his work are not satisfactory.

I am chief surgeon for all our industries and I have gone into the examination office and examined for three or four hours myself. I say three or four hours is enough of that kind of work for any physician to do and do it properly. Unless these examinations are made carefully and conducted properly, they are absolutely useless. We have a superintendent of employment and he has a number of clerks, stenographers, and aids. First of all we try to analyze the man. I don't think you can fit the man to the job nor the job to the man.

I will give you an illustration. I was selected as chief surgeon for a large interurban station not connected with the Doherty organization. The views of the different doctors were asked regarding the merits of the physical examination. I have been for many years a strong advocate of the physical examination of the workmen and I think you have to educate the employer first. I think opposition or lack of cooperation often comes from the employers and not from the employees.

I find the greatest objection on the part of our employees is due to the fact that they object to having all of the clothes removed at once. If you take the portion of the body from the chest up and make an examina-

tion carefully and then from the waist down afterwards, in other words, do it piece-meal, the objection is not so hard. The unions in our town objected to our methods of physical examinations at first because we brought the men in nude, purely to save time. We corrected this objection and as far as I know, they are now satisfied.

DR. C. F. SCHRAM (Fairbanks-Morse Co.): I think we are swiping the thunder of Dr. Selby for this afternoon. I would like to know if anything has been done by the government towards this examination.

RESPONSIBILITY FOR INDUSTRIAL ILLNESS

DR. E. B. STARR (Dept. of Health, Columbus, Ohio): I am a little disappointed in the paper in view of the apparent disposition to shift the responsibility for industrial illness almost entirely on to the circumstances that are extraneous to industrial life. I think most fair-minded men of experience will agree it is impossible to put all responsibility on one side or all on the other. We will agree to this: It is impossible to draw a short line of demarcation between the responses of the influences outside of the industry and those incident to the industry.

Frederick Hoffman has made a very careful study of this question, in several trades, from a statistical standpoint. Dr. Hoffman brings out very clearly, I think unmistakably, the fact that industry, especially certain industrial processes, have a marked deleterious effect on the workman. I think it is highly important that we understand this one point: That industry is already paying a great price for ill health among the employees, whether responsibility for that ill health is to be assigned to the industry or employers or to outside influences.

When it comes to morbidity, we have statistics as to all public health work to show in actual figures the actual facts in the case. However, any medical man who has studied this matter or any other person who has taken this matter up for careful study will recognize this fact: That they are paying a tremendous price for what they are getting. Considering it from a purely selfish standpoint, the industrial manufacturers recognize that they are paying a heavy price and they are taking the best means to overcome that condition. That means first, to determine the status of their employees, and I think the papers that will follow will show clearly the value of that determination on the basis of physical examination. If you place the matter squarely and fairly before the employees, it is only a matter of time before they will be heartily in favor of physical examinations and will insist that they be made.

SECRETARY SELBY: I will now call on Dr. Lauffer to close his discussion.

FEDERAL HEALTH CHARTS

DR. LAUFFER: With regard to the gentlemen's question covering the Federal health charts, I don't think there is any serious move being made by the Federal Government to put through any such arrangement. The idea has been advanced by others, but the thought as I presented it to you, I claim responsibility for; it is the gist of a paper I wrote about two years ago, and which I read in New York before the Conference Board of Physicians. I am firmly of the opinion that the physical examination of

employees is a burden to which industry is not equal, particularly in prosperous times, and during war emergencies, such as we have passed through, when industrial workers were very migratory, and when every employer was trying to pay a little higher wages than the other fellow, in order to steal his workers.

If these men in migrating from one plant to another could pull Federal health charts out of their pockets and say: "We are 'Class One,' or 'Class Two men', they could be fitted into industrial plants in positions where they belong.

On the other hand, we have the military side to think of. I have particularly stated the industrial side. It was a spectacle of colossal unpreparedness when we went into the war with our draftees unexamined. Why shouldn't the Surgeon General have authority to tabulate all men of military age, year by year, so that in case of a necessary call to arms, within twelve hours there could be an army of 4,000,000 called to the colors? Federal health charts are entirely within the range of possibilities, and would serve the industries in peace as well as assure national man-power preparedness for war. It would also serve public health purposes.

Many people have been thinking along the same lines but as yet Federal diagnostic clinics, and Federal health charts, are day dreams that we indulge in, and until we attain them, industrial physicians will have to keep on in the old way, doing the best we can, in examining employees who present themselves at the gates of industry.

I must say that working men welcome physical examinations, and it is very unusual for a man to refuse such examination. We examine approximately 15,000 to 20,000 a year. We have reason to suspect that individuals refusing to be examined have some communicable disease, and do not wish to be turned down, so they put up the matter of indisposition, or refusal, merely to avoid being rejected.

With regard to the statistics of higher incidence of tuberculosis, and higher death rates in certain trades, I have endeavored in my paper, to state that lead storage in the tissues, likewise brass and mercury—as well as health impairment from whatever source—must be discovered and combated, and the patient transferred to other lines of industry. The physical examination, the industrial clinic, is the remedy being applied.

Pulmonary tuberculosis is a terminal disease. It is a universal menace. It strikes those with impaired vitality, whether that impairment comes through industry, or other sources. I am not blaming industry entirely, and am far from excusing industry. Statistical studies prove that alcohol is chiefly responsible for pulmonary tuberculosis; other group studies show that the victims of gonorrhea and syphilis quite generally acquire tuberculosis as a terminal disease. The great multiplicity of factors in the production of tuberculosis makes it incumbent on the industries to tabulate these cases, since the appreciative viewpoint, as to what the industries are up against, is lacking in the library studies of those who read statistical reports, but who lack the industrial contact. During their quiescent stages, tubercular patients demand and obtain industrial employment. Ninety-five per cent of all postmortems show pulmonary

tubercular foci in one stage or another. Most persons have had industrial employment; their tuberculosis, however, may have been implanted before the industrial age. This being true, why make industry the scapegoat for tuberculosis?

FATIGUE

As to the manner of fatigue. Fatigue does pass through many stages. There is a stage of fatigue in which we are merely tired, and we become sleepy. There is a further stage of fatigue in which we are much excited, and we cannot sleep. This latter stage of fatigue, when the ability to rest is lost, is by many called "fatigue delirium." We see fatigue delirium in the mother who sits up with a sick child for many days and nights, and loses much sleep. As soon as the child recovers, the mother may collapse.

There is the delirium or fatigue in the soldier who undergoes prodigies of valor and wades through physical impossibilities. He could not undergo such hardships under ordinary circumstances, but the excitement of the occasion spurs him on. When he gets a chance to rest or to sleep, he may sleep two or three days. Dr. Crile and others of our medical men, who have been writing up this subject of fatigue through the medical press, have emphasized that fact. Fatigue, as we understand it, is largely a matter of blood stream toxemia; an accumulation of waste products formed more rapidly than eliminated. There are certain toxic substances produced by effort. Certain tissue cell elements break down, there is heightened metabolism, and all these toxins of the increased mental, emotional, or physical effort depress and tire, or may excite and cause fatigue delirium. What I have been contending in my paper is this: For a man to be fair with his job, he has to ascertain to what extent his fatigue is coming from the work he is doing; to what extent it is coming from that bad investment in oil stocks, family cares, or other outside concerns.

DR. KLOEBER: If in your physical examination department you have an applicant who, for instance, would have moist rales; you find lymphatic nodular condition, but he makes a denial of specific infection, do you give him laboratory service?

DR. LAUFFER: Unless the disease that you mention is in an infectious stage, we accept him for employment. We coöperate with agencies that do give those laboratory tests. We find three or four a week, who have venereal disease, that we refer to the public health service in Pittsburgh.

CHAIRMAN LAUFFER: The next paper on the program is by Dr. Alfred Stengel, Professor of Medicine, University of Pennsylvania, Philadelphia, on "The Subnormal Worker". Dr. Stengel could not be present, but we will be very glad to hear from Dr. Schubmehl who is scheduled for discussion on this paper and we hope he will make a few remarks that will open discussion on this interesting subject.

THE SUBNORMAL WORKER

DR. F. E. SCHUBMEHL: Inasmuch as there is no paper to discuss, I am going to give my time, which I would have taken to discuss his paper,

to the general discussion from the floor after one or two remarks. I hope you will all take advantage of that opportunity and I am sure it will be much more beneficial to you all than if I were to discuss a paper that does not exist.

The subnormal worker, pathologically, of course, as you physicians all know, is with us in large numbers. They are the men and women who give us a great amount of trouble through their negligence to attend to the small injuries or conditions that happen to them in the employment. Largely, they are the ones that neglect themselves, their jobs, and everything else. They are subnormal workers. The more people I examine the more I am impressed by the percentages that are shown. The examinations of the boys in the army who were the best and healthiest class, for example, showed a large percentage. They are not being eliminated from employment, however, by the discovery of those subnormal conditions.

There has been an intimation that one of the reasons labor objected to physical examinations was because of the tendency to exclude men from employment. I want to say right now that the majority of the physicians I have come in contact with in industry, do not examine the men for the purpose of eliminating them from a job, notwithstanding the statement made by Mr. Stewart, the head of the Labor Statistics Department. They have all been doing their job pretty well and I know we make the examination for the purpose of determining what the subnormal condition really is. When we find it, we recommend such jobs as are open in the factory, where they will fit in. The physician in industry today, who is recognizing the subnormal worker, is the best element we have got in industry. He is placing the men around on jobs where they can do the best work.

CHAIRMAN LAUFFER: We shall be pleased to hear from other gentlemen who wish to speak on this subject. The time is limited to three minutes.

DR. J. FRANK KAHLE (Berger Manufacturing Co., Canton, Ohio): The question so often in my mind has been in my examination of employees as to what should be done with the individual who is subject to tonsillitis, or the individual who is negligent with the care of his mouth in a general sense. I have noticed that that class of individual is a subnormal representative in production, generally speaking. The question is what to do with such cases.

CHAIRMAN LAUFFER: Our Company has an employees' beneficiary association and when we run across these subnormal individuals of the type you mention, with putrescent stumps, pyorrhea, and imperfect dentures, bad tonsils, etc., we accept him for employment but deny him membership in the employees' beneficiary association. If we admitted such persons, who neglect personal hygiene to such a marked degree, the beneficial association would soon find itself bankrupt.

DIFFERENCES BETWEEN INDUSTRIAL AND MILITARY EXAMINATIONS

DR. KLOEBER: I want to bring up the military service as applied to industrial service examinations. I think too much emphasis is laid upon the fact that military service examination and industrial service examination should be the same. I object to that. I have the honor of being

at the head of 278,000 workmen in the State of Washington, and the experience is great. At the same time, it was my privilege during the war to have charge of a large number of the drafted men. In military surgery, anatomical conditions with accompanying symptomatic relations were always rejected. In industrial surgeries, there should never be an anatomical disqualification under any circumstances. As an illustration of that, I will mention flat-foot. Flat-foot has no significance in industrial employment unless it is symptomatic in character.

A point that has not been brought up, and one that is going to be considered within the next few years by all of you, is the relation of hypothyroidism to industrial employment.

You in the Middle West here do not have the toxic goiter as we in the mountainous sections of this country. Hypothyroidism is today the most important subject with which we have to deal in fitting our men in employment, and in that, again, I am going to ask that when you do examine and particularly when you examine for goiter and find that you have a toxic goiter, by all means get your relations definitely between your hypothyroid goiter and your small goiter that is producing accompanying syndromes. It is an important subject and I want to impress it upon you.

DR. F. M. FURLONG (Commander, Medical Corps, U. S. Navy, Retired, 60 West 58th St., New York City): The last speaker questioned the differences between industrial and military examinations. He also mentioned flat-foot. It is well known that the Negro race are all more or less flat-footed, which does not seem to interfere with their capacity for work.

The reasons military surgeons are so fussy about flat-feet is not so much that they hurt or incapacitate the individual, but it is used as an excuse. That is why we are so careful about persons who have affections which later on may be used as a pretext to evade some irksome or disagreeable job or to prevent being sent to some remote foreign station.

If one man hobbles into the sick-bay of a battleship alleging disability on account of flat-feet and he is placed on the sick list, you will have to put many others on the list with him. The only thing to do is to eliminate persons from the start who have defects which they may later on use as a pretense to escape their legitimate duties.

In the industrial field the services of many persons with physical defects can often be used for selective work though it is desirable to record their imperfections at the time of the physical examination in order to prevent them from being used as the basis of a claim for damages later on.

DR. KLOEBER: Instead of putting the flat-footed man, who appears, on the sick list, put him on his toes for a few minutes.

DR. FURLONG: I would like for you to try it, doctor.

CHAIRMAN LAUFFER: The time for discussions has terminated. We will proceed with the third paper—"Industrial Dermatoses" by Dr. Wm. Allen Pusey of Chicago, who is so well-known in his specialty, as to require no extended introduction.

INDUSTRIAL DERMATOSES, THEIR SOURCES, TYPES, AND CONTROL

DR. WILLIAM ALLEN FUSEY, PROFESSOR OF DERMATOLOGY, EMERITUS,
UNIVERSITY OF ILLINOIS, CHICAGO

There are two sorts of factors that act in the production of industrial, as well as of other skin diseases: The first are the individual or predisposing factors; the second, the specific exciting causes. It may clear the ground and save time if, before taking up the exciting causes, which are our chief concern, we consider for a moment the first group—the personal, predisposing causes.

PREDISPOSING CAUSES

The predisposing causes are the factors in the personal equation which make the skin of varying resistance in different individuals. And these factors are many:

The protection afforded by the skin varies greatly in different individuals and under different conditions. The youthful skin is more delicate than that of the adult. The skin also shows senile changes—that may occur prematurely without reference to other senile changes—which lower its resistance. The woman's skin approximates the youthful skin and is more sensitive than the man's skin.

Local conditions in the skin, as for example, vascular disturbances, may weaken its resistance; the skin in which the circulation is poor is of increased vulnerability. The skin which normally sweats profusely is more resistant to some external irritating influences than the dryer skin, but is more vulnerable to others. Previous injuries to the skin, as for example many reactions from some external irritants, may permanently damage its protective quality.

THE SKIN SHOWS RACIAL DIFFERENCES

The greasy skin of the Negro, Mexican, and Indian is tough and can endure exposure to many insults that damage the white skin. Individuals show even greater variation. At one extreme we have the normally tough skin whose resistance is remarkable; at the other we find the individual whose skin is so sensitive that blisters and ulcers are produced by slight blows and pressure that are harmless to the normal individual.

We also have variable personal susceptibility to irritants. What is one's skin poison may be harmless to another. Every one knows that poison ivy, for example, is not poison at all to many persons, while in others it produces an inflammation of the skin of extremest severity. We see manifestations of this personal susceptibility to particular irritants constantly in industrial dermatoses. Often, after repeated exposure, the skin will acquire resistance to an irritant. Unfortunately, also, it may become sensitized after repeated exposure, so that we not infrequently see persons suffering from inflammation of the skin from irritants which formerly were harmless to them.

These factors of varying susceptibility come constantly into play in in-

dustrial dermatoses; and they must be borne in mind as an essential part of the problem whenever we are considering the exciting causes of such conditions.

EXCITING CAUSES

The exciting causes of industrial dermatoses are beyond exact enumeration. These causes, however, may be classified into a few groups, and by briefly considering these we may obtain, perhaps, a suggestive orientation of the subject. More than the briefest consideration of these various groups is impossible within the limits of this paper.

The exciting factors of industrial skin diseases may be included in the following classes: (1) Heat; (2) cold; (3) weather; (4) posture, friction, and pressure; (5) parasites; (6) infections; (7) mechanical and chemical irritants.

HEAT

The direct action of heat is not a common cause of trade dermatoses, except as it produces scalds and burns, which are in most cases surgical injuries involving more than the skin. Radiant heat may irritate the skin to the point of producing inflammation—dermatitis—either chronic or acute; we see this, for example, in the form of an eczema of the forearms and face in bakers. Occasionally, after long habitual exposure, heat may produce structural changes in the skin, shown by pigmentation, dilation of the capillary blood-vessels and thinning of the skin—a condition that sometimes occurs in stokers whose legs are especially exposed to the effects of heat. Rarely, it excites one of the uncommon skin diseases, such as lupus erythematosus. But on the whole, the dermatoses resulting directly from habitual exposure to heat of endurable intensity are surprisingly few.

On the other hand, the indirect action of heat in producing sweating is a frequent cause of skin disease. The skin sodden with sweat is a vulnerable skin. It chafes and develops eczema; and in it trivial diseases, such as mild seborrheic eczema, become exaggerated into troublesome ones. A habitually sweaty skin is also a favorable soil for bacteria; and infections frequently occur. Pus infections are commonest, resulting in boils, forms of purulent infections of the skin, and certain sorts of eczema. Other sorts of infections are also not infrequent, particularly forms of ringworm of the crotch, and of the hands and feet that at times become disabling.

It is very difficult to counteract the damaging effects of radiant heat on susceptible skins. Some protection is afforded by covering the skin to protect it from direct radiation and more can be done by interposing an impervious screen between the worker and the source of heat, where this is possible.

The bad effects of habitual continuous sweating can be minimized by frequent bathing and other measures to promote cleanliness, and by intelligent attention to beginning skin diseases, particularly to beginning infections. The bad effects of sweating are shown chiefly on the hands and feet and in the deep folds of the body. Much can be done to control trouble in these locations by intelligent medical care.

COLD

Prolonged exposure to cold is apt to damage the skin by producing permanent damage to its vascular structure. These permanent changes occur chiefly in terminal areas of circulation such as the ears and nose, and especially the hands and feet. Every one is familiar with these manifestations as chilblains, but not so familiar is the condition of chronic passive congestion of the extremities that shows as cold, clammy, purplish hands and feet and is very common in outdoor laborers in rigorous winter climates. It is the same condition as chilblains but to a lesser degree. It greatly lowers the resistance of the skin and is important because it is a frequent predisposing cause of trouble. This condition and chilblains are of so common occurrence that they constitute occupational dermatoses of considerable practical importance.

The early experience of the great war with so-called trench-foot—which is chilblains—has shown that there are several factors in the production of this condition: First, prolonged or habitual exposure to cold, especially if the extremities are covered by wet clothes that give off heat rapidly by conduction. Second, hardship, in the sense of overfatigue and failure to get proper food, including at least one hot meal a day. Third, the wearing of clothes that by constriction interfere with the return circulation, such as tight shoes or tight gloves. In passing, it may be said that the wearing by soldiers of puttees which shrink when they get wet and then bind the legs were found to be particularly bad in this respect.

The application of these facts to the prevention of the bad effects of cold of the skin in industry are obvious.

WEATHER

It may seem to be going far afield to refer to industrial dermatoses that are due to exposure to the weather; but they are a real occurrence. You are familiar with the weather-beaten skin of old sailors and farmers and others whose occupations have kept them exposed to wind and sun and cold for years. The skin is wrinkled and ruddy and rough. In those more susceptible to these influences, the cumulative effects of many years of exposure produce serious degenerative changes. They are results of wear and tear and they cannot be guarded against; but they are truly the result of occupation. Fortunately the skin cancers that result in these cases can usually be easily cured if recognized early.

POSTURE AND THE EFFECTS OF FRICTION AND PRESSURE

The familiar callouses and corns and thickening of the hands in workers which occasionally produce disability can only be referred to. More important are the vascular disturbances of the legs which may result from habitual standing and which is a common source of skin troubles. These troubles are due to varicose veins. Varicose veins, and the passive congestion of the skin of the legs that the condition entails, sooner or later leads, almost invariably, to more or less dermatitis of the legs and not infrequently to ulcers.

There are some uncommon dermatoses which are occasionally excited by standing; but these are so rare as to be of little practical importance in comparison with the very great practical importance of dermatitis and ulcer in the skin caused by hypostatic congestion.

Varicose veins cannot be guarded against. They may be the result of inherently poor vessels (our blood-vessels are very much like rubber tubing and they vary in quality in different individuals) more frequently they are the sequel of disease.

Men with varicose veins cannot make efficient workers in standing jobs and should avoid them. They do better in jobs that require a reasonable amount of walking; but they are not good workers for these jobs. Varicose veins are common in women as a result of child-bearing. Women with this condition are likely to suffer eventually from its effects on the legs and should avoid standing jobs.

PARASITES

The damages of parasites to the skin occur in those occupations which involve the collection of groups of men in intimate association, as in work trains and labor camps. Under these conditions, the ravages of vermin are almost inevitable. Fleas, bedbugs, lice, and itch are more than an annoyance; they lead to infections of the skin that produce disability to an important extent. For example, in the allied armies on the Western Front, under conditions of heavy warfare, where measures to control the pests could not be applied, the ravages of itch and lice, and the secondary pus infections which follow them, produced more disability than any other form of disease. Practical measures for the control of vermin are well known and they should be applied to their extermination in industrial camps.

The causes to which we have referred above, while they produce a very considerable quota of industrial dermatoses, are relatively unimportant in comparison with the two great causes we have yet to consider, viz., Infections and External Irritants.

INFECTIONS

In the practical consideration of infections of the skin, we will leave out of consideration, as one of the factors in their occurrence, lowered individual resistance, although this is a factor of importance in infections of the skin, as of infections of other tissues. For infections of the skin to occur, there are at least two other essential conditions:

- (a) A break in the skin surface through which organisms can find entrance.
- (b) The presence of pathogenic organisms.

For all practical purposes, it may be said that an infection cannot occur without a break in the skin. Infections therefore occur most frequently in rough occupations.

Bacteria and other microscopic organisms require for their growth organic matter, either vegetable or animal. Infections, therefore, are most frequent in those whose occupations expose them to more than or-

dinary contact with organic matter. Pus organisms are everywhere and pus infections occur in all men; but even infections of this sort are much more frequent among those whose occupations are, speaking bacteriologically, dirty. Although pus infections are far and away the most frequent of disabling dermatoses, there is a formidable list of other infections of the skin which occur in industry. These specific infections occur preëminently in those whose occupations bring them into intimate contact with organic matter, whether live or dead, such as manure, soil, grasses and moulds, live and dead animals, furs, hides and hair, meats and fish. These bacteriologically dirty occupations furnish almost exclusively a large group of troublesome and often dangerous specific infections of the skin.

To guard against these specific infections in practice, is an exceedingly hard problem. It is the more difficult because these infections are often sporadic and of infrequent occurrence, although in the aggregate they cause a large toll of disability and death.

The two essentials in reducing infections are to maintain an unbroken skin, as far as possible, and to prevent infection when breaks occur. It is a matter of practical importance for workers to guard against slight wounds of the skin and, when they occur, to take proper care of them. Superficial breaks in the skin which are not infected, should be sealed to prevent infection. This can be done by covering them with flexible collodion or with clean adhesive plaster or by a clean bandage. Before sealing them, they should be disinfected.

The industrial custom, now common, of having all wounds disinfected with tincture of iodine might be very well extended to encouraging the use of tincture of iodine in disinfecting all small breaks in the skin. It would be an equally useful measure, I believe, to encourage in workers the custom of protecting, either by sealing or by some dressing, all minute breaks in the skin, particularly about the hands. Flexible collodion is as practicable to keep accessible and to apply to the surface as is tincture of iodine; and if the custom were fostered among workers of sealing with collodion all minute breaks in the skin, the result would be almost as important as that which has followed the habitual use of tincture of iodine to disinfect immediately trivial wounds. There is one caution that must be used, however, in sealing wounds. Penetrating wounds—that is wounds going beneath the skin—should not be sealed, particularly wounds from objects which have been in contact with the soil, because of the danger of lockjaw and of other serious infections which occur especially in soil and grow freely only when excluded from contact with the air.

EXTERNAL IRRITANTS

A list of the irritants that produce industrial dermatoses would include practically all known local irritants. Such irritants may be mechanical or chemical.

The mechanical irritants are relatively few, but purely mechanical irritants may produce dermatitis, as for example those occurring from prickly or thorny non-poisonous plants or their fruits, and from the

silicious, spiny particles in sponges. The origin of such inflammations of the skin may be quite unexpected and difficult to determine, as is illustrated by a baffling epidemic of dermatitis which occurred among stevedores in Bristol, England, and which Wills finally demonstrated to be due to fine vegetable prickles on barley barbs.

But by far the greatest number of irritants that affect the skin are chemical irritants. These may be animal irritants, such as poisonous hairs of some caterpillar; or vegetable irritants, such as poison ivy or sumach, or primrose and other poisonous plants; or lacquers; or the dust of irritant woods, as teak-wood. The list of such irritants is long and of practical importance.

The chemical irritants, using this term in its ordinary sense, range from the oldest known substances used in industry, such as salt, soap and soda, to the newest, such as T. N. T. and mustard gas. Even to enumerate those better known would make a list covering pages. We see their effects in all grades of occupations from the humblest to the most technical.

The damage they do usually expresses itself as a dermatitis—an inflammation of the skin—of greater or less severity. In its slightest degrees it may be only a pinkness or redness of the skin with some itching or burning. It may in other cases be a violent inflammatory process with blistering, swelling, and secondary systemic symptoms. In extent, the eruption may affect only a small part of the body surface, or it may be universal. The severe chemical irritants, such as the strong acids and alkalis, may produce complete destruction of the skin with the formation of extensive wounds or ulcers.

In addition to the irritants that produce the usual inflammatory reactions, there are certain industrial substances that produce lesions in the skin that are not of the ordinary inflammatory type. The substances that do this especially are tar, mineral oils, and greases and their derivatives, and, perhaps, true fats. The commonest lesions which these substances produce are boils and large crops of blackheads and pustules. Such eruptions are seen not infrequently in men habitually exposed to these substances in their occupations. It is a very interesting fact that similar substances are well-determined causes of skin cancer in workers. Chimney-sweeps' cancer from irritation of soot, has long been recognized. More recently, it has been shown that similar industrial cancers may be produced by pitch, tar, paraffin, creosote oils, and other coal and petroleum distillates.

The control of industrial dermatoses manifestly presents many special problems, which vary with the numerous irritants that are involved and with the conditions of their use. Under certain circumstances, practicable measures are available to neutralize the irritants, either before or after they come in contact with the skin. Under certain conditions, it is possible to prevent their effects by the wearing of protective appliances such as ordinary gloves, or rubber gloves, or gloves treated with shellac or other substances to make them impervious. In the manufacture of T. N. T. a varnish of orange shellac which is painted over the hands, forearms, and other exposed surfaces, is said to furnish effective protec-

tion; and is suggestive of similar protective varnishes that might be devised for use in other irritating occupations.

But of course, the only entirely satisfactory protection against industrial dermatoses from external irritants, consists in preventing such irritants from coming in contact with the workers. This may be practicable, or it may be impracticable or impossible. It is sometimes found to be practicable under necessity, where before it was held impossible.

The most practicable way of handling the problem in certain industries, is by the selection of workers who can endure, without damage to the skin, the amount of external irritants which is necessarily involved in the occupation. Some men cannot work at all, where others can work without damage. My impression is, that nothing is gained by trying to keep these susceptible men at work which produces skin trouble. The best thing is for such men to shift their occupation, if possible, when the inability to endure the irritants involved is discovered. When old workers acquire a susceptibility, shifting of occupation may involve heavy sacrifices which they desire to escape. In such cases, unusual precautions and medical care may enable them to continue, but it is usually only at the expense of discomfort and periods of disability.

INTENSIVE STUDY OF INDUSTRIAL DERMATOSES DESIRABLE

I am conscious of the altogether general character of this consideration of the subject. My only hope is that it may suggest the extent and, possibly, the importance of the problem of industrial skin diseases. I think these two facts are not generally appreciated. Industrial medicine is so largely concerned with surgical injuries and serious diseases that it has little time to devote to troubles of less gravity. And yet, I believe that the aggregate of distress and disability resulting from such minor troubles as industrial dermatoses, is so large that it is a matter of great practical importance and worthy of intensive study. It is unfortunately a matter which has not been given systematic study by experts in skin diseases, either in this country or abroad, with the possible exception of Germany. It is, of course, a matter of thoughtful consideration to every conscientious industrial physician, and of sporadic study by expert dermatologists, when circumstances bring such cases within their experience. The experts in industrial medicine are unfortunately not experienced in dermatology, which is a highly technical specialty.

There is an important field here which is worthy of systematic investigation and which promises important practical results. I believe it would be highly useful if a systematic investigation of this subject by experts were undertaken in this country. One practical way of undertaking it, would be as follows: Employ a few men who are trained dermatologists, to devote all of their time to an investigation of industrial dermatoses as they occur in our industrial centers. Competent, younger men of this sort could be found, who would be willing to undertake it. Associate with these full-time investigators, a consulting board of mature experts in skin diseases who would be available for consultation and advice and for special investigations. Such men are to be found in our large cities and are in practical contact with nearly all industrial centers.

I believe a well directed investigation of industrial dermatoses continuing for a considerable time—for several years—would result in an important addition to our knowledge of this subject—not so much to our knowledge of the diseases, because they are pretty fully and accurately known, but of the factors which are important in the production of these diseases and in their prevention and control. It was found possible to do very useful work along these lines in the handling of very complicated problems of disease that threatened our army during its mobilization in this country; and I believe such a system could be effectively carried out in studying this problem in industrial life. It could not be so effectively pursued, even by thorough coöperation, by experts who are all in fixed locations. It requires a certain number of men to be mobile, so that their services may be used anywhere. I avail myself of the opportunity, which this occasion affords, to call attention to this matter as one worthy of being fostered.

CHAIRMAN LAUFFER: We certainly have very much appreciated the illuminating paper on this very troublesome subject, which has just been read; and we are favored by having with us this morning, Dr. John G. Burke of Pittsburgh, Pennsylvania, who will open the discussion.

DISCUSSION

DR. JOHN G. BURKE (Jenkins Arcade, Pittsburgh, Pa.): Dr. Pusey, in his usual brief and concise manner, has covered this subject very thoroughly in the time allowed him, his idea of a commission to study this subject is a good one as it will require some agency that can coöperate between the patient, employer, physician, and manufacturer of the material or supplies that cause the trouble, before we can get much definite data on this subject. A physician can tell a patient that the eruption is due to some irritating substance that has been in contact with his skin, but the physician cannot take the time to go in the mill or factory and endeavor to find the irritant. I have been told by patients that they noticed that a particular lot of material, barrel of oil or lubricant seemed to be irritating while other lots from the same source and with the same label did not give any trouble. If these troublesome lots could be examined and the irritating ingredient discovered, by requiring them to be labeled so that extra precautions could be taken with them, many of these troublesome eruptions could be avoided. No discussion of this subject would be complete without considering the malingerer, a term used for an individual who feigns sickness or who after a trivial injury aggravates the wound or otherwise mutilates themselves so as to receive additional compensation. A brief review of two cases will illustrate the point I wish to bring out and show the extremes of this type of cases. The first case was a girl whose finger was punctured by a piece of copper wire. It made a slight wound which was dressed a few times by the nurse and apparently healed in the usual manner. A few weeks later the girl presented large ulcers on the chest, abdomen, and thighs. The first ulcers healed leaving large scars, but new ones would appear. The company had her removed to a hospital. She also developed some abdominal

trouble and her appendix was removed. She claimed that all her trouble was due to the injury and put in claim for compensation. When I saw her the ulcers were all healed, and from the character of the scars, the history of their sudden appearance, the non-resemblance to the usual dermatological lesions, the sites of the ulcers all being on areas covered by clothing, and the delight the patient took in telling of the number of physicians who had been confused by her case, all convinced me that the skin lesions were self-inflicted probably by hydrochloric acid, and my testimony so convinced the referee that the case was dismissed. The second case was a man who received a cut on the finger which was dressed with a mercuric lotion. This man happened to be an individual who has a susceptibility to mercury and the lotion caused a violent dermatitis of his hand. This was recognized and the lotion was discontinued and the wound and dermatitis both healed under a soothing dressing. About the time he should have reported for work he presented himself with a severe vesicular dermatitis involving both hands, also his neck and face. The eruption would subside and then recur. From the history I was positive that he was applying the antiseptic lotion that he had found produced a dermatitis on contact with his skin, but as it is impossible to differentiate an eruption of this type from a number of eruptions produced by plant and chemical irritants, the man was given the benefit of the doubt and a settlement was advised, after which he had no more recurrences. As most of the states are increasing the allowance for compensation, we will likely have more of these cases to deal with, and we should always suspect malingering when an eruption does not present or follow the usual course. It is rather hard to think that we have people of this type but those of you who are physicians know that a certain number of patients do not want to get well and they will not do anything they are advised to do and will do everything they are told not to do so as to prolong their disability.

DR. MARVIN D. SHUE (U. S. Public Health Service): The United States Public Health Service which I have the honor to represent is conducting an intensive research between the various cutting oils and compounds and dermatoses. The Service is desirous of coöperating with industries experiencing this trouble in order that the best results may be obtained and the cause could be determined. If, therefore, any of the firms you gentlemen represent are troubled with dermatosis, we will be glad to coöperate with you. You can get in touch with us at 3412 Fulton Road.

DR. KLOEBER: I think there is one point that should not go unchallenged. It is a positive menace to the men who are working in the industries of this state to spread a doctrine of sealing wounds by collodion. I say this from actual experience. If you can be absolutely sure that you have not introduced an infection in that wound, or absolutely sure that your application of iodine has destroyed the pathogenic bacteria so introduced, then you can be safe in sealing it, but you can be sure of neither, and particularly is that true of a wound that is of punctured variety that practically always carries some kind of infection with it, which is absolutely impossible to reach by the application of iodine. Our experiences

have been of such character that we have some time ago made an order that excludes collodion, entirely, from those kits.

DR. STARR: I think there was an important suggestion made by the essayist that should not be overlooked. I think we all grant the vast importance of the study of dermatosis as applied to industries. He made a suggestion that a committee of dermatologists be appointed to make a study of these various dermatoses as found in industry. It seems to me this is a mighty excellent suggestion and I would like to make a motion.

I thought I would ask for a discussion, whether it would be better to have this section request the dermatological section of the American Medical Association to appoint such a committee or what would be the best method of procedure in the matter.

CHAIRMAN LAUFFER: We wish to begin and close these meetings on time and consequently it is, unfortunately, necessary to ask Dr. Pusey to close the discussion. In doing so, I wish he would please state what he would consider the better procedure in the matter, and tomorrow morning at the beginning of the session at 9:30, we will have several items of business to consider, among these, advanced work for the new year, and I can see nothing more fruitful before us than for us to enter into an arrangement, probably with the dermatological section of the American Medical Association, and the United States Public Health Service, to the end that we may from all angles investigate industrial dermatoses, because this is really a very annoying proposition to the industrial physician, and to industry.

DR. PUSEY: I am glad Dr. Burke referred to malingerers. Malingering is of course not in itself an industrial dermatosis, but it is a condition that occurs among industrial workers, and when it occurs in the skin it usually requires an expert dermatologist to recognize it. The most atrocious cases of factitious dermatitis as a rule escape detection for a long time and until they are seen by a dermatologist.

As to the proposition of sealing wounds, I am glad it was challenged. The point I made was that breaks in the skin—superficial breaks which are not infected—should be sealed to prevent infection. It is practical to make a distinction between uninfected or probable uninfected breaks in the skin, and infected wounds; and if the uninfected breaks are habitually sealed over it saves an immense amount of infection. I carefully excluded penetrating wounds, and wounds that were likely to be contaminated with soil bacteria. Such wounds should not only not be sealed, but the patients should be given tetanus antitoxin if they have penetrating wounds.

The action I had in mind was that this organization should pass a motion something like this:

"It is the sense of this organization that it would be desirable to have a commission such as that outlined by Dr. Pusey in his paper for the intensive study of industrial dermatoses."

There is nothing to be gained by a committee of the American Medical Association, this organization, or any other organization getting volunteer workers on a committee of this sort. What is needed is a group of

paid workers, expert in dermatology, such as could only be furnished by the Public Health Service or some of the research organizations that could furnish the money for salaries for full time workers.

CHAIRMAN LAUFFERT: We have one remaining paper for this morning to be presented by Dr. Weston A. Price, President of the Research Institute of the National Dental Association, Cleveland, Ohio, on "Bad Teeth and Fatigue." I understand this paper is illustrated and contains some advance information that we, as industrial physicians and general practitioners will be extremely interested in.

DR. PRICE: I deem it a great privilege to bring this message to you, although I feel entirely incompetent to do so. I will ask you to orient yourselves to this problem by thinking with me of the relation of the importance of the dental problems to other problems this week when we are studying the safety of the community.

BAD TEETH AND FATIGUE

DR. WESTON A. PRICE

PRESIDENT OF THE RESEARCH INSTITUTE OF THE NATIONAL
DENTAL ASSOCIATION, CLEVELAND, OHIO.

One of our great surgeons recently said, that of the people who are living today, nine out of ten will die when they do because of a final blow that will be struck by a streptococcal infection. Even though they die with pneumonia, that germ becomes rampant and strikes the final blow. For those who die with pneumonia show the streptococcus germ in the blood. Some one said, "What about the other ten per cent?" The doctor said he was expecting that they will die by accident.

You notice, then, that we have a safety week in which we are putting nine-tenths of the emphasis on one-tenth of the problem. Our responsibility now is all the greater because streptococcal infections that kill people, almost invariably come from focal infections.

The men having the responsibility in your great concerns, in my opinion, should learn the relation of the health and the strength of the individuals to the health of their mouths and I haven't any hesitancy in saying that you haven't the slightest conception, probably you haven't one-tenth of the conception that you should have of that importance and of the facts as they exist, and there is good reason for it. We have all been taught to believe that we could trust symptoms. The greatest menace and the greatest misfortune in this whole problem has been that the teeth that are most likely and surest to produce the grave systemic disturbances are teeth that are giving no trouble to the patient whatever.

TWO TYPES OF FATIGUE

What is fatigue? We may express it as exhaustion or we may go to Webster and find that it is "the condition of cells or organs that have undergone excessive activity with resulting loss of power," in brief the inability to do work. The facts are that fatigue has two particular types.

One is a normal physiological process where the resultant work has made an accumulation in the tissue of the waste products and has not supplied to the tissue the rebuilding structures fast enough, and temporarily, we have an exhaustion of the cells. That very process which is fundamental may be impaired, not by overload of work but by a toxin which is going through that patient's body and which is putting on the brakes.

If you take a strain of streptococci that would produce an involvement of the thyroid gland and inoculate goats with it, it attacks a little group of nerves which control the functioning of that gland. The first effect is a hyperthyroid activity. Later that gland becomes exhausted until the organisms may invade it or we may have a state in which it ceases to produce the proper amount of the secretion. The infection produces the effect on the controlling mechanism, just as the large colon may produce a condition of chronic constipation, not necessarily because of a structural change, but because the infection and the toxin are involving the nerve centers that control that system. It is as though you would turn on the current and leave the magnet of a bell under tension all the time. It puts the muscle of the bowel wall in the state of chronic contraction, and similarly may control the functioning of various organs of the body that have to do with repair and the feeding of the tissue.

Our great problem, then, readily will be seen to be one of studying the relation of the dental infection to these various disturbances which produce fatigue.

TEETH INFECTIONS TAKE MORE LIVES THAN TUBERCULOSIS

You, again, will think of the white plague, tuberculosis, that is killing people. There were more people died, year before last, from heart disease, than from tuberculosis and probably more than nine out of ten of the cases of heart disease are the result, directly, of streptococci infection. The great majority, or a large number of the infections of the heart, come from focal infections. Ninety per cent of the focal infections are said to come from above the collar—teeth and tonsils chiefly. The teeth infections probably take more lives though indirectly than tuberculosis.

But your concern is with the man before he breaks. Fatigue is a quantitative process. We may and do have, large numbers of men who are doing less than the normal amount of work because they are invaded by a streptococcal infection producing a toxin which is disturbing the functioning of those organs or tissues which are involved, and that diminished productive quality of your man or woman is directly caused in many cases by dental infection. It may be a tonsil infection.

What are the lesions that will produce those effects? will be a natural question. In my judgment the time is coming, and very soon, when every corporation that has the well-being of its men in mind, as well as its own well-being, will do, gratis, a complete dental examination, a complete restoration, so far as the elimination of focal infection is concerned, from the mouth. I believe, further, that the time is not far distant when our communities will take that responsibility just as our United States Government does it for our armies.

EFFECT OF INFECTIONS ON MUSCLES

Let us now look at the slides. We will see first an illustration of the effect of infections on muscles. Here is a man who could only lift five pounds with his left hand and he could lift fifty pounds above his head with the right. The difference in the size of the muscles in circumference of the arm is one-half. That man's lesion started when he went into cold water to repair a broken water main and the chilling of his body produced a lowered resistance which, together with the fact that he was carrying extensive dental infections, permitted him to be overwhelmed and he came down with multiple neuritis which put him in bed for weeks and months.

Take rabbits, for example, and inoculate them with a small culture and it will not produce, let us say, arthritis, but if you take one of the rabbits and put it out in the cold, it is more likely to produce rheumatism or arthritis than the others if they are kept warm. If we take others that have not had any inoculation and expose them to cold they do not develop it.

When your worker develops a condition of the muscle which you call stiff-neck, the chances are more than two to one that it is not simply the exposure from the draft, but it is that plus infection. He had resistance enough in that tissue to protect it until it was exposed. Now this man was able, after removal of his dental infection, to swing a pail of water over his head with the hand with which he could not lift five pounds as high as his head at the time we began. He later developed that arm so he could handle a heavy hammer. This repair did not begin until the removal of the dental infection, and his arm was impaired as was his health for twenty years during all of which he carried his obscure dental infection.

You have many people developing involvements of the eye. We have a number of eye specialists that immediately upon seeing certain forms of eye lesions say, "This is caused by a definite focal dental infection." They are so constantly meeting it that without further examination they say, "This type of lesion is from a dental source."

Here is a man who had an Iritis of the left eye and not of the right. That lesion had persisted for months, recurring. A dental infection was removed and it cleared up and did not come back. The important part of that history is that we were taught a few years ago that a very large portion of these cases were syphilitic. Treatment for syphilis did not help him.

DEAFNESS CAUSED FROM DENTAL INFECTION

Here is a woman who had deafness of the right ear. So complete was the deafness that if her left ear was lying buried in the pillow, she could not hear people talking or children playing in the room. That condition had existed for two or three years. Within six weeks after the removal of a focal dental infection, that neuritis of the auditory nerve cleared up entirely and she regained her hearing, and for three years has had perfect hearing in that ear.

The man in this picture weighed only 122 pounds. He had been sent away with tubercular sputum coughing, night sweats, fever and heart involvement. He was fifty-two or fifty-three years of age. After remaining in one sanitarium for six months, he went to two or three other resorts for his health and made no improvement. He was bed-ridden a great deal of the time. After the removal of his dental infection, within six months' time he increased in weight from 122 pounds to 176 pounds. You can judge the man's real improvement when I tell you the cough entirely stopped and he succeeded in taking out a large life insurance. At first the insurance company said to him, "You made application for life insurance years ago and were rejected because you have an organic heart lesion. We cannot give you insurance, although this examination you have just presented seems to indicate that you are all right. We will have to have another examination." They sent him to another examiner who also gave a favorable report, but they would not accept it and sent him to a third examiner who again gave him a favorable report. He then succeeded in getting a large insurance.

If I do not bring you any other message this afternoon than this, I hope you will retain it and that is that as we see it today, there is no such disease as gall-stones; gall-stones are the symptoms of a disease. There is no such disease as stomach ulcer; that is a symptom of a disease, a systemic infection. There is no such disease as dropsy; it is simply the symptom of disturbances. We might go through a list of lesions which are considered primary but are now known to be secondary. The important thing for you to remember is that when one of your men or women shows fatigue, he is beginning to break; in other words, he is beginning to die. Now you may not like this, but I believe it as much as I believe anything; that you and I are going to die when we die because of a fight with a streptococcus infection in nine chances out of ten, and whether it is at fifty or sixty or seventy or eighty, will depend largely on whether the conditions are favorable to the organism and unfavorable to us, or the reverse, so you must put very favorable conditions around your people who are working and you must recognize that that condition of pathological fatigue is approaching death of tissue for that person. It may be they will recover many times before a final dissolution, but it is death of tissue and excess of fatigue breaks the machine. I am now referring to pathological fatigue. To repeat what I have stated, you and I, when we die, will in all probability die from a streptococcal infection, which infection we will probably carry with us as a focus somewhere in our body, and even though we have pneumonia which lowers our resistance, that streptococcal infection will be present to strike the final blow and the important thing is to break up and remove all nests of focal infection. Tonsils probably are the most important for children and the teeth are far the most important for adults.

FOCAL INFECTIONS ARE A GREAT MENACE

There is no greater responsibility on this great convention which is meeting here this week than to teach people that focal infections are a

great menace to their strength as well as to their health, and also teach them they are likely to be so obscure that they won't know they have them.

This picture shows a woman who was dying by inches for about four years. She weighed about sixty pounds. For nine months she had not been able to move a muscle of her body with the exception of a faint movement of the fingers, and within twelve weeks after the removal of dental infection, she was able to be put up in a wheeled chair and she could feed herself and put her fingers into her hair. Not one of her teeth showed marked disturbance about the roots, and for a good reason, which however we have not understood or perhaps suspected.

The greatest mistake we have made in the dental profession is to think that all people react the same to similar focal infections. We have thought we could take dental x-rays and see whether they were likely to be systematically involved by dental conditions as shown by the x-ray. If the patient is making a good fight, there will be a local inflammation, and if there is an inflammatory process, there will be soreness and absorption. If this is continued, there will be pus flowing and gum boils. That person is seldom involved by that type of infection because if you will take the pus from that gum boil, it is very often steril. That patient is making a good fight and is killing the germs at the source.

If you had a source of pollution such as a sewer, wouldn't it be better to destroy it before it got into the lake and from there into the homes? Nature tries to kill those germs at the source, but the people who do not have the normal fighting power, do not kill them at the source and they break down some organ or tissue without any local soreness of the tooth furnishing the infection. This woman's mouth did not show such a condition as would be alarming or even recognized.

The next slide is even more conspicuous. Here is a boy eighteen years of age. You see how his joints are bound up. He has had acute inflammatory conditions existing in his wrists, ankles, and joints. He had been suffering and crying by the hour, day after day since he was twelve years of age. He could not feed himself; he could not do anything. His mother said, "If I could see him die, I would be so happy." That boy today is up and around on crutches enjoying good health. He wrote how he had made \$10.00 whittling, making doll furniture out in the country. He could use his hands, in other words, and before he could not do anything with his hands. The dental infection showed almost no resorption of tissue around the root ends.

The thing that is deceiving the medical and dental profession is because a tooth is not giving trouble and the x-ray does not show much absorption, they think it is not a source of danger, but just the reverse is true in a person with low fighting power and a definite locked streptococcal infection about a dead tooth.

This is the picture of a woman who was carried into my office and could not feed herself. She was a hopeless cripple, and, incidentally, you will be interested to know how her attack came on. She was working in a cold foundry making small parts. She had a lowering of resistance

caused by the chilling of her hands which brought on acute arthritis in her hands. They did not have a properly warmed room for her and that lowered her resistance which was a primary cause of her break, together with the focal infection. As her husband went out with the chauffeur to see where to put the car, she said, "Dr. Price, I want you to do everything you can for me. They have taken my four children away and my husband has told me I must either die or get better or he will leave me."

If you will go with me to their home on the West side, which home is now paid for, you will find her cooking for and feeding five children, not four. She is doing her own house work and she couldn't move her hands before. All that has been done was the removal of dental infections that were not giving her a particle of trouble.

I see no lesion related to the teeth so often as I see involvement of the neck.

INFECTION OF TEETH FREQUENTLY INVOLVE THE NECK

Here is a woman with stiff-neck. There is a picture showing four animals with stiff-neck, inoculated with the infection taken from her tooth, and yet the tooth was not giving any trouble.

This is an infection of the spinal cord, the same streptococci growing in pairs in the roots of the cord. Here is a girl with typical stiff-neck and the dental infection produced in an animal's neck which you will see in the next picture. There is a rabbit with a large abscess in the muscle of the neck.

The next picture shows a magnification of these muscles. There you see those germs right in the muscle itself.

Here is a woman who sat in her chair for eight days because she could not go to bed on account of severe pain in the muscle of her neck, a typical torticollis of the neck with severe pain. The condition in her mouth was that she was wearing a plate which covered the roots of three teeth, the crown of which had broken off, and rather than have the roots removed, she had the plate extended over those roots. Every time she bit on the plate, she pushed the pus up into the tissue. People who are biting on infected teeth are putting a pressure amounting in total to about a ton every twenty-four hours in the process of mastication which directly impresses that infection into the tissues. We can bite all the way from a few pounds to several hundred pounds with our teeth at one time. This woman was pressing this infection through into her system and she remembered after she had associated these events, that within a few months she was not able to turn her head sideways to the window. She also remembered that the condition got continuously worse.

The important thing for you to notice is that when we took out these roots of the teeth and inoculated one or two groups of animals, we produced in the animals a lesion quite similar to the lesion suffered by the patient. We anesthetized her neck, cut into the muscle, took out a piece, made cultures from that and inoculated the other of the two groups of rabbits. The next slide shows the rabbits. To the left you have rabbits inoculated from the teeth and to the right from the neck muscle. Each

produced typical miositis infections of the muscles. Here we have a dissection of the rabbit showing the involvement of the thigh. For two years she had no recurrence. About six months ago that woman had an involvement of the other side of her neck. I found an infected tooth under the bridge. Took off the bridge, made a puncture of pulp which had pus in it and immediately this neck involvement got better. Within twenty-four hours after extraction it was subsided and she has not had a recurrence. I believe her neck involvement was directly caused by her dental infections. You have large numbers of men and women who have involvements less severe than this caused by the dental condition and you don't suspect them and they don't suspect them because their teeth are entirely comfortable.

This picture shows the importance of the study of the teeth in connection with pelvic involvement, particularly in women. We took the cultures from the teeth of thirty-three patients and inoculated them into 430 rabbits and only the pelvic organs of rabbits inoculated with the cultures taken from three patients showed infection. Here we have a distinct infection of the ovaries and uterus of this rabbit. I said only the cultures taken from three patients produced that involvement in rabbits.

Two out of the three patients had been operated for ovarian infection and one had been operated twice and a large number of the girls working in your plants who have a shadow being held over them because of pelvic involvement and ovarian trouble, may be suffering from dental infection which is picking out a weak tissue. It is a matter of very great importance, both for the protection of those people because they are so generally misunderstood and for their efficiency that they be given the best possible service.

HEART INVOLVEMENT FROM DENTAL INFECTIONS

Here is a boy with a very bad heart involvement. Within eight months after this picture was taken, he was dead and buried. When they brought him to me they thought he simply had rheumatism. They had no thought that a heart involvement existed. Cultures taken from this boy's dental infection and inoculated into rabbits, produced heart involvements in 93 per cent of the rabbits and 100 per cent developed acute rheumatism which this boy had.

The responsibility for the care of the heart is tremendously great, for the body has no value to us without a good heart. Since heart muscles will be attacked as readily as other muscles and since heart valves have a great weakness for streptococcal infections it is necessary that we protect the boys and girls from focal infections.

Here is a girl who gave up her work because of a serious heart involvement and rheumatism. Within a few weeks' time after the removal of these dental infections which, incidentally, were not giving her trouble, she had gained twenty-two pounds and had gone back to work. She expressed her delight with her work in this way to me, "I just love to work, now." She was completely incapacitated at the time of the removal of this infection.

This is a picture of Mr. Roosevelt. We speak of him as the greatest human dynamo the country has ever produced and yet when it came to the final fight, the streptococcus was probably the cause of his death. The important lesson to me is this: Not bad dentistry, but the fact that Mr. Roosevelt went to South America and he did just what many of your workers are doing, he submitted himself to conditions which lowered his total resistance. He got fever and after the fever had lowered his total resistance, the pulp died in some of these teeth. We who are dentists know that this tooth never had a root filling, nor this, nor this (indicating.) The important thing was that those dead teeth became the hiding place, the harbor, for the streptococci. They grew, probably, in those places. He did not know it. No one knew it and the result was that they went out from that hiding place and went through his body, selecting the weakened tissues, and finally took his life.

RESPONSIBILITY OF THE EMPLOYER

Your great responsibility, as I see it, is to save those people who cannot save themselves and you can do it by putting into your plants the conditions that will find these focal infections, which means a skilled dental operator with a splendid equipment and then support him with all of the finances that are necessary and all of the assistance that he needs to give the proper relief to these people. It will be the best investment that you will make in your business this coming year. I thank you.

CHAIRMAN LAUFFER: After hearing this excellent address, we would like to listen to some discussion, but the hour is such that we will stand adjourned to reconvene at two o'clock in the adjoining room for the general session of the afternoon.

FRIDAY AFTERNOON SESSION

CHAIRMAN LAUFFER: In opening our program for this afternoon we will be favored with a paper by Dr. C. D. Selby, formerly Consulting Hygienist, United States Public Health Service, of Toledo, Ohio. Dr. Selby will take up the subject of "The Scope of Physical Examinations in Industry."

SCOPE OF THE PHYSICAL EXAMINATION IN INDUSTRY

DR. C. D. SELBY, TOLEDO, OHIO. FORMER CONSULTING HYGIENIST,
U. S. PUBLIC HEALTH SERVICE

Industry exists solely for the purpose of converting raw materials into finished products of marketable value. Labor is employed in industry for the assistance it is in the accomplishment of that purpose, and its value is fixed by the skill and facility of its effort in that direction as manifested by the quality and quantity of its output.

Formerly, when labor was plentiful and the margin between the cost of production and a moderate selling price was sufficient to bring a reasonable profit, industry gave but little concern to labor. Workingmen came and went as they saw fit, were hired and fired as suited the fancy of their bosses, or were let out in dull seasons and taken on again when business improved. No well-thought-out attempt was made to offset unstabilizing influences and practically none to improve skill.

More recently, when labor has become relatively scarce and the cost of production higher, industry has been forced to realize that it has a problem in its labor relations: in fact, industry concedes this to be among the serious, if not the most serious, of its problems. Though old in existence, having been ignored, it is relatively new. Employers do not yet know how to solve this problem. They are groping. They have created welfare departments, employment, service, and sociological departments, have sought to amuse, edify, and pacify the working people, have divided profits with them and have appointed them to act on joint committees in the determination of policies—with little effect as indicated by the present unrest, the greatest the world has ever known.

Employers are still groping, and they are progressing. Labor turnover has been studied, absenteeism investigated, and the cause of spoilage and breakage sought. Information of value has been gained. It has been learned that the most capable and dependable workmen are those who are healthy, physically competent, and are assigned to tasks they like and know how to do rapidly and well. It has been learned that such, working under pleasant conditions void of undue fatigue and hazards to health and limb, are the best producers and consequently the best paid, are the most contented and valued of employees. Industry is now striving to procure such workmen: if unable to procure them in the usual way, to develop them; and, having them, to retain them by offering favorable working conditions and opportunities for further development and advancement.

The procurement of healthy, physically competent workmen may imply the rejection of those who are not so. However, it does not necessarily follow that such should be rejected outright and deprived of the privilege of gainful occupation. There are positions in industry, in fact in virtually every plant of reasonable size, that people of varying substandard conditions of health and body can fill with efficiency, to the profit of their employers and themselves. For example, defective eyesight may justly disqualify a man from operating a machine that requires acuity of vision, yet permits him to supervise a gang of laborers with competency. Again, a chronic bronchitis may render employment in a foundry hazardous and unprofitable, while in the open it may have no detrimental effect. Even the blind and the legless, the tubercular and the nephritic, are capable of productive labor under proper conditions of employment. Only the manifestly unfit and the victims of communicable disease should be rejected, is a growing opinion among employment managers. The procurement of health and physical competency among working people requires that they be selected for and assigned to such jobs as they are or can be adapted to—with rejection a last resort.

The maintenance of a healthy, physically competent force of employees

requires that working conditions shall be such as to safeguard health and limb, that workmen shall have knowledge of how best to live and labor in compliance with the laws of health and safety, and that health and limb shall be restored as promptly and effectively as possible after impairments or disease have occurred.

The service of physicians, originally sought for the treatment of injured workers, has been found to be of use in the procurement and maintenance of healthy, physically competent working forces. Medical knowledge and skill are, therefore, welcome to industry, for anything that is capable of assistance in the stabilization and improvement of working forces is welcome. Because of this, medicine has come to be an important branch in the science of modern industrial management.

The physical examination is the means whereby physicians acquire the information they deem essential to the procurement and maintenance of healthy, physically competent working forces. It is consequently the basis of medical knowledge in industry and is fundamental to the successful practice of industrial medicine.

The scope of the examination should be broad enough to enable physicians to gather the information that is requisite. This means it should uncover defects and diseases that render employment hazardous to him who seeks it or to his fellow workmen. It should uncover imperfections that contribute to inefficiency. It should uncover diseases and substandard conditions of health. In short, the examination should be such as to divulge the true condition; it should be fairly comprehensive.

Although a complete physical examination, with blood pressure readings, urinalysis and other laboratory tests, is a desirable procedure to follow in industry, it is not always practical. In the first place, industry has not found it necessary except in unusual cases and, in the second place, industrial physicians are usually too pressed for time to investigate deeply. Experience has gradually evolved four grades of examination, depending upon the objective sought, which in turn is frequently fixed by the policy of the company immediately concerned. They are as follows:

1. *Superficial Inspection.* This consists of a hasty survey for obvious defects and apparent sickness. It considers height, weight, appearance, deformities, distance vision, hearing, hernia, and occasionally the heart and lungs (stethoscope applied outside of shirt). Its objective is *rejection* of the evidently unfit and *exclusion* of communicable diseases.

2. *Inspection.* This consists of a more complete survey. All parts of the body are exposed and their condition noted. Diagnostic instruments are used when in the opinion of the physician they are needed. This is practically an examination—without urinalysis and other laboratory tests. Its objective is *selection and assignment* of workers.

3. *Examination.* This consists of a reasonably complete survey of the body according to accepted methods, and includes blood pressure readings and urinalysis. It is virtually the same as the examination required by life insurance companies. Its objective is not only the selection and assignment of workers, but *their health supervision* as well.

4. *Special Examination.* This consists of all measures that are neces-

sary to a thorough study of the body, including intra-ocular observations, gastric analysis, proctoscopy, cystoscopy, x-ray interpretations, investigations of the nervous system, blood counts, etc. Very few industrial physicians are prepared to make such elaborate and painstaking examinations. Individuals needing them are usually referred to consultants.

The objective of the special examination is the *diagnosis* of obscure diseases and pathological conditions. It belongs rather to the realm of internal medicine than to industrial clinics.

Inasmuch as by far the greatest number of occasions for investigation into the physical state of industrial workers occur when they seek employment, the inspection would appear to be the most useful of the four grades. It has the advantage of gaining enough information to enable physicians to eliminate the manifestly unfit, if desired, and to advise intelligently in the assignment of others, and to do so with a minimum expenditure of time. Furthermore, it secures enough information for physicians to determine which individuals must have additional study, in the form of the examination or special examination, for the intelligent supervision of their health.

To exemplify the author's conception of the scope of examination or, more properly, the inspection, the routine in use at the Toledo plant of The National Malleable Castings Company is outlined as follows:

The worker is received fully clothed and remains standing until the feet are inspected. He is greeted in a friendly manner, and attempts are made to put him at ease if embarrassed or backward.

1. As he enters gait, carriage, and appearance are observed.
2. He is weighed and measured for height.
3. Vision, both near and far, are tested.
4. The right ear and right side of head and neck are inspected. While this is being done the hearing on that side is estimated by a question in a low voice.
5. This procedure is repeated on the left side.
6. The face is inspected; the condition of the eyes is noted by lifting and depressing the lids; the nares, the mouth and teeth, then also the throat and the anterior surface of the neck are observed. The worker is requested to remove all clothes from the waist up.
7. The chest is inspected and the condition of the heart and lungs estimated by percussion and auscultation.
8. The abdomen is inspected and the condition of the organs estimated by palpation and percussion.
9. The back is inspected and the posterior aspects of the lungs estimated by percussion and auscultation.
10. The spine is palpated and flexed.

The worker is requested to loosen his trousers and undergarments and let them fall down around the ankles.

11. The external genital organs and inguinal regions are inspected and palpated.
12. The sacroiliac articulations are examined and the anal region inspected.

13. All extremities are inspected, mobility of joints and condition of blood vessels being especially observed.

The worker is now requested to draw up his underclothing and trousers, after which he is directed to sit down and take off his shoes and socks.

14. The ankles and feet are inspected. If there is any doubt about the arches, impressions are taken.

15. Blood pressure readings are taken (optional).

16. A specimen of urine is obtained (optional).

The worker is now dismissed. During the inspection, as defects appear, the physician is expected to inform the worker of their presence and to give him such advice as may seem wise, an interpreter being used when needed. Special features are emphasized immediately before departure and further advice given if necessary to enable the worker to do his work without hazard to health.

In commenting upon this procedure, it may be said that inspections by this method may be made superficial or thorough, as desired, with minimum expenditures of time and effort. The inspection moves easily, without offense, from the exposed parts of the body to those the blunt exposure of which can prove embarrassing to the worker. It meets the requirements for job placement, and prepares the way for subsequent examinations essential to the supervision of health. When accompanied by appropriate advice, when the information obtained is properly used in assignments to work, and when those found defective are afterwards helped through medical and social service and continued advice—then the inspection contributes to the health, earning power, and peace of mind of the workers, and its scope may be regarded as being adequate.

In some establishments applicants for work enter the examining room stripped. If this can be done without offense, the physician's time may be thereby economized to the extent consumed in undressing and redressing. This is an advantage where large numbers are hired, but the tendency of physicians, speeding from one to another, is to slur the educational feature, which is of exceeding importance. On the contrary, if the doctor is forced to wait, he has the opportunity to discuss with the workers their conditions and therefore no real excuse for not doing so.

That which has been said applies to the inspection of men. The inspection of women is quite another matter and, although the same general plan may be followed, considerable tact and discretion must be used. The thoroughness of the inspection must frequently be dictated by discretion, and it is wisdom always to have a woman nurse present. Good judgment really indicates that women should be inspected by women physicians.

For the further exemplification of the author's conception of the scope of the inspection, a form which has been devised for recording the information is presented, as illustrated. This form has been evolved from experience in the physical inspection of school children, the inspection and examination of applicants for employment and, during the war from studies of industrial medical departments and the forms used in sixty-four of them. The form will not be described as, with the exception

of the code at the top, it is self-explanatory. The code, it may be said parenthetically, is a part of a plan in use at the Toledo plant of The

TM 273

REPORT OF PHYSICAL EXAMINATION

THE NATIONAL MALLEABLE CASTINGS CO., TOLEDO, OHIO

DATE

CHECK NO.	NAME	AGE	FINDINGS:												
			A	B	C	1	2	3	4	5	6	7	8	9	10
DATE OF EXAMINATION															
CLASSIFICATION															
EYES															
11 Defective Vision															
12 Old Injury															
13 Contagious															
14 Trachoma															
15 Interocular Nystagmus															
16															
EARS															
17 Wax in Ears															
18 Other Matter															
19 Deafness from Other Cause															
20															
NOSE															
21 Old Fracture															
22 Obstruction															
23															
THROAT AND MOUTH															
24 Pharyngitis															
25 Enlarged Tonsils															
26 New Growth															
27 Syphilis															
28															
TEETH															
29 Defective Teeth															
30 Malocclusion															
31															
TONGUE															
32 New Growth															
33 Syphilis															
34															
NECK															
35 Goiter															
36 New Growth															
37															
LUNGS															
38 Pulmonary T. B.															
39 Pleurisy															
40 Acute Bronchitis															
41 Asthma															
42 Emphysema															
43															
HEART															
44 Valvular Disease															
45 Myocarditis															
46															
ABDOMEN															
47 Enlarged Liver															
48 Enlarged Spleen															
49 Chronic Appendicitis															
50 Ventral Hernia															
51 New Growth															
52 Kidney Disease															
53															
54															
INGUINAL REGION															
55 Inguinal Hernia															
56 Inguinal Adhesions															
57															
GENITO-URINARY															
58 Chancres															
59 Venereal															
60 Hydrocele															
61 Undescended Testicle															
62 Epididymitis															
63 Gonorrhea															
64															
EXTREMITIES															
65 Old Fracture															
66 Old Mastoiditis															
67 Varicose Veins															
68 Ankylosed Joints															
69 Other Ankylosed Joints															
70 Wound Deformities															
71 Flat Feet															
72 Bunions															
73 Ingrowing Toe Nails															
74															
SCALDS															
75 Arsenic Poisoning															
76 Anemia															
77															
BLOOD PRESSURE															
78 Systolic															
79 Diastolic															
80															
SKIN															
81 Acne															
82 Eczema															
83 Psoriasis															
84 New Growth															
85 Syphilis															
86 Other Infectious Diseases															
87 Scars or Identification Marks															
88															
GENERAL															
89 Weight in Pounds															
90 Height															
91 General Appearance															
92															
URINALYSIS															
93 Sugar															
94 Albumen															
95 No G															
MISCELLANEOUS															
96															
97															
98															

NOTE:—USE V TO INDICATE DEFECTS THAT DO NOT REQUIRE MEDICAL MEASURES. X THAT REQUIRE MEDICAL MEASURES BUT DO NOT DISQUALIFY. D THAT DISQUALIFY. DESCRIBE X AND D ON OTHER SIDE, USING REFERENCE NUMBERS AND DIAGRAMS WHERE NECESSARY.

One side only of this form is here reproduced. Diagrams of the human figure with numbered sections are printed on reverse side of original form.

National Malleable Castings Company for determining the kind of operation an applicant for work is physically fitted; a description of this plan and an explanation of the code is not appropriate to this discussion. The principal advantages of the form are as follows:

1. It provides for specific mention of conditions most usually found providing also for the recording of unusual conditions.
2. It records finding practically in the order of inspection and indicates at a glance the side of the body involved.

3. It permits recording with a minimum of clerical effort.
4. It permits tabulations and compilation of reports with a minimum of medical knowledge and clerical effort.
5. It permits diagrammatic representations of abnormalities and amplified description of special features.
6. It permits the recording of three subsequent inspections in direct comparison with the original. And
7. It has a wide range of adaptability in the recording of information secured by means of any of the various grades of examination, except the special examination.

In the use of this form, the physician may himself register his observations or, better, he may memorize the numbers and indicate to his clerk the findings by their number. The latter method is of course quicker and easier for the doctor.

It will be said in closing that neither the procedure for physical inspection, as outlined, nor the form is regarded as final or conclusive or in any sense a finished product. Minor changes and additions are constantly being made in both, as experience indicates their need. They have been presented here today primarily for the purpose of exemplifying the author's conception of the scope of the physical examination in industry. It is hoped, however, that their presentation may stimulate this organization to take further steps toward the standardization of the examination and the form, and a promulgation of a better conception of the relation of the examination to industrial medicine and of that to the needs of industry and labor.

CHAIRMAN LAUFFER: Discussion on this paper and the papers to follow will be taken up in order at the conclusion of the four papers.

The next paper is that of Dr. D. L. Edsall on "The Industrial Clinic." In the unavoidable absence of Dr. Edsall this paper will be read by Dr. Harvey of the Crane Company of Chicago.

INDUSTRIAL CLINICS IN GENERAL HOSPITALS

DR. D. L. EDSALL

DEAN, HARVARD MEDICAL SCHOOL, CAMBRIDGE, MASS.

Clinics in industrial plants for the immediate care of injuries and medical ailments have become of undisputed value and laws are even being passed to require them. They need no argument now with those of open and educated mind and I have no need to discuss them as they are outside my personal field. The character and extent of the service that they will render may ultimately go far beyond what is now done in most plants, though this is of course a very debatable question, since it is by no means certainly desirable and because it conflicts with the established interests of medical practitioners. But however far this may progress, general hospitals will for an indefinite time to come, if not always, be the centers for groups of experts in the various clinical and laboratory lines that are now essential in the diagnosis and treatment of patients and in the study of problems of health. Individual industrial establish-

ments can scarcely be conceived of as having each within their own employ a group of leading men in all the various lines of clinical and scientific medicine. Hospitals, particularly those connected with medical schools and with the staffs that the latter have, will always therefore need to be centers for the study and treatment of difficult cases and for the investigation of problems, however far health establishments in industrial plants may progress.

At the present time, however, the general hospitals receive and they will long continue to receive not only complex cases but the every-day routine sort of case for ordinary diagnosis and treatment, and they have in their clientele all told a greater number of industrial workers than any other organized establishments for the care of the sick. In performing their simple daily round of duty then, as well as in acting as consultation centers, the hospitals can not give proper service unless they have on their staffs persons familiar with industrial hazards and their results who will be alert to recognize these and capable of determining their importance or insignificance in individual cases. Let us contrast this matter with others that are comparable.

STUDY OF HAZARDS OF INDUSTRY AND THEIR EFFECTS,
A DEFINITE TYPE OF WORK

No hospital is capable of giving what is now recognized as good diagnostic or therapeutic service to patients with infectious diseases for example unless it has available the men and the equipment for expert bacteriological work any more than it could give good surgical care without surgical equipment and expert surgeons. Although not a separate science like bacteriology but work based upon various sciences, the study and recognition of the hazards of industry and their effects is a clear-cut and well-defined type of work. Its problems are quite as definite as those of bacteriology and, while they are even more varied and complex, the nature of many of them and the method of attack upon them are clearer and in expert hands more likely to be successful.

The possibility of an industrial origin of health disturbances and the need of determining this point comes up too in the great bulk of the hospital clientele; in fact, its possible importance needs to be considered in a far larger number of cases than does any other health factor. In the first year that our industrial clinic at the Massachusetts General Hospital was so organized that it received the greater part at least of those patients who might be suffering from effects of industry and in whom this needed to be determined with care and through trained and intelligent inquiry over fifty-one hundred persons were sent to this clinic for investigation; of this number approximately one-tenth showed actual results of their work that were at least of noteworthy and often of dominating importance in explaining their ill health. In most of these instances the question could not have been settled, and in those in which there was a relation the relation would have been overlooked, had the investigation been done in the customary way by persons who had not accumulated interest in and extensive knowledge of the possible relations of the patient's

job to his illness. This is clearly shown in our experience in that time in lead poisoning.

EXPERIENCE IN LEAD POISONING

A special search was made for lead poisoning in all persons in whom careful inquiry showed any exposure to lead. Ordinarily the poisoning is looked for only when either the hazard is obvious and commonly known or the symptoms clearly suggest it. The difference in method had the result that the same number of lead cases were found in one year by special search as were diagnosed in five years by the ordinary methods and this in the same clientele coming from the same general line of industries.

A considerable trial of a special industrial clinic in a general hospital and of other less well-defined methods of attacking the problem of the relation of industry to general medicine has convinced me that no other method than a special clinic goes so far to insure good service to the patients and no other method so stimulates and enlightens the interest of the hospital staff in general in this important health factor. Likewise, by no other means is it possible to group the cases together in such manner that the results of study can be analyzed and made available, and in no other way does there occur such an accumulation and repetition of experience as to make evident and important problems that had been unrecognized or had seemed of little significance.

PAID STAFF NECESSARY

To be really useful and successful several things appear to be necessary. The clinic should be in charge of a physician whose greatest interest is in the work and he should be on sufficient salary to enable him to spend most or all of his time at the work. This is necessary in order that he may properly develop his clinic and may be free to make many visits to factories in order to accumulate constantly increasing knowledge of industrial processes and in order to determine day by day whether in doubtful cases seen in the clinic the work really explains a part or the whole of the effect upon health. Much of his time will be needed also in making studies in the clinic, in factories, and in the laboratory of the problems that are frequently suggested, and in this he will have many opportunities to keep occupied voluntary or paid assistants. Another essential element in the clinic's success will be a trained social worker who is familiar with factory conditions and industrial processes as well as with general social conditions. Through her, will be best handled many of the social details of the records and she will be able to investigate both home conditions and factory conditions in order to provide the essential knowledge of the relative bearing of the home and the factory upon the health of the patients. Such a small paid staff is necessary for success. From this it may easily be enlarged with voluntary or paid workers as occasion demands. Furthermore a method must be adopted which will make sure that all cases with interesting or suggestive industrial relations get to the clinic. It will not suffice to depend upon those in the medical, surgical, or other clinics for sufficient

interest to refer cases either spontaneously or upon request. They usually do not recognize the hazard or its relation to the patient and in the pressure of their work they frequently forget to send any that they do recognize.

We have with some success adopted the plan of having a social worker, who is sufficiently instructed in industrial hazards to serve in this way, stamp the cards of all new patients as they enter, if their occupations come within a list furnished her or if they otherwise seem interesting. Whatever other clinics they go to, they must when so designated go also to the industrial clinic before leaving. The other social workers in the various clinics are also instructed to send to the industrial clinic any cases showing points of interest in relation to industry. Cases that are primarily of industrial interest, especially certain groups that are being particularly studied in the industrial clinic, are transferred to that clinic for regular care; others are simply referred for diagnostic, therapeutic, or preventive advice while their management is continued in the other clinics.

Carried out consistently in this way the clinic will, in any large outpatient department, have abundance of material both to provide wide experience in industrial effects upon health and also for study of the problems that local industrial activities furnish. Some of these problems will be already known; some will become apparent from time to time as a large number of people pass through the clinic and the possible relation of a job to a disorder becomes emphasized by repeatedly meeting the possibility.

PRIMARY VALUE OF INDUSTRIAL CLINIC

The primary value of such a clinic has been, in my mind, the better care of the patients. Equally obvious are the opportunities for furnishing new knowledge and thus improving conditions through carefully planned studies and through accumulation of records and analysis of these.

Likewise important to a hospital that has relations with a medical school is the opportunity to train all students into an appreciation of the relations between varied industries and medicine, and to give special and detailed training to undergraduates or graduates who wish to become especially qualified in the medical service of industry. The latter students can be given thorough knowledge of a limited number of hazards through serving temporarily in one or more plants. In no other way, however, than in such a clinic, so far as I know, can they so well be given a comprehension of the extremely numerous and varied things they should be prepared for and then have opportunity to observe in factories a considerable number of types of these and the methods of controlling them. By serving with the staff in the industrial clinic, and in the factory visits that the work there leads the staff to, they get a wide general training in elementary knowledge of these things that would be otherwise obtained only slowly, laboriously, and unsystematically.

Beyond those mentioned, however, we have found other not unexpected sources of interest and helpfulness arising through the clinic.

Diagnoses made in individual cases or advice given to the patient have often been transmitted to the employer with the result that he has thereby first recognized the existence of that hazard in his plant or first seen how it may be controlled. Employers have frequently extended the advice to cover all those exposed, or have investigated conditions not previously studied, or have sought further advice from us or from others. This has been especially true of the small employer who has but slight or no health service in his establishment, but it has repeatedly occurred with large plants.

Labor unions have also at times come to us for health advice through some of their members having been in the clinic. Fairly and tactfully carried out, the relations with labor unions may be made very useful in furthering industrial health, among other reasons because a clinic in a general hospital is obviously not subject to the suspicion that the unions unhappily often have toward the health service in their own industry.

COÖPERATIVE STUDIES OF INDUSTRIAL HAZARDS

The largest possibilities of useful development lie, however, in the research that can be carried out if the clinic acts as a center for coördinating the problems that are unearthed in it with the health and technical departments of the industries on the one hand and the men and facilities on the other that are found in medical schools and hospitals. There are all told among these two groups and their equipment the possibilities of attacking all sorts of problems and not infrequently of solving them. Research developments that will control or do away with hazards are of course in the long run far more important than the diagnosis and treatment of a group of cases, important as the latter is. In the past several years coöperative studies of blood problems, problems in pure physiology, problems in metabolism or in biochemical matters, toxicologic problems, problems of general hygiene and sanitation, and others have appeared desirable as a consequence of observations in the hospital clinic. Some of these have been carried out with our colleagues in the medical school and hospital in spite of the heavy pressure of war conditions. Studies have also been made in co-operation with physicians in charge of large plants and several corporations, some of them very large, have offered the coöperation of any portion of their research departments in working out the technical industrial end or the engineering aspect of some hazard that observations in the clinic suggested the existence of. In this way as in most others our clinic as well as our whole method of attack upon industrial medicine, from the hospital or the academic standpoint, is really in its infancy but progress thus far seems to open a vista of real public service if the varied departments of hospitals and medical schools can develop cordial coöperative relations with the health departments and technical departments of industries. Unlimited possibilities of good results with satisfaction and credit to both sides seem open and the problems and the opportunities for interesting and serviceable work grow constantly as one studies the matter.

CHAIRMAN LAUFFER: It is unnecessary to introduce the next speaker Dr. Evans of Chicago who has previously addressed National Safety Council audiences. I take great pleasure in welcoming him to us.

HEALTH EDUCATION IN INDUSTRY

DR. W. A. EVANS, CHICAGO

In the fight against premature death and disablement due to accident, injury, and illness, progress is being made in certain directions but not in others. The bacterial diseases with the exception of pneumonia, bronchitis, and influenza have been very greatly decreased. The death rate of infant and older children from all causes has been greatly decreased. These two decreases have been considerable enough to lower greatly the death rate. Heart disease, Bright's disease, apoplexy, and diabetes have very materially increased.

We attempt to make a distinction between diseases due to habits and those due to customs. For instance, the bacterial diseases in the main are spread by community customs. The habits of the individual are of lesser importance than the mass habits called customs. On the other hand, in the case of diabetes the larger factor is the habit of the individual. While many flaws can be picked with this classification in the main it serves to make a useful distinction with a reasonable degree of accuracy.

Applying the rule we find that in the main the diseases which are on the increase are those due to faulty habit. Another line of division would be on the basis of organized effort at prevention. Applying this rule broadly we find that the improvements have been in that group where preventive effort has been made and the lack of improvement has been in those where there has been neglect.

When we come to study accident rates we find that there has been a tendency upward for fifty years. The fatal death rates from all external causes by decades in Chicago since 1867 have been:

1867-76	93.2	1897-06	106.3
1876-86	90.6	1907-16	120.8
1887-96	122.6		

The rates for 1917 and 1918 were 118.1 and 99.8 respectively.

SUGGESTED CHANGES IN CLASSIFICATION OF ACCIDENTS

In an effort to analyze these figures I have come to this conclusion. In the rearrangement of the classification of the causes of death it would be wise to divide external causes into those where there is intent to injure and those without intent. The former are not related to carelessness. In this group there should go suicides, homicides, and legal executions—Numbers 155, 155a, 155b, 155c, 155d, 156, 157, 158, 159, 160, 161, 162, 163, 177, 182, 183, 184, 186a—18 causes in the Bertillon classification responsible for more than one-quarter of the deaths due to external causes.

I suggest that when the next revision of the Bertillon classification is

being considered you be represented and that you endeavor to bring about such revisions in the nomenclature and classifications as will make it easier to marshal the facts relative to accidents. Also that you have proper governmental agencies collect and tabulate non-fatal accidents.

And now returning after the digression. We find that the tendency of rates for deaths from all causes to rise is due to a rise in the rates for homicides, suicides, and what have been termed public accidents, and that this rise has been enough or more than enough to compensate for the decrease in industrial accidents.

Between 1913 and 1917 the number of fatal accidents in industry fell from 25,000 to 22,000—an improvement of 12 per cent, and the number of serious accidents from 700,000 to 500,000, and the number of accidents serious enough to keep a man from work six weeks or more from 300,000 to 26,000—a fall of 26 per cent. This improvement was due to education of both employer and employee and the use of safer types of machinery.

During the last seven years the employer class has become greatly interested in accident prevention, the employee class moderately so, but the interest of the general public has lagged far behind. In 1917 of the 77,000 fatal accidents in the U. S. registration area 55,000 were outside of industrial plants. Of the 510 fatal accidents in St. Louis in 1917, 400 were outside of industry. Of the total death rate from all causes in the registration area of about 14 a little more than 1 or one-fourteenth of the whole is due to violence. In 1901-5 the violence rate was 101.7; in 1906-1910 it was 1.07. Since 1910 it has been: 1911, 1.04; 1912, 1.04; 1913, 1.08; 1914, 1.02; 1915, .99; 1916, 1.05.

Table showing number of employees' death rates from all causes, death rates from disease, and death rates from external causes among the employees of the Panama Canal Zone, 1906-1917 inclusive:

Year	Number of Employees	Death rate	Disease death rate	Death rate External Causes
1906.....	26,547	41.73	39.66	2.07
1907.....	39,238	28.74	25.44	4.30
1908.....	43,891	13.01	8.68	4.33
1909.....	47,167	10.64	7.55	3.09
1910.....	50,892	10.98	7.5	3.48
1911.....	48,876	11.02	7.65	3.38
1912.....	51,852	9.26	6.36	2.81
1913.....	56,654	8.35	5.24	3.11
1914.....	44,329	7.04	4.40	2.64
1915.....	34,785	5.77	4.05	1.72
1916.....	33,176	6.03	4.58	1.45
1917.....	32,589	7.09	5.74	1.35

Note the following points—

1. The personnel referred to were almost all adult males.
2. Negroes predominated.
3. The work was done largely out of doors with heavy machinery. The climate was unhealthy but the efforts to control disease were ex-

ceptional. (In none of the reports is there any stress put on accident prevention.)

4. The fatal accident rates of 1908 (4.33) and 1907 (4.30) were higher than the disease death rate of 1915 (4.05) and only 1.44 per 1,000 less than the death rate from all causes in 1916.
5. The death rate from disease after 1911 was exceedingly low.
6. The death rate from accidents was very high every year.
7. The improvement in the death rate from disease is far greater than the improvement in the fatal accident rate.
8. Dr. Gorgas explains that the very high death rate from disease in 1906 was due in greater part to an epidemic of pneumonia.
9. The rapid rise in the death rate due to external causes in 1907 he explains is due to more blasting and railroad work.
10. In 1906 he says there were 35 deaths among the white employees, of which 19 were from disease and 16 from violence.

As a side light showing the importance of fatal accidents in determining the total death rate I call your attention to the attached table. This table shows the death rates per 1,000 from disease and from accidents in the Canal Zone among employees between 1906 and 1917 and compares them with the fatal accident rate in the registration area in the United States. At one time the fatal accident rate in Panama was four and one-half times that in the United States. It is even yet one-third higher. The death rate from disease fell from a maximum of 40.5, thanks to intelligent, well supported effort. The very high fatal accident rate fell only from 4.52 to 1.35 minimum. I hope when we come to build another canal we will have an accident prevention policy comparable to the disease prevention policy employed when the Panama Canal was being dug.

After showing the steady decline of accidents in industry between 1913 and 1919 Payne says, "There is another story for public accidents or accidents occurring in the home, on the street, and generally outside of industrial establishments. There has been a marked growth in the number of this type of accidents in the past few years. The reason for this rapid increase in the number of public accidents while the industrial accidents have as rapidly declined is that industrial managers are thoroughly aroused to the necessity of accident prevention in their plants but the public in general is still unconscious of the significance of safety."

To bring about the desired ends it is not enough to inform and instruct. That does not go far enough. The habits of the people must be changed. Each person must not only know what practices are safe and what hazardous but he must apply it to himself. In the back of his head he must carry the thought constantly. While his mind runs in its proper grooves and his muscles are doing their customary work there must be a subconscious realization of hazards and an instantaneous response to stimuli of danger. It may be that a tendency to go about in an absentminded trance must be corrected or that a naturally poor incoordination and clumsiness must be overcome. This is the problem. How can it be solved? The solution when found is to be applied to the employer group including general managers, superintendents, and all bosses;

the employee group including all who feel no responsibility for others, and the general public. The employer group are very well informed but many are indifferent for one reason or another. At least many do not act at all and others act somewhat thoughtlessly. The employee group are less well informed and less interested. The general public are most in need of information and of interest.

Recently a great professor in a great university wrote as follows of personal hygiene, "Personal hygiene is not a subject that can be advanced by public meetings. It has to be worked out by (or with) each person individually." A good answer to this opinion appeared in the headlines of a daily paper issued about the time this letter was received. It read, "Dress designers call for larger hips this season. Checks and stripes and lots of yellows appear to be favorites."

When fashion decrees that hips are to be larger hips will be larger, or that checks, stripes, and lots of yellow are to be worn, you can bet they will be worn. It will scarcely be denied that fashion determines wearing apparel, clothes, shoes, the shape of the feet, in great measure the food and the methods of its preparation, and in some measure hours of sleep. Now no one will contend that fashion is worked out by or with each person individually. An impulse, and not infrequently a convention of the interested issues a decree and forthwith the civilized world obeys it. There is no other field where there is so little individuality, so little work by or with the individual.

All of the items specified in the above paragraph—clothes, shoes, food, sleeping hours—are matters of personal hygiene. Now personal hygiene is a matter of good habits on the one hand or bad ones on the other and so is safety work when viewed from the standpoint of the general public. Personal hygiene and accident prevention are cut from the same cloth. What I have said about personal hygiene applies to accident prevention. If there is no field for any but individual effort in personal hygiene the same holds true of accident prevention. On the other hand, if public work pronouncements, feats, discussions, newspaper articles, publicity can affect changes in matters of personal hygiene they can be effective in accident prevention.

I agree that the most effective method of education is by personal individual work. I am for it as strong as any one. But it has limitations which make it impossible as a solution of our difficulties. It is tedious, expensive, and requires too much machinery to be practicable as a means of meeting the whole situation. There are great possibilities for the group method even in educating adults. I propose to discuss some phases of some of the group methods.

EDUCATION OF ADULTS

Moving Pictures. This method of education is so well understood by you that I need not say much about it. Let me offer you this suggestion. Try one short run of lessons in a program of lighter stuff. When Health Commissioner of Chicago twelve years ago I found that evenings devoted to health talks and health pictures lost their pulling power, whereupon I

gest that in these articles suggestions of control and compulsion be minimized.

Speakers. Since so many foreign speaking people do not read, it might be well to employ some pensioners and disabled men as conversers, talkers—a functionary corresponding somewhat to the Jewish schnorrer. Go among the men and subtly talk the harmfulness of accidents. But the larger field for personal and oral presentation will be lectures and demonstrations. Many of you have made very efficient use of lectures illustrated and non-illustrated. Let me suggest that you vary your method occasionally by introducing a brief lecture unexpectedly into a program arranged on a basis of entertainment solely. Thus you will secure a little of the time and thought of the indifferent. Such a lecturer remembering the lack of interest of most of his audience will do well to speak briefly, epigrammatically, making use of catchy, easily-remembered phrases.

Still Life Pictures. On the market there are now several automatic projection machines. These can be used to advantage if their pictures and texts are frequently freshened and if the location of the machines are changed occasionally.

Talking Machines. Occasionally advantageous use can be made of talking machines. For instance, short talks by Judge Gary, Mr. Rockefeller, Lloyd George, President Wilson and the presidents of great corporations would prove effective.

Expositions, Museums, and Kindred Methods are of service in educating employers as museums of safety and other permanent exhibits such as the display in the rooms of the Illinois Labor Bureau. Hazardous machines with dangerous parts advantageously set in rest rooms.

So much for the education of adults—always a difficult thing to do, expensive and wasteful.

EDUCATION OF CHILDREN

The education of children is a far more satisfactory field. I have read with interest *Education in Accident Prevention* prepared by Dr. E. G. Payne upon request of the National Safety Council. It is a guide book for teachers. In other words it may be considered an excellent work for the education of teachers in the teaching of accident prevention. The U. S. Public Health Service and various state boards of health have prepared text-books on health subjects to take the place of ordinary readers. As I understand it none of these have ever come into very wide use. Teachers have explained to me that they must use the adopted text-books and no book agents ever attend the meeting of the adoption boards to secure the adoption of these free health readers. If you go into the text-book field there is but one way to do and that is to play the game as it is played. It might be advisable for you to consider coöperation with the health people in the production of readers, spellers, and other texts making use of such stories as you could furnish as material for the books.

There is a general agreement among teachers that teaching should deal more with the experiences of the day. Even first and second readers would be more interesting if they carried some experiences from the work

shop and the home rather than many of the stilted, far-away stories now carried. But when you get into this field, if you do, play the game as it is played.

Payne says while industrial accidents are limited very largely to adults, the same is not true of public accidents. In 1916, 10,534 children under 10 years of age in the registration area were killed by accidents with perhaps 250,000 others severely injured.

Discipline.—This is a good place to say that discipline is a most potent factor in the prevention of accidents. Childhood is the time to teach discipline.

Workmen's Compensation. Far and away the most potent educational influence of accident prevention was the passage of the workmen's compensation laws. The placing of accidents on an economic basis was directly responsible for much of the result. A great part of its effect came through creating a background for the National Safety Council and its superb educational work. Thus indirectly and directly workmen's compensation was responsible for the Safety First movement. Personally I would like to see the application of the same principle to prevention of accidents in fields other than in industry and the general prevention of disease.

CHAIRMAN LAUFFER: We will next be favored with an address by Dr. C. E. Ford of the General Chemical Company on "The Coördination of Industrial and Community Health Activities."

COORDINATION OF INDUSTRIAL AND COMMUNITY HEALTH ACTIVITIES

DR. C. E. FORD GENERAL CHEMICAL COMPANY, NEW YORK CITY

In the early history of medical work in industry the employment of a physician in a plant was considered an evidence of a benevolent attitude on the part of the employer. The protection secured against excessive costs resulting from accident and injury, the shortening of the period of disability, the relation of the doctor to relief agencies, and the doctor's value as an intermediary in industrial relations established more or less the value of the plant physician as a member of the Operating staff; and as a result of really meritorious work on the part of a few pioneers in the field, it became evident that pre-employment examinations, as well as periodic re-examinations, prolonged the usefulness of the employed, both to the industry and the individual, his family and therefore to society.

Probably the greatest opportunity for the promotion of the public health has arisen through the rapid development in industry of medical departments—manned as these departments should be by medical men giving their full time and thought to the conservation of human lives.

In the discussion of our subject, a review of the relationship of the public health department and the medical profession and through them the latter, the public, would seem, perhaps, profitable.

"Public Health" is a field which embraces sociology, engineering, chem-

istry, and bacteriology, as well as medicine, and the man with administrative gifts may have qualified for his post through any one of these allied sciences. The fact of a man being a competent physician does not make him a qualified health officer. Public health is a science and art in itself and peculiar to itself, the essential being that the official should have studied and practiced this science and art. If he be a medical man, his position, with the present professional view point, is strengthened with his profession and the public.

FUNCTIONS OF A HEALTH DEPARTMENT

A health department, in performing the functions imposed upon it by law, must reach, more or less directly, every person within its jurisdiction. The past generation has witnessed radical changes in the theory of preventive medicine. Officials are no longer permitted merely to meet emergencies as they arise. "Health promotion" has become more important than "disease prevention," and "disease prevention" has come to be more regarded than "disease suppression." The archaic policy of acting only in the development of emergency, of merely being ready to make the best of a bad situation in repairing damage after it has occurred, has been relegated to a less enlightened day. In carrying out its work of prevention, a health department must endeavor to arouse the interest and attention of individuals rather than of the masses or classes.

It has become axiomatic that the Government relation can only be as strong as the individuals who constitute it; but it must be borne in mind that public health is a matter for the state and the nation—not merely individual towns or cities, and the war experiences demonstrated that disability, preventable in character, is far more prevalent than we have been conscious or willing to admit.

IMPORTANCE OF PUBLICITY

An aggressive health department employs every possible means of publicity—the public press, as well as the other agencies of which I shall speak later—in an effort to maintain a personal contact. Unfortunately public health publicity costs money and to be obtained, must be paid for. The controllers of the public purse strings have not yet arisen to the importance of this function, and, excepting in the few instances in which private funds are available for the promotion and support of publicity, the endeavor has failed. The success or failure of any endeavor for the betterment of public health depends, to a great extent, upon the attitude of the medical profession. In the main, that attitude is sympathetic and encouraging. However, there have been measures of very decided public value involving principles of social and economic worth that have been so strongly opposed that their worth has been lost to the community. The canons and ethics of the medical profession provide that the first duty of the physician is to the individual, whereas in preventing diseases, the first duty is to the public.

Throughout a relatively brief but active relation with the medical profession it has been observed that the individual doctor has been so

occupied with the specific case that he has all too frequently permitted others to direct the social, economic, and professional adjustments that modern progress has made necessary. This notwithstanding that the professional interests and those of the public are identical and should be solved and applied only by a socially-minded medical leadership.

The present day is intolerant of isolation from affairs. With others the doctor must become active and not only support and direct actively but create those remedies for the ills of society with which he is or should be familiar. Unless medicine does this and makes apparent its group strength before the people, the people will all too frequently be victimized by the various cults and pseudo-medical interests that quickly grasp the importance of public control and especially with legislative and governmental interests.

Science has developed facts that have afforded remarkable opportunity for progress, but, in so doing, serious obligations have been imposed upon the doctor. Changes in health administration have, at times, been radical, perhaps revolutionary, but no more radical and no more revolutionary than the changes that have come to our scientific thought.

The modern health administration, in asking much is likewise giving much to the physician. The individualization of health work, instead of threatening the material interest of the doctor, actually benefits him in many ways. The more intimately the individual doctor becomes acquainted with the aims and purposes and underlying motives of the modern health department, the more valuable his influence becomes to the people of his community and the more useful the department becomes to him in the pursuit of his practice.

PERIODICAL PHYSICAL EXAMINATIONS

Health officials are now urging periodical physical examinations for all persons, as the means of detecting insidious organic diseases in their incipient and easily curable stages and while the medical profession may be called upon at certain times to render service gratuitous, or with small direct return, in such examinations for the purpose of education and demonstration, it is true that the establishment of this excellent custom is not only likely to save or prolong the lives of thousands, but in the ultimate brings largely increased returns to the physician. The more people think health and talk health, the more generally they seek medical counsel and guidance, consequently the more generally the physician is employed.

It is invariably true, whenever there are established anti-tuberculosis leagues, with their dispensaries, medical nursing service, together with the educational and publicity campaigns essential to their success, those medical men specializing in tuberculosis, as well as the general practitioner, have an increased clientele among those actually suffering from tuberculosis and seeking treatment for it, as well as those who came to think seriously of their own physical condition on account of the agitation of the subject. This is similarly true in communities in which campaigns against venereal diseases have been undertaken. In such communities the venereal specialist and general practitioner report an in-

creased demand for this service and, of course, this means that the uninformed have not sought the advice of the advertising or itinerant quack. This well illustrates the fact that that which is best for the people of the community and that which may be over-insistently urged upon them—redound, to the material advancement of the reputable physician.

The physical examination of school children with the discovery of the enormous amount of the heretofore regarded relatively harmless defects of the upper-air passages of the ears and mouth, have conferred enormous physical benefit to the community as well as the financial support of the medical man. This same helpful attitude is maintained by the diagnostic laboratory in their relation with the medical profession. While these laboratories are maintained for the benefit of the people as a whole, the service of the laboratory is rendered almost wholly through physicians.

Occasional specimens are received from laymen but the name of the attending physician always accompanies the specimen, and a report sent to the physician, and in practically every instance it is found that such specimens are sent with the advice of the doctor. In the case of Wassermann tests, it is doubtful if the laboratory ever received a specimen, except from the physician. This is similarly true of specimens from patients suspected to be suffering from diphtheria, typhoid, and the other communicable diseases.

In actual practice the laboratory is maintained wholly for the convenience of the medical man, saving the individual hours of labor and no inconsiderable outlay of money and if one may judge by the increasing demand for laboratory service, this convenience is becoming generally appreciated. On the other hand, the more general the medical profession engages in modern health activities in their own community, the more quickly they utilize the service of the staff of the several divisions of the department, the more constantly they employ the services of the laboratory for the exact diagnoses, the greater assistance they are rendering the Government in meeting its obligations to the people.

The closest possible relation should exist between the private or industrial physician and the public health official. Public health departments heretofore have been limited in their relations with individuals for the purpose of teaching personal hygiene.

THE INDUSTRIAL HEALTH DEPARTMENT

The industrial health department can be made the new and strong arm of the public health department in bringing about precaution in matters of health.

Morbidity statistics ~~not~~ now available may be secured, as well as organized assistance in times of epidemic.

The demand for this sort of service by the far-seeing executive, unappreciative of the necessary qualifications of a medical director capable of undertaking the responsibility, has led many medical men, the recent graduate, the unsuccessful or moderately so, into the field of industrial medicine; but until qualified men are created by university training or long and varied experience, the cause of industrial medicine, and in turn industry itself, will not obtain the largest measure of benefit.

It no longer suffices for an industrial organization of any size to employ a part-time physician who utilizes his job to pay office rent or automobile upkeep. The physician who considers accident work or casualty surgery as a mere "pot boiler" or "stop gap" for a period of financial stress will hardly prove ornamental to his profession.

To meet the present-day requirement of a medical director it seems that the following qualifications, in addition to a medical degree, are essential:

At least five years of general practice—in that a knowledge of man and his foibles may be acquired. During this period it is necessary that the future industrial physician should maintain a connection with the public health agencies, such as the city health department with its various dispensaries, the general dispensary, and other public medical service, in order to develop the social viewpoint as well as to broaden professional skill.

The industrial physician should have a knowledge of practice, not necessarily profound, of the fundamentals of industrial relations and these include—applied preventive medicine, medical and psychopathic medical investigation, recreation, accident prevention, and the methods leading thereto.

Knowledge of the special problems relating to the employment of women and children: some knowledge of pensions and insurance, including liability, group, and social; some knowledge of plant organization, which is likely to prove effective in dealing with the problems of labor.

Knowledge of employment methods; some notion of job analysis, physical and mental tests, to determine the fitness of applicants; knowledge of race problems, knowledge of industrial training, apprenticeship, continuation schools for training in particular jobs; at least some knowledge in relation to the cost of living according to local standards.

Knowledge of the hours of work in relation to fatigue and output; knowledge of shift systems, rest periods, regularity, absenteeism, etc.

At least a superficial knowledge of the security and continuity of employment in slack seasons, while convalescing from accident or disease, in case of labor-saving improvements, as well as with the advent of old age.

He should have a general knowledge of physical working conditions, safeguards, disagreeable gases and dusts; heating, lighting, ventilation, locker rooms, wash rooms, rest rooms, restaurants, hospitals, laundries, toilets, showers, plant beautification, drinking water. Of course he should be responsible for the physical examination of applicants and the periodic re-examination of employees, as well as the medical attention to families of employees when such is supplied.

He should have a very definite knowledge of housing, transportation, recreational and educational facilities; the transfer and replacement of misfits, or as has been said, "fitting the square peg to the round hole."

He should be familiar with the follow-up work, especially among new employees—with absenteeism and the injured: the replacements of injured and crippled employees.

He should have at least some knowledge of the athletic and social

activities, company stores, commissaries, the type of house suitable for economic administration and housing problems generally.

He should be familiar with labor turnover and its cost; designs and data for the construction and operation of hospitals, lunch rooms, neighborhood and community houses; general education and Americanization, together with a knowledge of broad methods of raising the standard of employees' living conditions and ideals.

In the foregoing I have perhaps wandered far afield with the object however of indicating that the medical man with a broad view and such knowledge, however general, will be of such great value to the organization and every person in it as to command the highest respect, wield a constant influence, find his post seeking him, and incidentally name his own salary.

With the broadening of concept a few plant service departments have extended this field by supplementing a series of lectures, or by other means, bringing attention to the various phases of preventive medicine, emphasizing their social and economic value.

That which has made America great in industry is her faculty of bringing together energies hitherto rambling and misdirected into a rounded concrete whole with largely amplified production.

The mainspring of production or success is individual action and not state action. Success is nothing more or less than opportunity for the individual. The enlightened business man of today sees clearly that the measure of his success is almost directly in proportion to the degree of opportunity his operation creates for others. But of what value is opportunity lacking its essential adjuvant?—the individual in good health.

In the U. S. there are 1,500,000 people constantly sick with preventable diseases, and 8,000,000 men between the ages of 18 and 45 are physically or mentally subnormal.

While most of us are born with good health we have but a brief existence before we carry within us, or are exposed without to the agency of our destruction.

COST OF PREVENTABLE ILLNESS

From a recent report by Irving Fisher of Yale we are informed that there are approximately 3,000,000 persons in the United States suffering from some form of sickness of whom 1,100,000 are in the working or productive period of life—three-fourth being actual workers who must lose at least \$700 per year, which aggregates \$550,000,000. The expense of medicine, medical attention, hospitals, extra food, etc., at least equals this amount. Thus we have a total cost of illness amounting to \$1,100,000—at least one-half of which is preventable.

The sick man is a burden to the community, while the well man is an asset.

Out of every hundred who are twenty-five years old today 36 will be dead at 65, 53 dependent upon relatives and charity, 6 self-supporting and only 5 well off.

It has been shown that of families dependent upon charity 77 per cent of the members were physically unfit.

A most effective method of reaching the employee and his family is through the house organ, which, if well edited, is a welcome visitor to the domestic circle of each employee. It is well, of course, that the printed column should be supplemented by presentations by the medical staff of the organization, who should reach groups of employees orally or directly as opportunity may offer by means of the stereopticon or the motion picture.

It has been my practice in lecturing to groups of employees and their families to discuss industrial medicine in accordance with the following scheme, closing the course by discussing problems and hazards peculiar to our own industry:

Physical examinations—their immediate and remote value; likening the human body to some well-known machine or device in the plant and demonstrating the analogy between the wornout and exhausted parts and the organs of the human body, emphasizing the vital importance of maintenance and repair.

This method can be readily applied to such organs as the kidneys, lungs, liver, circulatory apparatus, etc. The acute and chronic infections, whether of industrial or general origin, and their importance are pointed out.

The subject of personal hygiene is simply presented, utilizing the diseases or defects that have come to recent attention in the plant as a basis for illustration.

The subject of sanitation is presented systematically by following the plan of organization of modern health departments and their various divisions; for instance, the department of sanitation. The discussion includes the nuisances—sewerage and sewage disposal; garbage, its collection and disposal—domestic animals, flies, mosquitoes, etc., together with the importance of good housing and the effects of bad housing, and lodging houses.

The spot maps made by health departments indicating the highest tubercular, the highest communicable disease rates—excepting perhaps typhoid fever—the greatest juvenile delinquency, crime, drunkenness, and so on through the entire category of social ills, match exactly the spot maps indicating the greatest housing congestion.

RELATION OF CONGESTION TO DISEASE

Some years ago the Department of Health of this city, through Miss Chadsey, made a study of two districts, one being in the old crowded section of the city and the other in an outlying section—Newburgh way, which is composed largely of employees of the steel mills. Rents were practically the same.

In the first district in 1907 to 1914, there were 908 cases of tuberculosis recorded—52 per 1,000 of population. In the second there were 450 cases, or 28 per 1,000 of population.

In the first district, in 1912, there were 665 cases of communicable diseases, or 3 per 1,000. In the second, 286 cases, or 1.29 per 1,000 of population.

From the foregoing, little computation is required to definitely fix in dollars and cents the higher value of life in the uncongested section.

It must be borne in mind that a house is not a mere place for shelter. It must provide that which will promote efficiency in labor and strength of character and citizenship. The house connotes the family; the family and not the individual is the unit of our civic structure.

It is now well recognized that in the modern factory at least the employee is in better environment than in his own home. It seems the height of folly for industry to expend many times the per capita cost of health administration on the maintenance of healthful surroundings in the factory and permit the ostensible beneficiary to return to a home environment carrying the elements potent with destruction to the individual worker, his children, and posterity.

Under the head of communicable diseases—prevention, treatment, and a simple discussion of antitoxine, vaccines, their manufacture and use, the length and importance of quarantine, etc. Venereal infections and their effects are discussed freely, as they have come to be recognized as the most important of communicable diseases, heretofore shrouded in mystery and crime and not discussed with candor and intelligence. This subject almost always enlists and holds the attention of an audience. It is amazing that the average individual knows so little or nothing of the remote effects of venereal infection.

Tuberculosis presents a wide and interesting field. Its relation to housing, overcrowding, foods, hours of labor, fatigue, rest, sleep, etc. are pointed out.

In connection with child hygiene in addition to the child itself, prenatal care, reference to obstetrics, obstetrical procedure and infant feeding are discussed. The value of the medical examination of children is emphasized.

Industrial hygiene is intimately related to child hygiene, yet when children leave school and enter active life the health authorities lose sight of them. Industrial hygiene is an important feature in public health work and it is plainly the duty of some authority to supervise these young men and women during the early period of their industrial activity.

Under the heading of food and dairy inspection—the production, cooling, handling, shipping, storage and delivery of milk, together with the food value, the importance of bovine tuberculosis and the dangers of the insanitary market, together with the handling of food in the home, are referred to.

In connection with vital statistics, birth registration, and their importance, invariably attracts attention.

The laboratory affords opportunity for a simple discussion of culture taking and examination of diphtheria, typhoid, gonorrhea, syphilis, etc. These subjects always enlist the closest attention of an audience.

A description of the examination of water and its importance is also interesting.

These and other health-department activities presented even with haste

hold the attention of an audience for half to three-quarters of an hour and bring forth questions indicating not a little grasp of the subjects discussed.

Supplementing the lectures it is advisable to offer a motion picture show. Stereopticon and motion pictures appeal to shop employees and their families and large and appreciative audiences are readily obtained either in the shop or at meetings under the management of Employees' Associations which now exist among larger industries. Films are available from many sources. Our Government, in coöperation with other Governments, together with educational and industrial institutions, maintains at Washington a Bureau of Commercial Economics, which has a large series of films on most of the subjects of personal and public welfare. The various state and municipal Health Departments and practically all of the state and national organizations for promoting health have series of pictures presenting strongly dramatic appeals on the subjects having their attention.

The American Child Hygiene Association, the Social Hygiene Association, The National Tuberculosis Association, The American Medical Association, The National Housing Association, and others supply for a very modest cost sufficient material for a season of bi-weekly or monthly lectures.

A satisfactory series of lectures by the Works' physician is difficult for the reason that most of our present-day industrial surgeons in small plants are part-time employees having neither the disposition, qualifications, nor time to discuss community problems. Unfortunately again the physician is trained to individualism, seeing only the case and not viewing disease in its community aspect. His services are usually limited to advice to individual patients, and if interested and conscientious this service is of course valuable and to him is due the highest credit for the discharge of this responsibility. That there is an opportunity for the industrial physician to make a great contribution to the advancement of public health cannot be gainsaid. The work is clearly desirable; but at what cost and how shall it be brought about?

COST OF HEALTH SUPERVISION IN INDUSTRY

In 1916 the National Industrial Conference Board surveyed 99 leading industries in an endeavor to ascertain the cost of health supervision in industry. It was disclosed that the cost incident to the care of 495,544 employees was \$1,238,485 or \$2.50 per capita. The budget of the N. Y. Health Department is \$2,957,202.15, or in round figures, \$4,000,000. The population according to the Bureau of Census July 1, 1918, is 5,872,143, or roundly, 6,000,000. Hence it is that the per capita expenditure is about 67 cents.

The population of Cleveland in the same year was 810,306 and its Health Department expenditure slightly less than \$250,000, or somewhat over 30 cents per capita.

This lack of expenditure does not include however the maintenance of hospitals. If industry sees its way clear to make an outlay of \$2.50 per

employee, surely it is possible for the community to make a somewhat larger output and obtain returns wholly out of proportion to the sum expended by industry and that from the public funds.

It is clear, therefore, that there is an overlapping of effort with no inconsiderable waste of money. Experience has shown that there are three stages to the development of social movements: a period of agitation, a period of organization, and a period of final incorporation of the desired order of things.

CENTRALIZATION OF PUBLIC HEALTH EDUCATION

It is obviously the time for beginning an agitation having for its object the centralization of public health education and control in some centralized governmental authority. This organization might well stand sponsor for such a movement. It is unfortunate that the present scope of function of the U. S. Public Health Service could not include the Administration of Compensation Funds and other forms of social insurance likely to eventuate, which in accord with the claims of their advocates will react to the prevention of disease.

It is perhaps more courageous than discreet to suggest that business in its present attitude toward Government control, complete or partial, of social or economic function, pool its interest in a small group of the community with that of the community as a whole. Nevertheless, with the advantage demonstrated, executives are quick to respond to the demands of the period.

It would seem entirely feasible to consolidate the function of Compensation Commissions with that of National, state or municipal departments of health, or, if the principle of States rights interferes, it would be workable to bring about cooperation between the agencies with the point of contact resting upon the state department to the end that their respective functions be applied to a single or at least correlated effort that would make its impress on the whole community in the better understanding of the purpose and value of preventive medicine.

CHAIRMAN LAUFFER: This brings us to the consideration of the papers which we have been hearing this afternoon.

DISCUSSION

MR. S. D. HUMARD (Department of Health, New York City): In discussing the paper of Dr. Selby I wish to call particular attention to the opposition regarding physical examinations which exists in the ranks of labor. I understand that one of the planks in the platform of the steel strike relates specifically to the matter of physical examination. In the city of New York, owing to the compulsory requirements of the physical examination of bakers and the arbitrary exclusion of bakers from their occupation when the presence of a communicable disease is found such as tuberculosis or syphilis, it has reacted in a very unpleasant and unhappy manner. There is at present being put into effect a scheme of re-vocationalizing these individuals. Even in the tubercular cases, an open

air bakery is being contemplated. So that we will try to work a less degree of hardship, but I do believe that this organization should put itself as in favor of physical examinations, not with the idea of excluding a man from his chosen vocation, but of practically showing him how he can work to better advantage for himself, his family, his employer, to say nothing of the community.

MR. ROBINSON (California & Hawaii Sugar Refining Company): I would like to ask Dr. Selby what he considers a fair remuneration to a physician for making physical examination of employees—that is in the case of a plant which does not employ a physician regularly. Our employees are examined by a local physician, and at present our examination is very simple. It does not go into the details of a thorough examination by any means, and I have in contemplation the request for a more complete physical examination of employees, and in regard to that I would like to get an idea of what this examination is worth to the average physician. We employ an average of about 1400 men.

MR. J. S. KLOBBER (State Medical Board, Washington): The industries which have taken the van in this movement of physical examinations are skimming the cream. They are getting the physically fit men in their employment and they are profiting by it; but if this movement continues we shall have universal examination for employment, and just as sure as you live you are going to have a discard, a discard that is just as inevitable as the discard in a poker game, and those industries which are forced to draw from this discard will not think very much of that which they will draw.

A condition of the physical examination which places on record that condition of the man when he enters industry is one thing. There is a permanent partial disability in industry due to the breaking down of the constitution of the man just as clear as there is a permanent partial disability to industry by reason of the fact that dropping a man down an elevator shaft or chewing him up in some piece of machinery or doing the thousands of other things that he receives compensation for. If that man or that woman is broken down in the occupation incident to his employment the world says, "It is too bad;" the doctor says, "A case of nervous breakdown." We who view that subject from its intimate relation are regretful. The general public says, "Well, another one gone." But there is a liability attached to it on the part of industry, that condition which created that physical disability, and that must be met and made a component part of your examination.

DR. C. D. SELBY: I think there were two or three points brought up in connection with physical examination. One is the attitude of labor. I realize full well that labor is antagonistic to the physical examination, not the theory of physical examination but the way it is applied. They are not opposed to the physical examination for the purpose of determining the condition of their bodies and the use of the information so secured to their betterment, not at all. If they have any advantage coming to them because of the physical examination they accept it willingly and gladly. I maintain that the physical examination and the subsequent

supervision and assistance in the maintenance of health instruction, etc., is a right which labor has the privilege of demanding, and I think labor should demand it. As I said the examination is basic to industrial medicine. Industrial physicians cannot act intelligently in the supervision of health conditions and working conditions unless they have a knowledge of the facts as they exist in the bodies of the men working in those plants, and the only way that they can secure that information is by making the physical examination, but if that information is not used for those purposes, if it is used only for the purpose of rejecting unfit applicants for employment, certainly the physical examination is going to get into disrepute. I visited a number of large institutions during the war. Several of them gave up the physical examination. "Why, did you give up physical examination?" I asked them. "Because the only evident result that we saw from it was the exclusion of workers and we want workers." That was the only effect that those manufacturers saw from the physical examination. Now Ladies and Gentlemen, that was the fault of the medical profession. I say that the theory of examination is all right and it is acceptable to labor. If labor has not accepted it, it is the fault of the medical profession in applying the principle of physical examination—nothing else.

As to what a physician should be paid for his services in making physical examinations, that is a matter for the physician himself to determine. I cannot suggest anything further.

MR. M. C. GOODSPEED (General Electric Company, Erie, Pa.): I would like to comment on this question of rejection. You must reject for certain positions in order to protect a man against himself and to protect his fellow workmen against the man. You couldn't put a man subject to epileptic fits up into the air. You must protect him and the men underneath him. You must reject him for certain jobs but you can give him a job somewhere else.

CHAIRMAN LAUFFER: As this concludes the discussions, we will stand adjourned.

Adjournment.

SATURDAY MORNING SESSION

THE meeting was called to order at 10:00 A. M., Dr. Chas. A. Lauffer, Chairman, presiding.

CHAIRMAN LAUFFER: First in order of business, we will ask for the report of the Nominating Committee. Dr. Davis of Cleveland, Chairman:

REPORT OF NOMINATING COMMITTEE

DR. DAVIS: Your nominating committee has agreed upon the following names as officers of the Health Service Section:

Dr. W. I. Clark of the Norton Company, Worcester, Massachusetts, as Chairman.

Dr. A. W. Colcord, Carnegie Steel Company, as Vice Chairman.

Dr. William A. Sawyer, Eastman Kodak Company, as Secretary.

(On motion the report was accepted and the candidates elected.)

CHAIRMAN LAUFFER: Another item of business before the meeting concerns advance work along technical lines for the ensuing year. The gentleman who read the excellent paper on "Industrial Dermatoses" yesterday, suggested that a motion be passed by this section to the effect that a technical man, a specialist in skin diseases, be put on the committee at the home office of the National Safety Council, and that work along constructive lines be organized through industrial physicians and members of the American Medical Association, to the effect that something in the way of prevention and treatment be arranged for the reduction of industrial dermatoses. We have the assurance that members of the Dermatological Section of the Medical Association will assist us with their records and in every way enable us to find out what has been done in the way of protective coverings for the skin; what has been done in the way of rendering gloves impervious to chemicals by the use of protective measures so that what a committee of this sort would have to do would be largely to visit and coöperate with men in this special field.

The United States Department of Health has done a great deal of work along these lines but there are some things that have not been covered. One year devoted to a constructive program along this line, and another year to a constructive program along some other line, would be highly advantageous to industrial medicine. I think the matter is an important one, and I would like to hear from Dr. Clark.

REGARDING COMMITTEE ON INDUSTRIAL DERMATOSES

DR. CLARK: It would be extremely valuable for us to take things up in just this way. This is a real constructive piece of work which can be done. We all have experiences with dermatoses. I don't think there is any industry that hasn't at least the danger of furunculosis in its work and we go from that to various definite forms of poisoning which occur in special industries.

Now to be able to have some definite ideas along these lines, to be able to call on some central body for information and advice when we run into some definite problem, it seems to me would be of the greatest value to every one. I would like to see such a committee appointed and I would like to see an appropriation for such a committee to carry on its work where it would be in contact with men who would be able to give the best advice possible, and where you or I, or any one else can send in and get information and advice in regard to any perplexing problem along the dermatological line which may arise.

I have been very much interested in the question of cutting oils. We have had practically no trouble in the way of infection in hands and arms, except in a very few individuals who apparently do have a lowered resistance and do have these infections. About a year ago, I established a conference with my nurses and each nurse reports once a week in this conference the number of infections which we have had in clean wounds, and we haven't had any. But, we do have a certain number of these skin

infections around the forearms and hands which we can't say are due to the cutting oil, but may be due to other causes. Now the problem which arises is, how are we going to get the best way of finding out quickly whether our cutting oil is infected? What is the simplest method of finding that out? What should we do if we find the cutting oil is infected? What is the best method, the best and cheapest method of protecting our workers' hands and arms in case there may be some infection in the cutting oil? That simply gives an experience which we are all bound to have, and we can readily see how important the problem is.

THE CHAIRMAN: Could we hear from Mr. Williams of the National Safety Council staff?

MR. SIDNEY J. WILLIAMS: The Council does not want to start competition with any medical organization. Most of you remember the discussion about a year ago in Chicago about a combination of health organizations. We don't want to run counter to that. On the other hand, if this section thinks the line of inquiry which you would like to carry out would be a contribution in the general field of medical and health development, certainly the Council is very glad to have you do anything along that line that you wish. The sections in the Council have always been almost entirely self-governing. I don't clearly understand whether you have in mind principally the appointment of a paid man to work on this subject, or the appointment of a committee from among your own men best qualified on the subject, or both. Is it both, Dr. Clark?

DR. CLARK: My idea, sir, was to have a central individual, or group of individuals, as the case might be necessary, to whom any one could write any dermatological problem and who would be in position to answer him thoroughly, just as you would write to the Public Health Service, but they would probably not give you as good and clear information without special investigation. This man would be able to give you a quicker answer.

MR. WILLIAMS: Would that involve the addition of a man with medical education to the National Safety Council's staff to take care of this work?

DR. CLARK: I don't think it would be necessary to have a man; we could send that matter in to the National Safety Council and let them handle it as they saw fit, and, if there is enough work to justify hiring a man to take care of it, all right. If there isn't, they can handle it as they see fit.

MR. WILLIAMS: So far we haven't had any one on our staff with any medical training whatever. The health bulletins have been prepared by officers of the section, and we have simply issued them. I am sure I can say for the Council and the Executive Committee that they would look with great satisfaction on the appointment by you of a special committee on this subject, because that would be quite along the line of our general policy of collecting and disseminating information in connection with safety and health and allied problems in industry. I am sure also, that the head office will give at least some time, on the part of someone on its staff, to carrying out the detail, routine work outlined by that committee, in the way of writing for information and so on.

I am not sure that we could at this time appoint a full time man on the staff, because just at present we are spending every cent of our income. It is possible you might find some of the younger medical men in industry in Chicago that might be paid a couple of hundred dollars a year for a few hours of work a week.

Dr. Davis makes the very practical suggestion that this committee which you may appoint, should be able to meet in Chicago one or more times during the year, inasmuch as most of you are connected with industries and could make a trip like that occasionally. You could meet at our headquarters, and then we could make such arrangements as seem necessary to take care of the detail work. Dr. Clark as Chairman of the Section is ex-officio a member of our general Executive Committee and will attend its meetings as often as possible and represent the section.

DR. HARVEY (Crane Company, Chicago): I take it from the speaker yesterday that this plan didn't contemplate the hiring of a full time man; neither did it contemplate putting the National Safety Council to any great expense. It was merely to bring out the fact that there was a need of collecting data on the broad subject of industrial dermatoses, and, while it wouldn't be feasible to have joint committees from the National Safety Council and the American Medical Association and the American Association of Industrial Physicians, because they wouldn't do any work, still, as Mr. Williams said, a committee would take hold of the work and get in touch with these experts in skin diseases who would be glad to go over the data and analyze it and get out some good information for physicians in the industrial field. I can't see that there would be any great expense and it doesn't contemplate a physician and surgeon to be added to the staff.

CHAIRMAN LAUFFER: In order to bring it before the meeting will you recommend that the incoming president appoint a committee of three, with power to act?

DR. HARVEY: I make a motion that the incoming chairman of this section be instructed, and requested rather, to appoint a committee of three or five, to handle this broad subject of industrial dermatoses, co-operating with the Executive Committee of the National Safety Council, and other organizations interested in this subject, and report back, if possible, at the next annual meeting.

(The motion was seconded and carried.)

CHAIRMAN LAUFFER: Our first paper on "Malingering" will be presented by Dr. Judson C. Fisher of New York—Dr. Fisher.

MALINGERING—INVOLVING THE PROBLEM OF GETTING THE SICK OR INJURED EMPLOYEE BACK TO WORK

DR. JUDSON C. FISHER, SPECIALIST IN INDUSTRIAL INSURANCE,
NEW YORK CITY

Malingering may be defined as the conscious and deliberate feigning of illness or injury, or as the exaggeration of symptoms. Some comparative Zoölogists, after studying the animal kingdom, say that malingering is a

form of self preservation—an offshoot of fear. In the animals it is called instinct. If one stops to analyze the cases of malingering in respect to nationality, physiognomy, and mentality, there are evidences that this "instinct," as it were, is a real thing and a trait which supports Darwin's Theory of Evolution. History and Literature have recognized malingerers since the beginning of the world. The earliest instance known is recorded in Genesis, Chapter 31, Verse 35, where Rachel, in 1056 B. C. malingered in order to secrete the stolen idols of Laban. What boy in our day hasn't malingered in order to attend the ball game, carry water for the elephants, go fishing, or escape an unprepared lesson? While the problem is old, yet in these fast-moving days of industrial activity there are new aspects which must be considered. The various methods of malingering, the tests for its detection, and the training of the doctors for this special branch are food for other papers.

That admirable legislation known as the Workmen's Compensation Act, now operating in the majority of the states, has given us an opportunity to study closely the injured employee, and, where occupational diseases are included, has stimulated interest in the sick employee.

In justice to the workmen in general, I believe malingerers to be in the minority. The ideas brought out in this paper are for the purpose of detecting and curing an ulcer which causes the innocent to suffer, and by its cure will cause the honestly-disabled employee to receive all the honor, sympathy, and consideration due him.

The malingering employees may be roughly classed as:

- A. Dishonest employees who say little.
- B. Exaggerating employees who are less experienced and therefore voluble to make the most of their injuries.

"FAKIRS"

The dishonest employees or "fakirs" are those who have a slight or no accident or illness. They report an injury and become immediately disabled. The doctor finds little or nothing upon physical examination, but, willing to be always fair, gives the employee the benefit of the doubt and sends him home. His disability becomes total, and on account of "pain" he says he cannot work. If he has a slight cold he reports sick and says the pain in his chest keeps him from work. A physical examination shows no evidence of illness.

Where settlements are permitted, as among stevedores and longshoremen under the Admiralty Law, foreign labor is urged and often assisted to mangle by the "Tunners" or "shysters." Within the last three months I have seen the following malingering cases of this class:

1. B. C. age 38, Italian, married, was lightly hit by a draft of boxes and was supposed to have injured his left shoulder. He went to a doctor, who treated him every day. Physical examination three weeks from date of accident for the purpose of determining the extent of disability, showed marked inability to raise the left arm and, upon palpitation, a very tender shoulder joint. After various tests, no signs of fracture or changes in or about the joints were

discovered. There was a mottled blue area of skin about 4 inches in circumference over the shoulder. The "bruises" were superficial and not deep. Investigation confirmed the suspicion that these "bruises" were caused by some one sucking the skin of the shoulder, and making what the boys call "fox bite." Had the man had a real injury the settlement would have been in proportion and the "runner" would have had a larger fee. In this case the employee was dishonest and the "runner" tried to assist him to be more dishonest with the hope for greater benefits.

2. P. Q. age 46, Hebrew, married, claimed to be walking along a warehouse when he slipped on a banana peel. In trying to catch himself he bent backward and hit his head and the middle of his back upon some crates standing near. No one saw the accident, but a doctor strapped his back. When examined there was a blistered area of skin across the small of the back, which proved to have been made by a hot poker in order to fool the examining doctor. While his back was being examined, his clothes were dropped down about his ankles, and his hat placed upon the floor. During the examination he claimed inability to bend forward. Upon being left alone he was seen, through a peek slit from another room, to bend over, pull up his clothes and pick up his hat.

At present, in the investigation of the State Insurance Fund of New York, a regular school has been discovered where employees of the Fund coached injured employees to malingering so that they received higher awards than they were entitled to receive.

Flagrant malingering where the claimant is dishonest, unassisted, is seen as in the following cases:

1. M. N. German born, age 22, draughtsman, was injured in Niagara Falls. He claimed that while lifting one end of a drawing board he felt pain in both groins. Physical examination showed a large indirect inguinal hernia on both sides. He claimed never to have had a lump on either side before. He insisted upon operation by his New York family doctor and not the Insurance Company's doctor. His doctor used carbolic acid in mistake for novocaine, burned the skin from the boy's navel to his knees and he became sterile by the contraction of the scar tissue over the cords. Investigation showed that the drawing board weighed 12 pounds and his end, therefore, weighed 6 pounds. His could not have been a traumatic hernia. This malingering caused loss of services and money to the employer and much suffering with permanent disability for the malingerer.
2. M. M. was led in by a young girl. He stated he was 51, married, family in Italy, and had been burned in both eyes by live steam. He claimed to be able to distinguish light and dark only. External physical examination seemed to bear this out, except for the fact that his eyes quickly followed the dropping of a ring to where it rolled. While he was faced toward the window his coat was put on another chair, his hat hung in a darkened corner of the room,

and his glasses changed to another position of the desk and partially hid by a paper. His ability and agility in finding these objects while talking about compensation led to his claim being rejected.

3. A young man, formerly an acrobat, age 28, married, sprained his ankles while carrying a heavy chain. He returned to work in three weeks, compensation was paid and the case evidently closed. He apparently did the same and heavier work for nine months. Then he laid off and asked for a rehearing. Physical examination was negative, x-ray was negative, yet he held his feet almost rigid. Several doctors, including the Chief Surgeon of an Accident Board, could find no cause for his complaint that "the pain in his ankles was so bad he couldn't work." I couldn't elicit the usual evidences of pain, and finally had him kneel in a chair facing the back. His feet hung rigidly. Tapping the achilles tendons caused an unexpected free extension of the feet. This movement was not painful. This was one of the very few cases where I felt justified in testifying "this man has no pain." Despite the negative evidence the Board awarded compensation. Leaving the building the employee said to me "I guess I didn't talk up to them enough. S. told me that he talked up and was given \$3000 and I got less than \$1000." After the settlement he had no further need for his cane.

EXAGGERATION OF SYMPTOMS

The second class is composed of employees who have been ill or injured so that the evidences are present upon physical examination, and yet who claim to be unable to return to work. In these cases the physical examination shows exaggeration of symptoms. The men decide not to return to work until they are as "fit as the day they quit." This class may be divided into (1) those who are in the age group 25 to 40, and (2) those who are in the age group 55 to 75.

The age group from 25 to 40 contains many malingerers who desire time off because when idle they make more money as follows: J. C. belongs to several Lodges or Mutual Benefit Societies, whereby the total weekly benefits, including compensation, exceed the average weekly wage. His wife may also be working and adding her mite. In these days of high wages and comparatively low compensation benefits this class has fallen off in numbers, but in ordinary times these employees we always have with us. The men find it much easier to have free medical attention, to have high weekly benefits, and to be able to sit around and talk or read, than to have to work in order to earn the amount sufficient for their needs. This is especially so when the earning power is less productive than the benefits.

The age group from 55 to 75 years—the winter season of life—usually contains men who own a little property purchased with their savings, and have rent practically free. They have children who are married, and any at home usually contribute, so that the income from Compensation Boards, Lodges, and members of the family with an occasional

gratuity from the employer is more than sufficient to feed and clothe the family. These men are satisfied to sit around and talk and do the chores, but when it comes to work they claim inability of all sorts. A good example of this class resides in the city of Buffalo. His history is as follows:

K. K. age 62, married, no children, while working for his brother as a carpenter, fell a distance of 10 feet and landed on both heels. He fractured both heel bones. The injuries were promptly and properly treated. The slight swelling of the legs, common to inactive men of his age, appeared occasionally, and there was a slight deformity due to callous formation in the left heel. He was fitted with proper arch supports and shoes, baked and massaged, and after a period of total disability for 52 weeks, was told to return to work. The brother-employer was approached concerning re-employment of K. K. He said he thought K. K. should rest, and thereby prolonged the disability, because K. K. would "work for nobody but his brother." K. K. claimed pain in the muscles of his leg after standing a while, and pain in the bones of his feet at night. He refused to try to do anything. Five years after the accident the examination revealed nothing more than the usual results of this type of fracture. Investigation proved that he owned his home, did the chores, cut the grass, cared for his garden, hoed the potatoes, and yet exaggerated his symptoms, so that the Insurance Carrier has paid him \$15.00 per week for five years, with the prospect of paying him as long as he lives, and the chance of supporting the widow afterwards.

Statistics show that more employees malingering who are injured than those who are ill. This is probably due to the legal liability feature, therefore, we will deal with our problem of returning the employee to work, with a tendency toward the accident feature. Necessarily this will involve problems of workingmen's compensation administration.

If Health Insurance ever becomes law in this country the American people will be astonished at the days lost through illness in comparison with the days lost now. The curve will increase each year. This was demonstrated in Workmen's Compensation. The first year the law went into effect the insurance companies made money because the benefits were not understood. The next year the days lost increased and have been increasing in numbers each year.

PROBLEM OF RETURNING A MALINGERER TO WORK

The problem of returning the injured or sick malingerer should be attacked as the medical profession attacks diseases. The premise is that the disease is present. To treat it properly there must be a knowledge of the causes, the symptoms and signs of the illness itself, and the cure by (1) preventative measures, so that others will not be afflicted, and (2) the treatment of the diseased one by eradication of the symptoms.

A. As to the premise there is no argument. No sane person doubts its existence.

B. The causes of malingering:

These are many, and because of their importance in treatment they should be mentioned in order.

1. *The Employee.*

Starting with the malingeringer himself we must consider him as to his

Among foreign elements all ages tend to exaggerate and malingering. ability to endure would result in a far less malingering in proportion especially the Latin races. The American youth, except in rare instances, wants to be back at work as soon as possible. His future is before him. About 50 years of age man begins to consider work as a means of existence and takes pride in his past achievements. He begins to feel that society owes him a rest and a pension, and exaggerates accordingly. Some older men, with the pride of years of service behind them, will drag themselves to work if possible that their record may not be broken. Men with such spirit are the real heroes of labor. Unfortunately human nature seeks rest as the sun of life sinks.

The influx of women workers during the world war has been too recent for reliable statistics. It would seem, however, that their ambition and ability to endure would result in far less malingering in proportion than among the male sex.

The less educated, the lazier men become. Conversely, as the mind improves its status so does the malingering become lessened. There seems to arise an ambition which refuses to be downed by ill luck. Therefore, lack of education is recognized as a cause of malingering.

The mental attitude of the employee is interesting on account of the motives discovered. (a) He may be revengeful and feel that his employer owes him more than the law provides, or that the prolongation of disability will tend to get even with the employer for some real or fancied wrongs. (b) He may be ambitious for attention, sympathy, and alms. All clinics have those who make regular rounds year after year. The Hospital Charity Organization Societies, Churches, Lodges, and various benevolent societies know this type well. (c) He may be defective mentally, and that type includes the fanatics, the convulsionists, the hystericals, imitators, and manic-depressive cases.

2. *The Employer.*

Employers may be divided into two classes for our purpose. (a) One class is composed of those who are too generous. They pay full wages for time lost irrespective of compensation laws. In some few cases this would be extremely gracious and well deserved, but the temptation of nature to prolong disability is too strong in the vast majority of cases. (b) The other class is just as close and indifferent as possible. While I was trying to induce a president of a large concern to introduce a sanitary lunch room, hospital, and first-aid organization, he said "Why should I try to make it pleasant and safe for those fellows aside from my question of rate? The whole 5000 would walk out tomorrow and not think about me if an agitator trumped up some fancied wrong." Had he paid more attention to the men's comforts, organized safety-first units, learned a few men's names, dropped a smile or word of commendation

here and there, or built up a brotherhood among the employees, there would be little economic loss through malingering. Personal interest properly exercised breeds loyalty among employees that even instinct can't abuse very much. Keeping the employees informed as to statistics of work in past years for comparison, and accident frequency with loss in terms of sick or injured days, will go far to arouse an unbeatable pride in the workmen's heart. A lack of interest on the part of the employer means a lack of proper follow-up methods and does much to favor malingering.

3. *The Industrial Accident Boards.*

These foster malingering by (a) having no facilities for quick hearings in malingering cases as soon as detected. In some states it takes from 2 to 6 weeks to have a case appear on the calendar after application for hearing has been made. If detected, the malingerer knows he will be given consideration at least to the date of the hearings, which gives him added weeks of benefits, which he otherwise would not receive. (b) Urging legislation, raising the amount of compensation indiscriminately. The man with a sore finger can do work of some kind where the man with a broken leg could not get out to look for it. The helplessness of the latter requires greater expenditures and should have a higher rate. In other words, a scale depending upon the degree of disability should be chosen. The simpler the injury, or the undue prolongation of an accident in like proportion, calls for less in benefits. The most worthy should be entitled to the maximum benefits. Malingering is fostered by high benefits. (c) Mixing politics and sentiment with business. Very few appearing before various state boards have not seen an elaborate staging of a case with relatives for supporting parts, in order to sway the Board, and the subsequent sympathy cause a ruling not upheld by the higher courts. Many have seen union cards and political affiliations worked to the limit, because the Law says that the Board shall be the sole judge of fact. With proper "introductions" the malingerer is confident that the Board may be generous. (d) Failure to prosecute perjurers or malingerers when so proven. This freedom from prosecution is a source of comfort to the malingerer. What has he to lose? (e) Failure to have a competent medical member of the Commission, whose duty would be to arbitrate all medical cases. He would weigh the opinion of the Chief Medical Examiner against the testimony of the Insurance Company's doctor, or the claimant's doctor. Malingerers could not then trust to the ignorance of a lay mind concerning the importance of the medical problems involved, or the symptoms presented.

4. *The Medical Profession, sad to relate, contributes much toward malingering.*

(a) Family doctors depend upon the families and their friends for their practice. They feel they can't afford to get on the wrong side of any fence, consequently the malingerer preys on them for certificates of extended disability which the doctor can later usually back up with some kind of opinion. (b) Lodge and Society doctors are in the same class and their reappointment the following year depends on the vote of the

Lodge. These doctors rarely perjure themselves for a few dollars, but they will stretch the truth. Malingerers get certificates comparatively easy from such men. (c) The shyster doctor, as well as lawyer, we have with us. To such the truth means nothing and they trust to their personality to convince lay Board members of a fearful and wonderful condition in the claimant. This type of doctor has his "price." (d) Incompetent doctors treating all manner of cases prolong and sometimes provoke disability unduly, and discourage the injured or sick. Thus they encourage malingering.

5. *The "Third Party."*

The so-called friendly enemy or runner who learns a few symptoms of disability and how to produce them artificially in some cases. This party, plus a natural malingerer, makes a hard combination to beat. The runner is after his percentage and the higher the cost to the employer, the greater his profits.

C. The detection and methods of detection of the signs and symptoms of malingering will be left to the Industrial Surgeon or Specialist in malingering. Suffice to say that the diseases having been proven present, we next consider the

D. Treatment.

1. *Prevention or prophylaxis.*

This consists chiefly in correcting or removing the causes.

As for the employee; pension the faithful employees before they are added to the industrial scrap heap, stimulate pride in men to outdo the women in stick-to-it-iveness. Educate them at least to an awakening interest; determine the mental attitude by physical and social examination before employment and eliminate the mentally unfit. The moral and physical hazard of those employees in daily contact would be greatly increased if defectives were allowed on duty.

The employer should be kind, gentle, courteous, and jolly, but firm and not unwisely generous. He should make the employees feel it is their business also, and each man is a spoke in the wheel which will not run smoothly if a spoke is missing. He should advocate employees' clubs, comforts, and organizations, and encourage them with his occasional personal supervision.

The Industrial Boards should have one-day emergency calendars presided over by a commissioner who is a competent surgeon and specialist in malingering; a fair scale of benefits so that the worthy receive their due; a high sense of honor as custodians of hundreds of thousands of dollars of employers' moneys; an understanding that politics and sentiment must be minimized in relation to business and the law, and the prosecution or assisting the district attorney to prosecute all malingerers and perjurers so proven.

The Medical Profession will from now on contain trained industrial surgeons. Progressive colleges are beginning the courses. These should supplant the family, lodge, society, shyster or incompetent doctor. These surgeons should be supported by industry but not subservient to it.

The Boards and Employers should refuse to discuss a case wherein there was a runner or shyster lawyer. These vultures prey upon the

laborer's ignorance of his rights under the law and demand a percentage of that to which the Law says he is entitled. There is no need for the runner and he should be eliminated.

2. *The active treatment of Malingering.*

The problem resolves itself into the fact that these employees are lingering and loitering on the threshold of industry. How best to encourage their voluntary return?

(a) Starting at the beginning of employment the application blank should have these questions on it:

- (1) Have you had any previous accidents? Explain.
- (2) Have you had any previous illnesses? Explain.
- (3) Are you now in good health?

A malingerer is not necessarily a *good* liar, for a good liar remembers his previous story.

(b) There should be a careful physical examination before employment. Defects can be noted so that minor injuries cannot be amplified.

(c) Accidents or illnesses must be reported by some one within 12 to 24 hours after occurrence or they cannot be considered. Employers should be protected by the law in this. A physician makes an immediate examination and controls the case, then a smashed finger at home can't be charged to industry; a gonorrhoeal joint can't be referred to a strain two weeks previous; lumbago can't be called sprain at work. Of course where eye particles give trouble next day, or infection sets in three days after a scratch there are definite signs of presumptive injury while at work.

(d) *Proper Organization.*

- (1) Chief Surgeon. A trained industrial surgeon who has specialized in malingering. He should have a pleasant and forceful manner, be a business man and well read. He must have a convincing manner on the stand and have tact.
- (2) Assistants, as many as necessary, to treat all injured men immediately upon report of accident or illness, and to make thorough examinations before employment and at any time where necessary.
- (3) Nurses who can pleasantly jolly a malingerer, and if possible shame him into going back to work.
- (4) One or more social service nurses, male or female, to check up and investigate any suspicious actions or questionable testimony. These nurses should have a claim training so that they know a few details which they could attend to when necessary.

(e) *Proper System.*

A system to lessen malingering could be used as follows:—

As soon as an employee reports ill or injured he has prompt attention by a doctor. The doctor's report, estimate of disability and history of the case seen the previous day, is filed every morning. The employment card is attached to his history and physical examination card and becomes

part of it. These cards or files go to a doctor for comparison. If the case looks legitimate the treatment continues until disability from that illness or injury ceases. The file then is placed back in the filing system and the case closed. If the case looks questionable the facts are investigated by the social service department and action taken accordingly.

If the claimant later tries to reopen his case claiming all sorts of symptoms, he can be confronted with his previous well-kept record.

If disability lasts over four weeks the case automatically goes out of the assistant's hands until the Chief Surgeon shall have made an examination and report. The Chief's word is final—the man goes to work or receives further treatment—general, operative, or reconstructive. This gives also the advantage of the Chief Surgeon being able to watch the work of his assistants. At any time an employee is thought to be malingering the report should be made confidentially to the Chief Surgeon.

The scheme may be expanded into the realms of state medicine. It may also grow into a clearing house for information concerning dishonest employees, such as the life and accident and health companies support. When an employee is dishonest to the point of malingering he should be known, that the honest employees be not made to suffer by his actions. This would reduce the number of so-called "traumatic hernias" alone, so that the saving in this one type would pay for the bureau.

This scheme is also applicable to any group of employers or insurance carriers in any one city where the individual system might be too expensive for any one employer.

(f) Proper punishment.

A firm hand by the Industrial Boards in dealing with malingerers is essential. It matters not whether benefits are cut off on the date the employee should have shown his good will and attempted to resume some work upon the physician's advice, or the knowledge that detection of malingering will certainly be punished by the Boards or Courts—the employee who is faking will fear the consequences. Fear goes a great way to keep people straight who otherwise might be intentional malingerers. This fraud is the meanest of all and should be severely dealt with.

(g) Expert Diagnosticians.

This group would include a well-paid Medical Commissioner, skilled in industrial medicine and surgery and in the detection of malingering, and well-paid Chief Medical Examiners.

Employees may have their own opinions, but they cannot seem to learn that working, after certain disabilities, will do more for them than medicines or treatment in hastening a cure. The difference between the patient visiting his own doctor and being examined by the Commission's Expert is that in the former case the patient seeks advice, while in the latter case the patient squeezes symptoms to fit the condition. The former doctor is perhaps biased. The Expert is unbiased, and while giving the employee the benefit of the doubt, he is an administrator of justice to all, especially that great class of honest employees who say "I don't want anything for myself. I want a good body and to get back on the job."

The Expert should be acquainted with industrial conditions so that his judgment as to a finger injury would be fair to a tailor, or watch-

maker, while the same injury would be less disabling to a foreman or driver, and the return to work order should accordingly be influenced.

The Expert should study the individual and know character. He should know when to agree with dishonest complaints and when not to agree.

He should have a fair knowledge of decisions of State Boards and Courts in various types of cases, as his questions and the answers thereto may prove of great value to the Commission in legally interpreting a malingerer's statement.

Finally, he should have a thorough knowledge of pathology. This is essential to account for many of the symptoms alleged by a malingerer. It is of untold value in the hundreds of tests to check malingerers. That is something of which the malingerer knows nothing. This will stop the testimony of unscrupulous doctors concerning a wonderful pathological condition, purely invented in the hope that the lay members of the Board will give the patient the benefits.

CONCLUSIONS

In attempting to recognize the disease, investigate the causes, and treat the condition, there has been one point in view—that of returning the sick or injured employees who tend to mangle, to work in the shortest time consistent with good recovery. This saves an economic loss to the employer and protects the honestly-disabled employee, who by reason of his honesty should profit in proportion as the malingerer should suffer. The American spirit is justice for all. Stress has been laid on well-trained industrial surgeons. This is because in my opinion few mistakes could be more serious or do more real harm than to stigmatize an honest man a malingerer. It is possible by proper methods to prove malingering. At the point of doubt the Medical Commissioner is essential and his opinion should prevail on all medical questions. A number of malingerers get surprisingly well before they will be examined by the Chief Surgeon or, Medical Commissioner.

The malingerers cause the medical profession making impartial examinations to view any case with suspicion until proven innocent. If we can minimize the number of malingerers we shall have done much for the honest sufferer. We shall also save the toiler from moral degradation which follows misspent time and unearned income. The detection of malingering is a highly specialized branch of medicine. for by it society pays its just debts, fraudulent claims against innocent parties are prevented, and industry receives back the men as useful members instead of their being leeches on society.

CHAIRMAN LAUFFER: In the absence of Dr. Hambrecht, Chairman of the Industrial Commission of Wisconsin, who was to open the discussion. Dr. H. F. Kollenberger, of East St. Louis, who has given a great deal of attention to the element of play in restoring the unconscious malingerer, will address us. Is Dr. Kollenberger present?

Dr. Kollenberger has done work in connection with the Y. M. C. A. and the Army, and has found that men playing ball, and doing various exercises, mere play, have unconsciously exercised the joints of their

backs and enabled themselves to bend and execute movements that they had before thought impossible. A person can do often as a matter of play, what he is unwilling or unable to do as a matter of work.

Dr. Kollenberger is not here. I would be very glad to hear from somebody on the subject of malingering. The question has been admirably opened for discussion.

DISCUSSION

DR. HOLTZ (Pittsburgh): I hesitate to comment on Dr. Fisher's admirable paper, however, he made one or two points which I would like to discuss. There is one point I would like to challenge rather mildly, that is reference to the greater amount of malingering being found in the foreign born, or the persons of low mentality. It has been my experience, in a few cases of malingering I have run across, that the malingerers have been of rather high mentality and shrewd. I don't believe that the successful malingerer can be classed among those of low mentality.

In the matter of getting injured employees back to work as quickly as possible, I have found that carrying into civil industry the practices of some of the things we did in the army are very beneficial. Such, for example, as those severe hospital cases that have been disabled for a number of months. Heretofore it was our experience, and it is possibly rather common, that the severely injured employee easily becomes hospitalized and forgets how to work. Quite recently we have had some pleasing results in applying the modified methods of vocational training or education, if we call it that. These cases in the hospital, if they can't use their hands, we try to have them use their feet. If they can't use their feet we try to have them use their hands. We try to have them do something that occupies their mind and we find at the end of their convalescence they haven't forgotten how to work, and we get them back on the job much more easily than we did before.

CHAIRMAN LAUFFER: Dr. Kollenberger has just come in. Might we hear from you about your work, Doctor?

DR. KOLLENBERGER: In the army, in dealing with the wounded soldiers, we found that the men who came back to us wounded needed many times mental treatment. We found also some of them, if there is such a thing as unconscious malingering, could do things if they would. So, we try to supplement the work of the surgeons in the treatment. We did our work rather through play activities for these wounded men.

I will be just as brief as possible because I know you are crowded here. We found this, and I think you will recognize the point, that when a man is being massaged and is given the various types of treatment his mind is focused on his injury and the poor fellow is wondering if he is ever going to get well. He knows the thing we call "hero stuff" is soon over, and he is up against it. So, we started a plan of play activities so it would give them the exact exercise needed with his mind focused off his injury.

For instance, playing ball. I happen to have this glove with me. Here is a simple glove, with straps to flex each finger and here is a man who

has been shot in the arm, or who has an injured elbow. Men have come to us who have had their arms in casts for six months; the elbow rigid, the fingers stiff. Now what can be done with that man to get his mind focused on some recreation? Well, we got a glove like this. The arms of some of these men were so weak they couldn't hold them up, and they would have to grasp the wrist with the other hand to punch a bag. In a few weeks' time we could put a tennis racket in the man's hand, strapped it on and then have another man opposite him with a tether ball. A tether ball is a ball attached to a string and a stick on the other end of the string. The injured man would try to hit that ball, he had forgotten all about his wrist and his injury, and he would hit that ball and try to wind the thing up on the other fellow. He would play for probably ten or fifteen minutes. You can readily see what would happen, the range of motion would be increased, he unconsciously contracted those muscles in there. If there is any break in the continuity of the nervous system they would not contract.

There was one man put this glove on his hand for the first time and played for about ten minutes, and the glove was taken off. It was quite warm and sweaty and he started to close his fingers, and as he closed them his eyes bulged, because he had never been able to close his fingers as much as that before, and in fifteen minutes he was able to move his fingers.

The thing is this, I have in mind that while there are a great number of tests to discover unconscious malingerers they sometimes discover themselves. They will stoop for a ball, or drop their crutches without thinking. If we can do this for the men who have been injured in our armies, isn't there a great possibility to serve these men who have been injured in our industries? It is a new field and I wish I had time to tell you of our other experiences, they all open up new ways of helping our men.

CHAIRMAN LAUFFER: The next paper is "The Treatment of Burns," by Dr. Clark.

DR. W. I. CLARK: I have a great deal of hesitation in reading this paper. When I was asked by the Chairman to read a paper on burns, I felt a good deal of reluctance in accepting because some of the men in industrial medicine see a great many more burns than I do. I think really a paper on burns should be read by a man who is in one of the steel industries, or some industry where the burn hazard is a very large one. However, from my small experience in burns I have worked out a few ideas, a sort of resumé of the whole subject which I hope will lead to a very active discussion. It is simply to provoke this discussion that I am reading this paper. It is a short one, so you will have plenty of time for discussion.

TREATMENT OF BURNS

DR. W. I. CLARK, JR., NORTON COMPANY, WORCESTER, MASS.

Moorhead, in his *Traumatic Surgery*,¹ published in 1917, writing of burns says: "Practically speaking, they should all be regarded and treated as infected wounds due to heat."

¹Morehead, John J., *Traumatic Surgery*, 1917, p. 616.

Colcord² in a most careful discussion of burns and their treatment says of a visit to a hospital where there were many burned cases: "Every burned surface was covered with pus and the smell was disgusting. Many writers speak of the absorption of pus from suppurating burns as a frequent cause of death."

Why is it that burns tend to run a septic course? The heat which is sufficient to kill the cells of the skin layers in a third degree burn should certainly be strong enough to destroy microorganisms upon this skin and it undoubtedly does. Thus a burn is an injury to one or more layers of the skin resulting in death of the exposed tissues and readily infected either direct from without or from the neighboring unburned skin.

Therefore if we can keep a burn sterile it should, after the separation of the slough, become a clean granulating wound and follow the same course as other wounds of this type.

While epithelium will grow on an infected surface its growth is slow and unsatisfactory as compared with its growth over a sterile surface.

It is exceedingly difficult to maintain sterility in a burn of any magnitude. Even with the greatest care any wound which is frequently dressed becomes infected and this is particularly likely to occur when a mass of dead and partially devitalized tissue is the type being treated.

In considering the treatment of a burn we have to consider two things, the treatment of the burned individual and the treatment of the local condition, the part burned.

The treatment first should be directly for the burned individual. The conditions to be combatted are shock and nephritis. Secondary conditions such as fever and pulse rise with meningeal symptoms, vomiting and diarrhoea, and sometimes symptoms of gastric or duodenal ulcer may appear as a result of thrombosis and toxic absorption from the local burned area. These must be met as they arise.

The order of treatment is as follows:

1. Put the patient to bed in a warm room with hot water bags to feet
 2. In removing the clothes, cut around burned areas being careful not to tear the clothes from the skin and cause additional trauma and avenues for infection.
 3. Protect the burned areas thus exposed by covering with sterile towels or sheets.
 4. Give patient $\frac{1}{4}$ gr. morphine with 1/100 gr. atrophine by hypo. Repeat with caution if necessary.
- Morphine is a stimulating narcotic and if used carefully can be employed to combat the shock without risk.
5. As soon as possible start a Murphy drip in order to combat shock and supply fluids to the kidneys.
 6. When patient's condition begins to improve start treatment of the local burned area.

The local treatment of a burn is practically the same for first degree, second degree, and third degree burns. One or all types may occur in any case.

²Colcord, A. W., *International Journal, Surgery*, May, 1919.

FIRST DEGREE BURN

The first degree burn involves only the outer layer of the skin, there are no blebs following and no scarring results. The first, last, and only treatment needed in this type of burn is to powder freely with powdered stearate of zinc. When this type merges into second or third degree burns in the neighborhood the whole area had best be treated with a solution dressing. Before this is applied, however, a careful cleansing of the skin with a mild antiseptic is carried out. This must be done thoroughly, but gently, especially around the burned areas. For the skin three or four inches from the burn, benzene applied with cotton mops and followed by 3½ per cent Tinct. of Iodine is probably the most satisfactory method of sterilization. As we approach the burn ether should be substituted as it is less irritating. It is applied with cotton mops. The doctor should wear sterile gloves, use sterile instruments, and if he opens blebs should first sterilize the area with 3½ per cent Tinct. of Iodine. Moorehead recommends puncturing the bleb aseptically at the junction between the sound and unsound skin.

After the surrounding skin has been prepared and the blebs attended to, the burned area should be covered with a suitable sterile dressing. There are three types of dressing now in use.

1. Wet Solutions of which the most favored are 1 per cent Sol. of Picric acid and Saturated Sol. of Bicarbonate of Soda.

2. Ointments of which the most used are Boric Acid and Soda Bicarbonate 3 per cent. There have been a number of special burn ointments developed, two of which have been so thoroughly tried out that their formulæ will be given.

First Ointment. Used by Dr. A. W. Colcord in the treatment of 8,000 burns.

℞
 Carbolic Acid
 Thymol
 Menthol
 Camphor of each gr. 5
 Ichthyol
 Balsam of Peru of each gr. 10
 Zinc Oxide
 Starch of each 1½ drachms
 Petrolatum to make one ounce. Mix well.

Doctor Colcord uses this ointment in 1/6 strength from the start. Applied daily with aseptic precautions.

Second Ointment. Used at La Panne,¹ Belgium, during the war.

℞
 Vaseline20
 Lanoline20
 Antipyrine60

¹Dr. René Sand, Belgium, personal communication.

Boric Acid	60
Salol	20
Iodol or Iodoform	20
Phenol	20
Bichloride of Mercury	02

This ointment gave extremely good results and was used with aseptic caution.

The third type of primary dressing is warm wax. This method started with the proprietary substance Ambrein, but it has been found that the action is only mechanical so that there are a number of mixtures of paraffin and resin now on the market which are quite satisfactory. One used at the American Steel and Wire Company and Norton Company at Worcester consists of

Paraffin	70
White Wax	20
Resin	10

All of the combinations are dispensed in solid form and must be melted before using.

METHOD OF APPLYING WAX

The method of applying the wax is first to dry the skin thoroughly using an electric blower such as is used in barber shops for drying the hair. After the area to be treated is thoroughly dried the wax is either sprayed or painted on. Spraying is wholly painless, painting nearly so. The wax must be just liquid before being applied and can best be melted down in a double boiler. When the wax is painted on, sterile cotton swabs on applicators are the best instruments to use. The warm liquid wax should be dabbed on not "painted." The wax hardens almost at once forming a smooth coating extending over the sound skin for a short distance on all sides of the burned area. Upon this thin hardening, wax layer sterile sheet wadding which has been dipped in the wax is laid and over this another layer of sheet wadding. The whole dressing is held in place by a bandage. The advantage of using wax is the immediate covering of the burned area with a smooth sterile protecting surface with splinting of the injured part.

The wax is removed daily coming off en bloc with the sheet wadding. The secretions underlying it are washed off with normal Saline, the area dried with hot air, and a fresh wax dressing applied.

It seems to make little difference which method is used if the work is done carefully and absolute aseptic technique maintained throughout. Personally the author prefers a sterile saturated solution of soda bicarbonate for the first few dressings. It is easy to apply, gives considerable relief to the patient and requires less technique and handling of the injured area than the ointment or wax. It should be applied by saturating a piece of old sterile sheeting in the solution and wrapping this loosely about the burned area. The moisture is maintained by surrounding the

wet linen with oiled silk. The dressing can be moistened from time to time by lifting a corner of the silk and carefully adding the solution.

If there is little sloughing the ointment or wax treatment can be instituted but if much sloughing is present a moist dressing will be needed. The disadvantage of continuing the soda is that if any infection is present it is liable to flourish in the alkaline medium unless the medium is distinctly antiseptic. For this reason it is well to stop the soda dressing after 24 hours and use alum acetate solution.

R
Alumpts. 5
Lead Acetatepts. 25
Waterpts. 500
Dissolve separately and mix.
Do not filter.
Shake before using.

This solution is mild, non-irritating and antiseptic. It has a white precipitate which seems to have a very soothing effect upon the skin. The solution has been used largely at the Worcester City Hospital and elsewhere for burns.

After the slough has separated and granulations begun the burn may be considered a granulating wound.

Three things must now be considered,—encouragement of Epitheliation, care of the granulations, prevention of a deforming scar.

Epithelium forms from the germinal layer of the skin and its down pocketings, and it is from this layer that fresh epithelium is formed. Three things seem to assist epitheliation greatly; first a sterile granulation tissue to grow over, second a smooth surface to grow under, third pressure.

The difficulty of preserving sterile granulation tissue has been mentioned. If it can be preserved, wax provides probably the best type of surface to grow under. Its chief advantage is the ease with which it can be removed without injury to the new formed epithelial cells. At the Ambrein Hospital in Paris a thin layer of sterile zinc oxid ointment is applied along the epithelial edge further to protect the cells especially when the hot wax is applied. The cleansing of the wound after the removal of the wax is easy as compared with the cleansing of a wound covered with ointment. However where there is any tendency to infection of the granulating surface the ointment is probably somewhat preferable because of its antiseptic properties. The importance of pressure in the healing of granulating wounds was first noted by the author when examining a series of burns in the Worcester City Hospital. Burns of the back were in all cases progressing better than burns of the chest or extremity, and it was concluded that pressure was an accelerating factor. It seems to make little difference as to the type of covering which is employed provided it is smooth. Thus sterile adhesive plaster has been used by many, and the author has obtained good results with gutta percha tissue, if there are no wrinkles or air spaces.

INFECTION

Granulation tissue once infected is almost impossible to sterilize as those who worked in France know only too well, therefore the basic principle in the treatment of burns as in all surgery is to keep asepsis of the wound if possible and if in spite of all care it becomes septic endeavor in every way to render it again aseptic.

In burns involving a large area the burned area always becomes infected. This has been strikingly brought out by Fauntleroy and Hoaglund in their recent paper in the *Annals of Surgery*. In cases of this type it is obviously impossible to expect to obtain sterility. The method used in treating these very extensive and difficult burns employed by these authors and also favored by Moorehead is the open-air treatment without any dressing at all. Massive crusts form over the burned areas and beneath these pus forms plentifully. Cases seem to do a little better if the crusts are not removed, but gently lifted when absolutely necessary to give drainage.

The crust forms a dressing very similar to paraffin. Fauntleroy and Hoaglund, in discussing the treatment of these crusts say, "There seemed to be two separate, distinct periods, at which time two distinct results occurred simultaneously in all cases. The first period in which removal was continuously followed by the same heaping up process. The second period in which following a week's period of non-interference, removal, at this juncture, of the crust with the application of a thin smear of boric ointment on lint was followed by a quick bridging over of the raw surface with new skin and complete healing with no scar formation in a few days' time."

To sum up: while it should be possible to maintain sterility in burns, this is difficult and where large areas are involved almost impossible.

In treatment the individual should be treated first, the burn second.

The treatment of the burned area may be divided into the primary treatment which consists of cleansing and the application of a moist dressing, and the secondary or more permanent treatment when open air, special ointments, solutions, or wax may be indicated.

Experience tends to show that absolute standardization of treatment is impossible in the secondary treatment as burns react in different ways. It would be advisable, however, to restrict the drugs and ointments to a minimum number and study each one carefully in order that a certain type of standardization may be obtained.

Emphasis should always be laid upon strict aseptic technique without which good results cannot be obtained.

CHAIRMAN LAUFFER: We are now ready for the opening of the discussion of Dr. Clark's excellent paper. Dr. Colcord, who was to open the discussion, is unable to be present, but his paper will be printed in the "Proceedings."

¹Fauntleroy, A. M., and Hoaglund, A. W., *Annals of Surgery*, June, 1919, Vol LXIX, No. 6, p. 589.

DISCUSSION

DR. A. W. COLCORD (Carnegie Steel Company, Clairton, Pa.): Dr. Clark has given us a splendid paper. He is up to date without being faddish—and conservative without being a back number.

His remarks about treating a burn with the same surgical cleanliness we do any wound cannot be commended too highly. His statements that every third degree burn must in the course of granulation and healing become infected is open to serious question. Much depends upon what we mean by an infected wound. Of course there will be pus germs and pus cells in the discharges. Lexer found in his Vienna clinic sixty pus germs per square m.m. in his cleanest made operating wounds. It takes more than the presence of pus germs, pus cells, and a visible discharge to make an infected wound. Sloughing flesh will have odor and will contain germs of putrefication. But this does not mean infection.

Infection is a disease of *living* tissue and there must be the clinical signs of the reaction—inflammation if you like—heat, redness, pain, and swelling—Nature's effort to repel the invader. The burns where the slough comes away kindly—where there is no marked rise in temperature, where the tissue about the slough show no clinical signs of infection I do not call infected. Much of the tissue must come away in the liquid form and during the coming away of a large slough there may be some rise of temperature.

I must insist that our burns in the Clairton Hospital are not infected as I understand infection. My nurses, assistants, visiting surgeons, and patients themselves all agree with me.

I have seen many infected burns during the past few years in our hospital. They are all from three sources:

SOURCES OF INFECTED BURNS

1. Delayed cases that came with an infection already started.
2. A certain percentage of our Ambrine series—say 25 per cent.
3. A few cases of slight infection of burns where skin meets mucous membrane about eyes, nose, mouth, or anus.

All other cases now reaching far into the thousands run a uniformly clean course and heal with a minimum of pain and scarring under the use of our burn ointment.

This ointment is a powerful local anaesthetic, a deodorizer, a germicide. It comes as nearly to sterilizing the surrounding skin as anything I have seen. It is with slight exceptions, non-poisonous and non-irritating. It can be put on full strength for first dressings, where skin is not broken, spread well beyond the burned area. The surrounding skin has been carefully cleansed with ether. As epidermis begins to shed we change to one-sixth strength, diluting with five per cent boric ointment. In an occasional case of what I call irritable burn (possibly one per cent of second degree burns) it is necessary to use the five per cent boric alone. I have never seen any unpleasant constitutional effects and the only local ill effects have been those with a Balsam Peru idiosyncrasy—say one case in five hundred. Here it or anything else containing even a small amount of Balsam Peru causes a dermatitis. It stimulates granulation and epi-

dermis formation, making the healing more rapid than by any other method I have seen.

Twice I have discontinued the use of this ointment for a time—once to treat a series of thirty cases with picric acid; once to treat several hundred cases with ambrine. In both instances the old employees who were familiar with the ointment treatment were loud in their demands that we return to it as they worked in greater comfort.

The open-air treatment as brought forward by Moore of Minneapolis in 1905 was a great advance over most methods then used. It was used for some years in a number of Pittsburgh hospitals. Dr. Clark is right in saying that the burned area gets covered with crusts and pus. This is infection and means pain and absorption of pus with a higher mortality in extensive burns. It means injured kidneys and the other long train of results of prolonged sepsis.

It means delayed recovery, greater destruction of tissue and more scarring.

I cannot say too emphatically that in my opinion there is no excuse for infection in the average burn. The days of "laudable pus" are gone, let us hope, forever. The same attention to cleanliness we pay in our appendicitis operations and leg amputations will yield as good results in burns.

Dr. Clark asks, "Why is it that burns tend to run a septic course" since the heat sterilizes the burned tissues. Many things happen to "unsterilize" the burned area—probably most are infected during the first few minutes after the injury—clothing dragging over the burned area; a blanket thrown over the patient and touching the burn; attempts to wash the surrounding skin; temporary dressing of cream, oil, butter, vaseline, or various home ointments, none of them sterile. Probably the most constant source of infection is the surrounding skin. Every hair follicle, sweat gland, oil gland, and the whole skin surface of the average working man are filled with pus germs. Here is the weak point in the Ambrine treatment: It does not provide for the sterilization of surrounding skin nor does it absorb the discharges from the burn—just holds them against the burned surface and surrounding skin affording perfect culture conditions for germ multiplication and pus manufacture. The only wonder is that more than 25 per cent of Ambrine cases do not become badly infected. Some advocates of the paraffin treatment advise the changing to Dakin's solution when the burn becomes very septic. But why let them get septic? Why not use a method that keeps them clean from the start?

When an infected burn comes to me I often use two or three days' constant wet dressings with Ochsner's fluid—then as pus disappears change to the ointment.

I also use the Ochsner's during the sloughing stage of deep large third degree burns. I have made a trial of a number of the wet dressings for burns, boric acid, soda bicarb., normal salt, but prefer borax 80 grs. to a pint or Ochsner's fluid for above named purposes.

SKIN GRAFTING

Dr. Clark makes no mention of skin grafting. To skin graft a granulating surface it must be fairly clean. I can readily see how a burn with

the open method or by the Ambrine treatment would be too dirty to skin graft. With the alum and lead solution I have had no experience. I usually use two or three days of wet dressings before skin grafting. Have used both Reverdin and Thiersch grafts with about equal success. Skin grafting should be done in every extensive third degree burn and as early as possible before much scar tissue forms. Young of Glasgow reports some splendid results with the whole skin grafts of Wolfe, Krause, and Matas.

I wish most heartily to endorse every word Dr. Clark says about the use of morphine and atropine as soon as a severe burn is seen. This followed by the constitutional treatment he outlines is, in my opinion, the most important thing in his paper.

His method of cleansing the surrounding skin sounds good. I have not tried it. Washing the surrounding skin or doing anything that may get dirt into the burned area is to be condemned.

On the whole it seems to me we are indebted to Dr. Clark for his bringing the subject of burns up to date. His endorsement of the Ambrine treatment and of the Open-air method has the backing of some of the best surgeons on both sides of the water. I have given my own personal opinions and the results of my experience frankly. It is only by this honesty and fearlessness that we can arrive at the truth.

DR. C. M. HARPSTER (Cleveland): I don't believe I have ever heard as fair a representation of the subject. Of course, we all have certain modifications of our own, but I agree thoroughly with the point brought out so strikingly by Dr. Clark that the large burned areas are almost always becoming infected. I suppose we all use the method of putting on paraffin wax, and I agree on the surgical principle of painting the infected area and sealing up with wax. Now we have made a simple modification in the treatment of our cases in the use of paraffin method of treatment. The paraffin is spread on fairly heavy paper impregnated with Balsam of Peru, a paper of six or eight thicknesses placed over the burned area. That is the primary treatment for uninfected wounds. If the wound becomes infected we continue throughout the case with applications of the paraffin and paper impregnated with Balsam of Peru and we have found we have had splendid results. I recommended this method of treatment in a large chemical works, and special Government industries where a large number of burns occur, and I have received reports from the military surgeons that they have been able to turn men back to work much quicker by the use of this method of treating burns than they did before.

You can also impregnate your gauze with the wax, or mosquito bar or anything like that. Once the wound has become infected, and we have treated cases where there have been extensive burns from the knees up purely with paraffin paper, but once it has become infected I believe the application of bi-carbonate of soda or some simple treatment of that kind is the proper way to handle a burn.

DR. AUGUST F. KNOEFEL (Terre Haute, Indiana): I am perhaps more careless in my technique than most men, but I have yet to see an extensive burn that has never become infected. We work in a coal mining district and the miner is burnt as a result of an explosion of gas, or coal dust. Most of these men work with canvas trousers and cotton shirts

and practically all the burns extend from the waistline up, that includes the two upper extremities, the face, head, neck, and ears, and as I say, I have yet to see one which didn't finally become infected. It is not the type of infection that is accompanied by any high temperature, more of a saprophytic infection. The former treatment was the application of salol ointment, but in the last two years the treatment adopted is to cover the patient's burns with a wet picric acid gauze. This dressing remains in position for two days, then the para-wax (we use the plain para-wax without any addition of medicament whatsoever) is applied, we use both the atomizer and the brush, the camel's-hair brush. We find that with the camel's-hair brush we can cover the body much quicker than we can with a cotton swab. A cotton swab, no matter how it may be prepared, or how it is manufactured will give perhaps half an inch covering with one swipe. With a camel's-hair brush three inches wide, we get three inches wide when we apply it, therefore, we expose our patient much less than if we used a small applicator. It works best at a temperature of 165, although I have seen it run up to 190. As you make the swipe with the brush the patient says, "Ouch" or something like that. But the pain does not persist.

With reference to the remarks read from the paper, that there is a time when there should be a change in treatment, if you continue your paraffin until the wound has entirely healed over, that is, skin epithelium has formed, you will delay that time by continuing the paraffin. There is a time when you are compelled to stop your paraffin dressing and expose it to the air and it will heal much quicker. We still use the old time stimulation method on the small areas that seem in spite of all treatment to fail to heal, and that is, the use of silver nitrate.

CHAIRMAN LAUFFER: Any further discussion on the subject of burns?

I believe Dr. Clark, that would be a good subject for a questionnaire, and if you will get the addresses of all the doctors here and other industrial surgeons by the questionnaire method, the committee that could be appointed could help in the solution of some of these interesting questions that we as industrial surgeons are much concerned in. The sooner we have a man ready to go back to work the less work we have on our hands, and it is to our interest to study the quicker methods of getting the injured back to work.

DR. BLOOMGOOD (Baltimore): I have had very little experience in burns. But in cases of burns where the healing process is very slow, no one will question the statement that a burn that destroys the entire epithelium must heal from the edge. The burn in which there is some epithelium left is different from the one where there is no epithelium left. We meet a stage in which we find it not only difficult to keep the tissues aseptic, but difficult to keep the granulated tissue from forming. But the danger of granulation exists: the greater with the excessive tissue as the base. That excessive tissue ultimately forms and you get edema as you would anywhere where the vessels are contracted because edema is most marked on the return vessels, the venus type not arterial.

The only thing I want to ask is this, I find that in some burns they reach a stage where skin grafting should be employed. That will shorten

the period of disability very much. I will not go into the very important thing which he spoke of, but it ought to be emphasized whenever you speak of a burn that throughout the entire course of the burn you feel you are responsible there is no contraction. Contractions in burns are in the hands of those who dress them. They can be prevented.

In skin grafting, when the patient has sufficient skin from which to take the graft the problem of skin grafting is simple. With a tissue graft I have demonstrated at the end of three weeks you can take another skin graft before you take the tissue, or cut a little pinch graft, and unless you are familiar with the technique you will look upon it as a very difficult thing. The pinch graft you can do every day, one, or two, or three. The pinch graft has an advantage in skin grafting on areas that you can't disinfect. The tissue graft, as a rule, rarely takes, unless you cut out the granulation tissue, or you make it aseptic. It apparently has a stimulating effect upon the granulation tissue.

Now we have learned from work in the war that when an injured man hasn't enough skin for his own graft, we can get successful graft from individuals whose blood matches, from individuals from whom you take blood transfusions. I have had most satisfactory results with grafts from individuals on burns. I have had no experience yet in matching up graft on persons whose blood matches. In the past our grafts have been very satisfactory, but perhaps you have found skin grafting unnecessary. The reason I have had a large experience in skin grafting is due to the fact industrial surgeons have not first treated the burns.

CHAIRMAN LAUFFER: Dr. Sloan, who will take Dr. Crile's place on the program is here, and will now read Dr. Crile's paper.

WHAT THE WAR HAS TAUGHT US IN SURGERY

DR. GEORGE W. CRILE, CLEVELAND, OHIO

The great contribution of the war to surgery was not the production of hitherto unrecognized methods of treatment, but rather the accumulation of masses of evidence regarding the comparative value of various methods.

There is no fundamental distinction between the war patient and the civilian patient. The soldier coming for treatment is in a greater or less degree of exhaustion from the conditions of his environment, the civilian patient is in a greater or less degree of exhaustion from the condition from which he seeks relief. Further exhaustion from the trauma of the operation, hemorrhage, and infection are the prime dangers in each case.

In the army the outstanding requirement is to return every possible man to active service in the shortest possible period of time consistent with a permanent cure. Efficiency in civilian surgery should demand the same.

It is to this end that the lessons learned in the field are being studied anew in their relation to the civilian patient.

"SURGERY LIVED YEARS IN DAYS"

In the service in the field many lessons were learned. Every theory was tested in the crucible of practical application on a vast scale. We

were dealing with hundreds of thousands of patients as we deal with hundreds here. Surgery lived years in days. The combined experience of thousands of surgeons was immediately available for comparison and for study by the individual surgeon; by the surgical staffs of hospitals; by the consultants; by the Red Cross Research Society; by the Interallied Conference; all of which were seeking to discard the false—to find and to hold fast to the true. All questions pertaining to the care of the sick or wounded soldier were thus studied in detail and in the mass by the nations at war; and finally in Paris at a conference of those chosen by their respective governments to make up a consensus of opinion, conclusions from this great mass of evidence were scrupulously drawn.

One fact stands preëminent among the many elicited by this vast experience; i. e., that the prime problems of war surgery as of civilian surgery are shock, anemia resulting from hemorrhage, and infection. Whatever the lesion of the patient, whether it result from war missiles or from disease, provided the lesions are anatomically operable, he will recover if these three menaces can be obviated or successfully treated.

INFECTION

The mere fact that man is surrounded, covered, and penetrated by an infinite number of bacteria, and lives, is a proof that the human body has within itself adequate defense against bacteria. This defense we may be sure was attained through struggle and survival—that is, through biologic adaptation—and is the bulwark of the treatment of infection.

An interesting proof of this biologic adaptation is the fact that the various parts of the body have varying powers of defense against infection, the most efficient defense in general being possessed by those parts most exposed to infection from injury, such as the external soft parts or those which lie in infected areas, such as the intestines.

On the other hand, the inner protected parts—such as bone, especially deeply-placed bone, the deep muscles and encased organs and tissues, such as the heart, the brain, the spinal cord, and the retroperitoneal tissue—have had less opportunity to make a selective struggle, hence in these parts weaker defenses against infection have been evolved. What does the tissue of the foot possess that is not possessed by the mediastinum, or by the femur? What does the peritoneum possess that is not possessed by the dura, what endows the skin and the peritoneum with a better defense against infection? That part whose defense is weakest usually possesses a limited blood supply, as compared with parts whose defense is stronger. There is apparently no other difference as striking, nor as marked as the difference in blood supply. We may then infer that a rich blood supply is the key to the defense against infection. The face and scalp, the external parts of the body, the abdomen, have a rich blood supply as compared with the deep lumbar muscles, the bones, the spinal cord, the retroperitoneal tissue. Not only is the normal blood supply less in these poorly defended regions, but the local vaso-motor mechanism is less developed, hence there is less reaction to the invading bacteria. For the most efficient defense there must be not only abundant blood, but normal blood. As Sir Almroth Wright has shown, the blood must not

be acidosed, as when blood pressure is low, for saprophytes flourish in such a medium. The bones, the deep tissue planes, the mediastinum, the spinal cord, the brain, the retroperitoneal space, are all hazardous regions for infection. In the mind of the surgeon the body should be charted like the sea, and he should direct his course according to this chart. One region requires one plan of action, another, such as the scalp or the face, no special plan. Face wounds heal almost equally well with good surgery, with poor surgery, with no surgery. The infected mediastinum heals almost equally badly with no surgery, with poor surgery, with good surgery. A pulseless patient becomes a universal mediastinum. A limb, anemic as from a neglected tourniquet or from the severing of the arterial supply, becomes as helpless as the meninges; the war patient in exhaustion from cold and wet and exposure, from loss of sleep and from fighting, and the starved civilian with cancer of the stomach or with perforating ulcers, alike have a universally weak defense. Patients prostrated by shock or by hemorrhage have low resistance. As a rule, defeated, dejected troops have less resistance than victorious troops. The defense, then, in the normal soldier varies with the several parts of the body, the frontiers of the organism being best defended. The defense, even at the frontiers of the organism, is lowered by interference with the local blood supply, whether of an entire limb, or of the devitalized bloodless tissue along the injured track of the missile; it is weakened by low blood pressure from shock, with its secondary acidosis; or by hemorrhage; it is weakened when the entire individual is in exhaustion. The defense, in turn, is augmented by rest, by sleep, by fluids, by the revision of wounds; by restoration of the local and general blood supply.

In addition to these measures which augment the resistance of the organism as a whole, it is essential to increase the local resistance as well. Whether we are dealing with a war or a surgical wound, this may be secured by vitalization of the part attacked; by physiologic rest, by destruction of contaminating bacteria, by the application of heat.

In war wounds vitalization is accomplished by the excision of every particle of devitalized soft tissue and bone; by removing every particle of foreign material—clothing, mud, missiles—in such a manner that there is no added surgical devitalization from goading retractors or rough handling of fractures. Vitalization is promoted also by making sure there is no interference with the blood supply, by employing a minimum of foreign material for treatment, such as tubes, etc.

The wound may be further vitalized by moist or by radiant heat. The vitality may be maintained by overcoming infection; by preventing pooling of wound secretions. Therefore in recessed wounds the Carrel-Dakin treatment does best. The deeper and the more recessed the wound, the greater the indication for Carrel-Dakin. It must always be borne in mind that the operation must be done lightly and sharply; for if there be rough handling, needless moving of compound fractures, if piercing hooked retractors tear the flesh, and if intermittent muscular contractions grind tissues between the ends of ragged bone fragments, then the net result of the operation is the substitution of surgically devitalized tissue for the devitalized tissues of battle casualty.

Physiologic Rest. Physiologic rest includes more than mere muscular and psychic rest: it implies equally *cellular rest*. Living cells are disturbed by air; by desiccation; by physical contact of dressings; by many chemical antiseptics; by bacterial toxins. These points have been strongly emphasized by Sir Almroth Wright whose teaching has placed a renewed emphasis on the importance of the *cellular protection* of wounds, to ensure cellular physiologic rest.

To secure physiologic rest in the case of a fracture, an even adequate continuous extension must be made—an extension sufficient to prevent the goading of soft tissues by sharp bone, and to prevent bony fragments from grinding each other. Physiologic rest of the soft parts means mass quiet by means of supports—such as splints, slings, swings, and extension suspensions; it means for compound fractures and for injuries of the soft parts no tight bandages, no tight stitches, no accumulation of wound secretions—blood, serum, etc. For open wounds it means that antiseptics must not be *damaging*; that dressings must be painless; it means elevation of extremities for comfort and the prevention of swelling. For visceral injuries it means absolute rest, low diet, freedom from excitation, associated environment.

Destruction of Contaminating Bacteria. The first and most dependable agency for the destruction of contaminating bacteria is the bactericidal power of tissue. This normal defense of tissue against bacteria is present only in living tissues: and the ability of living tissue to overcome infection depends on its vitality. Normal living tissue has strong bactericidal power. As vitality is impaired down to the death point, so is the bactericidal power impaired to the zero point. Moreover, when infection begins, the infecting agent itself has the power of diminishing the vitality in advance of the infection through chemical injury, tension and swelling. Thus as Kenneth Taylor, Cuthbert Wallace, Bashford, and others have shown, many anaerobes cannot live at all in normal tissue, but only in damaged tissue. The anaerobic invasion is made possible only by injury through chemical action, through shell injury, through swelling or anemia, or shock and exhaustion whereby the resistance of the tissue is lowered. Therefore in a compound fracture that is settling down, one goading by a sharp fragment of bone will devitalize a small area, and in consequence an area of infection with the advancing tissue damage will be established. Therefore we may say that the whole wound is defensively only as strong as its weakest point. If the defense line is broken at one point, the entire line of defense may give way.

Antiseptics. As for the relative value of the various methods of antiseptics it is difficult to choose among them. Perhaps the method which has proved most universally useful, excepting under battle conditions, is the Carrel-Dakin. This is of value in wounds with necrotic tissue, in empyema, in recessed wounds with a tendency to pooling of the wound discharge, and as a general method. Carrel and Dakin have made an outstanding contribution to surgery. Dichloramin-T, flavine, bip, and Wright's hypertonic solution, each has its value under certain conditions. Perhaps the most useful of all in civilian surgery after Carrel-Dakin is flavine

which is non-toxic and can be used for days without ill effect. It is of special value in multiple stage operations in which it is necessary to keep the wound in *statu quo* for a limited period, as in certain cases of exophthalmic goiter. It should be noted that it should not be used in contact with silk sutures as it dissolves them.

Heat. The therapeutic value of heat has been sanctioned by the experience of physicians and of the laity since the dawn of medical history. The therapeutic place of no other agency is as secure. Moist heat, dry heat, radiant heat, electric light, sunlight—all influence the infections favorably.

In what way may heat exert its beneficent influence? Granting the premise that the natural defense of the organism against infection is made through the agency of phagocytosis and the chemical antagonism of the blood plasma, it becomes evident that in either case the defense is chemical. The fact that the defense is chemical gives at once a clue to the mechanism by which heat assists the defense against bacteria. It is probably because with the rise of each degree in temperature in any system—inorganic or biologic—the chemical activity is increased ten per cent and the electric conductance two and one-half per cent. The increased chemical activity increases the chemical defense: the increased electric conductance increases the metabolism. Therefore, we may suppose that heat accelerates the chemical defense so far as it involves the metabolism of the phagocyte, and so far as it involves chemical defense of the blood plasma, and that heat also aids by increasing the total amount of blood in the inflamed part, thereby increasing the number of phagocytes. Moreover heat assuages pain.

ANALOGY BETWEEN APPENDICITIS AND THE WAR WOUND

In this discussion of infection an interesting analogy between appendicitis and the war wound suggests itself.

In a case of acute appendicitis, if the dead appendix is removed before the infection has invaded normal tissue, then the wound is closed immediately, primary union follows, and the vast possibilities of the inflammation of the great abdominal cavity will be averted. Likewise, if the dead tissue in the track of a war wound is excised, before living tissues are invaded, the inflammation of a great mass of soft tissue will be averted.

In appendicitis even after the infection has penetrated the wall of the appendix and invaded the peritoneum, excision of the dead appendix will facilitate recovery. In war wounds, even after the infection has passed beyond the devitalized tissue, excision of the devitalized tissue will facilitate recovery.

When an appendicitis has developed into a localized abscess with an organized wall of granulations, the surgeon deals with the abscess as such. When the infection in a war wound has developed into an abscess with new tissue organization, no debridement is done, but the abscess is treated as such.

In the war wound the stage of contamination of dead tissue—the period before infection develops—corresponds to the period before infection from

a dead appendix penetrates the wall. In this period if the dead appendix is excised cleanly, the case recovers; if the dead tissue of the war wound is excised cleanly the case recovers.

Appendicitis and war wound infection develop through identical phases—localized infection, spreading infection, abscess.

If an appendix abscess is roughly handled, spreading peritonitis, phlebitis, bacteriemia, etc. may result. Comparable results follow when an infected war wound is roughly handled.

Appendicitis was not mastered until the surgeon had learned to forecast its future accurately, and today—in other words until he took the initiative away from the disease and attacked instead of defended. In like manner the military surgeon discovered that in the case of the war wound, as long as he left the initiative to the infection, he could not achieve mastery. To wait in the case of a devitalized war wound until the infection had spread widely—until there were pain, swelling, redness, and tenderness, was to court defeat. Like the tomorrow of the appendix, the tomorrow of the war wound must be read today—and action taken today.

An antiseptic does not cure appendicitis—it does not cure the war wound.

There is no difference in principle or in practice between the treatment of appendicitis and the treatment of war wounds. The time factor is equally vital; the treatment is comparable; the natural defense is identical.

SHOCK AND HEMORRHAGE

The consensus of opinion of the Interallied Surgical Congress and the British and American surgeons in military service generally may be summed up in the following brief dictum: *The best treatment of hemorrhage and shock is rest, warmth, fluids, morphin for pain, and blood transfusion.*

Civilian surgery and war surgery in their relation to shock present one important difference. The depleted civilian patient may be in a "pre-shock" state when he comes under the surgeon's care; the wounded soldier is often in shock. Nevertheless identical methods will prevent the development of shock in the first case and will successfully combat the present shock in the latter.

Physiologic Rest. Physiologic rest includes mental and psychic, as well as physical rest. It means reassurance; it means an atmosphere of quiet and confidence: it means optimism as well as skill. Physiologic rest can be achieved only by the cooperation of surgeon and intern, nurse and orderly.

Warmth. The loss of power to create body heat is one of the damaging effects of shock, for the organism is much injured by a subnormal temperature. The application of heat, therefore, is one of the essentials of the treatment and of the prevention of shock. The most readily applied form of heat is hot air under blankets. Under war conditions, hot-water bottles and other forms of direct heat are not useful, because of the time required for application, and because of the danger of producing burns.

Morphin. If the patient has pain, if he is restless, and if the pain and

restlessness cannot be otherwise relieved, then give morphin in one-sixth grain doses until the pain and restlessness is overcome; and there is evidence that morphin in still larger doses is specifically useful.

Oxygen. If there is a wound of the chest interfering with the supply of oxygen, then give oxygen. If available, all cyanosed, all gray-blue patients, all shallow-breathing patients should have oxygen. A nitrous oxid machine for giving anesthetics is an excellent means of administering oxygen under pressure.

Fluids. Water in some form should be given, preferably by the mucous membranes. Sodium bicarbonate in a five per cent solution and combined with five per cent glucose is most effective. But in acute, grave cases from 2,000 to 4,000 c. c. of fluid should be given each twenty-four hours. Water intravenously is rapidly eliminated from the body. Water absorbed through membranes or tissues is retained in much larger amounts. Water to be most useful should have a biologic pass.

Prevent and Overcome the Damaging Effect of Low Blood Pressure: (a) by elevating the foot of the bed; (b) by early transfusion, the Bayliss solution of gum acacia may be used. It has the advantage of being more readily available than blood. Under war conditions, donors for blood transfusion are usually numerous among the lightly wounded patients.

One of the greatest errors is to allow a patient to remain in a state of low blood pressure in the hope that he will improve through his own resources, reserving a blood transfusion to be used as a last resort after it has become obvious that the patient is going to die. This is the same faulty logic that was once used in dealing with appendicitis. When the indication for operation in appendicitis was supposed to be a clammy, pulseless state, when the patient was dying, surgical treatment became almost discredited. It is equally illogical to wait for impending dissolution in shock before improving the circulation. Treatment should not be deferred until the inaugural state of death is established. There is another method of treating shock which is not generally applicable to war conditions, that is narcotization with morphin—giving morphin on the same scale as in the Alonzo Clark treatment of peritonitis, i. e., keeping the patient under morphin so completely that the respirations are cut down to about twelve to fifteen per minute and the patient is deeply asleep. During this time one should give between 2,000 to 3,000 c. c. of normal saline infusion subcutaneously. When properly carried out excellent results may be obtained by this method which, however, should never be employed if there is cyanosis, and never routinely, and always under expert supervision.

THE OPERATION

The Interallied Surgical Conference adopted as one of its conclusions that in the treatment of wounded soldiers *the anesthetic of choice is nitrous oxid-oxygen combined with local anesthesia.* Among the evidence offered in support of this tenet Surgeon-General Sir Anthony Bowlby presented the work of one of the most brilliant British military surgeons, Captain Douglas C. Taylor, and the work of the Chief of the Anesthetic Service of the British Army, Captain Gregory Marshall. The experience

The essential points in the associated treatment of abdominal infection, therefore, are the following:

1. Nitrous oxid-oxygen.
2. Anesthetized incision.
3. Accurate, clean-cut operation to diminish both infection and shock.
4. Adequate drainage.
5. Fowler's posture.
6. Vast hot packs over the entire abdomen, spreading well down over the sides.
7. Five per cent sodium bicarbonate, with five per cent glucose by rectal tap, continued as long as it is tolerated.
8. Primary lavage of the stomach, repeated only if indicated. (It will rarely be indicated if *anociation* is complete.)
9. From 2,500 to 3,000 c. c. of normal saline subcutaneously every 24 hours until the period of danger is past.
10. Morphine hypodermically until the respiratory rate is reduced to from 10 to 14 per minute, and held to this rate until danger is past.

Under this combination of the association of peritonitis with the associated operation, my associate, Dr. W. E. Lower, and I have performed 499 consecutive operations for acute appendicitis, with or without generalized peritonitis, without a death.

THE GOOD SURGEON

The surgeons and the pathologists who for four years have intensively studied war wounds, have formulated many theories of treatment—many apparently contradictory theories. Thus there have been presented the claims of the value of various chemical agents against those of no chemical agent; of moist dressings against dry; of heat against cold; of frequent dressings against infrequent, and of no dressings against both; of sunlight and of electric light against occlusion; of immersion against hot air; of bacteriological control against clinical judgment; of vaccines, toxins, and foreign proteins against normal reaction; of wound inoculation with harmless organisms against wound sterilization; of isotonic against hypertonic solutions; paste has competed with paste; bip with ip; sap with both; and chromic pastes with all.

Does not this intensive study of infection in war wounds for this comparatively short period equal and recapitulate the more leisurely study of infection during the thirty years since Lister first proposed the carbolic spray? And is there *not* slowly emerging from the present conflict of opinions the same fact as that which emerged from the post-Listerian period—that the one agent of successful surgery, whether war surgery or civil surgery, is *the good surgeon*?

In civil surgery here in America, by what agency was mastery achieved over appendicitis, over cholecystitis, over tubal infection, over adenitis? What agent has contributed the most to the success of resection of the intestines and of the stomach; of gastroenterostomy; of treatment of suppurating stone in the kidney; of the treatment of infection of subcutaneous tissue? What agencies have achieved survival? One and but one

—*the sound surgeon*, who always creates opportunity. Is it possible that in these four intense years of war surgery, in which more experience in traumatic surgery has been accumulated than during the past 30 years, we have traveled around the same circle as in civil surgery and have again found the same *surgeon*?

By sound surgery we mean the assumption of complete inclusive responsibility for every item that enters into the result; the consideration of the wound as well as the patient; the development of an ability to read the wound as well as the man aright. Sound surgery means quick, innocuous, timely intervention; it means seeing clearly the tomorrow of the wound; it means no intervention unless there is to be a net gain; it means a sharp knife, a good anesthetic, a painless innocuous dressing; it means as much respect for the tissues of the anesthetized man as those of the unanesthetized man; it means a training in judgment that unerringly tells when to cut, how far to cut, when to quit cutting. It plays all the defenses and reparative forces of the patient. Good surgery is the exponent of no single method. It recognizes the anatomical and environmental situations in which chemical and physical agencies are useful. Good surgery exploits physiologic rest and fluids and sleep; it gives little pain. Good surgery evokes confidence; and confidence begets restoration. Good surgery, then, makes use of antiseptics and physical forces, just as it uses incisions, counter-drainage, revisions, skin-grafting, blood transfusion. Good surgery does not substitute an easy formula for its principles; above all, it always is dissatisfied with its work and always is open to suggestion.

What could the good surgeon accomplish with the wounds of war, with good opportunity but no antiseptics? Without antiseptics he could close by primary union a higher percentage of contaminated wounds than with antiseptics; he was able to remove damaged tissue with such accuracy that the natural defenses of the revised wound became its best antiseptic; he closed penetrated knee joints more securely without than with antiseptics; he closed penetrated skulls without, better than with, antiseptics; he cleared up foul and infected superficial wounds as well without as with antiseptics; he met gas gangrene with the timely use of the knife as well without as with chemical agents. He closed healthy superficial wounds with early suture tied lightly; healthy wounds that could not be closed by suture he closed by skin-grafting, both as a healing and as a bacteriocidal policy; he closed fecal and urinary fistulæ without antiseptics.

On the other hand, he realized equally that in compound fractures with or without bone infection, in deep, recessed wounds, in pyocyanous infection in many other types of wound that antiseptics might have great advantages, and he used them and used them well. In certain phases of a wound, he would use Carrel-Dakin; in another, acetic acid; in another, hot pack; in another, incision—a physiologic incision today to avoid the tissue tension of tomorrow; in another transfusion; in another, sunlight or electric light; in another, continuous alcohol to make a scar covering.

In the rush of a great battle, he incised for drainage, and in addition

he made "physiologic incisions" to avoid the tension that is sure to follow the next day from the inevitable infection.

But in quiet times, he dissected out every atom of devitalized tissue. He read accurately not only the wound, but the patient; not only the patient, but the military situation; not only the military situation, but the condition of the infecting soil, the state of transport, his surgical assistance, and the type of nursing care—that is, he weighed accurately his chances for success. Therefore, the army medical service and the wounded man pinned their hope and their faith first, last, and always to the one agency of wound treatment that in civilian surgery emerged clearly from the confusion of the Listerian period; emerged clearly from the confusion of the four years of military surgery—the sane, sound surgeon.

CHAIRMAN LAUFFER: In opening the discussion of this paper, in the absence of Dr. Moorhead (whose paper will be published in the proceedings) I would like to call on Dr. Bloodgood.

DR. BLOODGOOD: I hope this paper will be published, and I believe I can say this summary is the best that he has done. Perhaps there are some surgeons who don't realize these little details because in civil surgery as a rule the tissue of an individual will stand a great deal of insult. It will heal in spite of everything. When you are called upon to treat an individual whose resistance is lowered, or a particular type of wound where the resistance is lowered, the results depend upon these details. But, unfortunately when you have an individual of that kind, a wound of that kind, and don't get recovery or don't get a good healing of the wound you can always place that individual in the group that should have died any way, so that your mistake is covered. It is a very difficult thing to compare the additional recovery and the lowered mortality in the group in which this detailed knowledge, and the action on that detailed knowledge, is required for the reduction of mortality and improving results.

A great many good surgeons think these points are more or less dreams, but there are some of us who know absolutely that these are essential to a certain group. Now the only way to develop that technique is by routine. You might say it is unnecessary, but the treatment must be in routine. Unless you have made it routine, you, your assistants, and your entire team will not be equal to applying the treatment the way it should be. I believe if we could corral all operations for exophthalmic goiter in this country the mortality would tell you the teams that have developed this technique in their lowered mortality.

CHAIRMAN LAUFFER: This very excellent paper will be published in the report of this Safety Council, whether it will have any publicity through the medical press or not, I don't know. But I believe it is worthy of publication in one of the surgical journals. It was certainly a very excellent paper and I hope arrangements can be made to have it put very extensively before industrial surgeons.

I would like to ask Dr. Bloodgood what is the most successful form of dressing to be used with the small pinch graft? I have used a large number of them and I would like to know what you have found, Doctor, has been the most successful dressing.

DR. BROODGOOD: I think all your questions will be answered in Davis' book on Plastic Surgery. I don't know of any surgeon in this country who spends more time on that subject. I wish that some of my associates were here because they do all the grafting now, but they taught me how to use the pinch graft. My experience in grafting has been excising a granulating wound, and we reached a point of one hundred per cent., we excised the area and cut it out in grafting. That is the ideal way, but after your area reaches a certain point you can't do it. The pinch graft we have been using, they just wipe the little granulated wound they have tried to keep clean, put the graft on, and no dressing. After that you can go back to whatever dressing you want.

I have had very little experience with the treatment of burns, but I believe Dr. Crile's statement in regard to good surgeons applies here. I have treated burns in children's hospitals, and I can see all those cases and I have never had any better results and that was a period when I had more time to treat a burn than any other time since. It is the essential feature of the treatment. You know, you can go all the way through the treatment but if you are dirty, no form of dressing that you can apply will be good enough to counteract your dirt. The cleansing of that wound is one of the important things, the daily dressing of that wound in which it is given a bath just as you give a young baby a bath. The skin must be clean. The burned area of the body must be clean, and Gentlemen, the best thing I find after a certain stage is soap and water. Soap and water, and it takes time. I believe that it doesn't make any difference what you put on your burn if you are clean. I have found just as good results with boric acid, but the burn after a time meets the stage that it needs some other food than boric acid, or any other treatment. Exercise of the individual is important and sunlight, but I think there is a stage when grafting should be done.

DISCUSSION

DR. J. J. MOORHEAD (Interborough Traction Company, New York City): Colonel Crile has very adequately stressed the importance of infection and the value of some of the antiseptics, notably Dakin's solution used by the Carrel technic. Unfortunately, this solution is difficult to prepare, it is unstable, it is not well suited for emergency treatment except in large hospitals. In addition to this, the application of the Carrel technic needs special training, it is time-consuming, in effect making each dressing an aseptic operation. For these reasons this valuable method of combating infection can have but limited application in the ordinary accidents of industry. One of the very valuable war lessons in this connection was the demonstration that thorough cleansing of a wound within twelve hours of its receipt was the best preventive of infection. This cleansing aimed sparingly to cut away all bruised or damaged tissue from the wound for the reason that the organisms of infection thrive on just that sort of soil. By this process (called debridement by the French) the vast major-

¹Dr. Moorhead was not present at the session and his discussion of Dr. Crile's paper was not read, but was later sent in to be included in the proceedings.

ity of wounds could be immediately sutured so that primary union would be attained. In the ordinary wounds of industrial warfare, it is not often necessary thus to debride the injured area as the same effect can often be obtained by vigorous scrubbing and mopping with soap suds. The part is then cleansed with sterile water, liberally swabbed with 3 per cent tincture of iodine, loosely sutured and provisionally drained for 24-48 hours. If then no evidences of infection are present the drain is removed. In wounds already infected we must resort to antiseptics, as Colonel Crile has stated. Once the process is under control and we have demonstrated the absence of streptococci, we may proceed to suture this class also, thus cutting short the period of healing. This plan of *primary suture* for cases seen within the first 12-24 hours, and *secondary suture* for cases seen later, is one of the great advances in traumatic surgery.

Shock and hemorrhage usually co-exist in the traumas of industry and Colonel Crile has had unusual opportunities before and during the war to demonstrate the value of transfusion. Likewise he calls attention to the safety of nitrous-oxid and oxygen as the anesthetic in this group. Of all anesthetics, chloroform seems particularly dangerous in traumatic cases and it should never be used. In the absence of nitrous-oxid, ether by the drop method on the open mask is the safest. For short operations, the French surgeons converted me to the use of Ethyl chloride and I have many times used it for cases not requiring more than fifteen minutes. It should be given on a mask and is valuable also to induce anesthesia preliminary to ether. Local anesthesia, intra-neurally or intra-spinally has also a place, notably in certain amputations.

After all is said, as Colonel Crile has so well indicated, the capacity of the surgeon is the big factor in the result, irrespective of the antiseptic, procedure, or apparatus employed. The routine of treatment can be learned by the novice; but the teaching of experience makes the sane, sound surgeon.

One other war lesson is that relating to the treatment of fractures. The conversion of a compound into a simple fracture by the process of debridement is a real gain. In well muscled parts, like the thigh and arm, this procedure should be used with extreme care. The Thomas splint and the modifications of it should have a wide application. The methods of direct traction such as the Beseley tongs and the Finochietto-Chutro stirrup have a place of great usefulness in fractures of the lower extremity.

Another important lesson is the procedure of early mobilization of injured joints. We learned in the war to keep an injured and even an infected joint active and not passive. Likewise we did not splint joints adjacent to fractures for nearly so long a period as was our former practice. Function is dependent upon activity and in future we will less often permit joints to remain long inactive.

CHAIRMAN LAUFFER: If our discussions are at an end, I wish to ask on behalf of the incoming chairman, that the courtesy extended to me during the past year be extended to him. I invite you all to the National Safety Council in Philadelphia next year, providing it is held there.

We stand adjourned.

Metals Section

October 2-4, 1919

J. A. OARTEL, Chairman

Director of Safety, Carnegie Steel Company, Pittsburgh, Pa.

HOMER J. WEEKS, Vice-Chairman

American Steel and Wire Company, Cleveland, Ohio

W. E. WATTERS, Secretary

National Malleable Castings Company, Melrose Park, Illinois

THURSDAY MORNING SESSION

CHAIRMAN OARTEL: As you know, at the last session of the Congress, Mr. Frank E. Morris of the American Rolling Mill Company was elected Chairman of the Metals Section, and he served until he was appointed Field Secretary for the National Safety Council, at which time the job was wished on me, so I have served only part of the year.

Because of this change in the officers of the section, the best work has not been done, but we have tried to do what we could.

The year that has passed has been a remarkable year in the reduction of accidents in the iron and steel industry. I suppose you are all familiar with the figures contained in a recent letter written by Dr. Frederick L. Hoffman, Third Vice President and Statistician of the Prudential Life Insurance Company, to Mr. C. L. Close, Manager of the Bureau of Safety, Sanitation, and Welfare of the United States Steel Corporation.

In that letter the Doctor tells of the remarkable reductions in life insurance premiums that have been given to men working in the iron and steel industry wholly because of the safety work that has been done. I think that is one of the biggest contributions that has ever been made to safety, the fact that a conservative life insurance company that does not do things hastily has, after a thorough investigation, decided that our safety work has brought such results that they can consistently lower premiums on life insurance. And so, I think it may be said that this is one of the big contributions to safety that has been made in the last year.

There have been some remarkable accident reductions by a number of companies, but I won't take the time to tell you of them.

I will now call on Mr. Watters, our Secretary, to give his report.

REPORT OF THE SECRETARY

Your executive committee had their first meeting in Chicago, on October 15, 1918, and their work for the coming year was planned. There were present: F. E. Morris, Chairman; Homer J. Weeks, Vice Chairman; W. H. Cameron, S. J. Williams and R. H. Guerrant of the National Safety Council staff. The Secretary was absent on account of illness.

Metal Section activities for the year 1918-19 were taken up in detail and it was agreed that each of the standing committees should be continued, and that the work of the section should be carried on along the same general lines as heretofore.

The advisability of having a special committee to disseminate information among the members of our section was discussed and it was decided that this work should be done by including this information in the monthly news letter.

BULLETIN AND SAFE PRACTICES COMMITTEE

After thoroughly canvassing the field, Mr. J. A. Oartel, Director of Safety, Carnegie Steel Company, was chosen as Chairman, of the Bulletin and Safe Practices Committee.

A report was obtained from Mr. Lamont, as to the amount of bulletin material on hand and it was learned that there was enough to run until the first of December.

It was suggested by Mr. Williams that many bulletins from other sections are applicable to the industries of the Metals Section, and that the scheme of leaving it to the headquarters staff to decide on material for the bulletins for all the sections would avoid any duplication of effort.

The different departments of the Iron, Steel, and Foundry Industries were outlined so that Mr. Guerrant would have a guide to work from, and it was agreed that the sectional members present would send several scenarios in to the Council headquarters so that the various principal hazards common to the section would be covered. A machine-shop bulletin would be of interest to all Metals Section members in view of the fact that every industry in our Section has a machine shop.

Therefore, it was decided that for the year twenty-six of our bulletins should be General Metal Working bulletins such as would be useful in any machine shop, and that twenty-six should be special bulletins applying strictly to the hazards of Iron, Steel, and Foundry members. The bulletins for the past year then have followed this plan, the Metal Working ones being issued on alternate weeks with those which were strictly sectional.

SAFE PRACTICES PAMPHLETS

The pamphlet on "Cleaning and Finishing Rooms in Foundries" which was prepared by Mr. Guerrant for the Metals Section, was carefully reviewed and was issued to members of the Section last Fall. The second Safe Practices pamphlet for the Section, that on "Blast Furnaces," is almost ready for the printer, and will likely be issued within the next three or four weeks.

NEWS LETTERS

Rather than depend on a general appeal for material for our monthly news letter it was decided to make a specific appeal to a limited number of members whose interest in the work of the Section is assured.

OTHER COMMITTEES

The selection of the other committees was postponed until the next meeting.

NEXT MEETING

It was decided to hold the next meeting in Pittsburgh, November 20. The meeting adjourned at 5:30 P. M.

THE SECOND MEETING

The second meeting of your Executive Committee was held in Pittsburgh on November 18. Those present were: F. E. Morris, H. A. Weeks, J. A. Oartel, J. A. Northwood, W. R. Rasmussen, W. E. Watters.

Each of the different committees reported much progress. The program for the next Congress was laid out more in detail.

There were two more meetings of your executive committee held, one in Pittsburgh in May, and one in Cleveland in June, for the purpose of completing the draft of the Safe Practice pamphlet on "Blast Furnaces."

Mr. John A. Oartel, Director of Safety, Carnegie Steel Company, succeeded Mr. Frank Morris, as chairman of the Metals Section, Mr. Morris being appointed District Field Secretary of the National Safety Council.

Since our last Congress the Metals Section has received 41 new members.

We have also had 31 members cancel their membership, the cause in a big percentage of the cases being the plants closing down.

(On motion the report was accepted.)

CHAIRMAN OARTEL: I think perhaps I should report for the Bulletin and Safe Practices Leaflet Committee, although Mr. Watters has touched on that in his report. I was getting along fairly well when I was made Chairman of this section and because of that, the work did not go along quite so well, but we have tried to do what we could and have been able to produce some very good bulletins.

I think, perhaps, I should also report for the Program Committee, of which Mr. J. A. Northwood of the Cambria Steel Company was Chairman. Mr. Northwood is unable to be present today, but I think the program we have for this Section, if not the best, is the most practical that we have ever had at a Congress. Of course, you will pass your judgment on that at the close of the sessions.

I think it would be in order now to appoint a Nominating Committee to nominate a Chairman, a Vice Chairman, and a Secretary for the ensuing term. I will appoint on that committee Mr. C. E. Pettibone, of the Pickands Mather Company; Fred Bennett, of the Buckeye Steel Castings Company; and H. E. Steinmetz, of the Midvale Steel and Ordnance Company. Will this committee please be prepared to hand in their report on Saturday morning?

The first address on our program this morning is by Mr. H. L. Church.

ACCIDENT PREVENTION IN A MALLEABLE IRON FOUNDRY

H. L. CHURCH, DIRECTOR OF EMPLOYMENT SERVICE, ROCKFORD MALLEABLE
IRON WORKS, ROCKFORD, ILL.

There are, broadly speaking, two angles from which one must view the question of accident prevention in industry—the physical and the human. By physical, I refer to the matter of safe equipment and the responsibility of keeping that equipment safe at all times. The other is the human element, and has to do with the habits of the men and the manner in which they perform their work. Owing to the fact that the amount of power-driven machinery in a foundry is comparatively limited, we are of the opinion that the vital matters in promoting safety in the malleable foundry are largely concerned with the human element and the various activities that grow directly or indirectly out of it. This is particularly the case when we are dealing with prevention of accidents distinctly characteristic of the malleable business, and are not considering such cases as are common to all branches of industry.

There are two factors that conspire to make work in a malleable foundry especially dangerous, if proper care is not exercised. These factors are *the work itself and the men who do it.*

FOUNDRY WORK MUST BE MADE SAFER AND MORE ATTRACTIVE TO HOLD THE MEN

In the first place, the handling of molten iron—especially of malleable—is fraught with danger. Malleable cools very quickly, hence a molder must work rapidly to pour off a ladle full. The fatigue attendant on carrying ladle after ladle of iron, the heat always in evidence, which produces an enervating effect, and the mental strain one is under at the time, combine to present a field of activity that is not very attractive. One often finds seasoned foundry men who for some reason or other get away from the molding trade, and who are with difficulty induced to return. One man told me some weeks ago that he had spent the best years of his life in a foundry and he was a blamed fool for so doing. He is now watching a machine in one of our large plants, not making as much money as he did while molding, but he says he is better satisfied. I do not wish to pose as a crape hanger, but we must face the fact that men, in northern Illinois at least, are leaving the molders' trade, and we are concerned as to where our future molders are to come from. This is preëminently a problem for the employment executive, but the safety engineer also has his role to play. We are of the conviction that foundry work must be made more attractive and more safe if we are to hold the men we already have, and that is part of the safety man's job.

The second reason grows out of the first condition I have outlined. As foundry work is not desirable and appealing, it does not attract the class of men who fit into organizations where the more skilled operatives are called for. Consequently, the foundry employment man usually has to take practically the lowest class of workers available. As a rule, these

are foreigners who understand little, if any, English, and read but indifferently their own language. Most if not all of these never have received in their own country even the most elementary notion of safety and sanitation. Put these men into a malleable foundry where working conditions are unpleasant and hard for even the fellow above par, and you have a combination that keeps the foundry safety engineer guessing most of the time. More than this, the employment service tries to develop and Americanize these men, and then is obliged to see many of them slip away into more enticing fields of industrial activity, conditioned, of course, by their ability to expand. This is true especially of the present generation which is characterized by apparent unwillingness to tie oneself down to a trade, and is not applicable to men of the older generation, among whom are the mainstays of present-day industry. However, the personal service director who has a broad outlook on life will not complain about this fact, but will face it gracefully, and feel that he is doing his part to develop and unify to a certain extent the heterogeneous elements that fall into our national melting pot.

The net result of these two conditions outlined, the nature of the work, and the kind of men who must do it, is that the problem of safety in the foundry is preëminently one for the employment department, as a large part of the labor turnover in a malleable foundry is due to this peculiar maladjustment of the man and the job.

FOUNDRY BURNS

Our organized safety movement dates back to the spring of 1917, when we installed a first-aid hospital. A few weeks later, our employment department was inaugurated. One of the first lines of research work we undertook was to study the accidents reported during 1916 and the first half of 1917. Interesting information was gathered from this study. We learned that a large percentage of foundry burns, which formed the most distressing and costly of our accident cases, were suffered by men comparatively new in the business. Our experience has revealed the fact that molders who have been following the trade for years, and helpers who have become seasoned to the hazards of foundry life, are almost negligible as far as the human element in accident prevention is concerned. Not so, however, the half-baked molder or transient gangway dancer. These fellows, we found, suffered by far the greater number of burns. This brought us face to face with our problem: to reduce the number of burns among the inexperienced foundry workmen, which constituted our most serious hazard. Insistence on the use of safety shoes, goggles, leggings, and gloves prevents a great many burns, but we believe one must go deeper than that to get at the heart of the matter.

I remember reading a number of years ago a humorous sketch entitled "Curtailing the Liquor Traffic." One old timer suggested that the traffic be curtailed by cutting off half of its tail. Another maintained that two-thirds of the tail should be amputated. Still another thought that the whole tail might be spared. Finally, a radical grapejuice advocate suggested "cutting off the cur's tail right behind the ears." We feel some-

what the same way, at least as far as curtailing the number of foundry burns is concerned. We believe that the best results are to be obtained by getting right at the men themselves. In other words, we can control such externalities as safe equipment, preventives, sanitary surroundings, etc., but we cannot control the inexperienced human element. This we must educate. To substantiate this, permit me to say that an analysis of the accidents during 1917 showed that 57.8 per cent were due to the carelessness of the injured man, and 17.1 per cent to the carelessness of a fellow employee. The remaining 25.1 per cent were accidents which occurred under such circumstances that no particular blame could be placed. During 1918, 38.4 per cent were apparently unavoidable, as against 25.1 per cent the year before. This, of course, reduces the number of accidents due to some one's carelessness, showing a gain over the preceding year. This year, to the first of September, has made even a better showing. We have had 38 accidents within this period, and just 50 per cent have been unavoidable; the other half being traced to negligence. I might add that a large number of the accidents referred to the company physician this year are eye cases, with no disability involved.

We have just said that the experienced foundry man does not cause us any concern as regards avoidable accidents, but we are especially concerned with novices. For this reason when we take on a man who is new to the malleable game, no matter whether he is an apprentice molder, a skilled molder who has worked only grey iron, or a laborer, we tell him how to do his work with the maximum of safety to himself and his fellow workers.

REQUIRE MEN TO WEAR MOLDERS' SHOES

Among other things, we explain our reasons for requiring all men who work in the foundry during the heats to wear molders' shoes. These we supply at cost. We further tell the new man that his feet are under inspection at all times, and we expect him to keep his shoes in such condition that they afford the necessary protection. If the new man is to carry iron, we warn him against damp ladles and explain the danger of dumping drops in damp places. We also explain that the rights of others must be respected, and that he must await his turn at the furnace spout. In order to enforce these rules, we provide a watcher at each furnace during the time that the heat is taken off.

The location and purpose of the first-aid hospital is told the newcomer, and we try to impress on him the necessity of reporting to his foreman immediately even the slightest scratch or abrasion. Often it is discouraging to find out that men who ought to know better sometimes pay no attention to a slight wound, but neglect it until it becomes painful. On the other hand, it is very gratifying to see a new man come to the hospital immediately.

GOOD PICTURES NEEDED FOR FOUNDRY BULLETIN BOARDS

I have already alluded to the fact that the average foundry laborer is unlettered, either in English or his native tongue. For this reason, we do not believe that bulletin boards have any particular value. Pictures.

however, speak every language, and he who does not read at all can profit by them. I wish there were more good pictures suitable for the foundry industry. Machine shops, railroads, electrical, and construction trades are well represented, but the library of pictures illustrating the distinctive hazards of the foundry industry make a relatively small showing.

We have developed one branch of activity at our plant which may have contributed somewhat to the reduction of accidents during the past two years. We have a man in our organization who speaks several languages fluently, and a few others in a passable manner. One of this man's duties is to spend some time in the foundry each day, and as opportunity presents itself, to talk to the men along the lines of safety and accident prevention, as well as other propaganda that occasionally seems advisable. More men of the untutored classes can be reached by occasional chats in their native language than can be appealed to by high-brow pay envelope stuffers, well written bulletins, etc. These are all right in their place, but their place is not the malleable iron foundry.

FIRST-AID WORK

Every foundry should have a first-aid hospital. In plants where the payroll runs up into the thousands, and where there are many accidents every day, a trained nurse or experienced first-aid attendant is necessary. In smaller shops, where it does not seem advisable to secure the exclusive services of an expert, there can usually be found two or three men with level heads and steady nerves, who can be easily trained in first-aid work, and any of whom can be available when needed. This reduces the cost of operating the hospital to a low point, and in small shops this is the only way to handle the matter.

So well has our first-aid hospital been handled that in the twenty-seven months of its existence, only two cases of blood-poisoning have developed from an injury or burn. In both of these cases, injuries were not reported until too late to stop infection. It might be interesting to add that one of these cases was the first-aid attendant himself, who scratched his hand on a rusty nail, and did not take the trouble to disinfect it. His penalty for not practicing what he preached was that he was tied up for two or three weeks and had a merry time keeping the blood-poisoning within check.

There is another problem connected with handling first aid in accident cases. The average workman is prone to neglect an accident for several days, until it becomes serious. One may follow up the policy I have outlined, and he may think he is getting the matter pretty well in hand, when some fine day, Tony or Mike or Pete lays off, and later we learn of an accident of a week ago that he neglected to report, and that has now become painful and of grave concern to him and to us.

We have developed a method of handling this situation which cannot fail to succeed if faithfully followed up. Every morning a list of absentees is made up and every man whose reason for absence is not known either to his foreman or to the employment office, is visited at his home and the reason for his absence is learned. We are doing this primarily

Metals Section

October 2-4, 1919

J. A. OARTEL, Chairman

Director of Safety, Carnegie Steel Company, Pittsburgh, Pa.

HOMER J. WEEKS, Vice-Chairman

American Steel and Wire Company, Cleveland, Ohio

W. E. WATTERS, Secretary

National Malleable Castings Company, Melrose Park, Illinois

THURSDAY MORNING SESSION

CHAIRMAN OARTEL: As you know, at the last session of the Congress, Mr. Frank E. Morris of the American Rolling Mill Company was elected Chairman of the Metals Section, and he served until he was appointed Field Secretary for the National Safety Council, at which time the job was wished on me, so I have served only part of the year.

Because of this change in the officers of the section, the best work has not been done, but we have tried to do what we could.

The year that has passed has been a remarkable year in the reduction of accidents in the iron and steel industry. I suppose you are all familiar with the figures contained in a recent letter written by Dr. Frederick L. Hoffman, Third Vice President and Statistician of the Prudential Life Insurance Company, to Mr. C. L. Close, Manager of the Bureau of Safety, Sanitation, and Welfare of the United States Steel Corporation.

In that letter the Doctor tells of the remarkable reductions in life insurance premiums that have been given to men working in the iron and steel industry wholly because of the safety work that has been done. I think that is one of the biggest contributions that has ever been made to safety, the fact that a conservative life insurance company that does not do things hastily has, after a thorough investigation, decided that our safety work has brought such results that they can consistently lower premiums on life insurance. And so, I think it may be said that this is one of the big contributions to safety that has been made in the last year.

There have been some remarkable accident reductions by a number of companies, but I won't take the time to tell you of them.

I will now call on Mr. Watters, our Secretary, to give his report.

REPORT OF THE SECRETARY

Your executive committee had their first meeting in Chicago, on October 15, 1918, and their work for the coming year was planned. There were present: F. E. Morris, Chairman; Homer J. Weeks, Vice Chairman; W. H. Cameron, S. J. Williams and R. H. Guerrant of the National Safety Council staff. The Secretary was absent on account of illness.

Metal Section activities for the year 1918-19 were taken up in detail and it was agreed that each of the standing committees should be continued, and that the work of the section should be carried on along the same general lines as heretofore.

The advisability of having a special committee to disseminate information among the members of our section was discussed and it was decided that this work should be done by including this information in the monthly news letter.

BULLETIN AND SAFE PRACTICES COMMITTEE

After thoroughly canvassing the field, Mr. J. A. Oartel, Director of Safety, Carnegie Steel Company, was chosen as Chairman, of the Bulletin and Safe Practices Committee.

A report was obtained from Mr. Lamont, as to the amount of bulletin material on hand and it was learned that there was enough to run until the first of December.

It was suggested by Mr. Williams that many bulletins from other sections are applicable to the industries of the Metals Section, and that the scheme of leaving it to the headquarters staff to decide on material for the bulletins for all the sections would avoid any duplication of effort.

The different departments of the Iron, Steel, and Foundry Industries were outlined so that Mr. Guerrant would have a guide to work from, and it was agreed that the sectional members present would send several scenarios in to the Council headquarters so that the various principal hazards common to the section would be covered. A machine-shop bulletin would be of interest to all Metals Section members in view of the fact that every industry in our Section has a machine shop.

Therefore, it was decided that for the year twenty-six of our bulletins should be General Metal Working bulletins such as would be useful in any machine shop, and that twenty-six should be special bulletins applying strictly to the hazards of Iron, Steel, and Foundry members. The bulletins for the past year then have followed this plan, the Metal Working ones being issued on alternate weeks with those which were strictly sectional.

SAFE PRACTICES PAMPHLETS

The pamphlet on "Cleaning and Finishing Rooms in Foundries" which was prepared by Mr. Guerrant for the Metals Section, was carefully reviewed and was issued to members of the Section last Fall. The second Safe Practices pamphlet for the Section, that on "Blast Furnaces," is almost ready for the printer, and will likely be issued within the next three or four weeks.

NEWS LETTERS

Rather than depend on a general appeal for material for our monthly news letter it was decided to make a specific appeal to a limited number of members whose interest in the work of the Section is assured.

OTHER COMMITTEES

The selection of the other committees was postponed until the next meeting.

NEXT MEETING

It was decided to hold the next meeting in Pittsburgh, November 20. The meeting adjourned at 5:30 P. M.

THE SECOND MEETING

The second meeting of your Executive Committee was held in Pittsburgh on November 18. Those present were: F. E. Morris, H. A. Weeks, J. A. Oartel, J. A. Northwood, W. R. Rasmussen, W. E. Watters.

Each of the different committees reported much progress. The program for the next Congress was laid out more in detail.

There were two more meetings of your executive committee held, one in Pittsburgh in May, and one in Cleveland in June, for the purpose of completing the draft of the Safe Practice pamphlet on "Blast Furnaces."

Mr. John A. Oartel, Director of Safety, Carnegie Steel Company, succeeded Mr. Frank Morris, as chairman of the Metals Section, Mr. Morris being appointed District Field Secretary of the National Safety Council.

Since our last Congress the Metals Section has received 41 new members.

We have also had 31 members cancel their membership, the cause in a big percentage of the cases being the plants closing down.

(On motion the report was accepted.)

CHAIRMAN OARTEL: I think perhaps I should report for the Bulletin and Safe Practices Leaflet Committee, although Mr. Watters has touched on that in his report. I was getting along fairly well when I was made Chairman of this section and because of that, the work did not go along quite so well, but we have tried to do what we could and have been able to produce some very good bulletins.

I think, perhaps, I should also report for the Program Committee, of which Mr. J. A. Northwood of the Cambria Steel Company was Chairman. Mr. Northwood is unable to be present today, but I think the program we have for this Section, if not the best, is the most practical that we have ever had at a Congress. Of course, you will pass your judgment on that at the close of the sessions.

I think it would be in order now to appoint a Nominating Committee to nominate a Chairman, a Vice Chairman, and a Secretary for the ensuing term. I will appoint on that committee Mr. C. E. Pettibone, of the Pickands Mather Company; Fred Bennett, of the Buckeye Steel Castings Company; and H. E. Steinmetz, of the Midvale Steel and Ordnance Company. Will this committee please be prepared to hand in their report on Saturday morning?

The first address on our program this morning is by Mr. H. L. Church.

ACCIDENT PREVENTION IN A MALLEABLE IRON FOUNDRY

H. L. CHURCH, DIRECTOR OF EMPLOYMENT SERVICE, ROCKFORD MALLEABLE
IRON WORKS, ROCKFORD, ILL.

There are, broadly speaking, two angles from which one must view the question of accident prevention in industry—the physical and the human. By physical, I refer to the matter of safe equipment and the responsibility of keeping that equipment safe at all times. The other is the human element, and has to do with the habits of the men and the manner in which they perform their work. Owing to the fact that the amount of power-driven machinery in a foundry is comparatively limited, we are of the opinion that the vital matters in promoting safety in the malleable foundry are largely concerned with the human element and the various activities that grow directly or indirectly out of it. This is particularly the case when we are dealing with prevention of accidents distinctly characteristic of the malleable business, and are not considering such cases as are common to all branches of industry.

There are two factors that conspire to make work in a malleable foundry especially dangerous, if proper care is not exercised. These factors are *the work itself* and *the men who do it*.

FOUNDRY WORK MUST BE MADE SAFER AND MORE ATTRACTIVE TO HOLD THE MEN

In the first place, the handling of molten iron—especially of malleable—is fraught with danger. Malleable cools very quickly, hence a molder must work rapidly to pour off a ladle full. The fatigue attendant on carrying ladle after ladle of iron, the heat always in evidence, which produces an enervating effect, and the mental strain one is under at the time, combine to present a field of activity that is not very attractive. One often finds seasoned foundry men who for some reason or other get away from the molding trade, and who are with difficulty induced to return. One man told me some weeks ago that he had spent the best years of his life in a foundry and he was a blamed fool for so doing. He is now watching a machine in one of our large plants, not making as much money as he did while molding, but he says he is better satisfied. I do not wish to pose as a crape hanger, but we must face the fact that men, in northern Illinois at least, are leaving the molders' trade, and we are concerned as to where our future molders are to come from. This is preëminently a problem for the employment executive, but the safety engineer also has his role to play. We are of the conviction that foundry work must be made more attractive and more safe if we are to hold the men we already have, and that is part of the safety man's job.

The second reason grows out of the first condition I have outlined. As foundry work is not desirable and appealing, it does not attract the class of men who fit into organizations where the more skilled operatives are called for. Consequently, the foundry employment man usually has to take practically the lowest class of workers available. As a rule, these

are foreigners who understand little, if any, English, and read but indifferently their own language. Most if not all of these never have received in their own country even the most elementary notion of safety and sanitation. Put these men into a malleable foundry where working conditions are unpleasant and hard for even the fellow above par, and you have a combination that keeps the foundry safety engineer guessing most of the time. More than this, the employment service tries to develop and Americanize these men, and then is obliged to see many of them slip away into more enticing fields of industrial activity, conditioned, of course, by their ability to expand. This is true especially of the present generation which is characterized by apparent unwillingness to tie oneself down to a trade, and is not applicable to men of the older generation, among whom are the mainstays of present-day industry. However, the personal service director who has a broad outlook on life will not complain about this fact, but will face it gracefully, and feel that he is doing his part to develop and unify to a certain extent the heterogeneous elements that fall into our national melting pot.

The net result of these two conditions outlined, the nature of the work, and the kind of men who must do it, is that the problem of safety in the foundry is preëminently one for the employment department, as a large part of the labor turnover in a malleable foundry is due to this peculiar maladjustment of the man and the job.

FOUNDRY BURNS

Our organized safety movement dates back to the spring of 1917, when we installed a first-aid hospital. A few weeks later, our employment department was inaugurated. One of the first lines of research work we undertook was to study the accidents reported during 1916 and the first half of 1917. Interesting information was gathered from this study. We learned that a large percentage of foundry burns, which formed the most distressing and costly of our accident cases, were suffered by men comparatively new in the business. Our experience has revealed the fact that molders who have been following the trade for years, and helpers who have become seasoned to the hazards of foundry life, are almost negligible as far as the human element in accident prevention is concerned. Not so, however, the half-baked molder or transient gangway dancer. These fellows, we found, suffered by far the greater number of burns. This brought us face to face with our problem: to reduce the number of burns among the inexperienced foundry workmen, which constituted our most serious hazard. Insistence on the use of safety shoes, goggles, leggings, and gloves prevents a great many burns, but we believe one must go deeper than that to get at the heart of the matter.

I remember reading a number of years ago a humorous sketch entitled "Curtailling the Liquor Traffic." One old timer suggested that the traffic be curtailed by cutting off half of its tail. Another maintained that two-thirds of the tail should be amputated. Still another thought that the whole tail might be spared. Finally, a radical grapejuice advocate suggested "cutting off the cur's tail right behind the ears." We feel some-

what the same way, at least as far as curtailing the number of foundry burns is concerned. We believe that the best results are to be obtained by getting right at the men themselves. In other words, we can control such externalities as safe equipment, preventives, sanitary surroundings, etc., but we cannot control the inexperienced human element. This we must educate. To substantiate this, permit me to say that an analysis of the accidents during 1917 showed that 57.8 per cent were due to the carelessness of the injured man, and 17.1 per cent to the carelessness of a fellow employee. The remaining 25.1 per cent were accidents which occurred under such circumstances that no particular blame could be placed. During 1918, 38.5 per cent were apparently unavoidable, as against 25.1 per cent the year before. This, of course, reduces the number of accidents due to some one's carelessness, showing a gain over the preceding year. This year, to the first of September, has made even a better showing. We have had 38 accidents within this period, and just 50 per cent have been unavoidable, the other half being traced to negligence. I might add that a large number of the accidents referred to the company physician this year are eye cases, with no disability involved.

We have just said that the experienced foundry man does not cause us any concern as regards avoidable accidents, but we are especially concerned with novices. For this reason when we take on a man who is new to the malleable game, no matter whether he is an apprentice molder, a skilled molder who has worked only grey iron, or a laborer, we tell him how to do his work with the maximum of safety to himself and his fellow workers.

REQUIRE MEN TO WEAR MOLDERS' SHOES

Among other things, we explain our reasons for requiring all men who work in the foundry during the heats to wear molders' shoes. These we supply at cost. We further tell the new man that his feet are under inspection at all times, and we expect him to keep his shoes in such condition that they afford the necessary protection. If the new man is to carry iron, we warn him against damp ladles and explain the danger of dumping drops in damp places. We also explain that the rights of others must be respected, and that he must await his turn at the furnace spout. In order to enforce these rules, we provide a watcher at each furnace during the time that the heat is taken off.

The location and purpose of the first-aid hospital is told the newcomer, and we try to impress on him the necessity of reporting to his foreman immediately even the slightest scratch or abrasion. Often it is discouraging to find out that men who ought to know better sometimes pay no attention to a slight wound, but neglect it until it becomes painful. On the other hand, it is very gratifying to see a new man come to the hospital immediately.

GOOD PICTURES NEEDED FOR FOUNDRY BULLETIN BOARDS

I have already alluded to the fact that the average foundry laborer is unlettered, either in English or his native tongue. For this reason, we do not believe that bulletin boards have any particular value. Pictures.

however, speak every language, and he who does not read at all can profit by them. I wish there were more good pictures suitable for the foundry industry. Machine shops, railroads, electrical, and construction trades are well represented, but the library of pictures illustrating the distinctive hazards of the foundry industry make a relatively small showing.

We have developed one branch of activity at our plant which may have contributed somewhat to the reduction of accidents during the past two years. We have a man in our organization who speaks several languages fluently, and a few others in a passable manner. One of this man's duties is to spend some time in the foundry each day, and as opportunity presents itself, to talk to the men along the lines of safety and accident prevention, as well as other propaganda that occasionally seems advisable. More men of the untutored classes can be reached by occasional chats in their native language than can be appealed to by high-brow pay envelope stuffers, well written bulletins, etc. These are all right in their place, but their place is not the malleable iron foundry.

FIRST-AID WORK

Every foundry should have a first-aid hospital. In plants where the payroll runs up into the thousands, and where there are many accidents every day, a trained nurse or experienced first-aid attendant is necessary. In smaller shops, where it does not seem advisable to secure the exclusive services of an expert, there can usually be found two or three men with level heads and steady nerves, who can be easily trained in first-aid work, and any of whom can be available when needed. This reduces the cost of operating the hospital to a low point, and in small shops this is the only way to handle the matter.

So well has our first-aid hospital been handled that in the twenty-seven months of its existence, only two cases of blood-poisoning have developed from an injury or burn. In both of these cases, injuries were not reported until too late to stop infection. It might be interesting to add that one of these cases was the first-aid attendant himself, who scratched his hand on a rusty nail, and did not take the trouble to disinfect it. His penalty for not practicing what he preached was that he was tied up for two or three weeks and had a merry time keeping the blood-poisoning within check.

There is another problem connected with handling first aid in accident cases. The average workman is prone to neglect an accident for several days, until it becomes serious. One may follow up the policy I have outlined, and he may think he is getting the matter pretty well in hand, when some fine day, Tony or Mike or Pete lays off, and later we learn of an accident of a week ago that he neglected to report, and that has now become painful and of grave concern to him and to us.

We have developed a method of handling this situation which cannot fail to succeed if faithfully followed up. Every morning a list of absentees is made up and every man whose reason for absence is not known either to his foreman or to the employment office, is visited at his home and the reason for his absence is learned. We are doing this primarily

to secure information that will help us to work along the lines of stabilizing our working force. However, a valuable by-product of this plan is the help it brings to the first-aid department. If a man has been injured and he has neglected to report it until it became painful and compelled him to lay off, we get at the fact the first day he is off duty. If it looks like a case that may be critical, we get the matter before the company physician. If it seems likely that the first-aid department can handle the case, and that a few days off is the maximum, we take the man back to the factory where the first-aid department takes care of his case. We then take him home if necessary. We follow him up and see that he gets the necessary care until he is able to resume work.

This, in the main, is the outline of our efforts and experience along the lines of accident prevention in the malleable iron foundry. No plans, however clever or well laid, will succeed without persistent, honest endeavor. No system is better than the man or men who operates it. Whether we have succeeded in reducing accidents by activities along the lines we have outlined is of course debatable. We may have been simply fortunate. Possibly so. Our records do show, however, that our accidents have been reduced in number, and if we have been simply fortunate, that fortune at least coincides chronologically with our organized efforts.

REDUCTION IN ACCIDENTS

Permit me at this time to present a few statistics. During the second half of 1917, which was the first half-year of our organized effort, we had one foundry burn to every twelve men employed. During the first half of 1918, we had one burn for every 30 men, and the same ratio obtained during the last half of the year. The first six months of this year was somewhat better, with a showing of only one burn to 44 men. Since the first of July to date, we have had only one burn that necessitated a man laying off. We are especially gratified at this result in view of the comparatively large number of apprentice molders we have been obliged to take on, owing to a serious shortage of skilled molders.

To judge from our own experience, we do not hesitate to say that every malleable iron foundry, no matter how small, should be equipped with a safety organization somewhat along the lines we have tried out. It may not be possible to have one who devotes all his time to this work, especially in the smaller plants. In view of the peculiar employment problems that confront foundries at present, we believe that every malleable shop should have an employment service department, part of whose functions is the safety-first propaganda. These two branches can be combined very successfully if plant conditions do not warrant an exclusive safety engineer.

EXTENDING SAFETY AND SANITATION TO THE HOMES

I have already alluded to the fact that the malleable foundry usually has to take practically the least desirable class of workers available and try to develop them. This affords the opportunity of the malleable foundry to serve society, if there exists any altruistic sense at all, and I for one, believe that there should be. We must take these men as we find

them, many of them hardly above the ten-year-old in mentality, and give them their first instructions in safety and sanitation. If we can do so without becoming manifestly paternalistic, we might extend the scope of our operations to reach them in their home life. The average man spends about nine or ten hours under influences created and maintained by his employer. The remainder of his time, not devoted to sleep, is with his family and acquaintances. If, under these circumstances, the employer cannot inculcate the principles of safety, who will? If it is inadvisable to extend our safety work to the men in their homes, we can at least hope that they will apply in their home life what we are trying to teach them in the shop. If we can impress the men with proper conceptions of safety and sanitation in such a way that they become not merely a formal observance of shop practice, but a rule of life, vital and dominating, we are contributing our share to the development of those elements of society that come under the sphere of our influence.

CHAIRMAN OARTEL: Mr. Church, I am very sure I express the sentiment of the entire Metals Section when I voice my appreciation for your very practical paper.

Gentlemen, we have two or three minutes left for discussion. Are there any questions any of you want to ask Mr. Church? Is there anything you want to add to his paper?

DISCUSSION

MR. WILLIAM RANDALL (Valley Mould and Iron Company, Sharpsville, Pa.): I would like to ask Mr. Church if he compels or demands his employees to wear leggings and safety shoes.

SAFETY SHOES

MR. H. L. CHURCH: We compel them to wear safety shoes. We have not compelled them to wear leggings as yet but are inducing them to do it by moral suasion. We expect to do so in the near future.

MR. WILLIAM RANDALL: If you can't obtain that result, what do you do, discharge them?

MR. H. L. CHURCH: We haven't had much trouble in compelling them because we furnish the shoes.

MR. WILLIAM RANDALL: Does your company furnish all the shoes?

MR. H. L. CHURCH: Yes. We furnish the shoes.

THE SECRETARY: Do you make any charge for the shoes?

MR. H. L. CHURCH: We handle them absolutely at cost. We had one spell several months ago when the fellows were complaining about the high cost of shoes. We discontinued the shoes and told them to buy them up town. In about a week there was an awful holler about it, and we went back to our old practice.

MR. H. N. YATES (Rogers-Brown Iron Company, Buffalo, N. Y.): What kind of shoes do you mean by moulders shoes, congress or lace shoes?

MR. H. L. CHURCH: Congress shoes.

MR. H. N. YATES: We find great difficulty in getting the men to adopt

those shoes. I would like to ask what the duties of your Service Department are.

MR. H. L. CHURCH: The employment service is intended as a clearing house of labor methods. We call the Employment Manager the Employment Service Director. He investigates discharges, secures new help, takes care of the personal relations of the men in the shop. He is the same as the Employment Manager in most concerns.

CHAIRMAN ORTELL: There is a request that Mr. Vanderpool say something on leggings and shoes.

MR. VANDERPOOL: At the National Malleable Castings Company we have no trouble in getting men to wear leggings. We furnish the leggings, making an initial charge. Their money is refunded if they leave us. We go around daily and inspect the leggings, and those in need of repairs we pick up and at the same time hand the man a new legging. We haven't had any trouble in getting them worn.

MR. J. D. JAMES (New Jersey Zinc Company): We have had quite a number of foot burns by metal. Very often we had as high as two or three a week. But, in the last few years we have eliminated burns altogether.

First of all, we tried leggings, but the men complained that in the summer months they could not wear them because they were too warm. So, we kept experimenting on a kind of footguard. We don't have any trouble in getting them to wear the spats, as we call them, and have eliminated foot burns altogether. I have a pair at the desk and if you would like to examine them, I will be glad to show them to you. We don't charge anything for them and we have no trouble in getting the men to wear them.

CHAIRMAN ORTELL: Let us leave the inspection of those spats until the close of the meeting. I am sure we shall all be glad to see them because this is so vital a point in our industry.

The next address was to have been delivered by Mr. M. F. Gartland of the Marion Gray Iron Foundry Company, Marion, Indiana, but Mr. Gartland is detailed on account of illness, and the paper will be read by Mr. T. W. Vanderpool of the National Malleable Castings Company.

THE PERSONAL ELEMENT IN A SAFETY PROGRAM FOR THE FOUNDRY

M. F. GARTLAND, MARION GRAY IRON FOUNDRY, MARION, IND.

We state a fact and we don't need to prove it when we say that the foundry can never be made as safe as a parlor. We may have the most expensive and most modern machinery and equipment that money can buy, our buildings may be models of perfection so far as light and ventilation and general arrangement are concerned, we may coerce our men in the matter of wearing molders' shoes, leggings, and goggles, but the fact remains that a splash of hot iron will still cause a burn when it comes into contact with the human body. A casting or a piece of pig iron will still mash a foot or break a toe if it drops at the right spot at the right time.

Our high grade equipment will do a great deal to eliminate the

splashes and other accidents due to machinery but beyond that there is yet another element. Improved methods of handling the product will eliminate a great deal of the danger that arises from this source but no piece of machinery or equipment has ever been made that is entirely fool proof. We must seek yet further for the final analysis of our safety problem. We shall still have our accidents in spite of all these good things.

If we could operate a foundry by machinery from the pig iron yard to the shipping platform without the touch of a human hand we should have no foundry accidents. But we can't do that, we must have men. Our foundries must be alive with men through every part of every working day. Again, if we had the men of our foundries engaged in the task of making mud pies by hand we should have no foundry accidents. The element of danger that lies in the nature of our product would be eliminated. But we are not in the mud pie business and we are not making and shipping castings by machinery. We are making our product from pig iron and scrap. To put it on the market we must have men. Men must unload the iron, the coal, and the sand. Men must charge the furnaces and heave in the coal to heat them. Other men must draw off the molten charge and pour it into the moulds, and still other men must dump the castings from the moulds and follow them step by step through the finishing processes and then put them on board the cars for their destination. In each of these operations from beginning to end there is a certain element of danger from the very nature of the materials and because of the fact that human hands must direct each one of them. This element of danger or hazard can be lessened but never eliminated entirely by the installation and use of more modern equipment.

THREE ELEMENTS OF HAZARD

We have, then, three elements of hazard with which to contend even in the best of our foundries: our equipment, our product, and our men. The safety engineer and the foundry expert have done a great deal to eliminate the danger in the manufacturing process and they will yet do a great deal more. Let them do it. That is their job but let us give them our best coöperation. They each have their field, and each is important to our organization. They have dealt primarily with machinery and mechanical processes and in the course of time may hope to arrive at something near perfection, so far as safe machines may be concerned. The greatest hazard yet remains and here is a job for the human engineer. While the safety engineer is dealing with machines the human engineer is dealing with a problem far more complex than any machine can ever be. He must deal with human nature and all of us know enough about human nature to know that we know very little. We don't know ourselves so very well so, of course, we cannot hope to know fully any one else.

THE HUMAN ELEMENT

It is the purpose of this paper to direct your attention to certain phases of the work of the human engineer. For the sake of clearness the sub-

ject will be presented as though his work were to be entirely divorced from that of the safety engineer. It will be so presented but with full knowledge of the fact that the two types of work are very closely related to each other and that the safety engineer is very often a human engineer as well.

We are asked to discuss today the strides that have been made in the progress of safety work for foundries. Perhaps the greatest stride possible has been made when we recognize the true nature of our problem and put our hands to the task of its solution. We may say with confidence that the foundries of the country have recognized the problem and that they have set about solving it. We may find conclusive evidence of this fact in every new safety device that is installed and in every piece of so-called welfare work that is being undertaken for the workers in our plants. Owners and managers everywhere are beginning to recognize the human element that enters into their safety problem and they are all striking out, some of them blindly, perhaps, to find its solution. We have housing plans. We have gardens by the thousands for our employees. We have clubs and classes. We have entertainments and socials. We have free clinics and visiting nurses and social service workers. We have bonus systems and plans of profit sharing and a score of other lines of welfare work all trying for the one goal of making the worker a more efficient and better satisfied man. All of these things are good and should have a great deal more of our attention. They should be encouraged among our workmen and should be given larger appropriations of money. We have but to look into our own lives to see how easily men are thrown off their guard. We know that a night without proper rest is fatal to our highest efficiency on the day following, and we know that a long stretch of hard work without periods of proper relaxation and recreation will bring about a break down in our better judgments. We may not suffer a broken foot from a falling pig of iron or a burned ankle from a splash of molten metal but we have accidents in our mental processes which are just as painful and a great deal more costly in dollars and cents. Perhaps we should have a great deal more serious accidents than the foundry laborer has if we carried our load and worked where he works and under the same conditions.

We know that everything we do in our leisure time has its effect upon our lives while we are at work. The thing that is true of the executive who works in ideal surroundings is still more true of the man who labors with his hands and earns his living in the heat and smoke and confusion of our foundries. To a very large extent he is made or unmade by the things which happen to him outside of his work-day life. So then we may say that a divorce suit in a local court may be more dangerous to the man involved than an open pit near his work bench. A threatening landlord may produce more injuries in our foundry than our worst hazard of equipment. In other words, the man whose mind is ill at ease or who isn't properly housed and fed may make our plant more unsafe than it would be if we removed every safety device in the whole place. The man who was just born careless and never outgrew it is more dangerous to our plant when he is in there at work than he would be if he stood off

at a safe distance on the outside and hurled firebrands into it three times a day.

THE MISFIT

Now let us look at some of these men of ours who are so prone to injury. Let us make up our minds to help them if we can. The effort will pay for itself in many ways. First there is the man who is a misfit. We didn't know there was such an animal a few years ago but we are beginning to recognize him now. There are men in all of our foundries who ought not to be there. They have been drawn into our employ through a chain of circumstances and it is hard for them to break away. They belong there just about as much as the members of the National Safety Council belong in the business of deep-sea diving. They have about as much sympathy for our business as the average safety engineer has for the business of the steeple jack. Not having interest in their work they lack the incentive to become efficient workmen. They drag through the day without enthusiasm and leave when the whistle blows with a full quota of accidents piled up behind them. These are the men who make our State Industrial Commissions keep one eye on our accident charts. It is because of such men as these that we have a high rate of industrial insurance for our foundries of all types.

But they are there. Our foreman can point out half a dozen of them any time we ask him. We know they are there but what are we going to do with them? That question is easier to ask than it is to answer. Perhaps the easiest thing would be to give such a man the opportunity to find work somewhere else. We would have done that in the old days but we hesitate to do it now; not that we love the man any more than we did but it is not so easy to replace him with a better man. Another and better solution is to give him his opportunity in some other part of our own plant if possible. We know this plan will work because we can all call up a great number of individual cases where it has worked. The trouble is that very few if any of us have adopted it as a principle for every day application. The consistent application of this principle will eliminate a great many of our misfits. It will make careful and efficient workmen out of a great many of our accident makers and will often be the means of keeping a valuable man on our pay-roll. Of course we can't do this by merely saying that it will be done. If we believe it we must work it day after day, week in and week out. It will call for a closer cooperation between our different production departments and between all foremen and the employment department.

We cannot lay down any rules for the application of this principle. Each case must be handled in its own way. We cannot say how long a man should be kept on trial. Some men respond much more quickly than others, and we cannot say that the principle will work in every case because we know it won't. There are some men who are misfits no matter where you place them and for such as these there is no hope in the foundry. The sooner we start them on their way out the better off we shall be. All that we can give to the plan is patience and perseverance and good common sense will not produce perfect results but we can accom-

plish something that is very much worth while. We shall understand our men better, at the very least, our men will understand us better and in this we shall have more of their loyalty and devotion.

THE MAN WITH PERSONAL TROUBLE

The next man who is a great maker of accidents is the man whose mind is ill at ease. He is not so easy to recognize and not so easy to deal with when we do find him. He may be troubled about any one of a score of things and very often there seems to be a combination of nearly all of them. He may be, under ordinary conditions, a very careful and loyal workman but when "troubles a ton" fall upon him he loses his sense of proportions and all thought of safety for himself or others is crowded out of his mind. The secret of his trouble is that his mind is focused on his own personal problem, so, of course, it cannot be focused on his work. When a man works without thinking we may be sure that he will soon make trouble for himself or for some one who works near him. When we meet with a case of this kind we must have a specific remedy. A prescription of the "shot gun variety" has no value to this man. He is not interested in generalities. His own personal problems must be met and solved. Every plant needs a squad of sharpshooters who can hit the spot every time. Call them what you will: visiting nurses, social service workers or what not but first find your men and women who have common sense and good judgment and then turn them loose with authority enough to ride over every precedent and break every rule of the plant if this be necessary to supply the one and only remedy for the worker who is in trouble. A dozen troublesome cases for which real remedies have been found and applied are worth more to a plant as a business asset than to have entertained the whole working force in most royal style. These personal contacts with the individuals of our work forces are just about as important and should be carried out just as systematically as our contacts with our best customers.

Now we shall have failures in dealing with this group just as we have failures in dealing with the misfit. Cases will be found where it will be impossible even to establish a friendly relation. It will be more than impossible to be of help but the effort, if honestly made, will not be lost entirely. On the other hand we shall find that the help we are able to give to those who do receive us, in many cases, is a real God-send to their lives.

THE CARELESS MAN

The next man who makes us lie awake at nights wondering what is going to happen next is the careless man. He was born that way or his life has been such that he has grown that way. Nearly all of us are careless to a certain degree but we find men in all walks of life who are dangerously and criminally careless. They are more dangerous to the plant than a box of dynamite. We can be sure that the dynamite will explode under certain conditions but we never can tell when the careless man will let go. He usually does so without warning and in a moment of time may put the whole works out of harmony for a month or two. If such men

bore the complete result of their own folly we might well say "Good enough for them" but they don't. The innocent must always suffer with the guilty and the careless man is more dangerous to his companions than he is to himself. We have all known men who continually keep others in trouble on account of their carelessness but who seem to live under a lucky star and never get hurt themselves.

The fortunate thing about the careless man is that we can educate him both as an individual and as a worker. We must appeal to him on the basis of loyalty to his family and the welfare of those who work with him. The careless men of our plant can be helped with the "heart-to-heart prescription" in the form of safety bulletins and messages about educational activities. A downward curve in the production report after the matter of pride to them. The most effective means we have may become the most careful if he should suffer a serious injury as the result of his folly or if he should inflict an injury upon a fellow worker. It should be said, however, that he probably will not rise to his new degree of efficiency on his own account, but that he may be led there after a heart-to-heart talk with some member of the executive staff. After all the safety meeting and the safety bulletin very often fail because most of us are prone to think that a safety message is a fine thing for the other fellow. The heart-to-heart talk will place the responsibility on the individual where it belongs. Here again the personal contact is the thing that is most effective in gaining the desired end.

As we shall find some misfits who cannot be "fitted" and some personal problems we cannot solve so we shall find some careless men we cannot cure. Carelessness is born in selfishness and where selfishness has taken deep root in the life of a man it is hard to lift it out. There are some men to whom no appeal can be made. When we find a man like this, the best gift we can bestow is the pay-off slip. We owe it to ourselves, we owe it to our careful workmen, and we owe it to our incurables of every kind to give them the opportunity to work where there is less that is hazardous. Our business has in it so many unavoidable hazards that we cannot afford to be hampered by the man who will not help us to make it as safe as possible.

ENVIRONMENT

There are two other elements in a safety program which should have consideration here. They are not entirely personal but they are so closely related that it would be a mistake not to mention them in passing. The first of these is the element of environment. Environment is directly related to efficiency and efficiency is a half-brother to safety. The man who works at a rate of speed which is normal to him as an individual will have fewer accidents than he would if he worked a great deal faster or a great deal slower. The piece worker, who, naturally, is interested in maintaining a high degree of personal efficiency, will have fewer accidents than the day worker who takes occasion to kill a block of time now and then. The one is keyed up to his normal pace with mind alert and with attention centered in his task while the other takes the pace that will keep him out of trouble with the foreman. His mind may be

a blank and his attention may be focused anywhere but on his work. It is not difficult to see the relation that exists between each of these men and the accident record of the plant where they work.

We may say with confidence that everything which has a bearing on the productive labor of our men has also a bearing upon our accident experience. Everything which takes the attention of our men from their work will be reflected in the number of accidents we have and everything we do to improve working conditions will mean not only a higher rate of production but also a lower rate of injury. Even the buildings where men work have their bearing on this personal problem of safety. A building so constructed that men can constantly watch the street outside is a menace to the safety of the plant. When men watch the street they do not watch their work and nothing is more productive of injury. We should have our buildings well lighted, to be sure, but the light should come from windows well above the level of the average workman's eyes.

Responsibility for the environment of the plant does not rest upon the management alone. All who work in the plant have their share in this. The foreman who keeps his department as neat and clean as possible will produce more and better castings than the foreman who allows his men to work in a place that is constantly out of order. Just as the executive will do better work in a well appointed office that is kept clear of rubbish so will the molder and laborer do better work if they are not compelled to climb over miscellaneous piles of slip boxes, bottom boards, and broken ladles every time they move about the shop.

The second thing which should have special mention here is that of proper instruction for the man newly hired. This is a more personal matter than that of environment. A man may be a good workman even a master of his trade but if he does not know *our* methods of doing work in *our* foundry he may cause any number of accidents to himself and others before he learns. No man should be turned loose alone on a job until he has learned all he can be taught about it. He should know all of its hazards and should be shown how his work is to be related to other work throughout the plant. He will work with more understanding and with a more sympathetic attitude of mind. These have a direct bearing on the question of his making a safe and efficient workman for us. That we believe in this is evidenced by the fact that we all say "we do it the best we can" but we are not thorough about it. We go about it in a haphazard way. One foreman will tell a new man this thing and that thing and the other thing and then some one else will tell him two or three other things and we suppose he has been instructed in all he needs to know. What the man needs is a comprehensive view of the whole organization. The task of giving him this information should be assigned to a definite group of qualified men and the new man's acknowledgment of having received such instruction should be made a part of his employment record.

The time allotted to this paper and its discussion will not permit us to go into this subject as deeply as we might wish. Let it be said that this is just one more of the loose ends that fly about all of our plants. If we

had the vision and the power to gather them all up and weave them into the fabric of our organization we should have organizations so strong that we need have little fear of the ordinary troubles that come to us.

INDUSTRIAL RELATIONS

All of these problems were greatly minimized in the old days when the workman lived in the home of his employer. The complexities of modern life will never permit us to return to this condition but we must approach the ideal of the constant personal contact with our workmen if we would seek to minimize the problems of this our present day.

That there is nothing that is entirely new or original in the subject matter of this paper is well known to the writer. It is only hoped that by bringing these same things to our attention again and again we can be brought to see anew our obligation to those who work for us and with us. There is nothing new to be brought forward in this problem. It is the old problem of the relation between men. We have not entered into any new obligation to our men in this new day of great industrial activity. Our obligation is the same if we have one man or a thousand men working for us. It is that we shall give them all we can of ourselves so long as they are faithful and loyal and continue to give us the best that is in them.

If the repetition of these things which are so well known to some of us has enabled any one of us to see our problem and our obligation with a little clearer light the effort has not been in vain. If it helps any one of us to get away from the running of our business as we would run a machine; or if it helps us to understand the personal element that is in our safety problem and helps us to make the solution of the problem a personal matter for our personal attention it will have accomplished its purpose.

In the absence of the Chairman while giving his address before the A, B, C Section, Mr. W. E. Watters, Secretary of the Metals Section, took the Chair.

ACTING CHAIRMAN WATTERS: In the absence of Mr. Gartland, we may be handicapped in the discussion, but if there are any questions Mr. Vanderpool can answer, I am sure he will be glad to do so.

If there are no questions, we will call on Mr. Earl W. Kessler for his paper.

SUGGESTIONS OUTLINING FUNCTIONS OF SAFETY COMMITTEE

E. W. KESSLER, DETROIT STEEL CASTING COMPANY, DETROIT, MICH.

I wish to take a few moments from the allotted time for the reading of my paper, to express my appreciation for the privilege of meeting with such a splendid organization, and also of representing the Detroit Steel Casting Company as a member of the National Safety Council.

The paper I am about to read contains suggestions outlining safety work as applied to steel foundry practice.

The support of the management is absolutely essential in inaugurating safety functions, and should properly recognize the work by giving it a genuine place in the organization, and best to prove its interest it should be willing to cooperate with the members of the Safety Committee in a frank and open manner; also to authorize the adoption of all consistent recommendations that may be offered by the Safety Committee or that may be otherwise properly presented.

The attitude assumed by the management will naturally reflect upon the employees, and should it be one of indifference then only indifferent results can be expected. The work will succeed only in proportion to the amount of conscientious effort put into it and the more support and cooperation given it the more gratifying and lasting the results will be. This is the first step.

The second step is that of organizing a Central Safety Committee, consisting of the foremen in charge of the various departments in the plant; also other high-grade men in whom the management as well as the employees have implicit confidence in their ability to adopt and practice safety methods affecting the departments under their supervision.

The Central Safety Committee should be a permanent one and its duties should be to outline and supervise all safety work, and to receive and act upon all reports, recommendations, and suggestions. It should meet regularly at least every two weeks for general discussion.

We have another committee in our plant, known as the Workmen's Committee, which is made up of men who are actively engaged in different operations. The duty of this Committee is to report to the Secretary any hazardous conditions affecting that class of work or operation, and especially the careless practices of fellow-employees, and less upon the points of danger to be protected by safeguards.

The Central Committee, which acts upon all the suggestions made by the Workmen's Committee, without any desire to disrespect or belittle its work, has found that in several instances it was not advisable to make corrections suggested by the Workmen's Committee.

This, Gentlemen, is the procedure that we inaugurated in the year 1913 and have continued up to the present time. We have during this period equipped our chippers, grinders, break-off men and acetylene welders with goggles. We have also obtained the best possible equipment for our sandblast men and electric welders. All emery wheels are properly guarded and properly set by one of our mechanics, who is held responsible for the placing or setting of the wheels on the arbors, as there is a possibility of the wheels being broken by careless workmen. This eliminates some of the danger of a wheel breaking while in operation. In our No. 2 shop we have a gang of men pouring hot metal. Previous to the time that we insisted upon these men wearing safety shoes, many of them suffered with burns on their feet. However, since our men have been wearing these safety shoes accidents of this nature have materially decreased.

HOOKS AND CHAINS

The question of hooks and chains was called to our attention at one time, and as a matter of fact there is a good deal of danger involved in their use. It was suggested that we have a weekly inspection of hooks and chains, and that we anneal all chains about every three months, also that when chains are found to be in bad condition, they should be scrapped and replaced as there is no economical practice in allowing a chain to be used in a defective condition. All these suggestions were adopted by the Central Safety Committee.

Of course we all realize that the equipment used in a steel foundry is very different from that of an automobile plant, and other manufacturing plants. In many of the large manufacturing plants in Detroit where methods of safety are in force, every machine is well guarded. Our plant has not a large equipment of machinery, but wherever gears are exposed they are properly guarded.

After all is said and done, however, a large percentage of the accidents in a steel foundry (I was tempted to say a majority of them) are of such a nature that they cannot be guarded against by the installation of guards or the use of any mechanical means which the company can reasonably be expected to install. There is always an element of danger where large weights, such as flasks, molds, castings, etc., are being constantly handled irrespective of whether these are handled by foreigners or native-born men. As a nation we are careless, and nowhere are we more careless than in the safeguarding of our own lives and limbs. In all walks of life we are prone to take chances to save us a minute's time, or something even of less value. It is a part of the feverish pace at which we live. The foundry is no exception to this prevailing spirit, and as long as it exists, though safety devices help, they will not eliminate many of the distressing accidents which are all too common.

One of the most important functions of the Safety Committee must therefore be to endeavor to inculcate in the men a greater degree of caution in their work and a feeling which will decrease the number of chances they constantly take.

A short time ago I talked with a safety man who is connected with one of the large concerns in Detroit employing several thousands of men. He stated that in their plant almost everything had been done toward making conditions safe for the employees, and that their big problem was the slight accidents of which I spoke a few moments ago, and he wanted to know how they could be overcome. My answer to his question was, "It is utterly impossible to employ safety devices to overcome them, as it is up to the employee himself." These slight accidents are caused by thoughtlessness, ignorance, and carelessness. Carelessness seems to be lurking in every plant in the United States, and the only way to get it out of the plant is by spreading National Safety propaganda around the plant trying to impress upon the minds of the men that this is a safe shop, where principles of safety are practiced, and they too must think Safety; and if it were not for constant medical attention many of

the slight accidents would probably result in infections and possibly something worse.

ACTING CHAIRMAN WATTERS: Is there any discussion on Mr. Kessler's paper? It was very good and brought out some very interesting subjects.

[Mr. J. D. James comes forward wearing a sample pair of the spats used in his plant, to show them to the members of the Metals Section.]

MR. J. D. JAMES: As I said a moment ago, we had quite a number of foot burns in our foundry so we tried to get the men to buy foundry shoes, but we couldn't compel them to do that. They claimed they couldn't afford to buy those shoes in addition to Sunday shoes.

PREVENTING FOOT BURNS

The next question was how to prevent foot burns. We designed a sort of spat. They didn't work very well; the string would come off. Then we went a step further and tried something in the shape of a legging. They complained against that and said they were entirely too hot. We couldn't compel them to wear the leggings, so we tried the spats you see on me. We have been using them over two years and we have not had one single foot burn during that time. In fact, before we take the metal from the cupola, every man has his spats on. As soon as we do the morning work and the casting, they get into them. The foremen put them on also, and in that way they set a good example for the men in wearing them.

(A discussion on the subject followed and Mr. James also showed the members of the Section a belt he devised for the use of brakemen.

Mr. Oartel resumed the Chair.)

DISCUSSION

CHAIRMAN OARTEL:—Mr. James has brought up a very good point. Hasn't it been true in the past that we have devised things like this and shoved them at the men? I think Mr. James has told us a better way, the way of moral suasion, of reasoning with a man and bringing it up in a friendly manner? I think if we will do that, it won't be long before we get the men on our side.

I have known of many instances where a foreman with tact has taken things up in that way and by the use of tact and friendliness has converted men to the safety idea who have been radically opposed to it.

USE INTERPRETER TO GIVE SAFETY INSTRUCTION

There is a question I would like to ask Mr. Church. I didn't have time after his paper. Mr. Church, you spoke of a man who would go around among the employees occasionally, a man who could speak their various languages and give them instructions and talk safety to them. What does that man do in your plant?

MR. H. L. CHURCH:—He is connected with the employment work.

CHAIRMAN OARTEL:—As an interpreter?

MR. H. L. CHURCH:—He does other work as well. He scouts out after

the men when they are absent and takes care of the first-aid work, as well as the interpreting work.

CHAIRMAN OARTEL: How do the men receive his safety talks and instructions?

MR. H. L. CHURCH: Very kindly, indeed.

CHAIRMAN OARTEL: I have always taken the attitude and insisted upon it wherever I could, that one of the places we are falling down in our accident-prevention work is in our lack of instruction to new men, and I think this idea is a very good one, and that is why I am interested in it.

In our own company we have a certain plant where they do something along that line. It is one of the hazardous departments—the shipping department—where they load billets, bars and plates of steel that have to be handled with cranes and slings. You men who know anything about that know it is very hazardous—the danger of chains breaking, the danger of not getting a good hold on the load and things like that.

They decided to appoint a man similar to the one Mr. Church has told us about who should have for his particular duty the instruction of new employees. The success in this has been wonderful. So, I wonder if we haven't neglected the new man just a little too much. He has come into our plants. We have given him a pick or a shovel or other tool and he has gone to work.

MR. H. L. CHURCH: We utilize that man also in interviewing applicants who don't speak English fluently. Our feeling is that the average foreigner asking for a job is very ill at ease because he cannot handle the English language fluently. So, we interview the man in his native language. We find that when you get a man on the quiet, he will present his better self to you, and the man who knows the other fellow's language, knows his national culture, too—the national viewpoint of the applicant—and he is able to put himself into the other fellow's place. You get at the better side of the men in that way.

We use that man for instructing the men in the American language and interviewing, also for interviewing these men in their homes in case of sickness or any trouble where we think we can help them. He is connected with the Employment Service Department.

CHAIRMAN OARTEL: Another thing that interested me was your mention of a man who looked up what we call "delayed treatment cases". I think that is a very good idea, in getting them before they develop into very serious cases. How long have you had that in operation?

MR. H. L. CHURCH: I think we started that about the first of March. We started that preëminently to keep a close touch on the fellows who quit. We found the labor turnover high. We found that going to see a fellow right after he quit and before he settled in a new job, if he did have a grievance, we could fix things up. In my paper I referred to that as a by-product. It has been working fine. We intend to keep that feature working as long as we do business on the lines we are now working.

CHAIRMAN OARTEL: I imagine most of you are foundrymen. This is the only foundry program we have and I hope that we will make the best of it. We still have about forty-five minutes before twelve o'clock, so if there is anything that lies close to your heart in safety, speak it out.

These are the occasions when we rub against the other fellow and get his ideas and viewpoints and frequently in that way we get a good deal of good, some ideas that we can take back and put into operation in our own individual plant.

There came to my notice in the last year a foundry case where the State Inspector came in and said they needed more light. That was one of the recommendations. Now, you as practical foundrymen know the situation either in an iron or steel foundry. You have the dust from the sand. You have the dust from the castings, and you know how dim it is in a foundry. But, they whitewashed that foundry and the result was nothing short of marvelous in the increase of light. There was a question as to how long it would last. Of course, the foreman and the old-timers said, "What is the use? It will last a day or two and then it will be in the same condition." But, it lasted more than a day or two. So, I give that out as a bit of information—the case of whitewashing this foundry. I have no doubt that it made more cheerful men.

I see our old friend Dr. Chaney is in the room. Dr. Chaney has been working at the safety game for a long time giving us some very valuable statistics and I know of nothing that would be better than to call on Dr. Chaney at this time to give us a few remarks.

DR. LUCIAN W. CHANEY (U. S. Department of Labor): I thought I was here to listen and not to talk, but called on in this fashion, I can hardly refrain from making the most of the opportunity.

NEW REPORT ON STEEL INDUSTRY IN PREPARATION

I have followed with a great deal of interest from year to year the fortunes of the different departments of the iron and steel industry. Now, this gives me the opportunity to advertise my wares. I am to have a new report on the steel industry coming out this next year. I am very sure you will be interested in following the experience which is shown there, and especially the influence of war times.

We have had the most tremendous upheaval, industrially, that has ever occurred and it has affected our whole experience in the matter of accidents as well as in a whole lot of other things. It has unquestionably affected the foundries. Following the experience of certain large companies whose figures I have had from year to year, I find that during the war period they all went up. Their accident rates were higher than they were before. The foundry is rather an irregular proposition. It doesn't vary so much from year to year in the matter of the number of cases that happen but severe cases do often happen.

You will have some years when you have a very high severity and other years when it isn't so much. The thing which is attracting my attention, and making me wonder, is why the foundry runs along so closely to some other divisions of the iron and steel industry which naturally are more hazardous. I think most of you would naturally think the blast furnace was a more hazardous place than a foundry. Now, as a matter of fact, the blast furnace has dropped a great deal faster than the foundry in the severity of their accidents.

Why are you still killing folks in the foundry? Do you have to? Some of you know that I talked about that subject this morning and I have it on my mind—that is, that the deaths in the foundry seem to be more numerous than they need to be. Where do they happen? Almost all of them in the transporting of material. That is the serious thing in the foundry, judging from the figures I have, that is, you pick up a big mould or casting with a crane; in connection with the operation of the heavy material with which you deal, you are having a considerable number of deaths. During the war, you had more. I don't believe I need to explain to you why you had more. If any of you were doing business then, you know why.

It seems to me that with the readjustment of the industrial conditions, which must come now after we have gone through this war period, there is a chance for a very heart-searching inquiry on the part of you foundry-men as to how you can cut down these dangers and get rid of them.

Your foundry accidents have not gone down as satisfactorily (and this does not mean any particular foundry but foundries in general all over the country) and as rapidly as I think they ought to as compared with other departments of the iron and steel industry. Now, I want you, with the reconstruction that is going on, to inquire into the situation more earnestly and more exactly than you have done.

You aren't going to get at the situation unless you adopt, as we have in the Bureau of Labor, statistics, and some of the accident commissions are adopting some method of following the costs.

You can follow your experience by costs per hundred dollars on pay roll per accident. You can tell whether you are better or worse this year than last year. It is a simple thing to do—to follow the cost. But, if you want to know if you are getting along as well as the other fellow, you have to have some other method of procedure.

Now, we have developed a method of investigating accident costs which we call the severity rate, and if you are familiar with that, it will enable you to compare your own experience with foundries in general. If you haven't given that matter attention as to finding some way of following accident costs from year to year, which will not only tell you what you are doing but tell you how you run in comparison with industry as a whole, you ought to know about it. Of course, I have a certain amount of personal interest in this method of procedure because I devised it along with a colleague of mine, but it isn't a point of whether you deal with it according to my method or somebody else's.

Study your costs, or go into them more carefully than you have done. You certainly have a margin of opportunity which will be disclosed to you by a study of that kind, which ought to help the accident severity more than it has.

CHAIRMAN OARTEL: Doctor, I am sure that if you can get them on their toes and send them back home asking "why," they will get results.

TRANSFERRING MATERIAL

Dr. Chaney in his remarks told us that most fatalities in foundries came from transferring material. Now, what does that tell you? There

are two factors in transferring material on an overhead crane. One is the crane man and the other is the man who does the hooking on. Has any one here had any experience along educational lines with those types of men? Have you done anything to educate your crane men or educate your floor men? I would like to hear some discussion along that line. I don't think we can get, either by engineering revision or mechanical safeguards, anything that will protect us from this hazard of transfer in a foundry.

MR. EARL W. KESSLER: I wish to mention several things that happened in our foundry during the past year, in the matter of transferring castings.

We have found it a very good idea to have a chain man. At different times we had chain men and other times we didn't, I presume owing to the fact that the labor situation was rather acute and we tried to get common labor. But, we always manage to have a chain man who will do the hooking on and then while the load is being transferred, this chain man gives the warning to the men. Of course, it is rather hard to carry a load and not pass over any one, so we always use the chain man to warn the fellows.

Then, when they are lowering a flask, they seem to get their hands under the flask, and it seems hard to impress on the foreign element that they should keep their hands from under the flask. Many injuries occur in that way. The chain man is always instructed to warn these men, too.

CHAIRMAN OARTEL: Mr. Vanderpoll has been requested to tell us something about how they transfer castings in his plant.

MR. VANDERPOLL: We have what we call the main man or the leader and he is to go ahead about twenty-five feet of the tray or whatever the crane is handling, and the crane man has a special gong he uses. We aim to keep men from being under overhead loads. It is hard work but we try to have a crane man who will confine the load to the gangway or that place where the men will not be working.

SECRETARY WATTERS: How do you transfer your material at the other plant where you don't have overhead cranes?

MR. VANDERPOLL: With plain, everyday hands.

SECRETARY WATTERS: How about those mules?

MR. VANDERPOLL: We are now installing the electric tractor. We find they are a big help. Nevertheless, it is more or less hand labor in getting loaded up.

It is not so much hauling the load that causes the accidents but getting the load to haul. Where we have our accidents is on the curves, knocking off the castings by striking gates and other objects.

MR. J. D. JAMES: We have decided that the only way to prevent accidents is to see that the slings and hooks are always kept in good order, and that care is exercised by the man who does the hooking. The road must be clear for the crane at all times.

SECRETARY WATTERS: I would like to ask if anybody here has a system of daily inspection on rope slings, either wire or hemp, and what his experiences along that line are.

MR. WILLIAM RANDALL (Valley Mould and Iron Co.): We have a report turned in to the safety director's office every week giving the number of the chain and its condition. They are either O. K.'d or sent to the shop for repairs. We must have that report, positively, every week.

SECRETARY WATTERS: Is there only one man who makes that inspection?

MR. WILLIAM RANDALL: Yes, sir, we have an expert in that line who makes the inspection on the slings and chains.

SECRETARY WATTERS: Have you any idea of the number of chains and slings you have, roughly?

MR. WILLIAM RANDALL: I judge possibly seventy-five to a hundred.

SECRETARY WATTERS: All sizes, I suppose?

MR. WILLIAM RANDALL: Yes.

SECRETARY WATTERS: Do you make a practice of giving a minimum size of rope or chain?

MR. WILLIAM RANDALL: I am not sure what the size is.

SECRETARY WATTERS: Is it as small as half-inch?

MR. WILLIAM RANDALL: Nothing as small as that. I am under the impression that an inch is the smallest in a cable. Of course, we have some very heavy loads in our foundry and you can't run any risks in handling such loads.

CHAIRMAN OARTEL: While we are talking on this subject, I want to call your attention to the fact that one of the topics of tomorrow's session is "Consider the Crane," and I am sure we will all be very much interested in that.

WEEKLY CHAIN INSPECTION FOR CRANES

MR. A. S. PHELPS (Pratt and Letchworth Company, Buffalo, N. Y.): In regard to this weekly chain inspection: about four months ago we started weekly chain inspection and every chain is numbered with the letter indicating the department prefixed, and the office clerk sends out a report to the master mechanic with a special man delegated to make these investigations weekly. He goes around every Monday or Tuesday. The chains are suspended from the crane, every link is inspected, and defects noted on the report. He is provided with red danger tags and if a link or hook is defective, one is attached to the crane, at once putting it out of service.

When the inspection is completed, one report goes to the master mechanic and one to the office, and that chain is not used until the repair is O. K.'d by the master mechanic. When the repair is made, a notation is made on the master mechanic's report which is then sent to the office.

We have a card index. One side shows the detailed construction of the chain, the size and capacity of the hooks, etc. On the reverse side of the card is the detailed report of the defect found and the notation made by the master mechanic of the department.

We hope from this to learn in what department and what class of chains are failing. That is, in one class you may find a hook continually pulling out. We wouldn't notice it otherwise if it wasn't for this report. It really takes a chain record to locate where some particular hazard is.

I haven't any copies of those cards here, but I shall be glad to send them to any one interested.

CHAIRMAN OARTEL: Have you had any result in accident prevention?

MR. PHELPS: The hookers and the foremen of the department are supposed to make a general inspection of the chains each day but the thorough inspection is made by a practical man each week and is recorded as I have told you.

We have noticed in the annealing department that two particular lengths were failing and continually failing. We noticed the notation on the card and it seemed there was a square type of stool where the chain hooked around and since then we have designed that stool on a radius.

CHAIRMAN OARTEL: That is what the Doctor would call engineering revision.

STANDARD SIGNAL FOR MOVEMENT OF THE CRANE

Have any of you had any experience in educating or instructing your crane men or floor men as to what their duties consist of? It has been the experience of all of us that in transferring a load, several men want to give instructions, and that has often resulted disastrously. I know companies that have restricted the giving of orders to one man. It has brought very good results. They have also designed a card of instructions for floor men which they post all along the floor regarding what the duties are in giving signals and illustrating these cards with the signals to be given. A standard signal has been published, gotten out by the American Bridge Company. The U. S. Steel Corporation is using it. The State of Pennsylvania has adopted it and I think a number of other concerns. It gives a standard signal to be given for each movement of the crane.

AMERICAN STEEL & WIRE CO. REPRESENTATIVE: We have safety rules and we hold what are known as departmental safety meetings. Those are held twice a month. The crane men have to learn these instructions by heart, and then they take them, one at a time, into a room and each one of the crane men is supposed to know these rules by heart. He goes through them every once in a while so he is thoroughly acquainted with them.

Whenever a crane man is taken sick or is absent and we need extra men, we take an apprentice from the electrical department, a man familiar with electrical apparatus. We don't get anybody from the mills.

CHAIRMAN OARTEL: Have you those rules published in a booklet?

AMERICAN STEEL & WIRE CO. REPRESENTATIVE: The rules are published in a booklet but I have no authority to say whether I could give them out. If there are any here who would like to get them, I could take their names and take it up with the higher authorities. In regard to signals, we are using the method mentioned and it is very successful.

CHAIRMAN OARTEL: Is there anything else along that line? Is there anything of general interest to foundrymen?

DR. LUCIAN W. CHANEY: I haven't heard any reference to the careful study by Mr. Earl Morgan with regard to chains, which was published by the National Safety Council and afterwards republished in one of our

bulletins. The question of the safety of the chain or sling used seems to me to be still a very serious one. I continue to have in the reports which come to me from year to year evidence that the chains and the slings which are used are not as good as they ought to be. They break too frequently and when they break, serious and even fatal injuries are very apt to result. Anything that will shed light on the way to safeguard the crane operator is worth while.

CHAIRMAN OARTEL: Is there anything else? If there is nothing else, a motion to adjourn will be in order.

Adjournment.

FRIDAY MORNING SESSION

CHAIRMAN OARTEL: The first paper on our program this morning is by Mr. C. C. Rausch. The topic is "Consider the Crane." Now, my experience has been that the crane is one of the live hazards of the metal industry today and I am very sure that Mr. Rausch, from his wealth of experience, will give us some good information along that line.

CONSIDER THE CRANE

CHESTER C. RAUSCH, ASSISTANT DIRECTOR, SAFETY INSTITUTE OF AMERICA,
NEW YORK CITY

Ever since Noah handled lumber while constructing the Ark and the Egyptians stones while building the Pyramids, the problem of handling material has been present in industrial work of whatever sort or kind. It is not improbable that one of the earliest methods of handling material was by the use of some form of rope manufactured of hide or woven barks passed over the limb of a tree. Later some means was found to use parts of trees that had been blown over, or that had in some way been felled, to construct the simpler forms of derricks. As we know them today derricks and cranes are the result of a development extending through centuries and representing the solution of many problems one after another. Of late years various forms of power have placed at the disposal of man a ready means for adapting his machines to types of work that were formerly done by the laborious efforts of man and beast.

In no particular field has greater development been made than in that of handling and conveying materials in connection with the processes of construction, manufacture, and transportation. More recently the fact that electric current furnishes such a flexible source of power has greatly accelerated this development and in the past decade the enormous increase in the use of steel and iron for the fabrication of structures and objects formerly made of wood has called for a further development of machinery to handle the greater unit weights involved. During the last three or four years particularly the production of cranes of all sorts has increased unbelievably and not only is their lifting capacity greater but

their flexibility of operation and their safety of manipulation as well. Where we formerly saw a braced pole derrick superseding a single stick or gin-pole, we now find locomotive cranes, tower derricks, overhead travelling cranes, gantry cranes, floating derricks, wall cranes, gib cranes, and a variety of combinations of these devices that enable almost any conditions where material must be handled to be met by the selection of a type of crane to do the work and that will at the same time, consume the least power, offer the greatest flexibility, and afford the greatest safety during operation.

During the last ten years the writer has had opportunity to observe the operation of cranes of all types used in manufacturing purposes and in construction work, as well as in those fields that generally are considered under the head of transportation. In spite of the developments that have been made, both from the point of efficiency and safety, there appear to be still a large number of hazards that are reproduced repeatedly in the construction of later models or that result from the manner of their installation or the method of using them. It is to call attention to some of these points and to offer some suggestions by which these recurring hazards may be eliminated that the present paper is prepared.

The locomotive crane is coming to be one of the most common types in use, both in shops and in yards. Unlike the overhead travelling crane, it is not confined to definite limits of operation within a building or over a given yard space but, because of its mobility, it operates equally well within a shop or about a yard. This flexibility of operation considerably eliminates the number of times that a piece of equipment must be handled when it is taken from one location to another. Moreover, the boom forming part of its construction enables it to reach places an overhead crane could not approach. This one feature, probably more than any other, has brought about its introduction in many plants to perform a great variety of work formerly done with the use of rollers, skids, and various sorts of lifting tackle. The locomotive crane is a rather recent development and while its hazards are more or less obvious, there are not as many men available who are skilful in handling this type of crane as there are of other types. The greater skill required in their operation, and their mobility, has resulted in a greater number of accidents from their use.

ROAD-BED SHOULD BE KEPT IN BEST CONDITION

One of the main sources of hazard consists in the failure to keep the road-bed over which the crane must travel in the best condition. Frequently, in an effort at economy, light weight or partly decayed sleepers and second-hand, defective or light rails have been used, resulting in an inconvenient and unsafe roadbed. The failure to keep the road-bed properly tamped and drained allows it to settle and become uneven so that the crane does not travel steadily and is far more liable to overturn. The use of improper frogs, crossovers and switches, and the failure to keep them in repair, increase this hazard. Such a road-bed throws nu-

merous strains into the structure of a moving crane by the swinging motion imparted to the load suspended from the boom. This condition sometimes becomes aggravated to a point where collision of the suspended objects may occur with other railroad property or with structures in the yards adjacent to the track upon which the crane travels. This distracts the engineer's attention so that collisions with pedestrians, trucks, and teams are more apt to occur.

When locomotive crane track-ways are placed too near buildings, especially on curves, the entire attention of the engineer is often required to prevent collision with buildings and in cranes that are capable of considerable speed of movement damage is frequent. Where the crane is large, both in lifting capacity and range of boom and the engineer's cab is located some distance above the ground, this hazard is peculiarly acute. The writer recalls a case where a slow-travelling fifty-ton locomotive crane could pass a building only by being turned on its table at the same time it was moving ahead on a portion of a curve. The corner of a building placed beside the curve was entirely demolished and a considerable portion of the roof removed by being struck by the frame. Another time, while making this turn, the engineer was giving his entire attention to avoid collision with the building and failed to notice an automobile truck standing close to the rails. On a straight track it would have cleared the truck, but caused a collision because the crane was turning on its table. The crane which had considerable power of locomotion, forced the truck against the side of the building, demolishing its entire front end.

CRANES FREQUENTLY OVERTURN

Overturnings are frequent with locomotive cranes. In the smaller sizes the wheel base is extremely short and in many cases the boom is swung with loads beyond the safe capacity for any increased angle of elevation and the crane is tipped on its side when this angle is increased ever so little as a result of even slight inequalities in the road-bed. Even when travelling on a straight track under these conditions and with the boom axis parallel to the axis of the track, slight obstructions on the rail are sufficient to cause disaster because the crane is working practically at its ultimate lifting capacity and its point of safe balance. This type of accident occurs in construction work particularly, because the road-bed is nearly always of a temporary nature and poorly laid. Moreover, on such jobs, supervision of crane operators is apt to be less careful and the material handled less standardized in size and weight, so that overloading is easier and more frequent.

Another difficulty is the inability of the operator to maintain a clear view both ahead and behind his crane while travelling. Inability to see toward the rear when the crane is moving forward frequently results in people being injured when the crane is turned on its table and inability to see toward the rear may cause people or objects to be run over when the crane moves in that direction. Reflecting mirrors, similar to those used on automobiles, tend to eliminate this difficulty, provided the mir-

rors are adjusted carefully and are of sufficient size to afford ample view. In some cranes small windows have been placed low down in the rear of the crane and the storage tanks and coal pockets altered to permit the use of peekholes through which the engineer while standing in his usual place and turning his head can see behind the crane. Even when alarm bells or gongs are used the engineer cannot be certain, without seeing, that an accident is not imminent to material or persons on the track.

Whenever any crane overturns, unusual and frequently very considerable strains are placed on the structure of the crane, particularly the boiler and steam piping which, because of the internal pressure in them are already seriously stressed. Engineers, even if they are fortunate enough to escape scalding or injury when the crane overturns, may be penned in and seriously burned unless the doors and windows on such cranes are arranged to open outward and are provided with fasteners operating from both the inside and the outside.

Many times the original structure of the crane, particularly the boom, has been changed: lengthened to increase its range, strengthened to increase its capacity for lifting. Any lengthening of the boom immediately reduces the capacity of the crane to handle safely loads at a given elevation and an increase of the cable size and strength or an increase of the steam pressure to permit the lifting of heavier loads at greater boom elevations introduces strains that frequently cause collapse. The failure of many crane engineers to recognize the tremendous reduction in the safe capacity of the crane due to any change in elevation has resulted in the collapse of many booms. This tendency to lengthen the boom has been greatly increased by a desire to facilitate the placing of work in locations beyond the reach of the boom as originally made. The writer recalls a number of instances where such changes as this have resulted in death to the operator. It is a tendency that most certainly should be corrected.

SPECTACULAR STUNTS GREATLY INCREASE HAZARDS

If the operator of a crane, and particularly of one that has been structurally changed, is given to the performance of spectacular stunts while operating it the limit of damage is beyond estimate. Speeding the crane along the track, rotating the crane upon its turn-table at such speeds that the load is swung far beyond a point directly below the end of the boom, thus virtually increasing its length in addition to creating a considerable side strain and the dropping of load from considerable heights and stopping it just before it reaches the ground, are performances which the cranes were not constructed to stand, even considering all factors of safety used in their design. The combination of two or more of these performances at the same time may introduce strains great enough to overturn the crane, to destroy its structure, and to injure not only the crane but many structures adjacent to it. Where the crane is elevated upon a trestle the hazard is greatly increased because strains are sometimes thrown upon such a structure that it cannot safely with-

stand them. If the crane falls from such a structure it is obvious that the damage is apt to be tremendous. Many operators overload cranes and take a chance that the crane can handle the load. This tendency is fostered by the fact that the crane is never under the observation of a single foreman but moves from place to place in charge of its operator. While such acts are, of course, matters of discipline, there are several devices which have been attached to cranes to indicate when the crane is at the point of overturning and to give audible warning beforehand. The best devices of this sort are placed in the cab of the engineer and are frequently supplemented by an indicator placed on the boom which shows, by means of a pointer, the safe load that may be picked up for any given boom elevation. This indicator may also indicate safe overhead clearances for the boom. The use of the tables of safe boom elevations for given loads frequently placed on plates attached to the frame of the crane or in the cab, cannot be depended upon because they require the exercise of the element of personal estimation of conditions upon the part of the operator.

Whenever cranes approach obscure corners of buildings, door openings, or other points from which traffic or individuals may issue, the engineer should be under obligation either to stop the crane or to have it in such control that a collision could occur only under unusual circumstances and then in a manner to cause only minor injuries.

Locomotive cranes are frequently poorly illuminated even when they perform their work in places where the operator has no adequate opportunity to see clearly the work he is doing. The placing of several storage battery cells aboard such a crane provides current for adequate light in the interior of the cab for firing and for illuminating the gauges and particularly for a spot light that can be controlled by the engineer and thrown upon the objects he is handling. Very frequently a light placed on the tip of the boom, and arranged to throw its rays vertically downward, has been found of great advantage. Whenever such cranes work at night consideration should certainly be given to these points.

The work done by locomotive cranes is nearly always conducted out of doors and little attempt is made to house them or to protect them from the elements. As a result rust, with all its attendant and subtle hazards, attacks the machine in various places—the cables particularly. Proper painting should be given at frequent intervals, adequate lubrication provided, and the boiler should have regular inspection. Improper feed water may introduce trouble enough to put the crane out of commission.

In the operation of such cranes dependence is frequently placed upon lowering the load and swinging the boom to throw an object upon storage piles or into a location that cannot be reached by the crane when in its ultimate safe position for such a load. The element of time is here depended upon to permit the load to swing into its final place before it can tip the crane far enough to cause it to overturn or leave the rails. Any failure of judgment on the part of the operator is fatal.

Another pernicious tendency is sometimes revealed when the crane is

derailed and a leverage action is created by attaching the boom to the track ahead and by the application of power causing it to lift the rear end of the crane so that it may be swung again to the rails. This is done with the boom in an almost horizontal position and has destroyed cranes by introducing the severest strains to which the crane could be subjected. It is obvious that this can only be done where the road-bed is laid in a manner sufficient to permit such a strain. Recognizing this fact and to increase the leverage the operator endeavors to reduce this strain on the track to a minimum by placing the boom in its lowest position. The housing of the hoisting mechanism and the anchorages of the turn-table are very often torn apart in this manner.

OVERHEAD TRAVELLING CRANES

Overhead travelling cranes have probably received as much attention at the hands of designing and safety engineers and inspectors as any other single piece of equipment. This is probably due to the fact that it travels over areas in which are located many workmen and much valuable machinery and material so that a failure of any part of the crane may bring about disastrous results. A locomotive crane necessarily clears its own way before proceeding so that there is not the same proportion of hazard as in the overhead crane which may create dangerous conditions over the heads of many men without their knowledge. One common fault is the failure to keep the rails upon which the overhead crane travels in proper line both for lateral and vertical adjustments. A slight settling of the rails or a slight misalignment sideways as a result of strains introduced by wind, settlement of building foundations, overloading of structural framework, etc., frequently causes the tracks to assume an extremely crooked appearance. The writer knows of a case where as much as fourteen inches of settlement occurred and where there was a lateral displacement of nearly eight inches. On this particular crane-way loads as heavy as twenty tons were being carried and in order for the crane to navigate at all one rail had been practically freed of all anchorage to its supporting girder and had even been greased under the flange to permit it to slide sideways and so follow the movements of the crane. Struts, with nuts on the end, held the rails from falling off the girder. The eccentric strains thrown on the frame of the building by this condition and upon the crane, due to a swinging of the load which was thrown out of equilibrium by such movements, was considerable and several serious accidents resulted. Fortunately a change in management furnished an incentive to eliminate these conditions. In another case a crane repeatedly jumped the runway rails at one end until the wheels were found to be of different diameters and so made one end progress farther than the other.

OVERHEAD CRANES SHOULD HAVE SIGNS INDICATING THEIR SAFE CAPACITY

Far too many overhead cranes are used without adequate signs to indicate their safe capacity. The writer recalls a case in which a load, so

large that the crane could not lift it, was placed under as much lifting strain as the crane could exert and was then dragged down the length of the shop to its location. Such practices, while they are not frequent, indicate a tendency on the part of the operator to take chances—a tendency probably fostered by his lack of adequate information regarding the capacity of the crane or of the dangers which such treatment introduces.

Wherever the space available in a shop will permit, there should be a free aisle-way from one length of the crane-way to another over which loads may be carried without the necessity of passing over more than a few individuals. There are not many old shops where this is possible but there should be some portion of the shop specifically kept as free as possible from men and valuable material and machines to permit the crane operator to carry material over such a space without any more hazard than is necessary. When unusual loads are carried over such spaces every individual should be made to stand from under the load.

There are many excellent installations of the highest quality of cranes operating over inadequately illuminated spaces. The fact that the operator is a considerable distance above the floor where the attachments to the crane hook are being made and that he must see through a haze that sometimes develops in shops from product being manufactured in spite of proper ventilation only aggravates an already bad condition. This hazy atmosphere might be a permanent or only a temporary condition. For example, a foundry is very often badly troubled with this haze during a pour and a machine shop that may be generally clear will become clouded for a portion of the day as a result of a large babbiting operation done inside the shop or from the wafting of smoke or fumes into the shop from other parts of the building or from out-of-doors. On days when natural illumination varies it sometimes happens that the lights are not turned on during the darker periods so that there are periods of comparatively poor illumination from the crane operator's standpoint.

PROPER ILLUMINATION AIDS THE CRANE OPERATOR

In many shops the artificial illumination is not sufficient to afford adequate vision at any time. It may be far too expensive to increase the general illumination for the benefit of a single crane operator and in such cases, and even when illumination is good, excellent results have been obtained by attaching to the crane trolley one or more lights properly covered with a focussing reflector and so arranged that the area immediately about the hook when at its lowest point and near the floor is brightly illuminated. Such illumination tends not only to assist the crane man to observe what is being done on the floor but helps the crane attendant to make proper attachments to the load. Furthermore, when such a load is travelling down the shop the brilliant illumination throws it into bold relief and it serves as an admirable warning of its approach. In many shops the hook of the crane is painted white and kept white in order that it shall attract attention to itself and furnish some measure of indication to the crane operator of its location with

reference to the floor. Where such a hook is illuminated by overhead lights as just suggested, it is very conspicuous.

In many shops lighting fixtures arranged to furnish general illumination of the floor are, from necessity, placed above the travel-way of the crane. If such buildings have wide spans the crane operator, unless properly shielded by an awning to his cab, is confronted in his view up and down and frequently across the shop with many spots of brilliant and glaring light that serve to confuse his vision. In some shops this general illumination from above the crane-way is augmented by lamps having angle reflectors, and too often no reflectors at all, placed just below the crane runway. When operating the trolley on the far side of the shop these lamps throw a steady stream of light into the face of the operator, seriously confusing his action. Such lamps should be shielded from above with reference to any position the load to be observed by the crane operator must assume.

A person making an examination of any considerable number of overhead travelling cranes is impressed by the fact that so many of them have none of the electrical equipment in the cab properly guarded. There are exposed contact points, circuit breakers, knife switches and terminal lugs carrying from 110 to 500 volts or more. Contact with these exposed points may not only kill a crane operator but may temporarily incapacitate him so that his crane continues its motions uncontrolled. The use of the simplest form of shields or guards composed of asbestos, wood, sheet metal or other material are not only easily applied but inexpensive. The possibility of serious accident in the movement of an uncontrolled crane is sufficiently great to require ample protection for the crane man and new equipment should be specified to have only back-connected control panels and inclosed resistance grids.

Many cranes have practically nothing more than a hand rail to keep the operator in the cab. During his slack moments, when he is comfortably stretched on a box, stool or bench, any lapse of consciousness would permit him to shoot under this rail and fall to the floor below. There is no reason why the crane should not be enclosed to a reasonable height with grillage to prevent such an accident and in a manner that need in no way interfere with the craneman's vision or movements.

REPAIR DECK SHOULD BE PROVIDED

Cranes, like all other apparatus, require occasional repairs and continual maintenance. It strikes one as almost criminal to note the lack of any adequate repair deck over which the crane may be housed and from which oiling, adjustments and repairs may be safely performed. There is scarcely a condition in any shop where such a deck cannot be provided in one end or the other for at least a portion of the width of the crane span. Although there are many heavy parts used in the construction of the trolley of a crane, no provision is made for a small wall crane or a travelling chain hoist to assist in this work. Many times repair men are exposed to serious hazards from falling on account of this lack. It is not infrequently the case that the bottom

chords of the roof trusses are used in making repairs and at such times they are subjected to strains which they were never designed to withstand. Workmen are frequently called upon to make crane repairs after dark and to use electric drills or soldering irons in connection with their work. The placing of a few plug receptacles for the attachment of portable extensions to make connections to these tools would greatly assist in this work. Such provisions should be made as parts of a repair deck.

Most cranes are now fitted with an over hoist or over travel stop that automatically arrests the upward travel of the hook and its load if the operator fails to disconnect the power of the hoisting motor as the hook-block approaches the hoisting drum. On large cranes that handle heavy loads the hook travel upward is slow and in many cases the part being hoisted requires a maximum upward travel of the hook. Crane operators have been observed to turn on the power and calmly wait for the load to come into contact with the over travel release, thus disconnecting the motor. The fallacy and danger of such operations are evident and should be matters of strict discipline.

Every crane requires its cable to be lubricated to prevent wear from friction and destruction from rust. While such lubrication accumulates grit and dirt in some shops the advantages of the lubrication tending to give long life to the cable more than offset the damage which this grit may do. The lubrication of the cables is sometimes accomplished by a man standing on the trolley who applies the grease as the cable is wound up. Sometimes the cable is all wound up and the top half of the drum properly greased. The bottom half is then greased after the drum has made a half revolution to bring the ungreased cable into an upward position. The writer recently saw a very clever greasing device which could be temporarily attached to the top of the hoisting block in such a way that an arm holding collar made of soft wicking could project out and surround the cable. This arm was connected with a tank supplying grease in such a way that the cable, by passing through the collar, became properly lubricated throughout its entire length.

PROVIDE MEANS OF ACCESS TO CABS

In view of the present knowledge concerning crane operation it seems rather trite to mention the fact that so many cranes are operated without a safe or convenient means of access to their cabs. The daily exposure of operators to falling, to contact with live wires, or to being overcome by fumes or gases while climbing to their cabs is considerable. It would seem the part of wisdom that not only new structures, but old structures as well, should be equipped with either a properly enclosed ladder or an adequate stairway from which the cab could be reached with a minimum of danger.

Overhead travelling cranes, and locomotive cranes to an increasing extent, are handling material by means of electro-magnetic lifting devices. These are so ruggedly constructed that they will withstand almost unlimited abuse. The only weak link in their safe operation is the cable

connecting them to the source of power or the power supply itself. Usually the source of power is sufficiently reliable to make failure only a remote possibility. The cable, however, is subjected to all manner of rough handling as a result of following the movements of the magnet and from its contact with the ground, material being handled and, sometimes, with the devices that are used to keep the slack of this cable from fouling itself with the boom. One of the best solutions of this difficulty has been the adoption of a cable which can follow the magnet in the same manner that the lifting cable follows it. If this cable passes over a suitably grooved pulley at the tip of the boom, or on the trolley drum of the crane, and is so arranged that a counterweight will carry the slack down the boom or that it will wind up on the drum of the trolley most of the wear can be avoided. Suitable electrical connections can be made by means of contact with a sliding bar or with a rotary collector ring on the trolley winding drum. A proper application of this device will not only result in longer life to the cable but avoid all damage due to kinks, cuts, abrasions, and strains.

One may still find a tendency to overload crane hooks. While the hazards created by the improper use of chains is well known, and may result in careful handling of them on the part of well informed operators, there are still a considerable number of floor men who introduce strains in crane hooks which it is impossible for them to stand without serious deformation or breaking. In handling some objects several chains are used so that the mouth of the hook is filled and attachments are made to the very tip of the hook in such a way that a severe side bending strain is introduced in addition to the lifting strains introduced by the chains hanging at the bottom of the hook.

NEGLECT OF CRANE REPAIR AND UPKEEP

The inconvenience attendant upon work performed on overhead cranes and the failure to provide convenient platforms from which to perform such work, has resulted in much neglect of crane repair and up-keep. One of the most noticeable defects is an increase in the amount of play and back-lash that is allowed to develop in all parts of the structure, particularly in the gears. When this is excessive and the gears pound badly, the starting of the motor or its reversal from a raising to a lowering motion introduces strains on pinions, shafts, keys, and other parts sufficient to cause much damage. This wear is very often due to the fact that adequate lubrication has not been furnished because access to the oil and grease cups has been difficult and the person responsible for maintaining the equipment has neglected to do his work because of the difficulty of getting at the places where it must be performed. In some cases this condition has been helped materially, and even overcome, by the use of oil cups or compression grease cups serving all parts of the crane and so located that they can all be reached from the crane walkway. It then becomes necessary only to go with an adequate amount of grease or oil to the several conveniently located cups to keep bearings adequately lubricated.

Gantry cranes, wall cranes, and other combinations of hoisting apparatus capable of operation in one or more directions, each has its particular problems, but they have been covered by consideration of similar conditions that occur largely in both locomotive and overhead travelling cranes. There is probably no piece of apparatus that does more to facilitate easy and convenient work than do these various types of cranes and it seems strange, when one considers that so much has already been done to make them safe, that there still remain so many obviously dangerous points at which they could be improved, not only to facilitate their speed of operation but to reduce materially the hazard to the operator himself and to those adjacent to the movements of such cranes.

(This paper having been printed in advance, Mr. Rausch with the permission of those present waived its reading and opened the discussion with incidents illustrating statements made in the paper. He said in part:)

STUNTS OF CRANE OPERATORS

MR. RAUSCH: One thing I have noticed is that men operating cranes become obsessed with a psychological reaction of their work. They find there are certain things they can do with the crane. They can allow it to run freely before it is brought to a stop. They can let it take a load up quickly, and so on, and after a time that becomes such an obsession that they endeavor to do stunts, and that has introduced a number of accidents.

I recall one case where a man was severely reprimanded several times in the operation of a tower crane that was handling steel construction plate for ships. You know, most shipyards are exposed to considerable and very high winds, perhaps more so than places where cranes are operated between buildings and the wind does not, therefore, get a large sweep. This man wanted to depend on the swinging aspect of the wind and to control by the force of that wind rather than to take the time and allow guides in the control action in the wind.

Now, a plate four feet wide and from eight to ten feet long presents a considerable area and the wind exerts a considerable force against it. Those of you who have attempted to swing a large barn door know the effect. That man was accustomed to do that. The result was that one day the sling instead of swinging in a uniform way got a gust or pocket of wind and the plate swung in such a way that it freed itself from the clutch. The clutch may or may not have been in good condition, but the plate under the action of that wind apparently swung in such a way that with the lowering effect, it broke loose. That may seem an exaggeration, but I think you men can appreciate that with a rapid lowering of the plate in a sudden gust of wind, the hook was freed and the plate came down. Fortunately, the only damage in that case was to property and not to individuals. That is one illustration.

In another case, an attempt was made to swing the bucket and at the same time carry it over the limit beyond which the crane boom itself could operate. That was done with the knowledge of the construction manager of the particular job because he would not take the time or

expend the money to move the rail over. Subsequently it was necessary to erect a derrick to supplement the action of the crane.

I wonder if anyone in the audience has had a similar experience with motions of cranes, due to winds or to centrifugal swinging or other forces that have caused the cranes to drop the loads or overturn or break in some way so as to cause damage.

— — — — —
LACK OF CONSIDERATION FOR NATURE OF THE WORK

One thing in construction work I would bring to your attention. In many plants the crane is taken off for a portion of a week and put on construction work. It is all perfectly well with a man familiar with cranes under regular condition, but when you take this crane down, you may change its boom length, you may alter it in some way to handle the drums of a boiler or a long piece of shafting or some piece of equipment.

I recall one crane used in a cotton mill to handle tiers. A tier is a big kettle from ten to forty feet in height. They used that crane to handle those tiers and they used their regular operator. The regular operator had very little to do. Practically all he had to do was unload coal and occasionally small loads from flat cars. The rest of the time he spent reading in his cab until called for. This day he was called was following a Saturday of rather strenuous unloading of coal. No one took the trouble to indicate to the crane operator the amount of load he was handling. He was judging the load on the fact that the tiers looked fairly light. They were hollow. They were nothing but a light load from appearance, yet it happened because of the construction and the chemicals used in them, in which case a certain plate had been used, he failed to take into account that the tier was about twice as heavy as it appeared. The result was that when he reached over the hole in the roof, the crane tipped forward until the hook rested on the edge of the roof and the result was one of the tiers was badly damaged.

Practically such accidents are due to the lack of consideration for the nature of the work that the crane was to do.

I recall one time the need for requiring an engineer to make a study of the crane that had been in use. It was presumed that that crane had been examined regularly and frequently. Ample lubrication apparently had been provided. The cables had been renewed. At proper intervals other repairs had been made. I don't know why I had the feeling, it may have been a plain, ordinary hunch, but I felt that the crane should be gone over. The result was the main block was found to have a sheave pin, normally an inch and a quarter in diameter, which, because of improper lubrication, had worn so that the thickness of the sheave pin was less than my little finger: and that was to take about twice the usual lifting load. I don't know what would have resulted if the examination had not been made. It is presumable it might have been taken up a short distance.

That only brings to light this point in operation: it is necessary to make periodical examinations. It is frequently well to have a man not concerned go over it in an unbiased way and check up every point. One would presume a worn sheave pin that had worn down to that extent

would have been observed. It happened that concurrently with the wearing of the sheave, the lip of the sheave had also worn and that had misled the man. There are other parts of the crane vital to the suspending of the load and those frequently are badly worn.

ILLUMINATION IN RELATION TO CRANE OPERATION

Another thing I have noticed in cranes is the failure to consider the crane operator from the point of vision. To place a crane operator in a cab over a load is to presume that he has an excellent opportunity to oversee what is going on when the reverse may be the case. You know, as I mentioned in the paper that it is a custom to provide more brilliant illumination in the shops. It has been a custom to insert in the old receptacles lamps of higher candlepower and much more brilliancy, and very often the crane operator has been the victim. I could mention several plants where that is true. The crane operator is obliged to look into extremely brilliant and high powered sources of light. Those can be shielded ever so little, without reducing the illumination, and give the operator a position from which he can work in comfort and with no trouble whatever.

The most successful arrangement for illuminating the object which the crane is handling that I have seen is one that has been evolved by two of the men of the Brooklyn Navy Yards. I don't know just who was father of the idea. That is to place a concentrated focusing shade with a high-powered light on the trolley of the crane so that it throws a flood of light on the object and on the block itself, thus furnishing illumination as they do on the policeman on the street crossing at night. In that manner, there is an area of brilliant illumination in which space the crane tender is able to operate. That also serves to illuminate the load when it is raised and lowered and serves as a warning when it is moved up and down the shops.

If, on the other hand, the block itself is painted white or black and white stripes, it then serves as a warning, particularly if illuminated in this way. You know, the average shop becomes uniform in color. On the other hand, if the block is properly painted, at day and night as well because frequently you have clouds in the day time, you will have very little difficulty of a block striking objects. That is beneficial to the crane operator. Many shops have planers, boring mills, presses, and other machines so situated that the load must be carried over them. I have in mind an accident where the crane operator gave as the explanation the fact that he could not see with sufficient clearness to distinguish the block from the general tools and walls of the room so as to raise it to clear the equipment.

I could think of a dozen other points along the same line as possible points to which some of you men, although you may be interested, had never had your attention drawn.

MR. G. G. KINGSLEY (Halcomb Steel Company, Syracuse, New York): I would like to ask if the men at the Navy Yards had any experience in regard to the life of the lamp that was focused for direct illumination?

MR. C. C. RAUSCH: I am glad you mentioned that point. It is a point of omission on my part.

It is necessary to so suspend the lamp that the vibration of the trolley as it travels, or in the turning of the drum, will not jar the lamp. The present-day lamps are pretty rugged but they will not stand an undue amount of jarring. It is necessary to make the suspension that the major portion of the shock will be removed by absorption. That can be done by suspending the socket on little piles of felt washers because they will pack down and yet absorb that little extra vibration that destroys the filament.

MR. G. G. KINGSLEY: The reason I asked that is because in our crane illumination in our melting shop where the atmosphere is hazy, we have suspended three lamps fastened to the end of a conduit along under the bridge walkway and it has been our experience that the life of the lamp is very short due to the vibration of the crane. We are just about to install at the end of the conduit a spring and allow the cable to run through. It will be giving the lamp sufficient space to take up that vibration.

MR. C. C. RAUSCH: It is surprising how little absorption in the way of shock absorption is necessary to have the filament in an electric lamp.

Even a single washer will absorb the shock sufficiently to save the filament. Your electrician, if he is aware of that fact can easily provide against it.

Mr. Lewis of the McKinney Steel Company, I believe was to punch the legal holes in my argument.

MR. O. J. LEWIS (McKinney Steel Company): No comment is necessary. I believe on the comprehensive consideration of the crane.

From our classified statistics, we find our crane accidents are more in connection with the appurtenances to cranes, the cables, the slings, and the chains; so, in order to get this under way, just let me touch on points that relate to the operation of the crane in that way, and it will be my experience in a steel plant, the open hearth, the rolling mills, and the shops connected with them.

We found that one of the things causing accidents was the lack of uniformity of signals, and we found that standardizing the signals adopted by the National Safety Council, illustrated in that way and posted throughout the crane cabs, was the starting point of our uniformity of operation.

We found the use of handles on the hook to be one of the most important things we have had. Hooks should not be welded. They should be forged.

We are still waiting for an efficient limit switch. I think the limit switch contributes to our accidents everywhere. We had a case the other day where the limit switch was placed very high. By the very nature of the work the limit switch must be placed high, and in running the switch, the momentum of the crane runs along and causes an accident.

In our analysis of the classification of accidents, classified under the headings of hooking or unhooking, struck by load, falling loads, we find a large percentage due to the process of hooking and unhooking. We have found more effectiveness in the use of uniform signals, avoiding the use of several giving the signals, especially in the changing of loads

where men are ready to lift. The best way to learn the lesson is to travel with the crane operator.

Just one more point: It is rather far-fetched from the operation of the crane and yet it has a bearing on it, especially in view of its serious consequences. It is the wearing of the trunnions on the steel ladle due to the tilting of the ladle. There is a heavy abrasion there that involves the strength of the trunnion and brings about the necessity for closer inspection on what might be considered merely a break or crack. That is deceiving, and should lead to the systematic and efficient inspection of ladle trunnions. That is a point I have had in mind and if any one has a system of scheduled efficient inspection, I would like to have it.

CENTER OF GRAVITY

MR. C. C. RAUSCH: There is one point that has occurred to me, brought about by this suggestion. Crane operators, crane signal men, and floor men are not men who really appreciate just what is conveyed by the idea of center of gravity. I don't want to introduce any technical discussion here but if a crane operator or a crane floor man could for once and for all be absolutely familiar with what is meant by the actual center of gravity, probably 95 per cent of the accidents due to the tipping over of loads would be avoided, and if to that knowledge he could add this fact, I am wondering if it would not be worth while to educate crane men, to take them by themselves, and demonstrate to them by picking up various objects. Show them how to pick up an object when supported by different points. For instance, you can pick up a roll in a sling and you know unless the sling is held perfectly in the middle there is a tendency to slip, or if it is not held by eyes in the hook so it can't turn you know perfectly well it will assume a position so that it finally comes to rest with the center of gravity under the hook which is the point of support.

You can pick up a tank or a crooked piece of structural steel so that the point of the center of gravity of the object is apparently supported without the object. Or, rather, the center of gravity appears not to be in the object, and in fact is not.

A crane man will learn that by experience but if you can take a crane man aside at the beginning and tell him, and illustrate by photographs, then he will eliminate those accidents due to picking up an object and swinging it along the floor rather than carrying the crane to pick up the object directly over its center of gravity, or move the crane in such a way that the object can be picked up without changing its location.

I have photographs in my office of an accident where a man was cut completely in two in a case where a transformer was lying on its side and was picked up by the ears on the side of the case, and at a certain point the friction of the end of the case and the concrete floor was such that the pull on the crane was sufficient to slide the thing against the wall, and the man was caught. I venture to say that every man who has seen a crane in operation has seen that tendency. When once a man gets that firmly in his mind, it is a thing apart from him and unconsciously he will govern his crane and so attach his slings to the load and bring

the crane over the general center mass of that body, that there will be no accident.

Now, that suggestion, if carried out by the man who will take the trouble to get his crane men and floor men and illustrate so fully that it becomes clear to them, will have cleared a point that has caused deaths and a great many accidents and much destruction of property. I am sure that is familiar to you all and only needs to be followed to more logical solution to avoid that sort of trouble.

CHAIRMAN OARTEL: We have overrun our time on this subject, but I think it was worth while, and am sure if I have anything to do with the Metals Section program next year, we will have Mr. Rausch speak on the center of gravity in connection with crane lifts, and perhaps have him illustrate in some way or demonstrate with an operator. Because as a practical mill man, I know how vital that point is.

To carry the point of Mr. Rausch a little further, have we not been preaching theory in our mills and factories when we should have been demonstrating things to our men?

The next paper was to have been given by Mr. H. P. Heyne, Safety Inspector of the United Alloy Steel Corporation, but we have a telegram informing us that Mr. Heyne is ill and unable to be present. So, the paper will be read by Mr. O. N. Toner of the National Malleable Castings Company.

NEW WAYS TO PUT SAFETY ACROSS IN A STEEL PLANT

H. P. HEYNE, SAFETY INSPECTOR, UNITED ALLOY STEEL CORPORATION,
CANTON, OHIO

Each establishment should have its system of shop discipline, but there are ways in which the employees can better inform themselves regarding what is expected of them, through the inauguration of a systematic program for conducting the work.

The new way to put safety across in any plant, is to meet the problems with a better understanding of affairs, and an assurance of fairness between the foremen and the employees, which should furnish the material for erecting the foundation for the coöperative spirit which the coming era is ushering in.

The two factors which bind men together are fellowship and good-will, based on mutual confidence. These are indispensable in attaining unity of purpose on the part of all for the welfare of all.

COÖPERATION

The spirit of coöperation brought about the desired results in the war. It will be found necessary to promote this same spirit in all lines of endeavor, and to direct our efforts toward minimizing the economic loss by teaching the elimination of waste and increasing human efficiency, which may be accomplished through advancing the average man's ability.

We are entering into a new age, and our advancement depends on enthusiasm and coöperation in industrial, social, and spiritual activities.

We must eliminate all forms which may not be in accordance with what is just and of good repute. Not until we can trust each other without being skeptical, shall we have made a great stride in the progress of humanity. A truthful person, one who can be trusted under all circumstances, surely is an asset to any community.

We should unite and maintain the forces of progress as they were united in war, and stand for construction and development of world welfare against demolition and retrogression.

We are living today in a changing era, and tomorrow will bring an advanced period in evolution, which means that more thought and action must be directed to the moral and intellectual side of life. The subject of living on a better and higher plane where all may come to a better understanding, should be taught and discussed, in private and public gatherings, so that the proper seeds may be sown in all directions and our efforts prove productive.

OUR SCHOOLS

We must get encouragement through our schools, for they are the greatest factors in the making of the future. Institutions of learning have devised ways and means for advancing education, through making the studies interesting and teaching as much as possible by facts. Pupils should be taught the right things in the right way, for many fundamentals have been neglected. There are many conditions, today, which might have been prevented had the persons been properly taught. It would not be amiss to direct our efforts to the end that all humans would be better and cleaner, through banishing all evil and destructive habits and customs. We have accomplished much through coöperation, fellowship, and efficiency; but there still remains a large area to be cultivated.

FOREIGNERS IN SAFETY WORK

Let us not disdain nor ignore one another, regardless of our so-called station in life, for we are all members of the universal family, and should assist our less fortunate brothers.

In our several departments where the workmen have little or no knowledge of the English language, we appointed the more enlightened foreigners on the mill safety committees, through an interpreter who explained to them just what was expected of members of the safety committee, and also that the safety committee button was presented to them in recognition of their ability in promoting safety among their fellow employees.

The committee button turned the trick, for the men felt that they were being considered, in assisting us in the work. The number of lost time injuries (those extending beyond balance of the working turn) was reduced 14 per cent for the first half of 1919 as compared with that for 1918 (our reduction in 1918 as compared with 1917 was more than 50 per cent), which was partially accomplished through getting the foreigners more interested in safety work. In other words, these fellows had a greater chest expansion. However, we made it clear that they must approach their fellows in a proper manner, otherwise they would

not obtain their cooperation; and we made them feel that they were safety investigators and were considered a part of the safety organization.

The safety button is a badge of an accident preventionist, and must not be construed by the men as having any authority invested in them, other than to signify to their fellows that they are safety investigators. The button which, of course, was not presented until after the men had an understanding as to what was expected of them, had a good psychological effect.

The personnel of our Workmen's Committees up to June 30, 1919, was composed of foreigners to the extent of 12.6 per cent, and they have shown quite an interest in safety work. (Members on Workmen's Committees, 339 Americans and 49 foreigners.) Why should not the foreigners be considered the same as the Americans, for an injury is an injury, regardless of race, color, or creed? The foreigners are a part of our working force and should receive consideration at least to the point that they are human beings.

ACCIDENT STATISTICS

Accident statistics should consist of simple summaries and charts, which enable the executive, by brief reference, to know the present condition as compared with a preceding period. Without the records, it is difficult to determine the degree of progress.

We maintained records of injuries from different angles; including the classification by departments, occupations, and by foremen. The reports were furnished the foremen so that they could study the conditions and get after the "high spots." The report indicating the injuries to men under the various foremen, shows at a glance the foremen's accident standing, and gives one something to work from when approaching the foremen, by comparing the rates with others who have a better classification.

This scheme created and maintained the competitive spirit among the foremen, and made them talk and practice safety.

THE FOREMEN

One of the important duties of a safety engineer, is that of keeping the foremen interested in accident prevention work, which means the changing of plans from time to time, so that their enthusiasm may be maintained.

The safety engineer should always be on the alert for articles dealing with accident prevention, and to distribute the information among the department heads and on bulletin boards, as the dissemination of the proper kind of information will manifest itself in a manner whereby the safety movement will be further advanced and receive the recognition to which it is entitled.

The service bulletins, issued by the National Safety Council, may be put to good use by distributing the messages among the foremen, as these bulletins may show up some of their weak points, and cause them to think.

We get our foremen to read the bulletins together with other material, by attaching a circular letter to the papers, which they sign and pass on to the one whose name next appears on the list. The file is returned to

the office after having made the rounds. In other words, we have a record of the papers having been read, and the psychological effect which the signing has upon the foremen. In cases of instructions, we give each foreman a copy for his file.

ACCIDENT INVESTIGATIONS

Too much stress cannot be laid on that section of safety engineering which deals with accident investigations, as corrective measures or methods are the outcome of the results of the investigations if they are conducted in a thorough and impartial manner.

Each accident involving lost time should be thoroughly looked into, together with injuries where no time was lost, but which might have been serious.

On the more serious cases, we interview each witness to the accident, so that we may get at the root of the trouble. The witnesses make affidavits to their statements before a notary in our department. The injured employee's statement also is taken, so that we have full information from both sides.

When the statements have been secured, a meeting of the investigating committee is called, which is composed of the department superintendent and foreman of the division where the accident occurred and the members of the safety teams. The information is gone over, whereupon the committee renders an "Investigation Report," which is signed by the members of the committee. The report brings out the results of the investigation as to what or who was to blame for the accident, and makes recommendations with the view to preventing a recurrence.

A copy of the witnesses' statements and the committees' report is forwarded to the General Manager, General Superintendent, and Department Superintendent. A copy also is retained in the permanent files of the Safety Department.

The time consumed in drawing up statements in a business-like form, and attacking the accident from various angles is well spent, in that each case is recorded in a detailed manner for future reference; and the psychological effect, which the investigations have upon the men, in time results in a reduction of injuries, and an economic saving to the employer.

PSYCHOLOGY IN SAFETY WORK

When a proposition is to be offered, it would prove advantageous to take the matter up with the persons concerned and invite their suggestions, for they might have something to offer which would prove practical and beneficial. At the same time their having been consulted would have a good effect on the men, which leads to cooperation in the work.

When a person is having a hard time and comes for sympathy, it is best to recognize his sufferings and find some word of encouragement. Then again, when one approaches with a message of his good fortune, try to share it with him in a sincere manner. This is human engineering, and will assist in a proper understanding and the binding together of individuals with a proper feeling and interest toward each other.

Supervisors should not criticise employees without first having made

an investigation, and then it is not necessary to ride "roughshod" over them, but give them an opportunity for an explanation, as a correct interpretation may clear the situation.

After all, what have we gained by following the method of "Rawhiding"? The men become dissatisfied, which affects their efficiency, and upon the first opportunity they will leave the service of the company; this necessitates the "breaking in" of a new man, which results in a loss of production, with greater liability to accidents, as well as increase in the labor turnover.

Every one desires cooperation in the work, and if the supervisors are considerate but firm, they will be successful in having the men work *with* them instead of working for them.

SAFETY ENGINEERING

Safety engineering might be called the study of human nature, which will be one of the important business principles in the future, and is worthy of serious thought.

One quality which plays an important part in safety engineering is the habit of being courteous, by simply saying "Please" and "Thank You," and bidding the time of the day; just a mixture of good manners and kindness. It produces sunshine on the cloudy days; its presence cheers a person and puts him in a better mood.

We can assist each other by being friendly, and our friendliness will be reflected among our acquaintances, who will become friendly in spite of themselves.

A safety engineer should be an example of good-fellowship,—to the extent where he needs an adding machine when he starts to count up his friends.

Safety first is applied common sense—it is a service of unselfish usefulness—for there can be no efficiency without common sense.

DISCUSSION

CHAIRMAN OARTEL: Is Mr. Darr of the Cambria Steel Company here? As Mr. Darr who was to lead the discussion isn't here, we will throw the matter open for general discussion. I am sure you gentlemen have tried out a few new stunts. You aren't up-to-date Safety Engineers if you haven't because my experience is that we have to keep bringing in new ideas from time to time.

Is Mr. Claude Smith in the audience? We would like to hear from you, Mr. Smith.

MR. SMITH: About the only new stunt we pulled off in the last year was a couple of months ago. We, the same as everybody else, ascertain what departments and what gang have few accidents and in order to reward them, we give them publicity. During the last year we have taken photographs of those gangs (eight by ten, mounted on ten by fourteen-inch cards) and given them to each man. Of course, you cannot get a department of several hundred to swing that stunt.

We get these men together, take their photographs, give them a little

talk on safety, and then publish the photograph in our safety bulletin, which gives them the publicity and honor for their achievement. We then have enough printed, and paste a letter on the back congratulating the men and expressing the hope that they continue their record, and that every one in the photograph will never be injured through neglect or carelessness. The photograph has a value to the men because every man likes to get a picture of the men working with him in the gang. We have found this has been a very popular undertaking for getting the cooperation of the men in connection with accident prevention.

Another stunt we have worked this year in departments where we have had rather a hard struggle in getting a good accident record is to hold a raffle of a gold watch. Of course, every one in the iron and steel industry knows I am strong on prizes. We work new stunts continually. For instance, on our plant number one we had a difficult time to get them down to the right kind of accident record, so we decided to hold a raffle in that department. Our plant interpreter took out cards with printed numbers on them. There was a detachable stub with rules to prevent accidents on the reverse side. Each man in the department was given a stub which entitled him to one chance on the gold watch. In that way the personal element entered into it because we saw each man and gave each man a card. His support was assured because in order for him to have a chance to win he would have to get through the month himself without having a lost-time accident. The department would have to get through without having any accident of more than seven days lost time. This department got through the month with a splendid record and a man from the pit won the gold watch.

When we awarded the watch, the men gathered around and we gave a safety talk. That can best be carried on in only one or two departments in a month.

Another thing we have done is to make use of blackboards on which to draw cartoons on accident prevention. We now have a blackboard about four times as large as the average bulletin board located in each department near the bulletin board. Our inspectors draw pictures on those bulletins twice a week. We draw up the design at the office; they draw them for the boards as they go around the plant. We don't have the same design on all the blackboards, but have a dozen designs ready. That seems to get a message to the men. They go around the blackboard and discuss in their own language what the picture means. That is a good educational stunt.

MR. PHILIP STREMMEL (National Enameling and Stamping Company, Granite City, Illinois): This is a very important subject and there is a great deal of thought in it—"New Ways to Put Safety Across in a Steel Plant." Now, there are a number of ways to put it across but there is only one way to put it across as it should be done.

THE QUESTION OF GIVING PRIZES

I have just heard the gentleman preceding me say something about giving prizes. I object to the giving of prizes to any man for the doing of work in any plant.

I have been a Sunday School Superintendent for twenty years, and I have always taken the position that no child should be rewarded because it is a regular attendant at the Sunday School. Are you educating the child to come to school or to get that which is fundamental in life? So it is in the safety game. Are you giving the safety work to these men, and getting them on these committees, and interesting them for the purpose of securing that prize, or is it for the purpose of interesting them in safety?—

Now, in our plant, the one thing we are trying to do is to impress upon the men of our plant that they have certain responsibilities resting upon them and that they must answer in the affirmative that they are their brothers' keepers, and from that standpoint, Mr. Chairman, we should present our safety program, not for the sake of prizes, or using them as a means to inspire men to become interested in safety, but to make them feel that it is a part of their job to be interested in safety. In the first place, it is for their personal benefit and they are doing the bigger thing. They are doing the humanitarian thing when interested in it in order to protect the other fellow. It is a mutual proposition.

There is nothing new in putting safety over in a plant. It is the old, old story of self-protection, and for the other fellow.

For example, we have meetings in our plant in such a way that the men want to come to these meetings. We have the meetings in a way that the men receive a vision of the responsibilities and the advantages of safety and they do not ask for any prizes.

When I took charge of the safety work, they were offering all sorts of prizes and I immediately cut it out. I want to say to you (I don't say it egotistically or because I have charge of it, either) that we are today accomplishing more along the lines of safety in our plant than ever before. Why? Not because we do it differently today than ever before but because we are constantly, through bulletin boards and other means, keeping before the men that they are their brothers' keeper, that there is a responsibility resting on them and that they have a duty to perform. By that means, from the smallest man up we have been able to put safety across in the plant without awarding any prizes.

In our last meeting we had a group of motor truck boys. One day a boy who does not operate one of these trucks, while it was standing alone, started it up, running into a man and breaking his leg. So, we got this young man and brought him into the safety meeting. We also brought the motor truck boys into the meeting and we discussed the question. After it was over, twelve of the motor truck boys asked if they could be members of the safety committee. We said, "Sure." It is amazing how careful those boys are operating the trucks today. They are not joy riding today as we have previously caught them. We do not caution them any longer because we brought the man whose leg was broken before them and it was an object lesson for them.

If you use the method of demonstration, bringing these things home vividly and constantly, getting them to realize that they are their brothers' keepers, I assure you, you need no prizes, no new fangled things to

put safety across because the average man has intelligence enough and there is a desire in his heart, not only to protect himself but the other fellow and home and loved ones. I think, that while some try this thing this way and that, there is only one way fundamentally.

MR. R. C. SALISBURY (Interstate Iron and Steel Company, Chicago): I do not see the comparison or advantage of comparison between the Sunday School boy and the foreign element, that is, in the teaching of the two. Mr. Stremmel hasn't outlined any specific plan or approved any other medium than the safety prizes.

For nine years we have conducted successful safety campaigns and always through the medium of safety prizes. The men come to learn why those prizes are given and are told by their foreman that the prizes are awarded for a good accident record. It would seem to me that a comparison between Mr. Smith's accident records and Mr. Stremmel's would be the only way of determining which is successful, without prizes or with prizes. I would like to see a comparison of their accident records.

CHAIRMAN OARTEL: That is a good point. I think if that could be kept in mind for next year, it would bring out an interesting discussion.

MR. SMITH: In speaking of new ideas to bring safety across, I don't want to omit the importance of that which Mr. Stremmel has been talking about. I believe in putting safety across from an educational standpoint just as much as anybody. In fact, anybody who has made an analysis of accidents knows about 98 per cent of the accidents occur, even after the plant is safeguarded, due to the human element. Knowing that 98 per cent is up to the human element, then 98 per cent of our efforts should be directed toward the human element. We know that education is the big problem, it is just a question of how you are going to educate your men.

We have a great many bulletin boards and all kinds of meetings; that is all a part of the regular routine work. These stunts which I just mentioned were some of the ideas worked out in conjunction with that work, not interfering with it, not deviating from the regular work in any way because we believe in just those things he believes in; it is fundamental.

A few years ago when rule books first came out, a great many companies issued rule books. They were published at Gary Works when I was there. We had no prizes when those books were given out. We got a good many men in the offices for witnesses. We asked, "Did you read your rule book?"

"No."

"Where is your rule book?"

"Home in the trunk," or "Thrown away."

Well, we commenced to find a way to make the men read their rule books. In a small plant that may be a simple matter, but when it comes to a plant of several thousand men, it is a problem to get every man to read his rule book. So, we got out safety service medals, which were given to any man who worked six months without having lost time on account of accident, and had passed an examination on the safety rules. Now, if that isn't worth while as a prize proposition, I don't know what is

worth while. I think it is very much worth while because we are getting the employees to read the rules.

You give a man a "prize" for producing a certain tonnage in a rolling mill. It is the same proposition in accident prevention. Of course, in some places the superintendents in small departments are able to put this across without the use of prizes. I believe that safety can be put across without prizes, but, prizes make it a little easier. It is just a case of making it easier to accomplish your purpose. If a man is going to receive a watch, belt or knife, or anything else as a prize, it will be an incentive. We found that before we offered prizes for suggestions, we got about one hundred suggestions a year. After we offered prizes, we got about four hundred; that proves it.

From my experience, there is no question but what prizes get some benefit, a whole lot more than they cost.

MR. H. L. CHURCH (Rockford Malleable Iron Works, Rockford, Ill.): The question of prizes seems to me to be based on whether a man is an idealist or a practicalist. If a man is a practicalist, he will take the ground that a child should go to Sunday School on general principles. He will take the position that any man in the mill or machine shop is his brothers' keeper as well as his own. While, the idealist will bribe the child to go to Sunday School. When I was a kid I was bribed to go to Sunday School, and I'm glad I was. If we can bribe these kids of twenty-five and thirty years of age, yet kids in mentality, go ahead and bribe them and then let the information soak in.

CHAIRMAN OARTEL: I am sure that a great deal could be said on both sides of this question, and as Mr. Smith has said, "By their fruits shall you know them," and I am sure I shall suggest this as an item on our program for the next Congress.

Next on our program is a "Practical Demonstration of Investigating Accidents," which will be staged by Mr. H. J. Weeks, Chief Safety Inspector of the American Steel and Wire Company, with a number of the employees of that company. Mr. Weeks' company has gone into that very thoroughly and I am sure we are going to get something good. We will have to ask your indulgence for a few minutes until we set the stage.

PRACTICAL DEMONSTRATION OF INVESTIGATING ACCIDENTS

STAGED BY H. J. WEEKS AND EMPLOYEES OF
AMERICAN STEEL AND WIRE COMPANY

Report of Court of Inquiry held in Accident Case of
Fred Koefig. Check No. 1,000. Carpenter

(Address to audience by Mr. H. J. Weeks.)

It is the practice of the American Steel and Wire Company to make an investigation of all accidents or near-accidents, the object of which is to determine the cause, place responsibility, recommend discipline for the

negligent person, and suggest means for preventing a similar accident. The members of the Court are generally the Works Superintendent or the Assistant Superintendent, the Master Mechanic, the Labor Employment Supervisor, three foremen, and the district and mill safety director. We will now give you a demonstration of our procedure.

MR. G. A. PHILLIPS addressed the Court as follows:

We are gathered here to investigate the accident of Fred Koenig. Koenig had his finger taken off in the Carpenter Shop while ripping boards on the circular saw.

The injured man makes the statement that he was ripping some $\frac{3}{8}$ -inch boards of short length and while pushing the last board through, his hand in some manner came in contact with the saw.

The foreman makes this statement. That the man was ripping some $\frac{3}{8}$ -inch boards 12-inches wide down to 8 inches with the saw guard raised and while doing this, in some manner his fingers came in contact with the saw.

Time of Accident: 2:00 P.M., Tuesday, Sept. 2, 1919.

Nature of Injury: Amputation first finger, right hand.

Length of time off duty: Two to four weeks.

Board: Messrs. H. J. Weeks, Chairman; G. A. Phillips, Assistant Superintendent; A. C. Germain, W. J. Smith, F. Fennell, O. Walker.

EXAMINATION BY THE CHAIRMAN OF O. F. WALKER, EMPLOYMENT SUPERVISOR

Q. Mr. Walker, do you have in your records, Mr. Koenig's employment slip?

A. Yes, sir.

Q. When was he hired?

A. On the fourth of February and started to work on the fifth.

Q. Who hired him, you, or your assistant?

A. I did.

Q. Did you read form No. 3453 to this man, explaining the safety rules?

A. Yes, sir.

Q. Did this man seem to comprehend their meaning?

A. He seemed fully to understand them.

Q. Did he sign one of these cards?

A. Yes.

Q. Who conducted this man to the Carpenter Shop?

A. I did.

Q. What did you do after you arrived there with him?

A. I introduced him to Mr. Kirtland, Carpenter Shop Foreman, who showed him the wood-working machines, safety devices, lockers, etc.

Q. How about the fire escapes?

A. He was also shown those.

Q. Did you stay with Mr. Kirtland while he was doing this, or did you return to the office?

A. I stayed with Mr. Kirtland until he finished.

Q. After you left Koenig that day did you make it your business to return to that department for the purpose of ascertaining whether or not this man was following his instructions?

A. On several occasions I went to the department to see how the man was getting along and as far as I could see he was doing his work in a satisfactory way.

EXAMINATION BY THE CHAIRMAN, OF MR. G. E. KIRTLAND, FOREMAN
CARPENTER SHOP

Q. Mr. Kirtland, tell us what you know about the accident to Fred Koenig.

A. I understand he was ripping some $\frac{7}{8}$ -inch boards for boxes, the boards were 18 inches long and 12 inches wide and he was ripping them down to 8 inches and doing this work with the saw guard up. He was pushing them through, one board following the other, until he came to the last board and then his hand came into contact with the saw.

Q. How do you know this man Koenig had the guard raised?

A. One of the shop men, Chase, told me.

Q. Had this man ever been instructed as to how to use the saw guard and other safety devices in your department?

A. Yes, he was brought in by the employment supervisor and I took him all through the shop and showed him different pieces of machinery, and I asked him if he was a carpenter and he said yes, and I asked him if he ever worked on the machinery such as we had in the shop and he said he was familiar with it. I showed him over the shop, explaining the fire escapes, water pails, fire extinguishers, and took all the pains I could to instruct him on the lines of safety.

Q. After you had your talk with this man you were then satisfied that he was an experienced carpenter and used to handling wood working machinery?

A. Yes.

Q. What was your observation of this man after he had been working there some time, was he careful or inclined to be careless?

A. I thought he was a little careless at times. I was walking through the shop and noticed the saw running with the guard up out of position, and he was preparing boards to put under the saw. I called him and told him it was not permissible under any circumstances to have the saw-guard raised.

Q. Was this the only time you saw him with the guard out of position?

A. I was through another time that I recall, and noticed the guard raised.

Q. Did you again call his attention to this dangerous practice?

A. I did and in a manner I thought he thoroughly understood and told him it would not be permitted under any circumstances.

Q. From that time on up until the time of the accident, did the man do his work in a careful manner?

A. Yes, so far as I know.

Q. Is there anything else you have to say in regard to this accident we have not mentioned: if you have, speak freely?

A. I don't know of anything.

EXAMINATION BY THE CHAIRMAN, OF FRED KOENIG, THE INJURED MAN

Q. Koenig, how is your finger today?

A. I suffered a good deal last night but the doctor said I might go back to work before long.

Q. Fred, tell us as near as you can how you got hurt.

A. I was sawing some $\frac{7}{8}$ -inch boards 12 inches, down to 8 inches in width and in some manner my finger came in contact with the saw.

Q. How long have you been working for the company?

A. Six months.

Q. When you were taken to the Carpenter Shop were you introduced to the foreman and did he in turn take you over the Carpenter Shop explaining the safety devices and rules of that department to you?

A. He did.

Q. Did you thoroughly understand the instructions you received?

A. I think I did.

Q. I understand that you are an experienced carpenter and used to handling wood-working machinery; is that correct?

A. Yes, sir.

Q. How much experience have you had?

A. About six years.

Q. When you were employed did you receive a card on the back of which were a number of safety rules with instructions to follow?

A. Yes.

Q. Have you that card with you?

A. I think I have.

Q. Read the rules on the back of that card.

1. This Company maintains a Safety Organization for the purpose of preventing injuries to employees.
2. Every employee is considered a member of the Safety Organization.
3. Safety instructions and rules must be obeyed.
4. Safety devices installed must be used.
5. Safety guards removed for repairs or adjustment must be replaced before machinery is started.
6. Unsafe conditions or practices are to be reported to the foreman.
7. The Company maintains an emergency hospital for treatment of injured employees, free of cost.
8. All injuries, no matter how slight, must receive immediate attention.
9. Good conduct is expected; horse-play or fooling will not be tolerated.
10. Failure to comply with Safety Rules and Regulations may mean immediate dismissal.

Q. Did the foreman give you other specific rules to follow in regard to the safety devices in your department?

A. He showed me all the workings of the different safety devices in the department and explained to me how to use them.

Q. Was this particular saw on which you were working at the time of the accident, provided with a guard?

A. Yes sir, it was.

Q. Was the guard in place at the time the accident happened?

A. Yes, I think it was.

Q. You are absolutely positive, Fred, you had this guard in place at the time the accident happened?

A. Yes, I think so.

Q. Is there anything else you wish to say in regard to this accident we have not talked about?

A. That is all I know of now.

Q. Have you any suggestions that would make conditions around the saw any safer?

A. No, the guard that is installed on that saw is a good one.

EXAMINATION OF J. ROITZ, CARPENTER. (WITNESS—FOREIGNER.)

(J. Tylicki, Interpreter.)

Q. Joe, do you speak English?

A. (Shrug of shoulders.)

Q. Have you ever attended a Court of Inquiry?

A. He never did.

(Procedure of the Court was here explained to the man by interpreter.)

Q. Joe, tell us what you know about this accident.

A. I was working at my bench and heard a loud conversation between Chase and Koenig. What he had to say I don't know. But as I was coming back I noticed Koenig measuring off a board and he began to rip the board and as he began I started to tell him to lower his guard, but before I reached him the accident happened.

Q. Who is Chase?

A. I don't know, but I know he works there.

Q. Joe, did you ever use a circular saw?

A. Yes, I did.

Q. Did you ever use it with the guard up out of place?

A. I always kept it down because I think too much of my hands.

Q. Joe, as I understand it, when you first turned around you noticed a man attempting to explain to this man, Koenig, that it was dangerous to saw with the guard up. How do you know that this man was telling him to put the guard down?

A. I don't understand the English language, but judging from his motions I thought he told him to lower the guard.

Q. Is there anything else you know about this accident we have not talked about?

A. That is all I know.

EXAMINATION OF W. CHASE, WITNESS

Q. Will, do you work in the Carpenter Shop?

A. Yes sir.

Q. What do you do?

A. General carpenter.

Q. Have you ever attended a Court of Inquiry?

A. Yes, sir.

Q. Did you see Fred Koenig get hurt?

A. No sir, I didn't see him. I was up there just shortly before he got hurt and he was running the saw with the guard up and I cautioned him about this and also told him to put it down, that it was very dangerous and against the rules and saw that he put it down before I left and he also said he had been doing this kind of work for a long time and had never been hurt.

Q. Where did you go after you warned him?

A. I got the board I was looking for and went back down stairs.

Q. You did not actually see the accident?

A. No.

Q. Have you ever used a circular saw?

A. Yes, a good many times.

Q. Do you always make it a practice to use the guard?

A. Yes.

Q. Does this type of saw guard on that saw cause you any inconvenience?

A. None.

Q. Is there anything else you wish to say?

A. Nothing else I can think of.

RE-EXAMINATION OF FRED KOENIG, INJURED MAN

Q. Fred, in your statement a while ago you said you had this guard in place.

A. Yes, I did.

Q. Does this saw-guard cause any inconvenience whatever when you use it?

A. No.

Q. Then Fred, why weren't you using it at the time you were injured?

A. Well, I

Q. Now wait a minute Fred. We are going to be fair with you and expect you to be fair with us. What I can't understand in your statement is this. You know as well as I do that the end of this saw guard protrudes beyond the teeth of the saw at least 4 inches and when down rests on face of the board and if you had the guard in place, explain to me how you could receive that injury.

A. Well I don't know. I think if I had the guard down I wouldn't have got my finger off.

Q. Now Fred, why did you want to tell us you had that guard down when you knew you didn't?

A. I remembered the rules I read and thought that I might be discharged for violating them.

Q. How many times have you read those rules?

A. When I first got the card and then stuck it in my pocket.

Q. What was the length of these boards you were sawing?

A. Seventeen inches.

Q. How were you pushing them through?

A. I took one board and started it through and took the second to follow the first and took the third to follow the second and in that manner kept my fingers away from the saw.

Q. Do you remember rule No. 5?

A. No, I don't remember it.

Q. Take out that card and read it.

A. (Reading the rule.) Safety guards removed for repairs and adjustment must be replaced before machinery is started.

Q. You understood that rule all right, now read No. 4.

A. (Reading the rule.) Safety devices installed must be used.

Q. Now read the last one.

A. (Reading the rule.) Failure to comply with Safety Rules and Regulations may mean immediate dismissal.

Q. Fred, I asked you a while ago if you had any suggestion to offer whereby an accident of this kind could be prevented and you said you had none. Have you any now?

A. None that I know of but I know if I ever get back to work I won't use machinery unless the guards are in the proper position.

Q. You know this guard should be kept down all the time, in fact you remember the rules pretty well. In a case of this kind what do you think we should do?

A. I don't know. I guess I will have to leave it to you gentlemen.

Q. Have you always made it a practice of keeping the guard in place before?

A. Yes, most of the time.

Q. Not always though?

A. No.

Q. Just before you were injured, didn't Chase come over to where you were sawing, when you happened to be sawing with the guard up? Didn't he attempt to put the guard down and caution you against the dangerous practice?

A. Yes, he did.

Q. What did you say to him?

A. Oh, I laughed at him and said I thought I understood my business.

Q. How do you feel about it now?

A. I wish I had taken his advice and I think I would have my finger yet.

Q. You know now just as well as Chase that it is very important that these guards be used, and if used they often prevent suffering. You realize that?

A. Yes.

Q. Now Fred, if you are permitted to go back to the work do you think you will use the guards that are put there for your protection in the future?

A. I won't use any machine unless the guard is in the proper place.

Q. You are absolutely sure about that, are you?

A. I am.

CONCLUSIONS OF THE BOARD

MR. WEEKS: Gentlemen, this concludes the testimony in this case. We will now proceed to work up the summary.

[The following were the questions and decisions reached by the Board.]

Q. What was the injured man doing?

A. Ripping some boards on a circular saw.

Q. How did the accident happen?

A. The saw guard was raised out of position. While in the act of ripping the last board, not having a board to follow and push it through, his hand came in contact with the saw.

Q. What was the exciting cause?

A. (Mr. Fennell). Mr. Weeks, do I understand that the exciting cause is the cause leading up to the accident?

A. Yes, exactly.

In this case I would say the exciting cause was the man sawing boards on a circular saw with the guard raised out of position. (Agreed.)

Q. What was the proximate cause? (Which is the near or exact cause?)

A. His hand coming in contact with the saw.

Q. Who is to blame directly?

A. The injured man.

Q. Who is to blame indirectly?

A. No one.

Q. What can be done to prevent a similar accident? Do you have any suggestions to offer, Mr. Phillips?

A. Well, the testimony shows that the saw guard is sufficient and the only thing we can do, I think, is to insist that our men make use of the guards provided. I might say that we have already called together all of the men who use the machinery and explained to them this accident, impressing upon them the importance of using the guards. Also at our regular departmental safety meeting held each month we review in detail each accident which happened in the previous month, and this accident will be taken up at the next meeting.

Q. Were there any safety rules violated?

A. Yes, rules No. 4 and No. 5.

Q. Were any safe guards involved?

A. Yes, the saw guard.

Q. Mr. Smith, getting back to what can be done to prevent a similar accident: Do you as Master Mechanic have any suggestions whereby that guard can be made any safer by adding some mechanical feature to prevent raising the guard?

A. I think it possible to put a locking device on the guard so a man can only raise it to correspond with the thickness of the board he is working on and lock it in position so it cannot be moved unless the foreman moves it. Make a key and lock it in position.

Q. If I remember that guard correctly, it is provided with a wing

nut which permits shoving out of place. By removing the nut and providing a lock as you say, and giving the foreman the key, this should remedy the situation. Do you think it can be worked out all right?

A. Yes.

Q. Will you try to work up something right away?

A. Yes.

Q. About how long before you can do this?

A. About ten days or two weeks.

Q. What discipline is suggested for the negligent person?

A. (Mr. WALKER, Employment Supervisor): I should think in a case of this kind, the man was properly instructed and cautioned and the safety devices explained to him, he ought to have at least a week off without pay after the doctor releases him.

Mr. PHILLIPS: I don't quite agree with that. That is rather a primitive method. I think we can agree on some other discipline. He will lose three or four weeks now as it is and I happen to know that he has a large family and really can't afford to lose that time. He has suffered a great deal with his finger and realizes it was the result of his own carelessness and will be safer and more careful than he was before and that will be a good example to the rest of the department. I believe, however, he should be disciplined in some way, and my suggestion would be to give him his choice of making a speech to the men in his own department or taking a week off without pay.

Mr. WEEKS: Gentlemen, I think Mr. Phillips' suggestion a very good one. This man has a large family and regardless of the fact that this injury was due to his own carelessness, we should not cause any suffering as a result of his losing time. He needs the money and I hope you will all agree to Mr. Phillips' suggestion. (Agreed.)

(It was suggested that his foreman be delegated to put this proposition up to him in a diplomatic way and try to persuade him to make the speech rather than take the week off without pay.)

Mr. Kirtland, Foreman Carpenter Shop, was called in at this time and addressed as follows by the chairman:

"Mr. Kirtland, from the testimony we have received in this investigation, we are all agreed that this accident was due wholly to Fred's own carelessness. He seems to understand the rules in a general way and with the instructions you had given him previous to the accident at the time he was employed and also cautioned him a couple of times after that, we can't help but feel that he is entirely responsible for the accident. We therefore feel he should in some way be disciplined and it has been suggested that we give this man his choice of taking a week off without pay or let him give a safety talk to the men in his department at the next departmental safety meeting. It is my opinion that Koenig would rather take the week off than give this talk but we want you to try and persuade him to give the talk, and suggest that you put it up to him when he comes in."

Mr. Koenig was then called in and addressed by Mr. Kirtland, his foreman, as follows:

"Well Fred, the Board of Inquiry has investigated this accident very carefully and the testimony of the men in the shop and also your own testimony proves it was gross carelessness on your part and no one to blame but yourself. They feel something should be done to discipline you to bring you to a point of realization that it is your duty to take care of your own person and follow the rules laid down for your protection. They have not entered into this with a spirit of punishment. It is simply done to bring you to the point where you will look out for yourself and follow instructions; and they have recommended that you either take a week off without pay or that you give a talk to the men in your department on safety at the next departmental safety meeting. You are a married man of a family, and it seems to me Fred, you have suffered enough, and more loss of time would bring a hardship on your family. I think under the circumstances if you will give your fellow-workmen a talk on safety it will do them good and won't deprive you of anything and you are certainly in a position now with your finger tied up, to impress upon them their duty to follow instructions and protect themselves. Now Fred, what are you going to do?"

Mr. Koenig's answer:

"Well Gentlemen, you certainly got me in an awful predicament. I don't like to lose the week without pay after losing all this time and I have never made a talk in my life, but I think I had better give my fellow-workmen a talk, so I will decide to give them one."

MR. KOENIG'S SPEECH

(Audience representing his fellow workmen)

Boys, you have guards on the machines. USE them. Don't try to skin out of them the same as I tried. It was my own fault I got hurt.

I tell you, boys, they have a bunch of foremen here in the Works that will get you if you don't. They got me. It is right up to you and up to me where you have the safety appliances, to use them. Don't try to have them sticking up in the air the same as I did, trying to hustle your work. I gained about two minutes, and here I lose three weeks, and suffering nights, getting my wife up at night and her telling me "For God's sake be quiet." I tell you, boys, the Company installed these safety appliances and paid lots of money for them and put them there to keep us from being crippled.

Mike, you remember when the foreman raised hell with you. You were grinding at the emery wheel without goggles. Now don't do that any more, Mike, your eye might have been a goner. Another fellow I saw ripping boards threw one down with a nail sticking up where lots of men pass. I'll tell you one thing, boys, right here: I am going to be for safety first, last, and all the time.

Now, boys, another thing: I used to look at the accident board and laugh at them putting the figures on there, but when it moved from three to four it was I, and believe me, boys, I didn't laugh then. I am going to see every time that clock moves, and I am going to that department

and talk to the fellow and see if I can't convert him to be a "safety first" man.

Don't try to get up in front of these fellows who investigate the accidents and lie like I did, for they will handle you rough. There is no use trying to sneak away, because they got you. If you try and lie out of it they get you cornered. You may as well "come clean", because if you don't you are trapped nine times out of ten. I was, and am ashamed to think how I tried to get out of it.

Now, boys, I want to thank you all for this little attention you have given, and I want to know that every one of you fellows are going to be safety first men. I want you all to preach safety first, last, and all the time.

MR. PHILIP STREMMEL: Mr. Chairman, if I am in order, I want to make a motion that we who are present this morning, who have had the privilege of listening to this Court of Inquiry given so splendidly by these gentlemen, give them a rising vote of thanks for what they have given us this morning.

(The motion was carried unanimously.)

DISCUSSION

CHAIRMAN OARTEL: We have about five minutes for discussion. If you have any questions you would like to ask Mr. Weeks, I am sure he will be very glad to answer them:

MR. R. C. SALISBURY: I would like to ask Mr. Weeks what accidents are conducted in this Court of Inquiry and how he conducts the Court of Inquiry in regard to hospital cases.

MR. F. F. PULSE (American Steel and Wire Company): I have been conducting Courts of Inquiry in the Chicago District for the same company. The accidents on which we hold Courts of Inquiry are those in which it is not obvious where the blame should be placed.

In my district we hold Courts of Inquiry when the facts are such that we don't get the information from the regular investigation. We also hold Courts of Inquiry where they serve as an example, also in case of serious injury, fatality, loss of a limb, or accidents of that kind. We hold them because this Court of Inquiry advertises the fact that when accidents happen in a department, foremen and men involved in the accident have to come before this Court. In these Courts of Inquiry, we make reference to the safety rules that exist in the department. We ask the witnesses if the foreman in his departmental meeting has taught certain safety rules that are involved in the accident. We get the opinion of the men. Sometimes there are a dozen witnesses. They will come in, one after the other, and they will back the foreman's discipline or they won't. They will sometimes say that they haven't heard of that in a safety meeting. Years ago we used to hear, "Nobody told me not to do that" or "Nobody told me to do that."

The publicity is the great advantage of these Courts of Inquiry. The minutes of the inquiry are taken and passed around to the other departments. The foremen know that these go to the highest superintendent,

the manager of the district, the highest officials, and that is one of the greatest restraining influences in this accident-prevention work.

MR. LEWIS: In case of a serious accident, when do you interview the man?

MR. WEEKS: We sometimes wait until he comes back from the hospital. Sometimes we take his deposition and he is asked the same questions that he would be asked at the Court of Inquiry itself. Sometimes it is best to have the Board of Inquiry immediately after the accident while there is still so much interest in the accident.

MR. LEWIS: Would you any time later bring the man into the Court of Inquiry?

MR. WEEKS: No. We would consider that the effect had been obtained by the publication of the Court of Inquiry and not do anything further.

MR. LEWIS: Well, providing there was discipline recommended?

MR. WEEKS: He would be acquainted with the discipline, and might be told in a departmental meeting when he came back.

MR. SMITH: I just want to ask whether these Courts of Inquiry are held privately?

MR. WEEKS: Ordinarily we hold them privately. We generally get more witnesses than are actually required in order to get more men from the department into the thing and thus let them see what happens when they break the rules.

MR. SMITH: It might be a good idea to hold one publicly.

MR. WEEKS: I never thought of that. We could hold it in the department. There would be one disadvantage, because some of them would take up quite a lot of time, and it would hardly be practicable to close a department down for about two hours to conduct a Court of Inquiry.

CHAIRMAN OARTEL: Gentlemen, Mr. Smith of the Inland Steel Company, who has been very active in the Metals Section since its organization, has something to say.

MR. SMITH: During all of the time since the Council has been divided into sections, it has been a difficult matter for the officers of the iron and steel section to secure cooperation from the men out in the field, and to carry on this work in a manner satisfactory to everybody concerned. I think every officer will agree with me on that point, and I think that at this Congress some effort should be made to make the activities of the Metals Section have more value to all members of the Section.

The iron and steel industry is probably the greatest industry of the United States. It is the backbone of all industries. The men here today are the representatives of that industry and while many are not here because of labor conditions at this time, they are as interested as those who are here.

PERMANENT SECRETARY FOR METALS SECTION

Some effort should be made to arrange that the activities of the Section will be of more value to each and every member during the coming year. I think one of the things that should be done is that a permanent Secretary should be appointed for the Metals Section. It is a hard thing for one man to handle all the activity for a Section of this kind. The dues

from the membership of this Section should be sufficient so that the National Safety Council should put some experienced iron and steel Safety Engineer in charge of the secretarial work, the dissemination of information, the gathering of information as to how accidents occur, guarding, special bulletins, anything that may occur in connection with the safety movement. I know that each and every one would be benefited by this.

There are accidents occurring in our plants every day. They may occur in Chicago, Cleveland, or Pittsburgh. If we knew exactly how that accident occurred, we would be able to prevent it in our plant. There are a great many other things that would be of special value in the iron and steel section.

I think this time is the only opportune time for the matter to be discussed and some conclusion reached, and a recommendation made to the Executive Committee of the National Safety Council.

I would like to have some suggestions on that line.

CHAIRMAN OARTEL: Mr. Smith, is it your idea that this permanent Secretary should be financed by the Council without an increase in dues?

MR. SMITH: Absolutely. I think there are enough dues so it should be done by the National Council.

CHAIRMAN OARTEL: I think the proper way would be by a motion instructing your Chairman of the Metals Section to bring it before the Executive Committee.

MR. SMITH: I will make such a motion.

(The motion was seconded.)

CHAIRMAN OARTEL: The motion is that a paid Secretary, who is a trained Safety Engineer having experience in the Iron and Steel Industry, be appointed for the Metals Section, the salary of said Secretary to be paid by the Council without an increase of dues to the Metals Section. Is there any discussion?

MR. F. G. BENNETT (The Buckeye Steel Castings Company, Columbus, Ohio): Would you want that taken up with the Executive Committee at once?

CHAIRMAN OARTEL: I think it would come at the regular Executive Committee meeting.

MR. SMITH: This has nothing to do with election of officers for this Section. This man would occupy the same position with the Metals Section as Mr. Price does with the National Safety Council. This man would not conflict with any officer of this Section. I am not trying to take care of any election of officers or anything like that.

My idea is that there should be some man (you might call him Executive Secretary, Safety Engineer of the Iron and Steel Section, or something else) to act as safety engineer for the entire iron and steel industry of the country. He should travel all around and study the systems that are in effect in different plants, then go to the other fellow and tell him how the others are doing it, giving advice as to what can be done, what is successfully carried out in other plants and what gives results. I think a man experienced in the iron and steel industry will undoubtedly be able to do that and accomplish a good deal.

CHAIRMAN OARTEL: I would like to postpone the question a little. Mr. Guerrant of the National Safety Council staff is here. He has been doing some work in the Metals Section in the preparation of Safe Practices pamphlets. I would like to hear from him on what the Mining Section is doing along this line.

MR. R. H. GUERRANT: I know that many of the sections want additional service from the Council. One man of our staff can't give any one section his entire attention. For instance, I have five sections in addition to preparing the general Safe Practices pamphlets.

The Mining Section for three or four years have wanted an experienced mining engineer to be of the same service to them as the man Mr. Smith has in mind would be to this Section, and today I think they are taking up at their meeting the advisability of appointing that man. They have been authorized, I believe, by the Executive Committee to take this matter up, but they intend to raise an additional eight thousand dollars a year. That man will be a mining engineer and will devote all of his time to the members, in the gathering of bulletin material, writing sectional pamphlets, visiting properties of the members, and helping them organize for safety. They expect to raise eight thousand dollars additional (to their dues) from the members for this service.

MR. SMITH: Do you intimate that the Executive Committee have informed the Mining Section that they are unable to finance that?

MR. GUERRANT: Yes.

MR. SMITH: If that is true, I don't think there would be any difficulty in raising at least ten thousand dollars in the iron and steel industry.

MR. GUERRANT: The iron and steel is the largest section, and, of course, ten thousand dollars divided among the members would not be a great deal for each one.

MR. SMITH: Why wouldn't it be better to change that motion if that is the opinion of the Executive Committee and raise ten thousand dollars? I move that we raise ten thousand dollars; that our new officers be given the authority to raise that amount among the iron and steel members and that they select and employ a trained iron and steel Safety Engineer for this position. This to be done under the auspices of the National Safety Council.

CHAIRMAN OARTEL: Do you wish to substitute that?

MR. SMITH: Yes.

MR. SALISBURY: I would like to ask how a plan of this kind will affect the proposed plan of the permanent Secretaries that the National Safety Council have under way?

CHAIRMAN OARTEL: What do you mean?

MR. SALISBURY: I understand the St. Louis and Pittsburgh districts have a permanent Secretary, and I think there is a plan of that kind in a tentative form now for a permanent Secretary in all big cities if they can finance it.

CHAIRMAN OARTEL: I think I can answer that question. I am from Pittsburgh. I know the St. Louis, the Cleveland, and Rochester plans. It means an increase of at least double the amount of dues you are paying.

That is, if you are living in a district where there is a permanent Local Secretary and you joined that Local Council, it means you pay possibly twice as much dues. This proposed secretary would be in addition to that.

MR. SMITH: In regard to the permanent Local Secretary, I don't think he would be as valuable to our Section as having a man in the iron and steel industry for this industry alone. The Local Council Secretaries are good for the membership, but in so far as taking care of the iron and steel industry, it doesn't answer the purpose.

MR. SALISBURY: It would occur to me that one of the two systems would have to be eliminated to keep down the cost of dues in order to make one of the two plans a success.

MR. SMITH: How many members are there in the Section?

MR. GUERRANT: There are over two hundred members, I believe. The dues paid are based upon the number of employees. Suppose your dues are a hundred dollars a year. You might have to pay twenty-five dollars a year more for a man to give you this service.

Just one more word, I think the plan proposed by the Mining Section, that this man be associated directly with the Chicago office is a good one. The Council will print all the literature as they do now for the Section, but this man will devote all his time to the Mining Section duties.

MR. SMITH: The mining proposition is about like the iron and steel. They have peculiar problems. They really need a man just as we do. They feel that need and I think we feel it in this Section. I think we are both following along the same line.

MR. PHILIP STREMMEL: I would like to say that so far as we are concerned, I think we would meet with some objection from our company for this reason: We have a tri-city, local council, a Mississippi Valley division of the National Safety Council. We support the tri-city, then we have the St. Louis, Mississippi Valley division, with a permanent secretary, then the National Sheet Association also have a man who is acting in a similar capacity, so that taking it altogether, with another additional Secretary, I doubt seriously whether our men would consider it.

CHAIRMAN OARTEL: Are there any other remarks on this very vital subject?

MR. LEWIS: It seems to me it would be observing better form if the matter is presented as in the original motion, that it be submitted to the Executive Committee.

CHAIRMAN OARTEL: I think I can answer for the Executive Committee that the Council would be perfectly agreeable if we could raise the money.

MR. SALISBURY: It seems to me that on account of the small attendance here at this time, it would be better to take this matter up at the meeting tomorrow morning and then we can get a full expression on it.

CHAIRMAN OARTEL: There is only one trouble and that is it would injure our full program. Why not have the Council send out letters saying, "Do you want this service and if so, do you want to pay for it by paying more dues?"

MR. SMITH: You could in that case advise them about what the dues would be in each instance.

MR. PHILIP STREMMEL: I think that would be the better plan.

MR. SMITH: I have no intention of forcing the issue. This was only an idea of service. I think everybody who has served as an officer of this Section the last four or five years has realized the difficulty in getting out bulletins. The benefit would be worth all the money it cost to any one who has any accident problem at all. But, in a large operation where they are having accidents continuously, there is no question but what the small amount of money it may cost would be many times regained by the service rendered.

There is no question about it but what the members in this room would like to get about four times as many bulletins as they do. If we could get real iron and steel bulletins more often, if we could get ideas on statistics, on safety, on rule books, on Courts of Inquiry such as held here this morning, and on a good many other things, the amount paid by each company would be small in comparison with the benefits derived.

MR. SALISBURY: I move the matter be laid over until tomorrow.

CHAIRMAN OARTEL: Do you offer that as an amendment?

MR. SMITH: I am satisfied.

(Seconded. Carried.)

CHAIRMAN OARTEL: The matter is on the table until tomorrow morning.
Adjournment.

SATURDAY MORNING SESSION

THE meeting convened at 9:30, Mr. J. A. Oartel presiding.

CHAIRMAN OARTEL: We have a matter that was held over from yesterday morning in regard to a permanent paid Secretary for the Metals Section. It seems that we don't have a copy of the resolution here. Mr. Bennett, will you state it?

MR. BENNETT: That we take up with the Executive Committee of the National Safety Council the matter of having a paid, permanent Secretary or Manager for this section.

CHAIRMAN OARTEL: This matter was laid on the table until today, so now it is open for discussion. Mr. Smith, who suggested the matter yesterday, went home last night. Do you wish to have any discussion? I will make this explanation for the benefit of any who were not here yesterday.

REGARDING A PAID PERMANENT SECRETARY

The idea is to have a man employed by the Council who shall look after and direct the work of the Metals Section. Heretofore the work has been done voluntarily by the elected officers of the Section. They, as you know, are employed elsewhere and cannot give much time to this matter.

The Section has grown so large, the development has been so great, that we think we have come to the place where a man should be employed to give his entire time to the Metals Section. So, the idea is that your Chairman, whoever he may be next year, shall bring this matter to the attention of the Executive Committee of the Council. To employ

such a permanent secretary would necessitate an increase in dues, or a fund to be made up in some way to pay his salary. It might run up as high as ten thousand dollars. Do the members of the Metals Section want to pay more dues?

Yesterday a thought was brought before us about membership in the Local Councils, which means an increase of dues wherever there is a paid Local Council Secretary.

A sectional paid secretary would mean an increase in addition to that. Do you want to take that step at this time?

I suggested yesterday that if this matter met the approval of the Executive Committee, that the National Council send out a circular letter to all the members to get their opinion about it.

Do you wish to have any discussion on this matter this morning before we put the motion? We have the motion before us. All we need to do is to vote upon it. Are you ready for the question?

(The motion was carried.)

CHAIRMAN CARTER: The first address will be "The Testing of Goggles for Protection Against Radiant Energy", by Mr. Charles E. Oakes, Associate Electric Engineer, United States Bureau of Standards, Washington.

THE TESTING OF GOGGLES FOR PROTECTION AGAINST RADIANT ENERGY

CHARLES E. OAKES, ASSOCIATE ELECTRICAL ENGINEER, U. S. BUREAU OF
STANDARDS, WASHINGTON, D. C.

The injurious effects to the eye of ultra-violet radiant energy which occur as a result of many operations in industry, for example electric arc welding, steel making, etc., have been known for many years but in spite of the fact that scientists have studied these phenomena, until recently no quantitative data, comprehensive in scope, have been available in such form that the engineer can use them for the purpose of writing specifications for glass.

Before entering into a detailed discussion of the methods of testing glass designed for protection from radiant energy, it might be well to explain the relation of the particular form of radiant energy with which we are concerned to the many other forms of radiant energy which manifest themselves in many well-known ways, some of which are applied commercially at the present time.

Radiation is a form of energy and can therefore be transformed into other forms of energy. Radiation in general is a transverse wave motion with a speed in space 3×10^{10} cm. per sec., but with frequencies and wavelength varying over an extremely wide range. The form of radiant energy which is most well known to us is light and this subject received the first consideration from scientists years ago. Radiation is visible, as light, only when having wave-lengths of about 76×10^{-6} cm. to 39×10^{-6} cm. Only radiant energy of these frequencies can be observed by the eye.

Alternating current waves, electric waves used in wireless telegraphy.

As will be noted, the total range of radiation is extremely great, the electric waves consuming the greater part of the radiation spectrum and a much greater part than the visible radiation.

[illegible]

means of a tuned circuit which contains inductance and capacity in the proper ratio and connected to a suitable indicating instrument such as a telephone receiver, a thermo galvanometer, a bolometer, etc.

In nearly every case where we want to measure quantitatively energy it is first necessary to change its form so that it can be recorded or detected. I may cite an example. The wireless sending apparatus propagates through space radiant energy in the form of electric waves. These waves impinging on a receiving circuit properly tuned convert the radiant energy into electrical energy. This electrical energy is dissipated as heat energy and in order to measure it a part of it is localized in a bolometer or thermocouple or thermo-galvanometer, or telephone receiver. The

localized heat energy is transformed into electrical energy, whose magnetic effect is used to turn a coil of a galvanometer against the resistance of a mechanical force such as a spring. The galvanometer visualizes the result by means of a mirror and a scale or by a pointer passing over a scale. We thus make use of the visible radiant energy of the sun or an artificial light to picture for us the relative position of the scale and pointer. By these few examples it can be seen it is necessary to make many transformations of energy before the final result can be visualized. The same general method is followed in measuring radiation in any part of the spectrum.

However, there is one important difference between electric radiation and light radiation. Electric radiation is usually, although not necessarily of one frequency while light radiations usually are a mixture of waves of an infinite number of frequencies. The infra-red and ultra-violet radiations are always present, although the worker is unconscious of the fact, and if present in considerable amounts. These invisible radiations are known to injure various parts of the eye. For these reasons the eyes must be protected especially where radiation of high power is encountered. Since light radiation is usually made up of waves of an infinite number of frequencies, it becomes necessary to separate them if measurements on a particular wave length are to be made. These waves do not travel through media such as glass with the same velocity as they do through space. Not only is the velocity usually decreased but the reduction in speed depends on the frequency. If the radiant energy of different wave lengths is passed through a transparent prism—transparent as far as the wave lengths under consideration are concerned—this difference in velocity results in the direction being changed and this affords a method of separating the waves. By focusing the radiant energy after passing through a prism on a screen a spectrum is formed. To the eye there can be perceived only the colors of the spectrum. That there is radiant energy of other wave lengths present but not visible can be proven by holding a sensitive heat measuring device in the path of radiant energy in the infra-red portion of the spectrum. If a photograph be taken of the spectrum, wave lengths shorter than those of the visible spectrum will be recorded and we thus have evidences of ultra-violet radiations. A heat measuring device will also detect ultra-violet radiation. An ordinary prism made of a material transparent to the radiant energy of those wave lengths to be studied is all that is necessary to separate the individual waves enough to conduct whatever experiments are necessary.

In the detection of the presence of radiant energy of different wave lengths a multiplicity of methods may be used. The eye can detect the wave lengths exhibited by the visible spectrum because the eye is particularly sensitive to these. The photographic plate can be used for the visible spectrum and it will record also radiant energy in the ultra-violet and beyond, even through the x-ray portion of the spectrum. A standard method of detecting the presence of radiation and obtaining a quantitative result is by making use of a heat-measuring device. All radiant energy if intercepted and absorbed disappears as radiation by conversion

With this general explanation of the methods of measuring radiant energy, which has been given in order to picture the whole field of radiant energy and the relations of the various forms one to the other, we now pass to the particular field in which we are especially interested, the portion

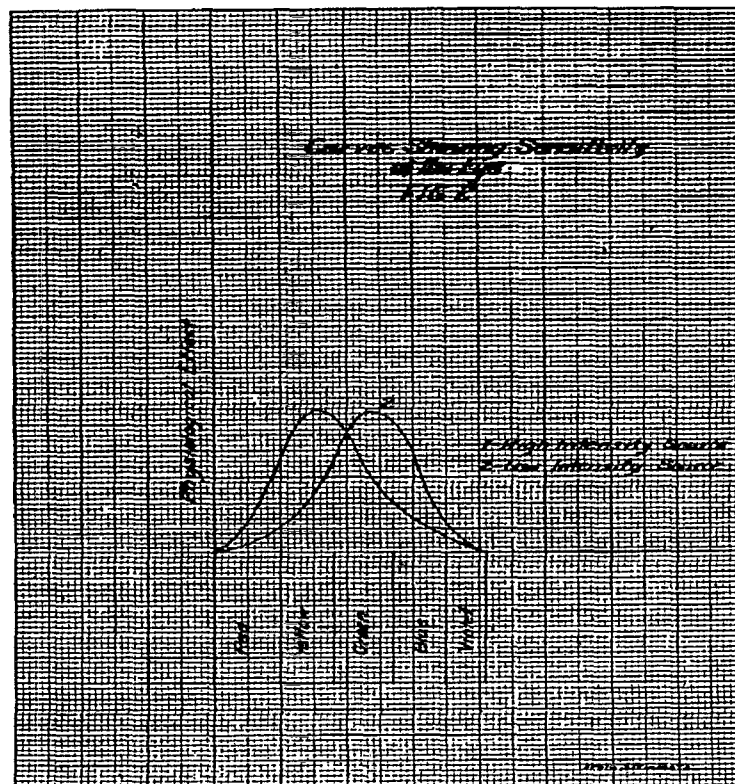


FIG. 2. CURVE SHOWING SENSITIVITY OF THE EYE

The safety man is interested in a glass that will transmit as little of the ultra-violet and infra-red as possible. But why is he interested in the transmission of glass? Because the reduction of the energy in the infra-red and ultra-violet to a degree which will not be injurious will give us the required safety.

The lack of sensitivity of the eye to radiations outside the visible is a

secondary reason why the presence of these radiations is dangerous. The man does not realize their presence.

Fig. 2. For the same amount of power expended the physiological effect on the eye, that is the amount of illumination evidenced, is a maximum near the middle of the visible spectrum and decreases on each side from there to zero at the end of the visible range. The ultra-violet and infra-red radiations on entering the eye are transformed into chemical energy or heat energy and produce harmful effects. This is particularly true of the ultra violet portion of the spectrum, the action on the tissues being chemical while that of the infra-red seems to manifest itself as a heat effect. That there is a permanent injurious effect from the infra-red radiation has not been proven, but there is no doubt that it may cause

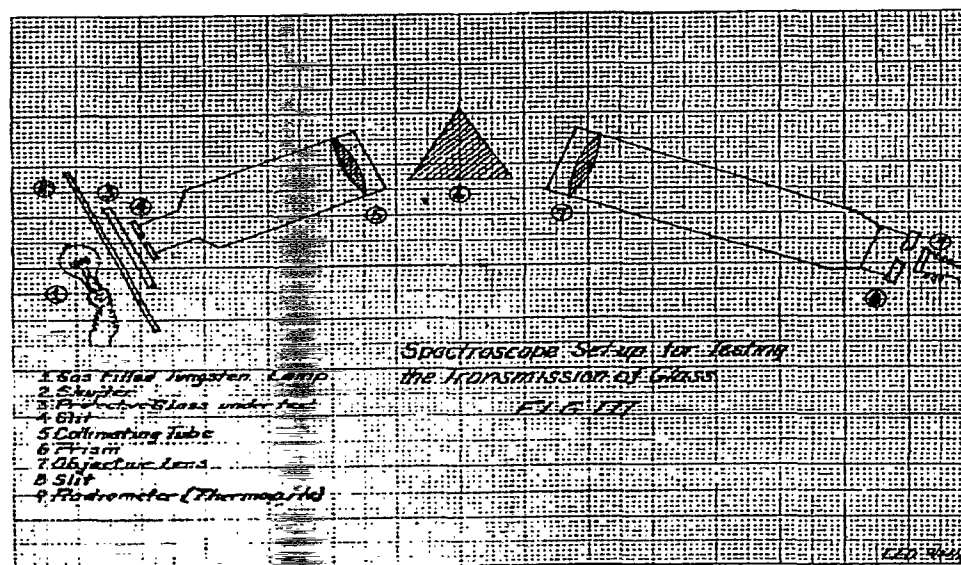


FIG. 2. SPECTROSCOPE SET UP FOR TESTING THE TRANSMISSION OF GLASS

serious temporary injury. It is, therefore, necessary to absorb as much as possible of these radiations before they reach the eye.

It becomes necessary to know the properties of the glass in order to insure adequate protection. This is done by tests and by buying on specifications based on these tests, protection is assured.

The apparatus used for testing such glass is simple in principle, although skill and experience in using it are necessary in order to obtain accurate results. The essential requirements are (1) a spectroscope for dispersing the radiant energy into a spectrum which will extend over the ultra-violet, visible and infra-red; and (2) a radiometer for measuring the spectral intensities of the light transmitted by the glass under test.

In Fig. 3 is shown the spectroscope with slit 4, 8; lenses (or silvered

mirrors) 5, 7; and prism 6 of glass fluorite or quartz. The radiometer 9, is placed at the narrow exit slit 8, through which passes a narrow strip of the spectrum. The radiometer may be a bolometer, a thermopile, a photometer, or a photographic plate. The bolometer or thermopile acts through a galvanometer.

The spectrum is formed at 8, and narrow portions pass out through the slit for measurement of intensity. The source of light, 1. (and infra-red and ultra-violet rays) is a gas-filled tungsten lamp placed in front of the spectroscopy slit. There is a shutter, 2, to exclude the light when desired. The glass under test, 3, is usually placed close in front of the entrance slit 4.

Suppose we wish to determine the transmission of a certain glass, for



FIG. 4. TRANSMISSION CURVES

the red (or yellow). The spectroscopy arm is rotated so that red light passes out through the exit slit, 8, and falls upon the bolometer or thermopile (or other radiometer). The intensity (galvanometer deflection) of the light is noted first with the glass in front of the slit and second when no glass is in front of the slit. The ratio of these intensities gives the per cent transmission. For example, suppose that, with the glass in place before the slit the light from the lamp warms the thermopile sufficiently to cause a galvanometer scale deflection of 50 mm. and when the glass is removed, the galvanometer deflection is 100 mm. The ratio is 50/100 i. e., the glass transmits 50 per cent of the incident light.

In this manner the whole spectrum is explored step by step and the transmission of the glass is determined. In order to show the result

obtained by this test I shall choose two glasses which have been tested at the Bureau. One is not suitable for electric arc welders' goggles and the other will give full protection.

Curve 1 is the transmission curve of a blue-green glass and curve 2 of a yellow-green glass. In curve 1 a high transmission in the ultra-violet, an average of about 16 per cent transmission in the visible which is predominant in the blue and green and a high transmission in the infra-red is shown. On the other hand curve 2 shows that the glass transmits no ultra-violet, the transmission in the visible is about 1 per cent and that in the infra-red about 2 per cent, the transmission being very low in the region of the infra-red adjacent to the visible. The test proves

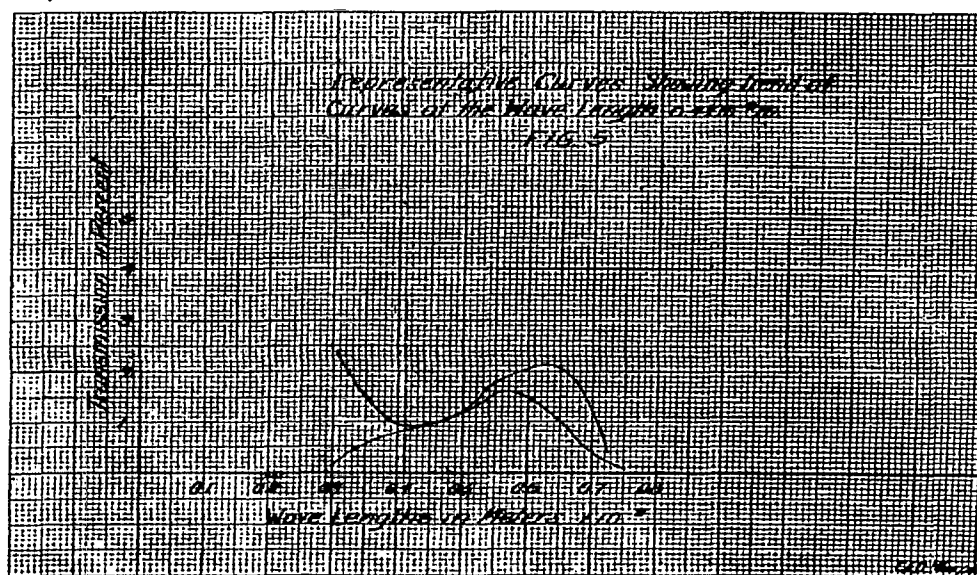


FIG. 5. REPRESENTATIVE CURVES

that the yellow-green glass will give complete protection. Data on a large number of glasses (the data being given under their trade names) can be found in Bureau of Standards Technologic Papers Nos. 93 by W. W. Coblentz and W. B. Emerson, and 119 by K. S. Gibson and H. T. McNichols.

Tests on a large number of glasses together with a knowledge of the glasses that have given good service in practice should give us sufficient data to construct a practical specification for glasses to be used in different processes. This has been done in the draft of the Safety Code for the Protection of the Head and Eyes, which has been prepared by the Bureau.

What are the essentials which should enter into a specification for glass for welders, for example? The intensity of the radiant energy from these sources is extremely high and is rich in ultra-violet. It has defi-

nitely been proven that ultra-violet radiant energy is harmful. Therefore it should be eliminated. It is, therefore, justifiable to place a limit on the per cent transmission of wave lengths less than 360 millimicrons, which is near the beginning of the visible. However, a much more satisfactory test can be made at a wave length of 406 millimicrons because the spectrum of a mercury lamp shows a sharp and distinct line at this wave length, and hence a test of great accuracy can be made. Further it has been found by test that all glasses have a transmission curve which either slopes up or down beyond this point, Fig. 5. If then a limit is placed on the transmission at this wave length, an accurate test can be made at this point and a rough confirmatory test made somewhere in the ultra-violet to show that the trend of the curve is not upward.

Although it has not been definitely proven that infra-red rays cause permanent injury to the eye, the protection against them is so easy of accomplishment that it should be furnished. However, it is not desirable to set a fixed limit on the transmission of all wave lengths in the infra-red, but rather to set a maximum total transmission for arc welders' goggles together with a limitation of the transmission in the visible. The specification for welders' goggles as proposed for the Safety Code for Head and Eye Protection is as follows:

Helmet windows shall transmit not more than 1 per cent of the radiant energy of any wave length less than 406 millimicrons, not more than 1 per cent of the light and not more than 10 per cent of the total radiant energy from a 200-watt, 110-volt, gas-filled tungsten-filament electric incandescent lamp operating as commercially rated (approximately 0.86 watt per spherical candle).

A similar specification has been written for oxy-acetylene welders and cutters' goggles. The light source in this work is not as intense as in arc-welding and the worker must be able to see his work clearly. These criteria must be taken care of in writing the specification for these lenses. Ultra-violet rays are present, however, and, therefore must be dealt with as in arc-welders' goggles. The visible and infra-red are limited by prescribing a maximum total radiant energy. The rule for oxy-acetylene welders' and furnace workers' goggles is as follows:

Lenses or helmet windows shall transmit not more than 1 per cent of radiant energy of any wave length less than 406 millimicrons and not more than 50 per cent of the total radiant energy from a 200-watt, 110-volt, gas-filled tungsten-filament, electric incandescent lamp operating as commercially rated (approximately 0.86 watt per spherical candle).

Protection may be obtained by the use of a single glass which has the proper transmission for the various parts of the spectrum or a number of glasses may be used providing the transmission through the combination is properly limited.

DISCUSSION

CHAIRMAN OARTEL: Gentlemen, while I will admit this was a little over my head and perhaps over the heads of some of you, yet it is a mighty good thing, this work that the Bureau of Standards has been developing. The practical end is that they are going to tell us just whether a goggle

will injure a man's eye or not. I am very sure Mr. Oakes will be glad to answer any questions you may have to answer.

MR. OAKES: Those papers I referred to are part of the regular publication of the Bureau of Standards, and you can get them by writing to the Bureau.

MR. HOMER J. WEEKS (American Steel and Wire Company, Cleveland, Ohio): I would like to ask Mr. Oakes if he has run any tests on "Crookes' " glass?

MR. C. E. OAKES: I haven't, but the Optical Section has. They have made a very elaborate test which is described in that publication.

MR. HOMER J. WEEKS: Can you tell me what per cent of the light is cut out by this glass and what per cent of the ultra-violet rays?

MR. C. E. OAKES: I can find it here shortly.

(Mr. Oakes referred Mr. Weeks to the pamphlet he mentioned in his paper.)

CHAIRMAN OAKEL: Are there any other questions?

MR. KINGSLEY (Syracuse, N. Y.): I have taken from what Mr. Oakes has said that the ordinary "Pug" glass will not eliminate very much of the ultra-violet rays.

We do a lot of melting steel electrically. The head of the department says that in fixing the slag of the furnace, the men do not look at the arc, they just look at the slag they are fixing. The arc is there and the rays hit the eyes. I want to know whether looking at the rays will affect the eye.

MR. TOLMAN (National Lead Company): I would like to know what the unit of area is in testing these lenses for admittance of radiation.

MR. C. E. OAKES: The unit of area isn't limited at all. You can use a piece of glass an inch in diameter, usually a piece of two inches by two inches.

MR. TOLMAN: What are the specifications in terms of the amount of light that would pass?

MR. OAKES: Just what do you mean?

MR. TOLMAN: I mean the thickness, the area through which the light passes.

MR. OAKES: If the lens represented four square inches and allowed fifty per cent to go through, the intensity would be one-fourth as great. It doesn't make any difference if you have it larger—

MR. TOLMAN: What I am getting at is that the eye is using at any one time a certain standard area of that glass and, for example, in exposing to arc welding, there is a very small area of that glass used at any one moment, and it is the density of that glass that interests us. It is specific density and not the density of an undetermined area. It seems the area must be defined on the test.

MR. OAKES: The only thing that controls it is the thickness and the quality of the glass itself.

For instance, I can take a high intensity source, and as I explained by the curve, the amount of light as detected by the arc, there is a physiological effect which varies somewhat with the density of the source, but not

enough to make those specifications in it practical, for they are now subject to much alteration.

MR. TOLMAN: There is one other thing, the question of lenses of varied thickness, that is, a lens with a dense spot in the center, with a tapering density, reducing resistance to the rays from that spot out—that protects the man's eye from the arc itself and yet enables him to see in the area around the dense spot. It avoids introducing a tripping or falling hazard at the time you are protecting his eyes from the light.

The lense that is dense all the way over is practically so thick that a man cannot see the moment he turns away from the light, and he is very likely to trip over some hazard on the floor. Has that subject been given any attention?

MR. OAKES: The thickness of the glass does have a slight effect on the transmission but the effect is so small that when you are considering arc welders' glass, it is almost negligible. We have to reduce it to such a low minimum transmission that the thickness is almost a negligible quantity. The ratio of the transmission varies.

CHAIRMAN OARTEL: If there are no other questions, we will proceed with the rest of the program.

This is a very valuable subject and it might be a good idea to continue the subject next year, because there will be more developments by that time.

I will now call for the report of the Nominating Committee.

REPORT OF NOMINATING COMMITTEE

MR. BENNETT: Mr. Chairman, the Nominating Committee offers the following nominations: for Chairman, the present Chairman. Mr. J. A. Oartel; for Vice-Chairman, Mr. W. E. Watters, the present Secretary for the Section; and for Secretary, Mr. H. E. Steinmetz of the Midvale Steel and Ordnance Company.

(These men were elected.)

CHAIRMAN OARTEL: I appreciate the confidence you impose in me in electing me Chairman of the Metals Section, one of the largest sections of the National Safety Council.

I have tried to do what I could in the term of my office, which was only a part of a year, and I want to assure you that I will do what I can for the promotion of safety in the Metals Section in the great steel and iron business of the country.

MR. W. E. WATTERS: I appreciate this honor, and I will give you everything I have and be as faithful in the coming year as in the past. It has taken a great deal of my time but I have given it with all my heart, and I will do the same the coming year. I thank you.

MR. H. E. STEINMETZ: I have nothing interesting to offer to the Section. I wish merely to thank the members of the Metals Section for having elected me to the office of Secretary, and I will try to carry on the work which Mr. Watters has so ably handled during the past year.

CHAIRMAN OARTEL: Gentlemen, I take delight in partially returning the compliments a certain gentleman has been paying me for a long time.

So, without preliminaries, I want to introduce to you a real man. I think that is perhaps the best thing I can say about him. It was my privilege to go to St. Louis in April to address the Safety Engineers' School which is being carried on there by the Mississippi Valley Division, and the audience was composed of 330 men—foremen, superintendents, safety engineers, and such people, interested in safety there to learn. That was the impressive thing, and they were there because Mr. Stremmel was at the head of the thing and kept it going. So, Mr. Stremmel has made a big contribution to safety in the Mississippi Valley during the past year, and I am sure his influence is going to become wider as the days and weeks go by. I take pleasure in introducing Mr. Philip Stremmel, who will speak on "Humanizing a Steel Plant."

MR. PHILIP STREMMEL: I do not know why this subject was assigned to me. To my mind it is the most important subject before this convention. It is a subject in which we are all vitally interested. It seems to me that there are men in attendance at this convention who are far better qualified to handle this most important subject than I am, but it has been assigned to me and I have done the best I could.

HUMANIZING A STEEL PLANT

PHILIP STREMMEL, SUPERINTENDENT, HOT MILLS, NATIONAL ENAMELING AND STAMPING COMPANY, GRANITE CITY, ILL.

The World War, through which we have just passed, and the innumerable problems growing out of it, challenge Capital as it has never been challenged in all history. The world, in respect to labor, wages, hours of labor, management, etc., is practically chaotic. No one knows what a day may bring forth. We do know, however, that underneath this seething volcano of unrest there are certain unmistakable facts. The part Labor has played in the great world struggle has rejuvenated her. The working men are not only awake, but they are conscious of exerting a tremendous power. They are also determined that the fruits of the awakening shall not be lost. They look back on the old days and wonder how they could ever have submitted to that regime, and now Capital and Labor must settle the issues so clearly raised. The issues being joined, we must candidly and intelligently set them forth and abide the arbitrament of Reason and the dictates of Justice.

How, then, can we Humanize the Steel Industry? And how do our share in solving the fearful problems of world reconstruction?

CONFIDENCE MUST BE RESTORED

First: If the steel industry is to be humanized, confidence must be restored between the employer and employee. The whole history of the steel industry has been one of struggle. The employees have believed that their rights could only be secured and maintained by organization. They must organize or they were helpless. On the other hand the em-

ployer fought organization, because he was convinced that it was an invasion of his rights. The truth is, both were partly right and both were partly wrong.

The employer and employee must come to a state of mutual understanding, and in the realization of that fact a great step forward shall have been taken. The employer must not limit his interest in his employee merely to his power to produce. He must also see his family; their educational, social, and spiritual needs must express themselves in the pay roll. Not merely an employee is to be dealt with, but his family also. The employer must have vision enough to see that he must not think only in terms of profit and production but he must also think in terms of his responsibility to the community growing out of his plant.

So when Capital, keeping pace with sociological thought as well as with modern methods and machinery, sets itself to see man as a man as well as a worker the old dissatisfaction and distrust will disappear. The basis of confidence, therefore, is self-respect. Without respect, mutual respect between employer and employee, there can only be struggle to the bitter end, which will ruin both.

The employer can no longer camouflage the employee. He can no longer get up in large conventions, make speeches about the rights of the laboring man, that labor is not a commodity, that labor has the right to organize, that wages must not be reduced, that there must be a fair system of collective bargaining, that there shall be no baron and serf, then return to his respective plant and permit the very thing to come to pass that he had spoken against and received much praise and publicity about.

But if we respect the employee's rights, concede that many of his demands are incontrovertibly just, he, in turn, will come to respect us and the basis of confidence becomes an established fact. This is basic. No enterprise, however great or strong or essential, can abide the troublesome days ahead, that does not seek to build upon the foundation of fundamental social needs. This matter of self-respect involves the freedom to think and to act on one's conviction. The employer cannot have the confidence of his employees if he discharges men because they believe in organization or belong to a radical political party. We have condemned wanton acts of destruction and did not realize that the employer's methods of repression, lack of fair play, had much to do in making their employees the prey of conscienceless agitators. To restore confidence means that the agitator will be a fact of history. In the new order of justice, honorable dealing, respect, there will be no place for the agitator who doubtlessly has prejudiced Labor's cause on many a field of battle.

COÖPERATION BETWEEN EMPLOYER AND EMPLOYEE

Second: If the steel industry is to be humanized there must also be coöperation between the employer and employee. The employer and the employee have certain definite interests in common, and the one lesson that all concerned must learn is coöperation. It means success anywhere. It must always be remembered that the steel plant is only a cog in this great progressive movement, and that our work must be viewed, there-

fore, from the standpoint of the world. Coöperation then would mean a united effort in attempting a solution of our present difficulties as well as the matter of increasing efficiency and production. If jealousy, suspicion, distrust, covetousness, are permitted to fatten in the minds of the employees, what can the employer expect but war? It will be war, day in and day out, as long as men are moved by such motives. Production will be curtailed; the men will grumble; the atmosphere will become anarchistic, and in the end both Capital and Labor must pay the cost. A way out can be found. It will be found. We have faith in our business and we must acquire faith in man, faith in movements, and look forward to the gradual elimination of the problems that at first seem insuperable. Coöperation is the outstanding lesson of the great war. As long as England, France, Russia, Italy, Belgium, Serbia, fought alone, Germany went from victory to victory. America upon entering the war insisted upon a unified command. General Foch then became Commander-in-Chief of the Allied Armies. Now France did not fight as France, nor England as England, nor did any other nation fight alone, but each and all, from then on, fought as a single Army in a Common cause. Political and racial consideration were left behind, and the splendid coöperation began by the Americans at Chateau Thierry, drove the German back and farther back until finally he begged for Peace. England, alone, would have failed; so would France, so any other allied nation. American resources saved the world; not in ourselves alone, but because we saw that the cause was one, and that coöperation on all fronts, all pulling together for the one great purpose of victory would make it an actuality. Labor and Capital must learn this lesson. The way is not clear, but the fog is lifting, and if there be a way out, coöperation will find it. Capital and Labor must see that no lasting victory can come to either side, if it come out of jealousy, envy, hatred, distrust. But all pulling together, a just wage, fair conditions, and shorter hours can be had; and all involved enjoy their rights and privileges as men and as citizens as we march onward to the triumph of right, of justice, of truth, or brotherhood—the day when dreams come true.

EVOLUTION OR REVOLUTION

In the third place, the steel industry must be humanized to save itself from industrial revolution. The old days are gone, and it is no longer a question of returning to pre-war conditions, which is unthinkable; but it is a question of working out the demands, the ideals of Labor, in an orderly process. It is either evolution or revolution; strikes, lockouts, will seem small matters as we face the deadly struggle of Capital and Labor growing out of the world upheaval.

Labor is organized, and is organizing more intensely and determinedly every day. Workmen mean to maintain the new standards of living and they will work out the pressing, if not distressing problems peaceably if properly approached, and in time. They have had to fight every inch of the way, and the laboring man, the world over, is in a fighting mood today and means to win. Labor, then, must be approached in the spirit

of the times. Capital will simply invite destruction if it attempts to maintain the old order. We must see the world as it now is and deal with the new conditions in a spirit of justice and of utter unselfishness. This does not mean that every demand made by Labor can be granted, but it does mean that in the granting of some of their demands that we propose thoroughly to face the issues, exhibiting a spirit of fairness, of willingness to do all that is within our power to give Labor her due and also keep our business upon a paying basis. Our profits may not be so large as formerly, but the confidence, the harmony, shall have made our investment trebly secure, because out of the readjustment will come not only respect, but love for law and order. There is no other way that is so full of promise: and in view of the unprecedented economic upheavals shall we not follow the path that leads to peace and security? If we still doubt and hesitate let us turn our eyes toward Russia. Do we want such an economic revolution in our land, and shall we, by sheer resistance, continue to feed the flames of hate between rich and poor, that when the revolution comes a man and his family shall be killed simply because he has money? The war did not cause Bolshevism, it only gave the Bolshevist-minded a chance to rally the oppressed peasants by promises of economic freedom. To understand Bolshevism we must know the history of Russia, and how the nobility—the class of wealth—by the abuse of their power, their utter selfishness, the lack of vision and of faith, made possible the most tragic spectacle of the modern world. We have judged Bolshevism by its atrocities, its cruelties, its vices, but we must also see an oppressed Russia—a Russia of economic slaves. They, the masses, have suffered long centuries, and finally maddened by the very inhumanity of their condition, Trotsky and Lenine make wealth or its possession the crime of crimes. Death and starvation stalk abroad in that once powerful empire, and the whole world shudders as her Bolshevistic doctrine threatens the very heart of civilization itself. Russia, ignorant Russia, is feared by the whole world. But America is not ignorant, and the American laborer has a leadership today that for brains, for penetration, for acuteness, for perspicacity, will compare favorably with leadership of any of the great corporations of the land.

Our Universities have made a scientific study of our social life. Sociology cries out that these conditions can be changed, that they must be changed, and the conscience of the country is behind these movements and preachments. Sociology is not socialism. Let us not confuse the issue. Sociologists on the whole are sane and are making an invaluable contribution to our social life. They are not prejudiced usually, but they are the prophets of a better day. These leaders of thought want the new day to come by evolutionary processes. They do not plead for confiscation of property, but they do plead for the admitted rights of men. These are some of the forces that are leavening the new order, and the world's greatest Prophet challenges Capital by the mightiest words of history, saying: "Whosoever loseth his life shall save it; and whosoever saveth his life shall lose it." So Capital can only save itself by losing itself, and in the losing of itself makes for Democracy, the brotherhood of the world.

shall be glad to answer them while I proceed to connect up the regulators to the gas cylinders.

The first question is, which regulator to connect to each acetylene cylinder. The manufacturers have arranged these so that there can be no mistake. You will notice that the oxygen regulations are usually painted red and the acetylene black, and the connections will not fit the wrong cylinder. The cylinders are made with connections that look as if they would fit, but generally one has a male connection and the other has a female connection.

The first thing to do is to look in all your valves and see that there is no dirt or oil. In charging these cylinders, some one may take off the cap, leave it undone, and some one else may drop oil in there. One drop of oil would mean that the man would go to the graveyard.

The next thing is connecting up the hose. Hose for oxygen is either white or red and for acetylene black. Both are tested to stand 300 pounds pressure to the square inch, but it is a good plan to use hose on one gas only, because in changing about one may take up one hose and connect it on the other connection and cause trouble, especially in acetylene and hydrogen. It causes bad results to change hose.

QUESTION: Do you use any filler on your thread?

MR. SCHLEICHER: No, sir. There is no filler, oil or grease of any kind used on the connections. Several government departments specify one quarter inch iron pipe thread connections so that any change of the hose will fit.

You will notice that there is a clamp supplied with each hose that prevents leaking at the connection. This clamp surrounds the hose completely. In tightening, there is no slipping of the hose to cause a leak. A spark on the man's clothing might ignite and cause fire.

QUESTION: Is there any danger of using glycerine?

MR. SCHLEICHER: Glycerine and graphite are the only lubricants safe to use.

QUESTION: What type torch is that?

MR. SCHLEICHER: This is manufactured by the Alexander Milburn Company. It is designed for cutting, and can be used for emergency welding.

Where a man has foundry work or any kind of light work, you use it for cutting and occasionally, when there is a necessity, you may use it for welding. You can use the same tips that are designed for this welding torch. You notice that one torch is heavier.

QUESTION: Where does the mixture take place?

MR. SCHLEICHER: The mixture takes place in the tip.

The mixture in the torch has been done away with, for the simple reason that the fire from the ignition of gas will always go back to the point of mixture, and we found this a good practice: by eliminating the mixture in the torch, overheating is done away with, and the possibility of burning the operators' hands.

QUESTION: Is that torch guaranteed from backfire?

MR. SCHLEICHER: Yes. The tips are so designed that there is no back-firing. The gases are mixed after they pass the seat and there is an ex-

pansion chamber in the tip. The chances are if the tip did get overheated, the fire would go back to that expansion chamber, but no farther.

QUESTION: What is your tip made of?

MR. SCHLEICHER: It is made of a special composition of an alloy of bronze.

After connecting up the hose, the next thing is to see that there are no leaks.

On all torches, the oxygen, as a rule, is the top connection, marked OXY. Some manufacturers mark them with an "O." All are made with the gases at the bottom marked "A." With this torch, on cutting, you could not use one gas or the other with improper connections, but in welding, if you did connect the oxygen on the acetylene connection, it would make no difference because there are no mixed gases in the torch. The tips are designed to take care of either connection.

Now that we have connected up, the next operation is to turn on the gas. Don't stand in front of regulator. The practice has been to stand in front while opening the valve. That has caused accidents. First see that the regulating screw is released, no matter what regulator you use. By having it screwed in with the tension on the spring, and the valve open, there is 1,800 pounds pressure released from the initial pressure side to the delivered pressure side of regulator.

Now, with the regulating screw released, open the valve. This cylinder has a stuffing box at the top and it is best to open it all the way, if there should be any leak, it is made tight by the steam inside. There are other cylinders that do not have the feature, but should there be any leak, they are arranged to shut off the supply immediately. Take the cap off and fasten the stuffing box that holds the pressure in.

The next thing is to get the pressure desired to the torch. Then it is well to find if there is any leakage. Shut off gas and try your connections. Now if the indicator stays in the position that it is set to, you know there is no leak. The acetylene gas is the same thing.

Next see that your regulating screws are released and then open up your torch valve. Always stand back of a regulator when you open up the valve. Don't stand in front because there may be something inside of the regulator to cause it to blow out.

The acetylene cylinders are charged at the stations to three hundred pounds pressure. They are then allowed to set, and the pressure drops to about two hundred twenty-five or two hundred fifty pounds. This bottle, and all cylinders of acetylene are filled with a porous substance that is saturated with acetone to absorb the acetylene gas. Free acetylene gas in a cylinder, if compressed to over eighteen to thirty pounds pressure, would be dangerous, but compressed into the cylinder charged with acetone is safe, the acetone acts as a sponge and absorbs the gas and keeps it from exploding from hard knocks. You could fire a bullet into that cylinder and it would not explode.

It is important to handle them carefully, especially oxygen cylinders. They are tested to 3,000 pounds pressure, but if you knocked that cylinder down, or stood it near heat, it might open up some bad spot not

shown in the test. It should not shatter in fragments but open in seams; whereas, the soft plug in the oxygen cylinder is immediately behind the valve.

Now, if this oxygen cylinder is set out in the sun it would raise the pressure, and if it gets in the neighborhood of 2,000 or 3,000 pounds, the soft plug would give way.

QUESTION: What temperature is dangerous in the sun?

MR. SCHLEICHER: Whenever they are set in the sun, it is a good idea to cover them. I have seen them blow out at less than twenty-six hundred pounds.

The acetylene cylinders have two safety plugs in the top and two in the bottom, so if there was any fire in the building, it would release and the acetylene gas would burn out as at a torch tip. The fire would not get into the cylinder unless there was a mixture of air. It is mixture of air that causes explosions.

QUESTION: I have known of two instances where the soft plugs did not blow out.

MR. SCHLEICHER: Did the bottle burst?

QUESTION: Both cases were identical. There were seventeen tanks in each case—sixteen worked all right and the seventeenth failed.

MR. SCHLEICHER: That was likely due to the oxygen producers or the bottle may have had a bad defect. They should be tested about every nine months, at any rate within a year.

QUESTION: What is the method of the test, a hydraulic test?

MR. SCHLEICHER: The cylinders are set into water and pressure of three thousand pounds put into the cylinders. The pressure is registered on a chart. You know that any pressure will make the bottle expand; that raises the water in the register column one quarter of an inch and if it doesn't come back as pressure is released the bottle is rejected. The working pressure is 1,500 pounds at seventy degrees Fahrenheit.

Now proceed with acetylene gas. This cylinder now registers 270 pounds. That is a little higher than usual. Probably this bottle might have been sitting in the sun and thus the pressure rose.

The ordinary operator may use but one size tip for general work. That is all right in his way of thinking, but it is not all right in the matter of gas saving. Each manufacturer gives a chart of the size tips to use on special work. This tip is number four. The chart shows what size work a number four tip will do. It is designed to cut metal from one inch up to six, and the pressures are two pounds for the acetylene, and six for the six inches material, and twenty to fifty for the oxygen. That is the correct amount of oxygen to operate this tip normally.

You will notice that below two pounds the cutting tip will be ineffective on one inch metal. Now, you can use a pound or so higher, but it is not necessary. You perhaps have noticed that some operators will screw the regulator in, getting ten or fifteen pounds, and try to cut one inch material. He is not only wasting gas but interfering with the proper mixture. It doesn't matter with the ordinary cutting but it does where you want a clean cut or want to keep from oxidizing the metal.

That is where you get your hard surfaces—by having too lean a mixture or too fat a mixture.

The number two tip will be used for this half inch material, with two pounds on the acetylene regulators and five pounds on the oxygen.

QUESTION: Does it make any difference the way you have the tip placed?

MR. SCHLEICHER: The principle of that is to work in a straight line, to have your holes one following the other so that the first hole is pre-heating the metal at the top surface and the back hole will take care of the sides, the center doing the cutting.

Some men say, "I can do cutting with a welding torch." Some can if they get the piece hot and are steady enough to hold it and continue to cut by shutting off the acetylene gas and by using oxygen alone. Any metal except cast iron, will burn under the action of oxygen. But the pre-heating is to do away with the lost time in trying to be steady.

QUESTION: Is there any trouble in starting a cut on a round, or circular surface?

MR. SCHLEICHER: In starting a cut on a round shaft, do not try immediately on top. I have seen a number of operators do that—try to cut on top and bore through. It is bad practice. It will give a bad cut and freeze up in the cut.

The best practice is to get about one quarter from the bottom of the round and work up. That keeps the bottom of the cut clear, whereas if you start on the top, it will freeze and cause the oxide to flow around the shaft, and before you get through, you will be cutting the oxide, also the iron.

That is on shafts up to eight, ten or twelve inches. In pieces of twenty-nine or thirty inches or larger, the manufacturers have a straight head torch. We have a straight head torch but this is the angle head torch.

In making shafts for steamers, they forge them out in two sections with a large flange in the center.

(Mr. Schleicher drew a diagram on the blackboard.)

They vary from twenty-four to thirty inches in diameter. The torch is fastened in a fixed position and the shaft is set on rollers and revolved toward the torch. This keeps the cut clear. You would cut in, say eight or ten inches, or as far as you can until the center ranges from twelve to fourteen inches. Then by getting a long tip and bringing in your torch, you can finish the cut through. With a machine held rigid, you can do that readily.

In connecting up the tip, it is always a good principle to make sure, no matter what seat or torch you are using, that both seating surfaces are clear. Oftentimes torches lying in a box or somewhere in the shop will get some dirt, oil or particle of iron on either seat which will cause a leak, and a leak is bad both for the operator and torch.

I will set the tip in position to cut a half inch thick on straight cutting and adjust the pressures for same, two pounds on the acetylene and ten pounds on the oxygen. Now oxygen in itself will not burn. The fuel in this case is acetylene. If you use a match, do not hold it in your hand because the flame might burn your glove or hand. If you have no

lighter, lay match on a surface and then turn the tip to it.

It is much cheaper to buy a friction lighter than to heal a burned hand. In lighting a torch put your thumb on the turned part of your lighter and use your friction lighter in the right hand and your torch in the left hand. Then if the gas does strike your lighter, it will not strike your hand.

Are there any questions you would like to ask? You may have something in mind.

QUESTION: At about what distance are the eyes, not protected by goggles, subject to injury?

MR. SCHLEICHER: There is no set distance that would be a good rule for the simple reason that one person could stand there all day and it would not affect his eyes, and another may be affected in a few minutes. With oxy-acetylene the ill results are not nearly so quick as with electric, if you look at an electric arc with the naked eye it is sometimes disastrous.

It is always a good principle to see that the goggles you are using are suited for your eyes. It is not good practice to get just any pair of goggles. We give all operators three or four pairs of goggles to try. We let them work with them for a while to see which are suitable. You may be using a light pair of glasses when a dark pair would be better for you.

Now, (demonstrating) there is the neutral flame; it is neither in excess of oxygen or acetylene. There is a second cone; there is a particle of dirt. Now, notice that flame is very blue, indicating an excess of oxygen. You could cut with that flame but it would be very much slower than the proper neutral flame. Notice the difference in color when I turn off and on. There is the excess of oxygen and there is the neutral flame. Can you see that extra stream of oxygen through there, in the center? That is what does the cutting—that stream of oxygen, the metal oxidizes or is cut away.

Now, the principle in cutting is to hold your flame so, (demonstrating distance from metal), as the greatest heat is at the end of the white cone. The heat there at the apex of that white cone ranges from sixty-one to sixty-three hundred degrees Fahr. If you hold it down hard on the metal, you will be smothering it. Then, if you hold it up too high, it won't cut well. The general rule is about one quarter inch. With this tip a quarter of an inch would be all right.

The first thing is to get your flame down to the metal which is about a quarter of an inch at the apex of that cone to tip end. The metal heats very readily. Do not turn in your oxygen until you can see the metal in a molten condition. If you do, you will have the metal thrown up in your face.

In general practice there are frequent calls for cutting holes in metal. The principle is to hold torch in right position, touching the metal with flame to heat it. Be very slow when you start in such a position and you won't have an excess of sparks flying.

If there are any questions you would like to ask, or if you would like to (Informal discussion followed.) try the torches and regulators, you can.

Adjournment:

Mining Section

October 2, 3, and 4, 1919

B. F. TILLSON, Chairman

Assistant Superintendent, New Jersey Zinc Company, Franklin, N. J.

H. G. DAVIS, Vice-Chairman

Lehigh and Wilkes-Barre Coal Company, Wilkes-Barre, Pa.

W. H. SHEARMAN, Secretary

New Jersey Zinc Company, New York City

THURSDAY MORNING SESSION

THE meeting was called to order at 9:45 A. M. by the Chairman, Mr. B. F. Tillson.

DELEGATES ATTENDING

Arthur, P. M., American Zinc Company of Tenn., Mascot, Tenn.
Bach, E. E., Chief, Americanization Bureau, State of Pa., Philadelphia, Pa.
Baker, D. J., "Coal Age," Pittsburgh, Pa.
Balck, Carl, Prudential Insurance Company of America, Newark, N. J.
Bennett, Charles B., U. S. Metals Refining Company, Chrome, N. J.
Betz, John A., Lytle Coal Company, Minersville, Pa.
Boardman, John L., Anaconda Copper Mining Company, Butte, Mont.
Bowyer, C. B., Stonega Coke and Coal Company, Stonega, Va.
Brissenden, P. F., U. S. Dept. Labor, Bureau of Statistics, Washington, D. C.
Budeller, William, North Butte Mining Company, Butte, Mont.
Carpenter, T. J., Semet-Solvay Company, Ensley, Ala.
Chase, W. C., Woodward Iron Company, Woodward, Ala.
Concannon, John, Anaconda Copper Mining Co., Butte, Mont.
Davis, E. K., The B. F. Goodrich Company, Akron, Ohio.
Davis, H. G., Delaware, Lackawanna & Western Coal Co., Wilkes-Barre, Pa.
DeBlois, L. A., E. I. du Pont de Nemours & Co., Wilmington, Del.
Dingman, Oscar A., East Butte Copper Mining Co., Butte, Mont.
Durkee, J. O., "The Coal Industry," Pittsburgh, Pa.
Dwight, Arthur S., American Institute Mining & Metallurgical Engineers, New York City.

Fay, A. H., U. S. Bureau of Mines, Washington, D. C.
 Flyzik, Martin J., State Safety Board, Olympia, Wash.
 Gidley, W. W., Phelps-Dodge Corporation, Bisbee, Ariz.
 Goodale, C. W., Anaconda Copper Mining Co., Butte, Mont.
 Green, C. L., Consolidation Coal Co., Fairmont, W. Va.
 Guerrant, R. H., National Safety Council, Chicago, Ill.
 Hall, R. Dawson, "Coal Age," New York City.
 Hamilton, Alice, U. S. Dept. Labor, Bureau of Statistics, Washington, D. C.
 Hubbell, N. D., W. J. Rainey Coal Co., Uniontown, Pa.
 Hunter, E. R., Dr., American Red Cross, Washington, D. C.
 Kerr, James L., E. I. du Pont de Nemours & Co., Wilmington, Del.
 Knoefel, A. F., Dr., Bureau of Mines, Terre Haute, Ind.
 Kurtz, R. H., Miller Rubber Company, Akron, Ohio.
 Lewis, T. D., Lehigh Coal & Navigation Co., Lansford, Pa.
 Lockney, I. L., Chief Safety Engineer, State Safety Board, Olympia, Wash.
 Luckenbach, G. A., Koehler Safety Co., Scranton, Pa.
 Lunt, Horace F., State Bureau of Mines, Denver, Colo.
 McLeod, Angus, Butte & Superior Mining Co., Butte, Mont.
 McMorris, Ed., Union Carbide Co., Sault Ste. Marie, Mich.
 Moore, P. W., Ohio State Mine-Rescue Car, Columbus, Ohio.
 Morris, F. F., American Atmos Corporation, Pittsburgh, Pa.
 Murphy, M. E., Pickands, Mather & Co., Cleveland, Ohio.
 Myers, Fred W., New Jersey Zinc Co., Franklin, N. J.
 Oda, Fumio, Kyushu Imperial University, Japan.
 Osborne, Fred, Somet-Solvay Co., Holt, Ala.
 Purcell, C. A., American Atmos Corporation, Wilkesburg, Pa.
 Quayle, S. E., W. A. Hanna & Co., Virginia, Minn.
 Randall, W. I., E. I. du Pont de Nemours & Co., Wilmington, Del.
 Raymond, R. M., Columbia University, New York City.
 Reed, Joseph W., Consolidation Coal Co., Fairmont, W. Va.
 Rellis, J. F., Union Carbide Co., Sault Ste. Marie, Mich.
 Roach, L. R., Wisconsin Steel Company, Benham, Ky.
 Roberts, J. C., Colorado School of Mines, Golden, Colo.
 Riggs, George W., Mine Safety Appliances Co., Pittsburgh, Pa.
 Richards, R. C., President, National Safety Council, Chicago, Ill.
 Schofield, W. D., Inspiration Consolidated Copper Co., Miami, Ariz.
 Seip, R. H., New Jersey Zinc Co., Franklin, N. J.
 Shearman, W. H., New Jersey Zinc Co., New York City.
 Shove, Byron D., Oliver Iron Mining Co., Ironwood, Mich.
 Sinn, F. P., New Jersey Zinc Co., New York City.
 Smith, E. W., Deputy, State Mining Dept., Byesville, Ohio.
 Southward, G. B., West Virginia Coal & Coke Co., Elkins, W. Va.
 Sperr, F. W., Michigan College of Mines, Houghton, Mich.
 Sullivan, W. W., Oliver Iron Mining Co., Hibbing, Mich.
 Swan, George, Davis Daly Copper Co., Butte, Mont.
 Tillson, B. F., New Jersey Zinc Co., Franklin, N. J.
 Trestrail, A. H., Pickands, Mather & Co., Palatka, Mich.
 Van Schaack, David, Aetna Life Insurance Co., Hartford, Conn.

Watson, Joseph E., Timber Butte Milling Co., Butte, Mont.

Williams, S. J., National Safety Council, Chicago, Ill.

Wilson, C. H., Utah Copper Co., Garfield, Utah.

Wilson, T. D., American Atmos Corporation, Pittsburgh, Pa.

Woodburn, Orr, Globe-Miami District First Aid Assn., Globe, Ariz.

CHAIRMAN TILLSON: Gentlemen, it is a pleasure for me to welcome you all to the fifth annual meeting of the Mining Section of the National Safety Council. In view of the fact that your Chairman has a paper at the last session on Saturday morning which, in part, deals with the past activities, as well as proposed new activities, he believes that time can be economized by not burdening you with any historical resumé of what has been taking place during the past year, as that will be covered to a general degree in that paper.

In addition to the papers we have listed on the program, we have arranged, if we have time, to consider several other subjects. The National Safety Council prepared Safe Practices pamphlets on "Manila Rope" and "Mine Car Haulage"; the former is a subject close to the hearts of mining members, which has been discussed at times in the past and on which a special committee has served since the inception of the Mining Section.

A few copies of this pamphlet will be accessible to us, and it is desirable, if any recommendations are to be made on the points not included in the pamphlet, that those things should be made record of.

Mr. Guarrant, Safety Engineer, of the National Safety Council, this year made a tour to some of the mining properties to start a Safe Practices pamphlet on Mine Cars and Haulage, which was a subject upon which strong opinion was expressed at the last Congress, and recommended as a subject first to be covered by a Safe Practices pamphlet devoted to the specific needs of the Mining Section alone. We may be well pleased to know that this new departure has been shared by only two other sections in the National Safety Council.

Instead of distributing the pamphlet previous to our meeting, it was deemed advisable to hold it in mimeographed form until we had the advantage of all the opinions of the members who would meet at this annual Congress in revising the suggestions which were made and giving the benefit of their experience, in adding new information and new cuts which might well illustrate it.

There is another paper not on the program which, when the time seems auspicious, will be brought up for discussion in the Section.

In the regular order of business, the reports of our committees are in line, and first I believe it is the proper thing for the Chairman to appoint a Nominating Committee to consider the officers of your Section for the coming year, and submit a slate at our final session on Saturday upon which slate you can vote or nominate any other men from the floor for the offices in question. It is merely the function of the Nominating Committee to see that at least the procedure is co-ordinated so that there will be some nominees for the positions. I take great pleasure in requesting Mr. R. Dawson Hall to act as Chairman of the Committee and for him to be assisted by Mr. C. W. Goodale and Mr. J. C. Roberts, to

gather together as they find time and consider a slate of officers for your Section for the coming year.

The Chairman of the Standardization Committee is absent. Mr. Mitke was Chairman of that Committee and he was called away for some work in Mexico. He has not forwarded any report and in due justice to him, I may say that his appointment was late and I know of no particular activities which the Committee has performed this year.

Mr. R. Dawson Hall, the Chairman of the Membership and Publicity Committee, is with us, and I will ask him for his report.

REPORT OF MEMBERSHIP AND PUBLICITY COMMITTEE

MR. R. DAWSON HALL ("Coal Age"): I am afraid that during the year I have been obliged to leave much of the work to the headquarters of the National Safety Council. All the information I have at this time is that the membership of the two sections, the Metal and Coal Mining sections, amounts to 253, of which 165 are of coal mining companies and 88 metal. They have paid in dues \$6,532.50 and \$7,877, making a total of \$14,409.50. I think we have a pretty good membership and I think the feeling is good with regard to our Bulletins and that there is a general feeling of satisfaction, the only trouble being with those who are particularly anxious for more first-aid activity. I feel that is a matter that will be taken care of during the coming year, and I think then we shall be able to overcome all the difficulties which may be in the air.

I believe everybody is very well satisfied with the Mining Section of the National Safety Council and the prospects are very good for the coming year.

(The report was accepted.)

CHAIRMAN TILLSON: The Chairman of the Mine Rescue and First-aid Contest Committee unfortunately resigned from his office, due to the stress of work which had kept him from performing his duties. Dr. Shoudy had first accepted that position, but he found that he was unable to continue, as he was greatly tied up with other duties, and it was not found possible to replace him with a man of the same caliber, and due to the late season there is now no active chairman.

The Chairman of the Accident Statistics Committee is Mr. A. H. Fay. We will now hear from him.

REPORT OF ACCIDENT STATISTICS COMMITTEE

MR. A. H. FAY (Statistician, U. S. Bureau of Mines): I am afraid, as Chairman of the Accident Statistics Committee, I have been rather remiss. We have not had any meeting. About all I have been able to do is suggest a number of topics which might be brought up at this meeting. These were accepted.

I also suggested the names of some men who might be able to handle some of the particular subjects.

I might also say in connection with my regular work in Washington, I am supplying statistics for all of you, anyway.

(The report was accepted.)

CHAIRMAN TILLSON: Dr. A. J. Lanza, Chairman of Mine Hygiene and Sanitation Committee, I do not see present, so I presume he has no report.

Mr. O. P. Hood, Chairman of the Committee on Ropes and Safety Devices in Hoisting and Haulage, has sent in no report.

Mr. John Lloyd, Efficiency Engineer, Lehigh Valley Coal Company, Chairman Mine Fire Prevention and Fighting Committee, is not here yet.

Lt.-Col. C. H. Connor, Chairman of the Committee on Standardization of First-Aid Methods and Rules for Conducting and Judging First-Aid Contests, is not here. I understood that he was going to be represented by Dr. Hunter. Dr. Hunter is not here, so we will pass his report.

D. J. Parker, Chairman, Standardization of Mine Rescue Training Committee, is detained at Pittsburgh, and will be here tomorrow, when he will deliver his paper.

The first paper we have is that by Mr. A. H. Fay.

¹MINE ACCIDENTS: ENGLISH SPEAKING VS. NON-ENGLISH SPEAKING EMPLOYEES

ALBERT H. FAY, ENGINEER, U. S. BUREAU OF MINES,
WASHINGTON, D. C.

The employment of non-English speaking labor in American mines has been brought about by reason of the rapid expansion of the mining industry, beginning in the early eighties. The Americanization of this great body of labor, and its relation to accidents in the mining industry, are two problems of prime importance,—the first as affecting citizenship and the growth of this Republic, and the second as an economic problem in mining costs. The former exerts an influence upon the latter, for the former implies education, social welfare, civic pride, and a general uplift to the ideals that America stands for. Ignorance, dirty and filthy living conditions, ill-health, disregard for law and order, discontent and lack of civic interest, lead to indifference and carelessness, perhaps the greatest of all accident causes. Eliminate carelessness and at least 50 per cent of the accidents will disappear from industries.

IMMIGRATION TO AMERICAN MINES

During the decade previous to the year 1880 (as well as in earlier years), the greater part of the employees in the coal and metal mines were Americans or representatives of the English, Scotch, Welsh, German, and Irish races. The majority of the men of foreign birth had been in this country for some years previous to the great expansion of the mining industry which began about this time. English-speaking miners continued to immigrate and to find employment in the mines in large numbers until about 1890. Since that year comparatively few immigrants from Germany

¹A large part of the data in this paper was abstracted from "Immigrants in Industries," a report of the Immigration Commission, 1911. Senate document, 663, 61st Congress, Second Session, Vols. 6, 7 and 16, which are devoted exclusively to the mining industry. It is a report based on an exhaustive study of the question, and should be studied by every one interested in the Americanization of the miner.—A. H. F.

and Great Britain have entered the industry, although Swedes and other Scandinavians have been constantly employed since the early eighties.

The employment, in the mining industry, of immigrants from Southern and Eastern Europe began about 1880. The Slovaks were the first arrivals and immigrated in considerable numbers. They were followed within a year or two by a few Magyars, and the number of immigrants of this race gradually increased each year. The Polish immigration began about 1890, although individual members of the race had been coming for a period of nine or ten years. After the year 1890 Poles and Slovaks arrived in great numbers. A few Italians were employed before the year 1895, but the immigration of this race did not begin upon a large scale until about 1900. They were at first engaged in railroad construction and maintenance-of-way work and gradually drifted into the mines. Croats were employed in some sections before 1890, and Servians began to arrive in small numbers in the early nineties. The great bulk of all the immigration from Southern and Eastern Europe, however, has occurred within the past eighteen years. Russians, Bulgarians, Roumanians, Ruthenians, Syrians, Armenians, Macedonians, Croats, Servians, as well as Poles, Magyars, Slovaks, and Italians, have been among the recent arrivals. The races of Southern and Eastern Europe have continued, up to the time of the war, to find employment in the mines in increasing numbers in almost every important mining district in the Eastern States, and the Lake district. Many of these recent immigrants have found their way to the Central and Western states. As a result of the rapid expansion of the mining industry, many mining communities have been founded, the population of which is largely made up of immigrants who have arrived during recent years.

The pioneer American, English, Irish, German, Scotch, and Welsh miners are thus outnumbered and their positions filled by the more recent immigrants. It is not difficult to account for this racial change which is still going on. The former operatives and their descendants had opportunities to secure more congenial and safer work in other industries. Many of them advanced in the industrial scale, becoming foremen and attaining other responsible positions. A large number have abandoned the occupation of miner for positions as day or shift men. Many also migrated and located in the Middle West and Western states. Many of the former miners who left the industry entirely because of change in mining methods or the employment of immigrants entered mercantile, clerical, mechanical, and more pleasant work of other kinds. Many of the business and professional men in the mining towns were formerly mine workers. Their places were filled without difficulty with recent immigrants who were content with the wages and working conditions which prevailed in the mines. The wages paid in American mines seem very attractive to the recent arrivals of agricultural laborers from Southern Europe.

FAILURE OF NATIVE-BORN TO ENTER THE INDUSTRY

Another noteworthy tendency is seen in the fact that the racial displacement has occurred not only through the departure from the industry

of the former employees, but also through the refusal of their children to enter the industry and the attitude of the parents themselves, who frequently discourage it. Of the total native-born, of fathers who were miners, a large percentage enter occupations other than mining. The conclusion from the limited data at hand, therefore, seems to be that while the foreign-born males of more than 16 years of age, whenever employed, work in the mines, the persons native-born of native father, together with the second-generation immigrants, are entering the mines only to a limited extent. This inference bears out in a large measure the experience of the mine operators, who state that the native-born and the second-generation immigrants are not entering the mines in the same numbers as formerly and that the industry is receiving a constantly decreasing number of employees of these classes.

There exists a prejudice against recent immigrants, which also operates to an important extent in the displacement of former employees. Many Americans, English, Germans, Scotch, Irish, and Welsh did not and do not desire to be associated in the mines with the recent immigrant, and the feeling has become prevalent that a sort of reproach attaches to an intimate working relation with the foreigner. The races of former immigration have, therefore, left the industry and have entered other work which they feel is more dignified and congenial.

The relatively small number of American miners who remain in the industry must work side by side with the recent immigrant. To a greater or less degree the standard of safety in the mine is set by the demands of the ignorant and inexperienced immigrant, not by the more intelligent American, and the standard of life is decided, to a larger extent, by those conditions which will be accepted by the same recent immigrant. In short, in order to work in the coal mining industry, the Americans must compete with the recent immigrant, who, as a rule, is not very particular as to the living and working conditions. These conditions, however, are in most cases far better than in factory towns where congestion prevails.

Another effect of recent immigration from Central and Southern Europe has been the preventing of the English, Irish, Scotch, and German immigrant entering the mining industry. As already noted, these Western European races were coming to the industry in large numbers prior to the early eighties, but began to decline toward the end of the decade and practically stopped about 1893 or 1894. There can be no question but that the immigration of the Slovaks, Poles, Magyars, and other races operated to prevent the further coming of these older immigrants to the industry, precisely as it operated to drive out of the industry those already employed together with the native Americans. There is, therefore, no incentive for the English or German miner to migrate to the mining regions and compete with the Slovaks, Croatians, and Italians, etc.

CITIZENSHIP

A point of general interest is the tendency on the part of the different races of foreign birth working in the mining industry to acquire citizenship, and their general interest in public and civic affairs. The recent im-

migrant manifests little real or intelligent civic interest. This may be ascribed to his ignorance of our political methods, his inability to read or speak English, the social and political aloofness of these races in the more or less remote mining villages, and their desire to avoid taxation. Those who reside in or near the cities seem to exhibit more interest than do those of the isolated communities. It seems that the Bohemians and Moravians, 94 per cent of whom can read some language, take a much more active part in civic affairs than any other race of recent immigration in the bituminous districts of Pennsylvania. Among the other Slavic races, the Slovaks (82 per cent read) and Poles (77 per cent read) lead in this regard, while the Croatsians (67 per cent read) make the poorest showing. It is almost the universal statement that this latter race shows but little civic interest, and that very few become naturalized. The Italians (81 per cent read) both North and South, are more active than the Slavic races in their efforts to become citizens, and appear to take a more active part in civic affairs. In cases where there seems to be encouraging civic activity it is nearly always due, not to their own intelligent efforts to attain citizenship and exercise its privileges, but to the influence of interested politicians, who in many cases may be leaders of their own race; for example, an intelligent banker and steamship ticket agent. It seems true of all the later immigrating races that they take far less interest in civic affairs than did the German (97 per cent read) and English (98.5 per cent read) immigrants.

The foreigner should be taught that the laws of America were made to protect, and not harass, every good citizen, rich and poor alike, and it is the duty of well-informed Americans to make this understood. If well-meaning foreigners, the making of good citizens, are left entirely to their own devices, they fall an easy prey to the designing I. W. W. and the Bolsheviki. Somebody who understands their language fully, and in whom they have confidence, should explain to them that they are being deceived so long as they listen to anti-American propaganda.

RELIGIOUS ORGANIZATIONS AND THE IMMIGRANT

The association between the native Americans and the Southern and Eastern European immigrants is limited. The general attitude of many members of the native churches toward the immigrants is one of indifference and there is a strong inclination in many communities to shun association with the immigrant in religious activities. In many cases where missionary efforts are made, services for the immigrants are frequently held in barns, stores, or other unattractive places, thereby lessening the interest in them. The races from the Southern European countries, which compose a large portion of the mining population have been reared where there is no social caste in religious organizations, and have worshipped in buildings which are unsurpassed in beauty and grandeur. When these people are offered services held in stores, barns, and similar buildings, their interest in the services naturally is less and they become indifferent. Lack of interest in religious affairs tends to decrease activities in civic affairs. The various religious organizations can be important agents in

TABLE No. 1

Foreign-born mine employees by nationalities, showing agricultural and mining experience prior to entering the United States.

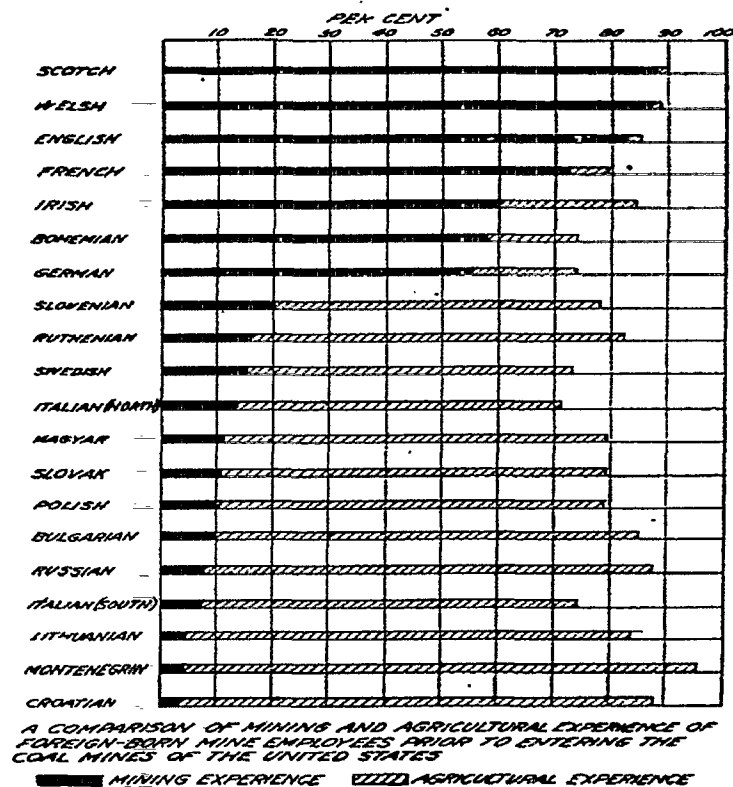
Nationality.	United States.			Pennsylvania Bituminous.			Ohio-Ind.-Ill.			Kans.-Okla.			West Virginia.			Mich. Copper.			Lake District Iron.			
	Per cent			Per cent			Per cent			Per cent			Per cent			Per cent			Per cent			
	Num- ber	Mines	Agri.	Num- ber	Mines	Agri.	Num- ber	Mines	Agri.	Num- ber	Mines	Agri.	Num- ber	Mines	Agri.	Num- ber	Mines	Agri.	Num- ber	Mines	Agri.	
Bohemian & Moravian	403	57.6	16.4	188	41.0	22.9	106	72.4	10.7				115	2.0	89.6							
Bulgarian	158	9.5	75.3																			
Canadian (Fr.)																						
Croatian	1,310	3.6	84.7	804	3.4	85.0	185	71.1	81.3				243	2.6	35.9	208	5.2	50.3	347	6.1	72.9	
English	1,277	32.6	2.6	1,235	73.5	2.3	647	87.8	1.5	1,250	87.6	5.4				737	90.2	7.0	147	53.7	6.3	
Finnish	352	72.3	6.8	181	50.9	0.4				141	90.3	3.5				1,408	2.7	74.8	910	0.4	71.2	
French	1,423	55.0	18.8	693	49.3	19.3	575	50.7	17.8	114	65.8	14.9				84	13.1	40.5				
German	1,321	59.2	25.9	189	53.3	34.3	1,551	25.8	52.0	853	31.0	46.8				515	5.2	63.7	600	14.7	52.8	
Irish	4,840	13.7	57.2	2,083	0.3	62.0	1,801	23.3	62.6	319	0.4	40.1	353	3.7	77.6							
Italian, north	2,883	7.7	60.5	1,331	4.3	63.9	1,023	3.8	79.7	109	11.0	65.1	1,072	5.1	78.4				323	9.4	76.3	
Italian, south	1,570	4.3	79.3	398	4.5	79.9																
Lithuanian	2,423	10.9	68.5	1,472	9.2	65.8	531	17.7	69.7	98	71.4	17.3	322	5.0	78.3	168	5.6	78.7				
Magyar	98	71.4	17.3																			
Montenegrin	118	4.9	91.5																			
Polish	3,771	9.8	68.9	2,573	7.2	68.5	741	14.2	70.9	175	33.1	44.9	277	7.2	83.3				393	9.4	62.1	
Romanian	97	7.2	82.5																			
Russian	1,939	7.8	70.8	800	7.3	78.8	344	7.3	80.0	88	15.6	67.9										
Ruthenian	451	15.9	66.2	120	13.3	68.5																
Scotch	951	83.2	1.8	187	84.5	1.6	337	92.4	1.3	80	87.8	3.3										
Slovak	5,378	10.7	63.4	4,237	8.7	67.7	684	13.1	73.3	122	54.1	34.1	335	10.4	76.5				184	4.8	70.1	
Slovenian	1,218	20.0	57.6	1,013	14.4	61.1	86	34.8	45.3	99	53.5	35.4				149	5.6	67.6	321	3.7	69.2	
Swedish	143	15.5	57.7														101	18.3	47.1	151	10.4	48.1
Welsh	178	37.6	1.7				92	91.3	1.1													
	^a 31,335	20.7	53.0	^a 17,246	14.4	61.2	7,173	30.5	53.9	2,340	43.0	34.6	2,710	10.4	73.9	3,781	14.0	63.8	3,185	8.5	63.3	

*The above figures include only races with 100 or more miners reporting. The totals are for all foreign born.
 Note: Compiled from "Immigrants in Industries", a report of the Immigration Commission 1911. See also Document No. 663, 61st Congress, Second Session, Vols. 6, 7 and 16.

teaching these immigrants the rudiments of the English language and pointing out to them their duties as American citizens.

LACK OF MINING EXPERIENCE ON THE PART OF RECENT IMMIGRANTS

Men of the races of the old immigration (Western Europe) have been employed in the mines of the United States for many years. As a result of their experience both in this country and abroad, they are far better qualified as miners than are the Southern and Southeastern Europeans.



The older immigrants speak English either as their native tongue, or, as in the case of the Germans and Scandinavians, because of long residence in this country. They may be treated in almost every respect upon the same basis as the American miners.

The employees of the races of the recent immigration, on the other hand, have been in the United States for so short a period of time that even though it be assumed that they have been employed in mining ever since their arrival, they must have had but a brief experience at most of the mines of this country. The data further show that very few of their num-

ber had mining experience abroad. The accompanying chart, based on Table 1, shows that, for example, over 80 per cent of the Scotch and English miners had mining experience in their native country before entering the American mines, while for the south Italian and Croatian less than 5 per cent have had mining experience. Most of the latter were farm laborers in their native countries as indicated by Table 1 and the chart. Upon coming to the United States they decided to follow the occupation of mining because the work was better paid than any other obtainable, although many of them had been here only a few months and many more but a year or two. Under these circumstances it is not surprising that they know little or nothing of rock formations, of fire damp, of the properties of coal dust, and of the handling of explosives,—matters about which every coal miner should be thoroughly informed. To determine whether a piece of slate or roof is or is not likely to fall, often requires a considerable degree of experience, and the majority of the Slavs, Magyars, and Italians have not this experience.

IMMIGRATION IN ITS RELATION TO MINING ACCIDENTS

The mines are presumably less safe than they would be with native American, English, Irish, Scotch, Welsh, or German labor, because recent immigrants often accept more dangerous working conditions than the first-named employees. Furthermore, the later immigrants are ignorant and untrained, and are a source of danger to themselves and to the other workmen. Among the older mine workers the feeling is strong that the employment of non-English-speaking races has complicated the problem of safety in the mines. They assert that carelessness on the part of recent immigrants, and the ignorance of those who are suspected of having obtained their places without having had the required experience as miners, have tended to render the mines less safe and thus increase accidents.

A large proportion of the deaths and injuries reported for the coal mines of the United States occur among the non-English speaking miners. The employees consisting of the races of Southern and Eastern Europe, having had little experience in mining either in this country or abroad, are particularly liable to accidents, and as the responsibility for accidents rests in many cases with the men injured, to say that they are particularly liable to accidents is in effect to say that they are responsible for a considerable proportion of all the accidents occurring in the mines.

The mine accidents for which the workmen are themselves responsible fall naturally into two classes—those due to carelessness and those due to ignorance. As regards the first of these, it is probable that the foreigner is no greater offender than the person of native birth. Many of the Americans and other English-speaking miners are undoubtedly reckless, and a very large proportion of all the accidents occurring among their number seem to be due to this cause. Grave risks are often incurred for the sake of avoiding a little extra labor. Props are left unplaced, open lamps are used instead of closed lamps, cars are driven in a careless manner, explosives are handled recklessly—all in defiance of the most elementary rules prepared by men of long experience in the industry.

Among the recent immigrants, on the other hand, many of the accidents

TABLE No. 2
Coal-mine accidents in Pennsylvania and West Virginia, by nationality of victims.^a

Nationality.	Pennsylvania (anthracite).				Pennsylvania (bituminous).				West Virginia.															
	Men employed (3 years).	Per cent of total.	Killed.		Injured.		Men employed (3 years).	Per cent of total.	Killed.		Injured.													
			Number.	Per cent of total.	Number.	Per 1,000 em- ployed.			Number.	Per cent of total.	Number.	Per 1,000 em- ployed.												
American: White	110,730	34.98	245	21.25	2.10	783	31.20	6.71	102,632	34.59	240	27.33	1.98	979	31.37	8.08	78,960	48.93	813	30.05	3.00	1,274	43.90	15.63
Negro	(b)	2.24	30	2.60	4.02	48	1.84	0.10	(b)	2.21	19	2.16	2.30	30	1.92	7.05	20,805	10.66	118	13.82	4.39	331	13.04	14.54
English	7,408	10,410	3.12	24	2.35	84	2.56	6.15	7,940	2.57	13	1.48	2.02	30	1.25	8.78	26,895	13.66	134	1.64	1.84	25	3.99	3.89
Irish	11,921	3.73	4	3.51	3.57	2	2.08	1.78	4,451	1.27	19	1.14	2.93	49	1.57	11.10	8,711	4.27	4	4.47	5	18	2.07	
Scottish	8,263	2.48	25	2.17	3.63	75	2.99	9.08	4,391	1.26	10	1.14	2.93	13	1.42	7.21	450	0.27	1	1.12	3	11	1.11	
Swedish	143,992	43.15	333	28.88	2.31	970	38.72	6.74	121,126	34.59	240	27.33	1.98	979	31.37	8.08	108,014	60.93	455	33.28	4.21	1,660	50.18	15.37
Total	10,342	5.8	60	5.08	3.57	114	4.55	5.80	21,775	6.22	80	0.80	3.05	278	8.91	12.77	3,042	2.29	40	4.08	10.98	122	4.35	33.50
Austrian	1,770	5.1	2	2.3	1.13	7	1.13	1.13	1,035	3.0	2	2.3	1.93	3	3.2	6.76	114	0.07	1	1.12	1.12	1	0.07	
Belgian	2,142	6.1	4	4.0	1.87	14	4.5	2.14	1,531	4.4	5	5.7	3.27	14	4.5	2.14	77	0.5	1	1.12	1.12	1	0.07	
Bohemian	7,402	2.17	15	1.71	1.54	50	1.92	7.90	4,115	1.2	1	1.1	1.1	5	1.6	1.1	976	0.80	3	3.35	3.35	33	1.18	
Croatian	802	2.5	2	2.3	1.13	7	1.13	1.13	802	2.5	2	2.3	1.13	7	1.13	1.13	345	0.21	4	4.47	4.47	1	0.04	
French	1,087	3.1	1	1.1	1.1	14	4.5	2.14	1,087	3.1	1	1.1	1.1	14	4.5	2.14	1,074	0.67	14	1.64	13.04	23	3.99	23.28
German	7,130	2.12	1	1.1	1.1	14	4.5	2.14	7,130	2.12	1	1.1	1.1	14	4.5	2.14	1,074	0.67	14	1.64	13.04	23	3.99	23.28
Finland	2,004	0.92	63	7.19	2.90	116	4.08	4.44	2,004	0.92	63	7.19	2.90	116	4.08	4.44	9,020	5.96	41	4.80	4.20	135	4.81	14.03
Irish	51,181	14.70	157	7.38	3.05	619	10.63	10.98	51,181	14.70	157	7.38	3.05	619	10.63	10.98	18,000	11.53	127	14.87	0.82	381	13.58	20.47
Latvian	4,704	1.37	19	2.16	3.06	71	2.37	14.81	4,704	1.37	19	2.16	3.06	71	2.37	14.81	921	0.57	0	7.70	3.11	33	1.14	
Maltese	332	0.7	2	0.7	10.69	2	0.7	10.69	332	0.7	2	0.7	10.69	2	0.7	10.69	460	0.58	2	9.3	2.9	8	2.9	29
Montenegrin	34,611	0.88	128	0.4	2.54	328	10.51	9.48	34,611	0.88	128	0.4	2.54	328	10.51	9.48	5,880	3.13	54	0.33	10.63	120	4.26	23.62
Polish	128	0.4	04	4.67	4.67	114	3.6	7.19	128	0.4	04	4.67	4.67	114	3.6	7.19	870	0.54	6	0.70	20	71	20	20
Rumanian	1,604	4.20	34	3.1	2.70	114	3.6	7.19	1,604	4.20	34	3.1	2.70	114	3.6	7.19	4,025	2.46	61	5.97	12.67	138	4.92	34.29
Slovakian	131	0.4	04	4.67	4.67	114	3.6	7.19	131	0.4	04	4.67	4.67	114	3.6	7.19	317	0.20	2	2.3	2.3	7	2.3	2.3
Slovenian	51,344	14.66	88	14.31	2.43	403	11.83	9.02	51,344	14.66	88	14.31	2.43	403	11.83	9.02	3,508	0.17	22	2.58	0.27	71	2.53	20.24
Spanish	3,441	0.8	1	0.69	1.74	31	0.9	9.00	3,441	0.8	1	0.69	1.74	31	0.9	9.00	591	0.31	8	0.94	3.12	9	3.12	3.12
Swedish	277	0.8	1	1.1	1.1	7	0.8	1.1	277	0.8	1	1.1	1.1	7	0.8	1.1	213	0.13	2	2.3	2.3	4	4	4
Swiss	117	0.3	1	1.1	1.1	7	0.8	1.1	117	0.3	1	1.1	1.1	7	0.8	1.1	211	0.13	2	2.3	2.3	4	4	4
Truck	700	2.2	1	1.1	1.1	7	0.8	1.1	700	2.2	1	1.1	1.1	7	0.8	1.1	211	0.13	2	2.3	2.3	4	4	4
Unk.	210	0.7	1	1.1	1.1	7	0.8	1.1	210	0.7	1	1.1	1.1	7	0.8	1.1	714	0.44	4	4.7	4.7	8	8	8
Total	199,712	56.15	920	71.12	4.79	1,533	61.28	6.09	229,007	63.41	638	72.07	2.79	2,162	69.83	9.35	53,372	33.07	399	46.72	7.48	1,145	40.82	21.45
Grand Total.	333,704	100.00	1,153	100.00	3.46	2,505	100.00	7.51	350,133	100.00	878	100.00	2.51	3,121	100.00	8.91	161,386	100.00	854	100.00	5.29	2,935	100.00	77.38

*Based upon official records for the years 1915 and 1916 as reported by the State departments of mines. Not segregated as only a few are employed.

TABLE No. 3.

Number of Employees in bituminous coal mines and metal mines by Nationality, showing percentage who can speak English.

Nationality	Bituminous Coal Mines						Metal Mines									
	Pennsylvania		West Virginia		Ohio, Indiana, Illinois		Kansas, Oklahoma		Copper, Michigan		Iron, Minnesota		Iron, Alabama		Iron, Michigan	
	Number	Per cent Speaking English	Number	Per cent Speaking English	Number	Per cent Speaking English	Number	Per cent Speaking English	Number	Per cent Speaking English	Number	Per cent Speaking English	Number	Per cent Speaking English	Number	Per cent Speaking English
Bohemian & Moravian	451	69.4	.....	.....	247	77.3	.....	.....	291	95.5	.....	.....	.....	.....	40	100.0
Canadian (French)	1,945	54.2	255	71.0	180	78.9	.....	.....	484	44.0	173	70.8	.....	.....	158	32.3
Croatian	.....	.....	.....	.....	.....	.....	.....	.....	1,498	37.9	405	76.3	.....	.....	661	60.5
Finnish	328	71.6	.....	.....	190	68.4	206	74.3	.....	.....	.....	.....	.....	.....	.....	.....
French	1,511	91.0	110	90.0	841	89.4	177	91.0	113	100.0	.....	.....	.....	.....	.....	.....
German	3,323	58.8	391	65.5	1,685	68.0	1,129	62.4	533	58.0	134	57.5	.....	.....	541	45.3
Italian, North	2,197	60.3	1,157	63.9	416	50.2	418	66.0	56	62.5	77	50.5	.....	61.2	54	48.1
Italian, South	630	71.1	41	92.47	1,080	75.9	119	83.2	40	22.5	.....	.....	.....	.....	.....	.....
Lithuanian	.....	.....	.....	.....	.....	.....	.....	.....	79	13.9	46	47.8	.....	.....	.....	.....
Magyar	3,489	50.3	337	63.5	596	50.0	48	75.0	.....	.....	.....	.....	.....	.....	.....	.....
Montenegrin	.....	.....	.....	.....	.....	.....	.....	.....	41	97.6	.....	.....	.....	.....	.....	.....
Norwegian	.....	.....	.....	.....	.....	.....	.....	.....	65	69.2	86	73.3	.....	.....	393	51.1
Polish	5,900	50.3	294	65.0	787	57.3	209	65.1	.....	.....	.....	.....	.....	.....	.....	.....
Russian	1,265	56.9	73	68.5	371	67.9	101	70.3	.....	.....	.....	.....	.....	.....	127	81.9
Slovak	9,853	57.1	382	63.1	778	73.5	124	65.3	.....	.....	62	76.9	.....	.....	65	50.8
Slovenian	1,534	59.6	51	54.9	94	72.3	185	68.1	157	65.0	298	79.5	.....	.....	160	89.4
Swedish	216	97.2	.....	.....	67	92.5	.....	.....	104	80.8	.....	.....	.....	.....	.....	.....
Grand total	32,642	58.2	3,091	63.6	7,332	69.7	2,716	69.1	3,461	52.7	1,276	70.5	121	61.2	2,199	57.3

Note: Compiled from "Immigrants in Industries," a report of the Immigration Commission, 1911. Senate Document No. 663, 61st Congress, Second Session, Vols. 6, 7 and 16.

are unquestionably due to ignorance, for by reason of their lack of experience, they do not see nor realize the dangers that confront them; nor do they readily comprehend the necessary precautions that must be taken to make their working places safe.

Lack of experience in the mines has a marked effect upon the high accident rate as indicated by a study of accidents among the immigrants whose experience in mines, before coming to this country, was known. The fatal, serious, and non-fatal injury rates in the coal mines of Pennsylvania and West Virginia are approximately 14.5 per 1,000, for those of whom 10 per cent had mining experience prior to coming to the United States. The accident rate for those of whom 10 to 20 per cent had mining experience is about 12 per 1,000, showing a rapid decrease as mining experience increases. It would seem from this while experience is limited, these immigrants soon gain sufficient knowledge to use a certain amount of caution thus giving a decline in accident rate.

As contrasted with the decrease in accident rates among those of whom 5 to 30 per cent have had mining experience, the accident rate based on similar data for those of whom 50 to 60 per cent have had mining experience prior to coming to this country is 10.5, whereas the rate is 12 for those of whom 80 to 90 per cent have had experience in the mines. A marked increase with the extra experience. This is largely due to the tendency of those with considerable experience to become more or less careless or reckless and to think that they can slight certain features of work without an accident. A new man entering the mine would not consider for a moment crimping a cap with his teeth, whereas many of the men who have been in the mines for 8 to 10 years would not hesitate and do not hesitate to crimp caps with their teeth. Other instances of carelessness might be cited. The available data, therefore, seem to indicate that inexperience is responsible for many accidents, and that a little experience begets much caution on the part of the recent or new employee. As indicated above, there is thus a tendency toward a rapid reduction in accident rates to a point where between 30 to 40 per cent of the employees have had mining experience. Beyond this percentage, caution wanes and is replaced by carelessness with a resultant increase. The green miner may be over cautious but he lacks experience. The worn-out miner has the experience, but too often caution is replaced by carelessness. Caution combined with experience will go far toward accident reduction.

Another element of danger is contributed by the fact that few of the recent immigrants speak or understand English (Table 2), while almost none are able to read or write the English language, and placards of warning do not reach them. It is probable that the instructions of the mine bosses and inspectors are, because of this fact, frequently misunderstood. An inspector, for example, tells an immigrant miner, in English, of course, that his roof needs propping. The miner seems to understand, but does not, and a fall results. In some mines printed signs are used to indicate the presence of gas or other peril. These signs are quite unintelligible to most of the foreigners. A common language is absolutely necessary in every safety-first campaign. Accident rates are much lower in England, France, Belgium, Germany, Austria, and Japan than in

the United States. In these countries but few foreigners are employed, a common language being used in each country. The difference in fatality rates cannot be entirely attributed to the lack of mixed languages, but certainly a large percentage of the accident reduction may be attributed to the "common language" mines.

TABLE NO. 4
Percentage of employees who read, by general nativity and race.

General nativity and race:	Michigan Copper Mines		Michigan Iron Mines		Oil Refining	
	Num- ber	Per Cent Who Read	Num- ber	Per Cent Who Read	Num- ber	Per Cent Who Read
Native-born of native father:						
White	145	99.3	51	100.0	37	100.0
Native-born of foreign father, by country of birth of father:						
England (Includes Canada)	486	98.5	56	100.0	-----	-----
Finland	64	100.0	-----	-----	-----	-----
Germany	188	99.5	-----	-----	-----	-----
Ireland	78	98.7	-----	-----	113	100.0
Slovak	-----	-----	-----	-----	31	100.0
Sweden	-----	-----	46	100.0	-----	-----
Foreign-born, by race:						
Canadian, French	291	75.3	44	86.4	-----	-----
Canadian, Other	77	98.7	-----	-----	-----	-----
Croatian	485	82.3	156	98.1	-----	-----
English	320	98.7	135	99.3	-----	-----
Finnish	1,509	99.5	656	98.3	-----	-----
German	114	99.1	-----	-----	-----	-----
Irish	40	87.5	-----	-----	108	95.4
Italian, North	537	94.4	529	94.7	-----	-----
Italian, South	57	89.5	54	90.7	182	48.4
Lithuanian	-----	-----	-----	-----	62	88.7
Magyar	81	92.6	-----	-----	-----	-----
Norwegian	41	100.0	-----	-----	-----	-----
Polish	65	90.8	385	85.2	221	90.0
Ruthenian	-----	-----	-----	-----	90	72.2
Slovak	-----	-----	123	88.6	130	88.5
Slovenian	156	98.7	70	98.6	-----	-----
Swedish	105	98.1	160	100.0	-----	-----
Grand total*	5,557	95.4	2,800	94.9	1,116	84.2
Total native-born of foreign father	927	99.0	215	99.5	214	100.0
Total native-born	1,072	99.1	268	99.6	251	100.0
Total foreign-born	4,485	94.5	2,532	94.4	865	79.7

*This table includes only races with 40 or more males reporting. The totals, however, are for all races.

Note: Compiled from "Immigrants in Industries," a report of the Immigration Commission, 1911. Senate Document No. 663, 61st Congress, Second Session, Vols. 6, 7 and 16.

TABLE No. 5
Percentage of employees who read, by general nativity and race.

General Nativity and race:	United States Bituminous		Anthracite		Penns. Bitum.		Ohio, Ind., Ill.		Okla.-Kans.		Ala., Va., W. Va.	
	Num- ber	Per Cent Who Read	Num- ber	Per Cent Who Read	Num- ber	Per Cent Who Read	Num- ber	Per Cent Who Read	Num- ber	Per Cent Who Read	Num- ber	Per Cent Who Read
Native-born of native father:												
White	18,097	96.0	23	100.0	6,406	97.2	5,833	97.4	1,616	97.5	4,242	95.3
Negro	5,472	55.3			300	81.9	656	91.4	374	90.1	4,639	60.7
Native-born of foreign father by country of birth:												
Austria-Hungary	813	96.4			534	95.7	172	98.8				
Belgium	50	98.0										
England (includes Canada)	1,822	98.5			954	98.1	681	99.1	174	99.4	66	97.0
France	168	97.6			62	98.4	67	100.0				
Germany	2,184	99.1			1,188	99.0	848	99.4	100	100.0	48	93.8
Ireland	1,340	98.3			802	98.1	318	98.4	135	100.0	85	90.5
Italy	182	94.0			62	90.3	53	96.2	52	96.2		
Lithuanian			42	100.0								
Polish			61	95.1								
Russia	171	95.9			87	93.1	56	100.0				
Ruthenian			62	100.0								
Scotland	306	99.6			423	99.5	279	99.6	138	100.0	66	98.6
Slovak			64	100.0								
Sweden	64	100.0										
Wales	462	98.5			210	98.6	208	98.1				
Foreign-born, by race:												
Bohemian and Moravian	737	94.6			451	93.1	240	97.6				
Balkanian	176	78.4									128	87.8
Croatian	2,404	66.9			1,957	65.6	182	70.9			261	73.7
Dutch	164	98.1			55	98.2						
English	2,478	97.7			1,310	97.1	803	98.1	248	99.6	117	96.6
Finnish	70	95.7										
French	765	91.0			334	88.9	190	90.5	205	94.1		
German	2,659	96.8			1,522	95.3	849	98.6	173	98.9	109	100.0

TABLE No. 5—Continued

General Nativity and race:	United States Bituminous		Anthracite		Bituminous Coal Mines							
	Penna. Bitum.		Ohio, Ind., Ill.		Okla.-Kans.		Ala., Va., W. Va.		Per Cent Who Read	Num-ber	Per Cent Who Read	Num-ber
	Num-ber	Per Cent Who Read	Num-ber	Per Cent Who Read	Num-ber	Per Cent Who Read	Num-ber	Per Cent Who Read				
Greek	119	65.5	.....	.....	75	57.3	.....	.....	.....	.....	.....	.....
Irish	924	93.5	.....	.....	660	93.0	.....	.....	.....	.....	.....	.....
Italian, North	6,584	87.8	.....	.....	3,346	86.3	.....	.....	.....	.....	.....	.....
Italian, South	4,197	65.7	50	52.0	2,219	67.2	.....	.....	.....	.....	.....	.....
Italian (not specified)	112	89.3	.....	.....	98	88.8	.....	.....	.....	.....	.....	.....
Lithuanian	1,878	79.5	284	57.7	638	74.5	.....	.....	.....	.....	.....	.....
Magyar	4,515	89.2	.....	.....	3,508	88.5	.....	.....	.....	.....	.....	.....
Mexican	1,007	80.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Montenegrin	184	69.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Polish	7,263	77.3	263	68.4	5,991	76.9	.....	.....	.....	.....	.....	.....
Roumanian	154	74.7	.....	.....	102	69.6	.....	.....	.....	.....	.....	.....
Russian	1,826	70.8	.....	.....	1,271	69.0	.....	.....	.....	.....	.....	.....
Ruthenian	303	59.4	202	65.8	281	58.0	.....	.....	.....	.....	.....	.....
Scotch	1,148	99.1	.....	.....	561	98.8	.....	.....	.....	.....	.....	.....
Servian	130	77.7	.....	.....	85	75.3	.....	.....	.....	.....	.....	.....
Slovak	11,238	82.4	135	73.0	9,945	81.8	.....	.....	.....	.....	.....	.....
Slovenian	1,877	83.6	.....	.....	1,539	83.1	.....	.....	.....	.....	.....	.....
Swedish	305	100.0	.....	.....	214	100.0	.....	.....	.....	.....	.....	.....
Welsh	396	94.7	.....	.....	189	94.2	.....	.....	.....	.....	.....	.....
Grand total*	86,908	86.7	1,239	71.7	48,747	85.2	18,333	92.6	6,785	93.6	13,043	80.3
Total native-born of foreign father	8,240	98.3	231	98.3	4,497	98.0	2,649	99.1	753	98.4	341	96.5
Total native-born	92,818	92.0	254	98.4	11,803	96.8	9,048	97.5	2,745	96.8	9,292	82.5
Total foreign-born	64,080	82.9	985	64.8	36,944	81.6	9,285	87.8	4,040	91.4	3,821	75.0

*This table includes only races with 40 or more males reporting. The totals, however, are for all races.

Note: Compiled from "Immigrants in Industries," a report of the Immigration Commission, 1911. Senate Document No. 663, 61st Congress, Second Session, Vols. 6, 7 and 16.

A comparison of accident rates with the ability of the miner to read some language or to speak the English language, shows that the ability to read, although it may not be English, has a greater influence on accident reduction than the ability to speak English. This may be accounted for by the fact that ability to read develops a higher degree of intelligence and places the employee in a better position to realize dangers more readily than one who cannot read. Furthermore, if he is able to read, he is more likely to heed danger signs put up in certain places.

The recent immigrant, because of his lack of experience, his inability to speak English, and his keenness for earning money, is often willing to work in places where more experienced or more intelligent men would refuse to work. For the same reasons he will frequently be satisfied with and accept mine equipment too defective for safety.

OCCUPATION OF ENGLISH SPEAKING AND NON-ENGLISH SPEAKING RACES

TABLE No. 6

Percentage of employees by occupation and English speaking and non-English speaking races.*

Occupations	Americans and Western Europeans		Southeastern Europeans	
	Number	Per cent	Number	Per cent
Superintendents	10	.78	.....	.....
Foremen	14	1.10	.....	.....
Bosses	76	5.96	6	.28
Inspectors	10	.78	15	.70
Engineers and Motormen	50	3.92	12	.56
Firemen	29	2.27	10	.47
Electricians and Helpers	12	.94	7	.33
Blacksmiths and Machinists	33	2.59	13	.61
Carpenters and Masons	46	3.61	9	.42
Track and Roadmen	64	5.02	21	.97
Car Runners, Droppers, Etc.	47	3.69	49	2.28
Drivers and Teamsters	124	9.73	67	3.12
Machine Runners and Helpers	75	5.88	148	6.90
Pick Miners	428	33.57	1,107	51.61
Loaders and Scrapers	45	3.53	379	17.67
Trappers	16	1.26	20	.93
Pipe and Pumpmen	20	1.57	7	.33
Laborers	176	13.80	271	12.82
Total	1,275	100.00	2,141	100.00

*Represents ten typical bituminous coal mining companies of Pennsylvania.

Table 6 shows comparative figures by occupations, based on the payroll of 10 typical coal-mining companies in Pennsylvania. These figures show that about 33 per cent of the English-speaking employees are employed as pick miners as compared with about 52 per cent for the Southeastern Europeans. As a matter of fact, from trackman to loader, the English-speaking employees represent about 61 per cent of the total, as compared with 82 per cent for the Southeastern Europeans. These figures, therefore, indicate that the non-English speaking foreigner is employed in the most hazardous of the mine occupations, hence one reason for the higher accident rate.

ACCIDENTS BY NATIONALITY, IN PENNSYLVANIA AND WEST VIRGINIA

For comparison of accident rates between the two groups of employees, the figures given in Table 2 are representative. In the Pennsylvania anthracite mines 43 per cent of the employees are English-speaking and this number is charged with only 28.8 per cent of the fatalities, whereas the other 56 per cent (representative of continental Europe) sustained 71 per cent of the fatalities. Likewise in the Pennsylvania bituminous mines the English-speaking employees represent 35 per cent of the total and are charged with 27 per cent of the fatalities, whereas the other 65 per cent (representative of continental Europe) are charged with 72 per cent of the fatalities. As regards the figures for West Virginia the English speaking employees represent 67 per cent, and notwithstanding the fact that this includes 17 per cent of colored employees, only 53 per cent of the fatalities are charged to the English-speaking employees, whereas the other 33 per cent sustained 47 per cent of the fatalities. Almost the same ratio holds for non-fatal injuries in the three groups of mines cited.

Had the fatality and injury rate for the English-speaking American been maintained throughout the three groups of mines, there would have been a saving of 716 fatalities and 900 very serious injuries, a strong argument for Americanization and education of the miner.

CHAIRMAN TILSON: Mr. Fay has added a valuable paper to his former valuable contributions to this Section, and I am sure it is a subject which is of considerable interest to all of us. We will now consider any discussion in regard to Mr. Fay's paper.

DISCUSSION

MR. N. D. HUBBELL. (W. J. Rainey, Uniontown, Pa.): Mr. Fay touched on one subject that has hit us in the bituminous coal region so hard that it is stirring up a lot of comment around the region. I don't know whether it will get outside the region or not. We are, like everybody else, feeling very much the scarcity of diggers. We get in the mine the second generation of foreigners. We probably have a higher percentage in the mines than Mr. Fay's figures show, but they do not go in as diggers. They start as haulers, trackmen, and many of them are taking the examination for fire bosses and assistants.

The officials of our company have raised this question, Is the state law, which limits the age to eighteen years, turning men away from the occupation of digging? They have cited many instances of boys who would go in the mine when they are sixteen years old with their fathers and dig, and by the time they are seventeen or eighteen, would probably be as good diggers as their fathers. Some of the officials of our company have made the statement that at that age I was just as good a digger as my Dad. However, if those boys wait until they are eighteen, they get a bigger, broader view of life and they won't go into the mine at all, and I doubt if two or three per cent of those who go in are willing to dig.

Would it be fair to ask for opinions of some one else on the question of whether or not the eighteen-year limit is really affecting our available material for making diggers?

CHAIRMAN TILLSON: Mr. Hubbell, I think that we can discuss that in one of our round-table discussions, which will be open for various subjects.

MR. MARTIN J. FLYZIK (Member State Safety Board, Olympia, Wash.): I would like to ask Mr. Fay a question. Where does the Bureau of Mines find the greater percentage of accidents per one thousand men employed or one hundred thousand tons of coal mined, in the bituminous region or in the anthracite region of the United States?

MR. FAY: I haven't the figures at my finger's ends. In Pennsylvania, bituminous is lower than anthracite. I am inclined to think the bituminous is lower.

MR. FLYZIK: For fifteen years we have tried to place on the statute books in the bituminous region, from Pennsylvania west, extending even into the Northwest of Wyoming and Washington, laws that would require at least two years of experience before a man could qualify for mining coal at the face. In all this campaign, we are always met with the opposition from the management, that we are trying to monopolize labor.

Many years ago I arrived at the conclusion that in order to minimize accidents in the coal mines of the United States, it will be necessary to make our laws more stringent, particularly so with the foreign labor in the mines. I am glad Mr. Fay has presented a paper on that subject. I have made a short study of the subject myself and I believe that the reason for many of our accidents in the coal mines in the State of Washington can be attributed largely to the bringing of foreigners from the factories and the agricultural fields of Europe right in to the face, permitting them to dig coal without any experience whatsoever.

MR. CARL BALCK (Prudential Insurance Company, Newark, N. J.): Our latest chart exhibited in the Armory shows the mortality of accidents, and the curve gradually goes up to age 30 and then goes down. I would like to know your opinion of the reason for it. I think that the young fellows do not take care, do not know the business well and also the foreigners do not know their business well.

MR. FAY: Part of the answer is that there are more young men employed in the mines than older men, and you will not get the true accidents nor will you get a true accident rate until you know how many men over thirty years of age are employed in the mine.

MR. BALCK: This is by age.

MR. FAY: Do you know how many are employed by age?

MR. BALCK: I think so.

MR. FAY: Unless you have the number of men employed in a certain age group, thirty to thirty-five, forty to forty-five, fifty to fifty-five, etc., and the number of men killed or injured within those groups, you have no way of measuring accurately the number of accidents.

Suppose you employ one Italian and he is killed. That will be at the rate of one thousand per thousand because there was only one man, and he was killed. If you have a thousand and only one is injured or killed, it would be one per thousand, although in either case only one man was

killed. The figures are not what they should be. You don't get a true conception of the hazard. There are more men employed in mines between twenty and thirty than any other group.

MR. BALCK: Don't you think the number killed, according to the figures, would be higher among the younger men?

MR. FAY: I would suspect it would be lower than among the older miners. It is only a theory on my part that the extended experience begets carelessness, and then too, when a man is forty, forty-five or fifty, he is not so active as he was when younger.

If you insurance people can get figures showing the number of men employed in age groups that are reliable, it will be of great value. I know you can get the number killed and injured, but it is the employees you don't get.

MR. JOHN L. BOARDMAN (Anaconda Copper Mining Company, Butte, Mont.): I would like to discuss some of Mr. Flyzik's remarks in regard to developing men in the mine. Mr. Flyzik wants the men prohibited from working at the face until they have had two years' experience. That, obviously, is not the duty of the state, for the simple reason that the state can't furnish the men. As soon as the state prohibits the man from working at the face until he has had two years' experience, you are in truth shutting off your source of supply. It is not the duty of the employers undoubtedly. It is up to the employers to keep the mine running. Here is the point:

LABOR UNION CONTRACTS

The labor unions are demanding this. Then it is up to the labor unions to provide a way for supplying men to fill the positions. The labor union, when it makes a contract with an employer, should guarantee its service, should guarantee that the contract shall be fulfilled, and they have closed shop agreements with almost all mining people in the United States. Therefore, they have the tools by which they can force the issue if they want it forced. All they have to do is to require that a man must have had this experience before he becomes a full-fledged member of their union. They can take care of his education in some way or other, because they have absolutely entire control over the entire business. In some cases, a man can't work for a mining company unless he is a member of the union. All they have to do is to guarantee that the man is qualified.

MR. H. G. DAVIS (D. L. & W. Coal Co., Wilkes-Barre, Pa.): Relative to the service clause of the mines, Mr. Fay referred to the stopping of immigration from England, Scotland, Ireland, and such places, and fixed the date at 1890.

In 1889 the Pennsylvania Assembly passed a law requiring the service of men in the mines as laborers for two years before they could qualify as miners. I don't know whether you can notice the connection or not. News of this law soon spread all over the European continent, with the result that the English-speaking men, particularly, stopped immigrating to the northeastern Pennsylvania coal fields. Nobody would come here

except those who had committed murder, or robbed somebody, and had to get out. The rest stayed there, for the simple reason that the men who were born and brought up on the top of a coal pit didn't want to come here and load coal for a couple of years. What was the result?

Some came and immediately returned to their homes or went on to western Pennsylvania, where no services were required before they could become qualified miners.

We have for thirty years been trying to have that law repealed or amended to this extent: Put a service clause in, if you please, of three months.

The D. L. & W. Coal Company had an Austrian come to us for employment. He showed me by a certain series of certificates that he had qualified in his own country to become a miner, and I want to say this, that the service rendered by that man proved that he was a miner in reality. Although he wasn't able to speak the English language, he was able to cut coal and do it well.

I do think that when a man who is born and brought up in a coal-mining country or state goes to another state, credit should be given him for his knowledge. Why can't he be a miner in Illinois if he is a miner in Pennsylvania?

I hope that the states of this country will never pass a law that will require more than three months' service, if they pass any, if a man can show that he is from a state or country where mining is in vogue and that he has had experience there.

MR. R. DAWSON HALL ("Coal Age"): I would like to question Mr. Fay's statement as regards the dangers of mining being so much greater than other work around mines. There are certain little things like driving, etc., which do not cause as many deaths as mining, but do in proportion to the number of men engaged in that occupation.

MR. FAY: The word mining, as I used it, meant everything below the collar of the shaft.

MR. HALL: Is the foreigner in a more dangerous occupation?

MR. FAY: I had 80 per cent of them. I picked five different groups. I not only took the miners, but the trammer, the muckers (in the metal mines), or loaders (in coal mines), and the man who is driving the team and the hauling man. In the five groups all the occupations go, and about 75 per cent were foreigners and about 25 per cent Americans.

MR. T. D. LEWIS (Lehigh Coal & Navigation Co., Lansford, Pa.): For two or three years we have conducted classes, and have specialized on a class in Americanization or naturalization. Our effort there has been to cause all these men to want to be good Americans, to instill in them a desire for citizenship, and that has worked out very well. Those men have come in bunches and taken a keen interest in attending the school for one or two years. We have started a great number of them on the road to first and second papers. In that class we made a specialty of instructing them in things they ought to know in the mine. We don't teach them the English language by giving them the A, B, C's. We try to teach the words and danger signs and the things they need most when

they get into the mine. That has done a good deal to reduce our accident ratio among the men who don't speak English.

FAILURE TO OBEY LAWS

Mr. J. C. ROBERTS (Colorado School of Mines, Golden, Colo.): Mr. Fay spoke of the fact that it was not so much disobedience as misunderstanding of orders or instructions that is to blame for the accidents. I believe that a great many of our accidents are due to the fact of disobedience to orders; that is, failure of men themselves to carry out the orders or to obey law and order, and it is not the fault of a foreigner so much as the fault of the American.

A few years ago I was in Chicago with a friend of mine. We were watching the traffic as it went one way and the other. After the traffic cop blew his whistle, a man whipped up his horse and went across the street. This friend of mine remarked, "In London the cop blows his whistle and the people involuntarily stop. Why? Because he is the law, and as such they respect him. It doesn't matter in what regard they may hold that man personally, he is the exponent of the law and they respect him because he is the law."

"In Berlin, on the other hand, the cop blows his whistle, and the people involuntarily stop because he is the law and they fear him."

I said, "Yes, old man, but we neither fear nor respect that law. Every man wants to be a law unto himself and do as he pleases."

I would say this to my men, "If you don't like the law and the rules and regulations laid down by the company or the concern for which you are working, move on. We don't want you. Go some place where they haven't those laws. As long as those laws are on the statute books, as long as those laws and rules exist in the mine or territory or state and county in which you live, obey them."

If the foreigner comes and sees you and me, American citizens, disregarding and disobeying the law, sees us saying, "To — with the law," what does he do? He goes us one better, and he takes liberty for license and does as he pleases. That, I think, is the cause of a great deal of the trouble in our country.

One other thing: We were speaking about the loaders. There was a mine in Montana—the Great Northern Coal Company's mine, which is not in existence now—Mr. Pierson was the manager. Several years ago he told me he hadn't had a fatal accident in his mine for over three years and not a serious one for over two years. He did it by regulating his labor. He only had a few skilled laborers in his mine. He had one class of men do the timbering; another, the track-laying; another to cut the coal; another to bore the holes; another gang of men to come along and shoot that coal. Then the loaders came around under a shift boss and loaded that coal.

The coal digger, as we know him, had no responsibility except to shovel that coal and leave the result of his brawn and muscle.

That man produced cheaper coal than any mine in Montana and had fewer accidents

CHAIRMAN TILLSON: Gentlemen, if we can find the time, and if the rest of you desire to continue some of this discussion in blanket towards the end, we will do so. I feel that I must call for the next paper, "The Management and Training of Men," by W. W. Gidley.

MR. W. W. GIDLEY (Phelps-Dodge Corporation, Bisbee): I was asked by Mr. Price to write a paper to be presented before this body on the "Organization of Committees as Conducted by the Phelps-Dodge Corporation in Its Operations," but owing to the fact that I was absent the entire summer, I was unable to get this paper together. However, I have had for some time some ideas which I should like to present to you. They have come from my own experience. I have had quite a varied experience in the handling of men and it is unquestionably true that today the training of men in safety, efficiency, economy, and in all the various phases of industry, stands vividly foremost in the present trend of affairs along industrial lines.

I believe that up to the present time we have failed to give the great faculty, human nature, the proper attention, and so I have written a brief paper along those lines and I trust that I have brought out, or will bring out, some features that will prove of interest to you.

THE MANAGEMENT AND TRAINING OF MEN

W. W. GIDLEY, SAFETY INSPECTOR, PHELPS DODGE CORPORATION
COPPER QUEEN BRANCH, BISBEE, ARIZ.

No factor in the industrial world today presents to the employer a problem of such extreme complexity as the training and managing of men. It has been proven repeatedly that wholesale discharging by those in authority, in order to procure the right man for the place, is a dismal failure. It is therefore expedient that a system be developed whereby this weakness may be properly analyzed and a correct solution applied.

The time has arrived when men who supervise labor must know the meaning of morale and how it is developed. The heads of various departments in any industry must be interested in safety, efficiency, and democracy, and understand how these features may be linked together with proper discipline.

There are three fundamentals in our subject which we will endeavor to discuss in their relative importance: design, management, and training.

DESIGN

Let us look at Humanity's general design and then consider it under the aspects of management and training, defining its province, explaining its duties, and pointing out some errors prevalent in these several departments of its action.

The simple preservation and continuance of the race is a fundamental design of Humanity. In his infancy, man is the most helpless of all creatures, the most narrowly endowed with instinct, and the most feebly furnished with strength; and hence demanding the most untiring atten-

tion to develop his physical system to a healthy maturity. It is to meet this early necessity that the family has been designed and instituted; and like all arrangements of this kind. It is self-acting and self-adjusting, working out its ends with a simplicity and perfection unknown to any human institution.

One of the great difficulties experienced with labor in industry today is due to the abandonment of training, as the young man reaches the age of maturity, in the several essentials designed to meet the necessities of manhood. We see thousands of young men growing up with no provision to meet later requirements of life. It is this class who usually become an easy prey for those filled with skeptical and socialistic philosophy; they begin to see only those things which are pessimistic and so many manifestations that vex and disgust them, that they eventually become incased in ideas un-American, with tendencies that remove the finer sensibilities. It is here that a counteracting agency is needed to oppose these influences in order to keep the better emotions in play. This is found by following up the early design of training, with changes necessarily expedient to prepare for the later callings in life. The individual who has received vocational training at the proper period is not apt to be susceptible to skeptical influences. He naturally becomes imbued with a desire to improve and perfect various methods connected with his vocation, has a broader vision and develops the faculty of perceiving a future.

Another design is the social culture and consequent happiness in life. It is in this fact that we probably find a reason for the protracted infancy of man. Were he designed, like the lower animal, he would be earlier fitted to shift for himself. But the continuity of training influences are essential to mould and perpetuate certain human elements requisite for social betterment. Many of the larger corporations throughout the country have proven to their own satisfaction that provision for social culture among their employees is a profitable investment.

MANAGEMENT

The management or government of men in industry is a problem requiring utmost scrutiny in working out its details. Human nature in its mature development of reason and experience demands the restraint of government of state; so it is in industry. Hence, right reason unites with reiterated declaration that successful industrial organizations must embody good government. Let us look at the points involved in this aspect of it. The governing power of industry is lodged in its executives. The authority of a department head is usually restricted to the sphere of certain rights and duties. Although the authority of the executives is not co-equal, yet it should always be co-incident, especially in the enactment and execution of the rules of the organization.

Every industrial organization should have its rules. These rules should be formed with utmost care and consultation. As there may be too much legislation in the state, so there may be in any industrial organization; but in both the greater danger consists, not as much in

undue as in unsteady legislation. A few plain rules steadily enforced will be worth more than the most minute attention to trivial details. These rules should be the expression of the united will of the industrial executives. They should, however, as far as possible, be such as would commend themselves to the employee and convince him that they are based on fairness and mutual principles. The moment the employee suspects deception on the part of the foreman, the authority of the latter is weakened and the respect of the worker is impaired. It is absolutely necessary that in every case the worker should thoroughly understand the reason for the rules governing the conditions under which he is employed: thus confidence in decisions by those in authority will be greatly strengthened by perceiving the propriety of these rules. This will enlist both reason and conscience on both sides and create mutual understanding.

The execution of rules is another problem. It is here that failures are most frequent and disastrous. The cause of these failures will be more fully presented when we speak of the mistakes usually committed in management. The rules of industry should be enforced gently and yet with inflexible firmness. Here there should be an absolute oneness in the governing organization. If the foreman of any department shield employees under his supervision from certain penalties for violating the rules of the organization, he creates a tendency that will be surely practiced on himself with redoubled effect. The grand agent in executing rules is mutuality. This, to be properly effective, should manifest itself in words and actions. The boss whose repulsive attitude represses all interest of the worker not only misrepresents his employer, but builds a wall between himself and his men which cannot be penetrated. One great mistake in management of men is that the boss is prone to censure but fails to commend them when work well-performed merits approval. As long as the nature of man remains what it is, it will demand reward for faithful service. It is not necessary or proper to show favoritism to any particular employee, but simply to enable him to feel that the path of his daily vocation is not entirely obstructed with dissension. The want of proper management is the greatest defect in industry: it acts at the very root of the organization and is felt in all its departments. The growing amount of delinquency among employees is, in a great measure, due to lack of proper discipline and control. Why are there so many complaints about inefficiency and such difficulty in securing improvement? Chiefly because of the neglect by those in authority to exercise good management by precept and example. The perception of unscientific management may be easier than the discovery or application of the remedy. That remedy will be found by correcting the errors into which the executives fall and training the employee in efficient methods.

Let us then consider in brief terms some common mistakes in management. Partiality is a very great error in the management of men and one that deserves specially to be guarded against, for it injures alike the favored and the slighted employee and the former more often than the latter. But to treat all dispositions alike is equally erroneous. There are marked differences of character in manhood. Some

natures are constitutionally tractable, others the reverse. and to treat both alike would be like trying to work wax and iron in the same manner. The first duty of the boss then is to study the character of the man and adapt his discipline to that character, in order that he may receive the training his respective nature demands. Again, it is wrong to raise an issue with an employee when it can possibly be avoided. This will seldom occur if men are properly trained. But if an issue is distinctly made obedience to the rules of the organization must necessarily be the point obtained. Extreme care should here be exercised, the employee must be convinced, not by criticism or ridicule, or by argument with tendencies to belittle his opinion, but by calm deliberation and persuasion in order to retain his respect and perpetuate mutual interests, thus avoiding disastrous after-effects.

Constant fault-finding is another common error and is pernicious. There are many minor faults in men that are like the branches and sprays of a large bough, all of which will be removed by the removal of the main stem. To be continually carping at these secondary faults, while the primary causes are neglected, only tends to disorganize and disinterest the employee. Instruction demands many words, management but a few; and these few closely connected with prompt, decisive acts, or they will be mere empty air.

It is often difficult in managing men, especially those of variable temperament, to preserve that uniform bearing that is requisite. But special effort should be made to do so. To allow certain working rules of the organization to be violated today, when tomorrow, because of a change of humor, we rebuke the same liberties, is to injure all good management. Uniform governing of men will do more to secure efficiency than the most strict severity alternated with seasons of laxity.

TRAINING

The philosophy of human nature is not only a most engaging study, as belonging to the highest department of knowledge, but is a most practical and necessary attainment.

All persons engaged in the supervision of labor should be familiar with it, at least with its general principles, just as an agriculturist ought to possess a general knowledge of the laws of vegetation, the order of nature in the seasons, and the powers of the soil with which he is called to labor.

Vocational training is a real science. We cannot easily over-estimate it. Surely a science which embodies the necessary attainment to develop the aptitude whereby a man's earning power is designated should take the highest rank.

The present phase of industrial development demands that the supervision of men requires the faculty of training ability, consequently all executives, regardless of the magnitude of their sphere of duties, are called to study and practice this important science. Like all other sciences, the science of vocational training rests on truths and facts. Most of these are now understood and established. A wise executive cannot safely overlook them.

dispositions and habits will secure success in life against many disadvantages; while the want of them will neutralize the most important advantages in external circumstances.

To be successful in educating the employee, the teacher must of necessity be a student himself. He may possess all the qualifications to direct and promote efficient methods but must reckon with the human element. He must assume the task of patiently seeking to develop all the faculties which requires constant study of the master-faculty, "Human Nature."

CHAIRMAN THILSON: Mr. Gidley, in thanking you for this presentation, I wonder whether it would seem to you suitable, if your voice isn't tired, to take up, before discussion, Mr. Willis' paper, which is on a kindred subject.

INDUSTRIAL RELATIONS IN THE MINING INDUSTRY

CHARLES F. WILLIS, CONSULTING SUPERVISOR, DEPARTMENT OF INDUSTRIAL RELATIONS, PHILIPS DOWGE CORPORATION, BISBEE, ARIZONA

Industrial relationship problems involve the more or less intangible recognition of labor as a group of men and women and not as a commodity; it recognizes men and women employed in industry as human beings subject to precisely the same desires, the same longings, and the same ambitions as the employers. The practical side of the problem, however, has been the creating of conditions which will give the employees the same opportunities in the enjoyment and pursuit of happiness as those employing them. It has come then to mean concrete things, industrial democracy designed to give workers a voice in the conditions under which they work, housing plans which will give them an opportunity to better their standard of living, educational plans which will open a road to promotion, health insurance plans proposed to remove the loss to labor due to ill health, and so on through innumerable so-called welfare activities.

CONDITIONS IN MINING INDUSTRY PECULIAR

The major part of industry is factory industry, many employees under one roof, living close by their work, in communities where there are other factories. Industry has naturally gathered itself into groups, those manufacturing similar products being segregated in districts. While the solution of industrial relationship problems are with each business, there is a good deal of similarity in conditions which render the experiments of one place valuable to another, but mining stands apart on account of great differences; even individual mines cannot solve the same problems in the same manner.

The individuality and psychology of the worker in a mine is no different from that of the worker in any other industry, but the natural conditions under which a mine operates are so different from those of factory operation that the things which have proven successful and efficient in

smoothing the difficulties between the employee and the employer in other industry often cannot possibly be applied to mining, and other solutions can be applied only with difficulty.

The fact is well known and appreciated that both factory and mine workers are restless, that there is industrial unrest which causes a general dissatisfaction with everything, but few of the workers have given any considerable thought as to the cause of this restlessness. Without giving any deep thought to the mental agitation in industry today, its causes, effects, and remedies, workers as a whole are prone to grasp anything new as a possible solution. The growth of Bolshevism is not due to the fact that so many men believe in the wanton destruction of capital and in the various other destructive doctrines of the sect, but rather that they believe that something is wrong and are grasping upon that in the hope that it may be the solution of their difficulties.

PSYCHOLOGY OF THE MINER

It is a fallacy to assume that the psychology of the worker is different from the psychology of any other human being. Without a doubt, much difficulty is caused by the fact that capital and management have often assumed that the worker has a different mental state than their own. John D. Rockefeller, Jr., in an issue of the Atlantic Monthly in 1916 said "In spite of the development of big business, human nature has remained the same, with all its cravings and with all of its tendencies toward sympathy when it has knowledge, and all of its prejudice when it does not understand. The fact is that the growth of organization in industry has proceeded faster than the adjustment of the interrelations of men engaged in industry."

More and more in the development of big business organizations has the worker gone to routine work, without expression of individuality and without recognition or distinction, and these are the normal desires of all men. Human nature is made up of fundamental instincts, and every man, whether mucker or capitalist, has the same desires. Industrial relationship work today consists in supplying concrete physical outlets for these natural cravings; each part of the work is in some way related to the expression, on the part of the worker, of those primary desires.

There is first the instinct of self-preservation, that desire to keep and retain health, to provide satisfactorily for himself and family, and to prevent accidents. There is normally in every man an instinct of workmanship, a real desire to do the best he can in every job that he undertakes and, if that desire is not smothered by a "what's-the-use" attitude on the part of the man, it will come to the front. The lack of opportunity for self-expression and initiative often suppresses the normal desires of a man to do his best in a job. Self-respect is present in every man, the desire to do, think, and act so that he may feel the equal of any man. The balanced life and the instinct of play demand recreation, to provide a safety valve for the inevitably repressed instincts—not frivolity or dissipation but wholesome recreation.

While there are many other normal instincts, they are of little consequence in this discussion except the natural desire of a normal man for a satisfactory and happy family life. The inability of the worker to use and develop his normal instincts are the real causes of unrest, and an analysis by the worker will often cause him to seek and find the remedy without groping in the dark for some industrial revolutionary change, which will not in the least change his desires or cravings. Psychologists call these cravings repressed desires or balked dispositions, and while all persons have some which are not satisfied, it is only an accumulation that causes unrest.

HOW THE INDUSTRY TREATS THE WORKER'S DESIRE FOR SELF-DEVELOPMENT

Let us see then how mining has promoted or defeated the desires of the workman for individuality, recognition or distinction, self preservation, workmanship, self-expression, recreation, and home loving. It is not so many years since mines were comparatively small affairs, when a miner knew mining, when he could drill as well as use a shovel, when he could timber, lay pipe lines, dress steel, and perform all of the functions that a miner is called upon to do in a small organization. The growth of large organizations, however, has limited him to an individual task, shoveling, car pushing, or drifting. It has segregated different types of drilling and has differentiated stopes, shafts, raises, and drifts. Tool sharpening has been further segregated, so that it now takes several men to sharpen steel where formerly one did the whole operation. The result has been a depreciation in the skill necessary to perform the various functions of mining and a natural depreciation of the knowledge of the men filling the positions. The old-time all-round miner is almost obsolete now, and he resents the lack of skill necessary to be a miner today.

In spite of the standardization of work around a large mine today, however, there is still the work for the all-round man. Miscellaneous jobs are constantly coming up which require real mining skill, and which, in most cases, involve additional hazards, and it is the old-time miner who is called upon to do them. Because of this he feels that he is penalized, that he is required to do difficult and dangerous jobs, jobs that any man could have done at the time he learned mining.

While at no time has the miner been able to do the whole of the work of producing metal, in small organizations he was often able to see each part, realize the dependence placed upon his work, and appreciate that the work and livelihood of other men depended upon his work. Today, however, the absence at work of fifteen, twenty or even a hundred men makes little difference in the progress of the industry. A few years ago a man expressed himself directly to the boss and would often see the results of his self-expression; today there is a multiplicity of steps to reach the boss, and even though he may ultimately see the results of his suggestion, the workman has had his desire for self-expression curbed.

Recognition is always difficult to give in large organizations, for it is

hard to measure a man's right to it. In the routine of a day's work, a man does little to distinguish his work from that of thousands of others. The opportunity for distinction is small, and promotion as an evidence of recognition of services can *only come to a few*, as compared with the days of small organizations. The saying "there is always room at the top" is hardly true in the growth of large organizations, for there are getting to be fewer and fewer top places, and a lessened opportunity for recognition.

While there is as much, if not more, opportunity for recreation in the communities of large organizations, it is of a different nature. The recreation of a small mining camp was not ready-made recreation, obtained only for the admission fee; it was initiated by the worker himself, developed and carried out by him. If it was a show, he was with it all the way through its rehearsals and performances, not merely seeing the finished product. Where the worker used to receive hours of diversion in self-made recreation in small mining camps, he now receives minutes. It is true that there are many more opportunities for recreation today, but it needs much more to make up for the loss of the community initiative and development which marked the recreation of small mining camps of a few years ago. The tendency of the recreation of today is toward frivolity, which does not tend toward the balanced life, as it does not use the facilities of a man that are dormant during his daily work.

While mining operations have gone to extremes to get safe and healthful conditions, the instinct of self-preservation has been repressed, due to the decreased lack of skill of the individual miner. Progress in safety work in mines has been such as to decrease the total accident roll by a large percentage, but the decreased skill of the individual miner has made him less able to take care of himself and recognize unsafe conditions. In no other industry does the safety of a man so depend upon his fellow workers as in mining. While this does not show up prominently in the accident statistics, the feeling exists among the men—particularly the feeling of dependency upon the fellow worker as a factor over which the workman himself has no control.

The opportunity for the development of home life has been the one instinct that has been promoted by the growth of large organizations. Mining was formerly done by single men, men with a roving disposition, who made up for a lack of recreational facilities by moving often and getting a variety of them. Housing plans, home building associations, good schools, etc., have made it possible for the miner to have a family and stay in one place. More important than this is the fact that large organizations have stabilized the industry; it has gotten away from the conditions of working today and shutting down tomorrow, and provides a security of employment which was formerly lacking. The miner used to feel that he could not have a home and family because of his uncertain livelihood, but that condition has entirely changed. Large mining organizations are not only continuous, but a man half way trying to do the right thing can remain in employment year in and

happen. Men and houses are needed. Everything is needed at once. The bosses are so engrossed with production possibilities that they have no time for civic problems, for the equal and consistent development of the community along with the mine. Everything is needed quickly; instead of houses, shacks are built; instead of streets one finds alleys and trails; instead of sewers, there are latrines; and instead of decent and civilized recreation, the red light district and the saloon.

In many instances, community problems are given some consideration and thought, but the operators are at a loss to know what to do. They cannot know at that time that the camp is to be a permanent and paying one; they know nothing as to the size and extent of the community necessary, they know nothing of the possible life for which the community must be built. As a rule, they do not realize that money spent in the development of the town is in any way related to the success of the mine. It is not until some pressure is brought to bear that the operator begins to understand that he is not only developing a mine but a city as well, and somewhat reluctantly, he begins to provide a few of the things necessary to a well-organized community.

It is usually during this period that labor troubles have their inception. Living conditions as a rule are bad, and working conditions not as good as they might be. The camp is unhealthful. Then, too, the mine is not yet on a paying basis; money is all going out and nothing coming in; wages are low and the management is slow to spend money not directly related to immediate production. Troubles are consequently frequent, grievances numerous and often real, and from this time on the feeling grows that the camp is operated for the company only. Workmen become disgusted and leave; often, they do not return but continue to spread stories of the treatment of labor at this camp and in this way the community gets a bad reputation in the mining world which is difficult to overcome.

It matters little whether or not these grievances are later corrected. The reputation remains and often will remain for a generation. Traditions are hard to live down. Even in the present day, one hears occasionally in camps of the West: "Don't go there, they have typhoid epidemics regularly." This is in spite of the fact that the conditions causing typhoid have been removed for many years, and that the disease is now almost unknown in the camp. It may be one of the cleanest, most healthful camps in the country, and yet occasionally this feeling against it, which is purely a traditional one, remains.

STABILITY OF PRODUCTION CONDUCTIVE TO CIVIC IMPROVEMENT

The next stage in the life of a mine is that of stable production and consistent profits. Mining operators have now become so systematized that attention may be given to town problems. Many times the sudden realization of the needs, accompanied by the fact that the mine is now in position to supply them, brings about a bad condition of hastily-thought-out and poorly-devised remedies, which in some cases are worse than the original conditions. The normal procedure is the slow and

laborious development of the community, a process often much more costly than if it had been done simultaneously with the mine development, but always behind the needs. Faulty living, social, recreational, and civic conditions are changed, one by one, as the operating heads have the time to devise correct methods.

The feeling of the miner has not changed, however, for in the short time spent in a place he has not seen enough of the corrections to be convinced that the company really does desire to make conditions good and to improve his lot. A miner seldom witnesses the entire development of a camp. As a rule, he works a few years here and a few years there. He hears disagreeable things and often goes to a camp with a prejudice against it, and he is the type with whom the company has to deal.

The last stage of development comes with old age, the deposit worked out, the camp moribund and the community likewise. Even here some development may be going on, and the satisfaction of the men during this period is dependent upon the conditions that have existed in the previous stages.

It might be entirely possible to make classification of mining communities based upon the relation between the progress of the development of the mine and the start and progress of the community development, and thereby measure the comparatively harmonious condition of the community and its relative freedom from social dissatisfaction and labor disturbances. There are cases when a mine comes into a community already organized, or when a new company buys a mine already developed.

It must be remembered when a mining company is sinking shafts, driving drives, etc., that it is building a plant for the production of ore, that it is continually building that plant, and that parts of its plant are continually becoming obsolete and useless. Therefore, in any way to compare factory industrial relationship activities with those of a mine, it is necessary to study the betterment activities taking place while the factory is being built and terminating when the factory building is completed. The welfare activities taking place during factory construction are usually nil.

NEED FOR INDUSTRIAL RELATIONS MANAGER

By virtue of the fact that mining operations are necessarily retarded in starting industrial relationship activities because of the different fundamental factor under which a mining organization is operating, it is necessary to make far greater speed to catch up with the procession. While undue haste means mistakes, it is impossible to get any great speed of development when the industrial relationship problems are studied solely by the operator, who must give his major time and thought to production problems. Hence no industry needs a man whose sole duty it is to study and supervise industrial relationship problems more than does the mining industry. It is backward to start, and even with the best of conditions it is hard to catch up.

Good physical conditions within a plant are probably the most fundamental factors in sound industrial relationships, and here a mine has inherent difficulties. Safety, sanitation, and lighting can be designed in a factory but a mine is built as it goes along, and to make a place safe it is necessary to work men in an unsafe place. Sanitation and lighting of underground workings have obstacles that can be readily understood and appreciated.

When one realizes that the temperature underground increases one degree for every fifty-three feet, and that practically all mines are operating below the ground water level, the discomforts due to heat and water are considerable and inherent in the industry. This added to the fact that oxidation of sulphide ore produces a good deal of heat, often enough to cause spontaneous combustion, makes the problem of ventilation, cooling, and fire protection of vital importance in maintaining good physical conditions. Also, it is impossible to create the better conditions until the poor conditions are encountered which makes it necessary to endure the heat and water until the necessary equipment can be provided and installed.

In the mining industry men are scattered through miles of workings doing their work in small groups, and they are under the eye of the boss but a small part of the time. They are therefore far more on their own responsibility than in a factory where a whole floor or room may be under the eye of a foreman. The 1919 type of foreman, who is a teacher and leader rather than a driver, has less opportunity in a mine to supervise continuously and correct work as a teacher should.

The roving nature of the population of a mining camp often means the continual changing of schools for the children of the miners, each change being accompanied by a loss of time and of school standing. This results in the average age of students being higher in mining camps, and before sufficient education has been acquired, many are at legal age where school attendance can not be forced. This condition makes necessary strong inducements on the parts of the school, and special educational facilities to get the older boys and girls to remain with their school work.

The ordinary typography of a mining camp adds greatly to the housing difficulties. Often, playground space is not available, athletics is something to be read about on the sporting page, and the mountainous rocky hillsides offer few opportunities for the development of home gardens.

PENSIONS AND PROFIT SHARING

While it is appreciated by the mining industry as well as other industries that a man who has given the best part of his life to an industry is entitled to some consideration in his old age, pension plans are frequently remote from the thoughts of the mine management. This is because a mine has a life, that life being shorter and seldom longer than the usual twenty or twenty-five years of service that places this social obligation upon the industry. When the ore is gone, the money ceases to come in and unless very large funds are set aside to be used for

pension payments after the mine is through, it is impossible to fulfill the obligation.

Profit and loss comes very much nearer being a mathematical problem in ordinary industry than in mining. Mining has natural risks that are large. The plant may be equipped, and then produce nothing. The inherent risks in mining are solely risks of capital, and this naturally requires larger profits from the mine that does make good to pay losses of those that do not. If mining could be assured of only eight or even ten per cent, profit on the investment from the mines that become profitable, capital would never risk its money in the development of new mines. Mining profits should go to capital that takes the risk, and this makes the question of profit-sharing in the mining industry one presenting many difficulties. Sometimes it is possible to show profits which are the product of increased effort on the part of the worker, and it is believed that such profits should be shared with the employees. This plan is being worked out in many mines today, but it is entirely separate from the larger question of profit sharing.

In spite of its inherent difficulties in the solution of industrial relationship problems, mining is in no way backward. Practically every device known to produce better feeling and equitable treatment is in use in the mines of the West. These often cost many times the sum necessary to install them into factories. Some operators show practically all methods used within the same operation. These statements apply largely to the profitable and successful operators and it does not require a very clear vision to see why smaller operators with mines in the development stage are slow in pushing personal relations work; they do not know whether their work terminates tomorrow, next week, or next year. Mining operators are thoroughly alive to the problems and their necessity for solution, and are operating strictly on a square-deal policy. The realization of the difficulty of the problems has made the study more acute but has not diminished the speed.

CHAIRMAN TILLSON: We certainly appreciate Mr. Gidley's presentation of not only his own subject, but the allied paper of Mr. Willis on a kindred subject. In opening the discussion of that paper, I made one note which I would call to the attention of those present if you wish to consider it. In the attempt to correlate some of Mr. Willis' suggestions with those of Mr. Gidley, it will be noted that Mr. Willis indicates that the attraction of women into mining camps and the performance of some industrial functions there which will hold them is highly desirable which brings up the inducement of various factories employing women to take part in the mining life.

DISCUSSION

PROF. R. M. RAYMOND (Columbia University, New York City): I wish Mr. Gidley would give some account of the good work being done by the Copper Queen, and an example of the training being given by that institution and some other good kindred institutions.

MR. GIDLEY: In answer to that question, I am very glad to state that for the last year the Phelps-Dodge Corporation has conducted a vocational school at Bisbee. This school is absolutely free to all employees and is very highly patronized. They are taught there practical methods of mining. Papers by the various department heads, all the mine foremen, many of the shift bosses, are prepared and presented to this school and are discussed. The papers, of all the various operations in the mine, are written by the different department heads for the benefit of this school.

One boss may write a paper on drifting; another on one method of stoping; one may take top slicing, and one may take the cut and fill method; one man, car setting, etc. These are all presented to this mining school and are studied by the pupils. The pupils are required to pass a certain examination, and after passing this examination, the company issues a certificate, which signifies their attendance at the school and enhances their chances for promotion.

They require an examination from this school now before a man can be eligible to advancement in the mining industry. This school has been carried on for one year, and is continually going on. Arrangements have been made to conduct this school throughout the year 1920. The school is open to everybody on the job, absolutely free.

MR. A. H. TRESTRAIL (Pickands, Mather & Co., Palatka, Mich.): There was something in the remarks that have been made about the miner being taught to recognize safe and modern methods and be subject to rules laid down by the organization. I would like to ask in reference to these rules laid down, whom do you term the organization?

MR. GIDLEY: When I speak of the organization, I mean the entire governing organization of the mine, and rules laid down by the organization, of course, must be respected if we are going to get anywhere.

In the management and training of men, we have a great many different kinds of men to deal with, but absolutely the greatest problem is dealing with the pessimist. I have an idea that perhaps you may have had some experience with that class of men. By the pessimist, I mean the fault-finder, the man who is looking on the dark side of everything; the man whom nothing suits; the man who is continually finding fault with his partner, and the man who thinks he has the worst boss on earth. As a rule, I believe that pessimism is absolutely the worst factor of human nature with which we have to deal.

There are several ways in which a man can be made to realize the importance of the rules of the organization. The attitude of the boss, right then and there, is the most important factor. Right there it shows whether the boss is an asset or a liability to his company. If the boss has the ability to use moral suasion, get right down on the level with his men, he is all right. He can't get up on a bench and look down; neither can he get down in the cellar and look up. He must get on a level with the man. It is strictly a man-to-man proposition. When the boss is willing and broad-minded enough to get right down on the level with his men and talk these things over and use moral suasion in convincing the man that these rules are for his personal benefit, his care and protection, he

will experience absolutely no difficulty in persuading the man to live up to his organization.

MR. TRESTRAIL: When I spoke of the organization that lays down these rules, I meant does the management do it, or do the employees have anything to say about the matter of forming the rules?

MR. GIDLEY: Every organization has different methods of framing their rules. I recently framed a bunch of rules for governing our steam-shovel operations. I believe I sent a copy of those rules to you, didn't I, Mr. Sullivan? I submitted those rules to the management for their approval. After they had received the approval of the management, I called a representative body of the workmen, one man for every sixty men employed, and we went over the rules thoroughly. I told the men I wanted their criticism. I told the men I wanted to find if there were any weak points or any rules they could not conscientiously obey. The matter was threshed out for the mutual benefit of all.

MINE RULES IN KENTUCKY

MR. J. W. REED (Consolidation Coal Co., Fairmont, Va.): In speaking of framing of rules, I think that the present system of mine rules as laid out in the State of Kentucky is about as good as any. In that state, the mine rules are gotten up by the company and they have to be gotten up with considerable care because after getting them up, they go to the Department of Mines, and the head of the Department of Mines goes over them and makes such alterations as are necessary to see that the rules do not conflict with the state laws and also sometimes takes them to the Attorney-General to see that they are of such a nature that they are capable of being applied as laws. After that is done, he approves the rules and by an act of the State Legislature of the State of Kentucky, his approval of those mine rules causes them to become laws and they are enforceable through court.

MR. GIDLEY: The only objectionable feature I see to that is that new conditions are continually demanding new rules. As we mine, take for the last few years, there have been many new methods introduced in the mines, and occasionally we find a problem in mining that requires absolutely new rules to govern, so our rules must be framed so they are subject to quick amendment.

Of course, it depends a great deal on whether or not your men at the head of the Bureau of Mines are qualified to pass on those rules. The large per cent of them are college graduates, you know. Many men who have had the technical education are not qualified to go into the detail end of the work until they have gotten down and obtained the practical experience.

MR. REED: I don't know whether you took the wrong impression of what I said or not, but I might have specified a little more clearly that those rules only apply to the company that they are got out for. They do not become state laws, but apply only to that company, and according to the desire of the chief inspector, those rules can be changed.

MR. TRESTRAIL: Providing these rules were violated, would the company be liable to prosecution by law?

MR. REED: The rules are made up for the safe operation of the mine and ordinarily do not cover things for which the company would be subject to prosecution, but rather, the rules for which the men have to have consideration in working in the mines in safe ways and by safe methods. Your state laws cover the rules for which the operator would be prosecuted if he did not live up to them.

CHAIRMAN TILLSON: Mr. Reed, what happens in the case of violation of these rules? What prosecution develops?

MR. REED: The man can be taken before a magistrate, or county court and prosecuted for misdemeanor and fined according to the county court's verdict. I can't say right now what the Kentucky law specifies, but I believe it is from \$10 to \$100 fine.

MR. J. O. DURKEE ("The Coal Industry," Pittsburgh): It appears to me that we are apparently crossing our wires in regard to the special teaching of men. Mr. Roberts, if I remember accurately, stated that a certain man in Montana, by having special men for the different vocations, had acquired great efficiency, not only in the matter of securing greater production, but with greater safety.

We are led to believe from the paper, quoting from it, that the day of the old miner is passing, who was driller, miner, and all the other accomplishments that go to make up a mine. That has been divested in a number of different men. Is it our impression, or are we led to believe, then, that the specializing of the different occupations of men, in a mine, is going to lessen the efficiency of men, or make them more dangerous, or what are we led to believe concerning that?

CHAIRMAN TILLSON: Mr. Durkee, I can give my impressions as I have read these papers in the past. It seems to me that Mr. Willis' intent was to indicate that the increased specialization of all of our industry left an aching void which most of us had not as yet filled, and due to that the standards of interest of our men in the industry had been lessened in the particular application of their minds to their jobs.

It seems as though it came down to a point where we realized that what was very largely required in this present-day unrest and inefficient production was the development of the interest of the workman in his workmanship. In days gone by, when the school of apprenticeship was in vogue, and a man actually had to pay in years of labor and his support for learning a trade, he was a skilled worker who had considerable pride in the work which he did and, therefore, performed it with ability, completeness, and at the same time with safety to himself, as far as means permitted.

SPECIALIZATION TENDS TO LESSEN INTEREST IN WORK

Now, by a tendency, with the specialization of certain fields, to limit the horizon of a man's viewpoint in regard to the work in which he is engaged, we have taken away his interest to a certain degree, by reason of

the fact that he becomes a machine-like automaton in his labors. The reason these two papers come before you now is due to the realization that the problem of mutual interest between the executive side of business and the more manual side of business had a correlation with the intense consideration of the subject of safety to the workmen, and to the public at large, because a man who is satisfied, contented, and really interested in his work and in what he is doing, will also be interested in the way in which he does his work, and will, furthermore, appreciate that the best way is the safest way. Therefore, the subjects are before you, with a desire for complete discussion, in the hope that those methods, which we can adopt toward developing all men in industry to take a broader interest and a more concentrated interest in their own industry, in their own work, will be brought forward.

The possibilities are great of any concern more openly indicating to its muckers or trammers the necessity for their making production on a proper basis, in order that they support allied departments, the coal breaker, or the concentrating mill, and ultimately the smelters and the consumers, who are so vitally dependent on his individual efforts that really a worker is performing a function toward the world at large in doing his mechanical share of labor.

As a homely illustration in the zinc industry, it seems to me that the very fact that things come so close to home to a man when he realizes that this shovelful of ore that he is placing in a car is needed in order that he ultimately may benefit by having a zinc sheet beneath his stove in his own home or his wife may have eyelets of zinc in her corsets would bring to him a realization that his productivity is necessary for the welfare of himself in many indirect ways, and his neighbors at large, and he will feel then that he is one unit in partnership with industry in according the good things which are enjoyed by himself and others.

I hope there will be discussion as to how we can best stimulate pride in workmanship in our workers, shift foremen and everybody else, giving them a breadth of horizon in which they feel their responsibility to the world at large.

MR. R. D. HALL ("Coal Age"): It appears to me very much as if we lay too much stress upon preparing mine foremen, shift bosses, etc., for their work, and too little on the varied forms of occupation in the mines of possibly a lower order, but in which a great deal of intelligence can be used. We lay too much emphasis on the bossing of the other fellow, and too little on the man being an efficient boss of his own work.

As I go around the mines, I have come to the conclusion that our miners today, while they are specialists, doing nothing else but a certain kind of labor, day after day, are doing it worse than ever they did it before. I have seen headings that were driven away back. I think, in about the year 1860 that were very much better than any I have seen today, and there is a general disposition today to slight work because there doesn't seem to be an intense interest in the way in which it is done and I really believe what we need is education, not applying directly

to the directing forces of the mine, but to apply to positions which we are likely to regard as inferior.

I don't think they are inferior, because they pay good wages, sometimes better than the foremen of the mine. We have gotten into the habit of thinking that it doesn't require much intelligence to dig coal, but that the man who is to show him and who is to watch him do the work should require all the intelligence. I think we have overlooked the fact that the men who perform the work are intelligent artisans. We don't have schools for motormen, miners, drivers; we don't have schools for dumpers, and we don't have schools for mining except for some man who wants to better his position.

I think if we would get the idea that the man who performs his duties around the mine is a man really worth while, no matter whether he is dumping rock, loading coal, or whether he is shooting it down, that it is something worth while that he should be taught to perform properly. I think we would find an entirely different aspect would be given to the work around the mine.

EMPLOYMENT OF WOMEN

As to women, I was very much interested to find that in Colorado in nearly every office there was one woman employed as a clerk. Strange to say, we have gotten around to using nothing but male help in mines for clerical work. Stenographers are almost unknown in these little mine offices. In the larger offices, they appear in larger numbers, but in the small local offices, it is very rarely that you see any women. I think it would be better if there were. I think the order and general appearances of the offices would be improved. It is very disgusting to go around to the average mine office and see how dirty they are and how dirty the men go about. Of course, they have some very dirty work. Many of them have to go out and crawl over the cars. We know that, but they seem to delight in having that mine office as gloomy and dirty and unattractive as it can possibly be.

In Colorado they hadn't given the matter much attention, but they had managed to get a few woman workers around the mine office. Of course, in Pennsylvania it is customary to have a lot of women around the mines. That could only be done in places where there is an idea that mine work will be permanent. There are many other industries that could be introduced in a mine region in which women are employed, the making of overalls, etc. I don't see, however, how isolated camps, which only have a limited time to operate, could do that. I think our camps are altogether too mannish. There are too many single men and too little settling down to the business of life, and it would be very much better for our whole mining life and organization if we could change that condition.

CHAIRMAN TILSON: The final paper on this session's program is on "Labor Turnover and Its Relation to Mine Accidents," by Mr. E. E. Bach. Mr. Bach is now Director of the Americanization Bureau, State of Pennsylvania, Philadelphia. I expected Mr. Bach here. Since he is not here, I will read the paper.

LABOR TURNOVER AND ITS RELATION TO MINE ACCIDENTS

E. E. BACH, DIRECTOR, AMERICANIZATION BUREAU, STATE OF PENNSYLVANIA,
FINANCE BUILDING, PHILADELPHIA, PA.

This is a subject of great importance to the mining industry and one worthy of most careful consideration, and deserving of a most exhaustive investigation. To arrive at any reliable conclusion in this matter, it is necessary that every step in the process of reasoning should be fortified by ample records obtained first hand from reliable sources in the mining industry. I know no industry which has less reliable records than this one in which we are so greatly interested. I know that the United States Bureau of Mines has been trying for many years, to standardize mine accident records. It has sent to the various collieries, printed forms upon which have been itemized the specific accidents which are most commonly used in the compilation of records. Immediately following a National Safety Congress, new records are begun and are religiously kept for a short time and then the ardor languishes and the records die. The purpose of hav-

ALL MINING COMPANIES SHOULD USE SAME ACCIDENT FORMS

ing all mining companies use the same accident forms is very commendable for the reason that comparisons can then be made between companies with some degree of intelligence. I personally know that these forms have been compiled after a most careful examination of the best accident records available and can be had without cost to any company. Although they have been distributed for a number of years, I will venture the assertion that there are not one dozen mining companies in the whole United States which are using this form from the Bureau of Mines. As long as such conditions prevail, there can be no reliable mining statistics; there can be no basis of comparison as between companies, and there can be no concerted effort toward the elimination of even a common accident.

Since the compensation laws of Pennsylvania have become effective, there have been some few earmarks of reliability as to the various accident records in industry. Yet, those of you who have to do with the accident records of a mining company, where competition between various sections has been keen and where bonuses have been given for reduction in number of mine accidents, know how easy it is to camouflage records.

You are aware that the labor turnover side of the proposition is replete with "voluminous fund of information and available records along these lines." It would seem to me that a large industry, ranking as does mining in this great country of ours, should take some steps toward compiling adequate records along all practicable lines. I am quite sure that from the purely selfish side of hard dollar economy, such a course would be highly justifiable.

By labor turnover is meant the employment of too many poor men

to get a standard organization. There was a time in the history of mining when the employment of a great number of men seemed to have no meaning whatever. New men appeared at the pit very morning for a job and were hired. Others who had worked in the pit appeared with the same mathematical regularity at the pay window for their money because they were going to leave their job. No one seemed to think there was anything in this process which might be translated into dollars and cents upon the debit side of the ledger.

Since the advent of the efficiency engineer, there has been created in all the large industries, what is known as the employment department. Its purpose is the selection and the keeping of the right man in the right place. No more "square pegs in round holes." No more bright boys entering a "blind alley" occupation. It is a proven fact that ninety-seven out of every hundred boys stick to the trade or occupation which they elect at the onset and in the final analysis it is discovered that this is the trade which they are best fitted to follow. There is no better field for an ambitious boy than mining, because it contains thirty-five trades and occupations. One of the most effective methods for reducing the labor turnover in any industry is to give vocational training, through the public schools, to the boys in mining towns. Industry might well invest a few thousand dollars in necessary equipment and place it in charge of the schools.

THE PROBLEM OF STABILIZING LABOR IN INDUSTRY

It is a commonly accepted fact that every time one man replaces another, it is at a cost of real dollars and cents to any company, no matter how seemingly menial the job. Personnel, welfare, industrial relationship, and all other departments in industry, under whatever name, which have to do with the human factor in industry, have for their objective the reduction of labor turnover. The greatest problem which confronts industry today is that of the reduction of labor turnover or the stabilizing of labor in industry.

This is especially applicable to the mining industry because of the great percentage of foreign-born miners. Where no effort is made to give them an intelligent understanding and a working conception of their job, a decent place in which to live, adequate recreation for themselves and children, places to worship God in the manner which they choose, facilities for self improvement and for the education of their children, you will find that the labor turnover is enormous and a most costly proposition. Immigration has practically ceased, and the mining industry now faces the problem of holding the men which it has and having those men so efficiently trained and so well contented that the depletion in the number of men employed must not effect the volume in production.

The process for the accomplishment of this seemingly impossible task will very much resemble the process of "making two blades of grass grow where formerly but one blade grew." It will require a most stringent conservation of the health and strength of the workman, accentuated by the improvement of his working, living, and social conditions. He must as-

same, in return for this consideration, a loyal and interested attitude toward his work which will guarantee to his employer a staple and regular production at a reasonable cost.

Industrial unrest, whether it be due to anarchistic doctrine, Bolshevik propaganda, bombastic utterances by organizers of labor, unreasonable attitude of the captains of industry, uncertainty of governmental policies, undue influence of other countries, or any one of a thousand or more other reasons, must be allayed or this seething, boiling caldron will overflow and will submerge all reason, in which case it might invite the calling forth of those brute forces which hark back to the time when battle grounds were staged for the survival of the fittest.

A satisfactory reduction of labor turnover will be accomplished when a more general practice is made of the teaching of the lowly Nazarene, as comprehended in the Golden Rule.

An accident is something which should not happen. A successful investigation of an accident proves an individual a liar who says that it should happen. We are coming to have a different conception of the meaning of an accident in industry. It is no longer possible to write after the name of a killed workman the common sentence of death, namely, "Killed as a result of his own carelessness." Accidents are no longer considered "Acts of God." Safety men who have made a careful study of all accidents have come to the conclusion that 75 per cent of all accidents are preventable. Seventy-five thousand (75,000) men are annually killed in the United States through accident. Thirty-five thousand (35,000) of these deaths are charged to industry. In round numbers, there are annually two million (2,000,000) non-fatal accidents in the United States. There are one hundred sixty thousand (160,000) accidents to the eye annually. Of one hundred thousand (100,000) persons that are blind in this country, ten thousand (10,000) have lost their sight as a result of accidents in industry. Loss of time due to accidents represents four million, eight hundred thousand (4,800,000) hours per annum. Aside from the loss to industry from accidents, there is a loss of \$2.00 per day through illness and \$1.00 per day from medical attention in the United States to thirty million (30,000,000) workers. Of the fourteen million (14,000,000) deaths in the United States due to disease and accidents, it is estimated that three hundred fifty thousand (350,000) could be prevented.

ACCIDENTS DUE TO INABILITY TO READ AND UNDERSTAND ENGLISH

To be specific as to one of the real causes of accident, I desire to state that there are three million (3,000,000) workmen in industry in the United States who are unable to speak or understand English. There are in Pennsylvania, alone, five hundred thousand (500,000) who cannot speak English. The mining industry of Pennsylvania contained in 1916, three hundred twenty-eight thousand, five hundred and five (328,505) coal miners comprising thirty-five nationalities. Of the total number of one hundred eighty-four thousand, eight hundred forty-four (184,844) accidents reported in the State of Pennsylvania, the mining industry is

credited with fifty-one thousand, eight hundred eighty-three (51,883). Of the total number of sixty-nine thousand, nine hundred twenty (69,920) compensation accidents in Pennsylvania, the mining industry is credited with twenty-three thousand, one hundred sixty-one (23,161). Of the \$11,639,915 compensation paid in Pennsylvania to all industries, the mining industry received \$5,125,749. Incidentally the wages lost to the miners because of accidents amounted to \$3,040,304. This is out of proportion to all other industries and there seems to be but one explanation that the predominating number of foreign-born workman is responsible for this undue number of accidents. The most illuminating information to carry out this statement is the following recently authorized by Director Van. H. Manning, of the United States Bureau of Mines:

"That the inability to read and understand English places the foreign-born in danger of his life, is the striking fact brought out in his last monthly statement of mine fatalities by Van. H. Manning, Director of the United States Bureau of Mines.

"The rate of accidents among the non-English speaking miners is not only greater in all the great mining districts of the country, but the increased ratio is uniform in all districts. This demonstrates clearly that the inability to read warning signs, to comprehend fully the company's instructions, and to understand their foremen, places an unnecessary hazard upon the foreign-born.

"The figures show the difference in the rate of serious accidents in the mines among the English speaking and those from the countries of continental Europe, almost entirely non-English speaking.

FIGURES FOR PENNSYLVANIA

"In the Pennsylvania anthracite mines, 43 per cent of the employees are English speaking and this number is charged with only 28.8 per cent of the fatalities, whereas the other 56 per cent sustained 71 per cent of the fatalities. This is a comparative ratio of 699 to 1,268 against the non-English speaking.

"In the Pennsylvania bituminous mines the ratio is 771 to 1,123 and in the West Virginia district, 790 to 1,424.

"Mr. Manning concludes his report with this striking statement: 'Had the fatality and injury rate for the English-speaking American been maintained throughout the three groups, there would have been a saving of 716 fatalities and 900 very serious injuries, a strong argument for Americanization and education of the miner.'"

From the personal investigations that I had the privilege of making covering a period of seven years, I feel perfectly justified in stating without fear of successful contradiction that the accidents in the mining industry are in direct ratio to the labor turnover; reduce the labor turnover and you lessen the number of accidents.

DISCUSSION

Mr. C. W. GOODALE (Anaconda Copper Mining Co., Butte): Mr. Chairman, with the help of Mr. Boardman, we started to prepare some curves

showing the relation of accidents in the Anaconda Mine in Butte, and we didn't find quite what we expected.

We have among the men employed in Butte, 53 per cent from non-English speaking countries. That doesn't imply that 53 per cent of the men cannot speak English at all, but they are from non-English speaking countries, and I think a very interesting line of thought has been suggested by Mr. Fay's paper, as to the number of accidents occurring among the men who could not speak English, but the Operating Department is always making an excuse or explanation of high accident rate as our safety measures are not bringing about results. Their assertion is that it is due to the great labor turnover.

STANDARDIZATION OF ACCIDENT RECORDS

MR. GIDLEY: The standardization of accident records depends a great deal upon the care exercised by each individual company in making those records. For instance, some companies are very careful in going into every detail regarding all accidents. Some companies require an accident report completely filled out for some very slight scratch, while other companies give an accident of that character absolutely no consideration. Until such time as those things can be gone into and properly adjusted so that all accidents will receive the same consideration from all employers, why it seems to me it is beyond the range of all possibility to get anywhere in standardizing accident statistics.

You take a man who occupies a position like Mr. Fay, for instance. Those things would have a tendency to benefit a person in his position wonderfully. If the very character of the accident could be gone into thoroughly, requiring a report, so that every operating company would have a standard to go by, then the records gotten out by Mr. Fay would be of material benefit to the entire mining industry throughout the country.

I have endeavored on several occasions to compare mine accidents of various operating companies with the Phelps-Dodge Corporation, but due to the fact that accidents which require a report from some companies are paid absolutely no attention by other operating companies, renders it impossible to get anywhere near a comparative statement.

CHAIRMAN TILLSON: I can't second too strongly these comments regarding the comparative value of accident statistics, as I have long felt that if you are going to spend money in doing what you should do, you had better get busy and make your records so that you can compare with every other line, so you can see whether you are getting anywhere or not. You had better change your methods and do things right. It seems to me it is like a man attempting to run a business without taking an inventory. If he has a big fund of wealth, he may think he is making money, though he may be losing, and not know it. If you don't get busy, those of you who are not keeping your accident statistics in refined form so that you won't have to worry in future years, you are wasting that much money. It is not business to keep your accident records in any other than a refined form.

Mr. Fay, from my conversations with him, would desire a greater refinement than he is able to get. He has felt that there is so much difficulty in getting a true report on a general basis that it was foolhardy to ask for anything further, and it is quite a derogatory thing that we have accredited to ourselves that we are in this condition. We have had an Accident Statistics Committee of the Mining Section for the five years since it has been in operation, but there hasn't been the support of industries in taking the trouble to get the information and get it to the Accident Statistics Committee, and Mr. Fay gets them anyway in his official capacity. He has been the Chairman all along. He is the best posted of any man in the country on mining accidents, and he finds it difficult with all the official Federal backing he has.

I think we have a function to perform as disciples so that people get information, so that we can realize whether it would profit us to get systems that are good when we compare the relative value of life and property with the accidents of some plants.

DIFFICULTIES IN STANDARDIZING

MR. FAY: May I interject a word on standardization? I have worked on this proposition for the past six or seven years until I am both bald and gray. There are forty-eight states in the Union and those that have metal mining have metal-mining laws, and those that have coal mining have coal-mining laws and each state tries to lay out what shall be reported, what companies shall report, and what not.

There are some five thousand coal-mining companies in the United States, and each wants to be a law unto himself and use his own judgment. There are three thousand metal-mining companies, and it is just about the same with them. There are five thousand quarries, operators, etc., and each acts according to his own mind. When it comes to standardizing, it is rather visionary. It is almost an impossibility and I feel a little discouraged myself. I have worked hard at it. I suppose some good work can be done. I have distributed some of those tabulation sheets, and I can vouch for about one hundred metal-mining companies who are using them.

CHAIRMAN TILSON: How many coal-mining companies?

MR. FAY: About ten or fifteen. The metal mines, however, keep writing in asking us to send twenty-five, thirty, or forty sheets at a time, and those companies are sending in the reports. All of the larger companies are sending in A-1 records and I feel that for the larger companies, we are getting representative figures, even in the metal-mining industry. We have no data on the coal mining. We attempted the work on coal-mine accidents and we have worked out fairly well on the reporting fatalities.

I am contemplating to stick to the monthly statement for coal-mining industries. I hope we can get a clerk to work in the different states and dig out of the state records something which they already have, and which are complete records in the state, but until I can do that, I can't see much hope of real standardization.

CHAIRMAN TILLSON: I don't know but what it would be in order for this body to show its liveness by the formulation and passing of a resolution urging the value of sufficient funds being expended to give the mining industry records which the states themselves have not been able to compile. If this meets the approval of the body, let's do it.

MR. FAY: If I can get \$75,000 for the accident work at Washington, that would help.

MR. JOHN L. BOARDMAN (Anaconda Copper Mining Co., Butte): I think Mr. Fay or the Federal Government wouldn't have much difficulty in getting standardization of accident reports if they didn't have such a complicated notion of what an accident really is. They want us to report a number of accidents for the number of men employed. We might have two thousand men employed. I think it is the province of the Federal Government to standardize this thing, but I think it ought to be reported on the basis of actual risk run, which means so many accidents per so many shifts run, and not men employed, and I think if it were worked on a basis of that kind, everybody would be willing to report on that basis.

CHAIRMAN TILLSON: I think Mr. Fay's intention is to get it that way if he can.

MR. FAY: In the coal-mining industry, it is difficult to get the hours of labor, or the days, or shifts, because so much of the work is done by contract by ton, yard, foot, fathom, etc. To get the actual hours performed in the coal mine is almost impossible. In some phases of metal mining, it is equally as bad, especially on contract work. If it is possible for us to get the actual number of days' labor, it can then be worked out on any other unit having the eight-hour shift previously. That is the basis on which they ought all to be reported to get comparative figures. That takes in the actual time supposed to be put in on the industry. If we can get on that basis, we can get better results.

MR. W. D. SCHOFIELD (Safety Engineer, Inspiration Consolidated Copper Co., Miami Ariz.): Wouldn't it be as well to put it on a basis of per thousand tons mined? If you put it on the per thousand tons mined basis, wouldn't that get away from the amount of time your men are underground. Wouldn't it standardize it?

MR. FAY: Not necessarily. I am handling it both ways.

MR. SCHOFIELD: So are we.

CHAIRMAN TILLSON: Of course, the viewpoint is very common that the hazard is dependent chiefly upon the length of time the man spends under unsafe conditions. He might be standing still, but he would be under that hazard for that length of time.

RESOLUTION FOR APPROPRIATION OF FUNDS FOR DETAILED MINE ACCIDENT
STATISTICS

MR. R. H. SEIP (New Jersey Zinc Co., Franklin, N. J.): I will make that motion as you stated it, or as you suggested: That the Mining Section of the National Safety Council recommend to the director of the Bureau of Mines that sufficient money be appropriated to provide means

for securing from all the states more detailed mine-accident statistics, for the benefit of the mining profession and industry.

MR. FAY: May I add to that, utilization of standardization?

(The motion was seconded by Mr. Gidley and unanimously carried, and Mr. Shearman, the Secretary, was instructed to see that a notification of the above motion be sent to Mr. Manning, Director of the Bureau of Mines.)

Adjournment.

FRIDAY MORNING SESSION

THE meeting was called to order at 9:30 A. M., Mr. B. F. Tillson presiding.

CHAIRMAN TILLSON: Mr. M. W. Price is on the program for the first paper. He is not present, so I thought it might be wise for us to ask Dr. Knoefel, who is to present Mr. D. J. Parker's paper, to present that first, although in some ways it is unwise to vary from the program. I haven't had any word as to whether or not Mr. Price is coming.

DR. AUGUST F. KNOEFEL (U. S. Bureau of Mines, Terre Haute, Ind.): Mr. Parker asked me to present his regrets at his inability to be here. As you all know, there has this week been held a dedication of the Bureau of Mines, and as there are some two hundred Mine Bureau men in the field, situated throughout the country, these various men, mining engineers, car foremen, etc., have been called in for the dedication, and now that they are in, they are holding their annual conference. It was impossible for Mr. Parker to get away, as he is the mining engineer at the head of safety. He asked me to represent the U. S. Bureau of Mines and present this paper.

THE DESIRABILITY FOR STANDARDIZING MINE RESCUE TRAINING AND PLAN FOR STANDARDIZATION

D. J. PARKER, MINE SAFETY ENGINEER, U. S. BUREAU OF MINES EXPERIMENT STATION, PITTSBURGH, PA.

The modern mine rescue breathing apparatus is a self-contained device, the function of which is to permit the wearer to penetrate irrespirable gases formed by mine fires or mine explosions.

There are several types of breathing apparatus, one of which depends on liquid air for the breathing supply, a second depends upon the generation of oxygen from a chemical compound, a third depends upon normal air under pressure, and a fourth, which is most widely known in America, depends upon pure oxygen under high pressure for its air supply.

The history of breathing apparatus dates from the year 1868, when a device was used similar to the submarine diver's helmet. Practically all succeeding forms were built along similar lines until 1896, when the present portable self-contained type was devised and used abroad. The first self-contained apparatus to be used in the United States were four

sets imported in 1907 by the Anaconda Copper Mining Company of Butte, Montana. In September, 1908, breathing apparatus was purchased by the Technologic Branch of the United States Geological Survey, for use in mine rescue and recovery work, which at that time was in charge of that branch.

Today the Bureau of Mines has ten rescue cars, five rescue trucks, and eight safety stations distributed throughout the mining regions of the United States, equipped with some 300 complete sets of such apparatus, while several thousand sets are owned by State mining departments and mining companies having rescue crews trained in their use.

Breathing apparatus may be divided into two types as regards the length of time the apparatus will furnish pure air on one charging; these are the half-hour type, principally used on vessels or where men are only exposed to dangerous atmospheres for short periods of time, and the two-hour type which is the kind used in mines. In mine rescue and recovery work the apparatus wearer may have to travel considerable distances from his base and two hours has been adopted as the maximum period of service compatible with lightness and convenience of portability. Only the two-hour type is considered in this paper.

In the United States there has been a steady growth in the use of breathing apparatus by the mining industry. As with many other new devices when they first appear mine operators and owners were at first decidedly skeptical as to the merits of the apparatus. However, owing to the progressive spirit of numerous operators, both coal and metal, the ingenuity of apparatus manufacturers, and persistent effort of the Bureau of Mines, a more intelligent understanding of the use and limitations of the apparatus has been attained.

As a result of the combined efforts of those appreciating the necessity for such a device for safely penetrating noxious atmospheres, a tremendous impetus has been given to its use in the mining industry, especially within the last three or four years.

I believe that all of you will agree that the apparatus occupies an essential and permanent position in the mining industry, so it does not seem necessary at this time to point out instances where lives have been saved directly by the use of the apparatus, or to give even approximately the figures showing the value of the vast amount of property saved to the nation annually.

Today there is not a mining district in the United States that cannot on short notice in time of disaster obtain the services of trained men equipped with apparatus either from State or privately owned rescue stations or from the Bureau of Mines. Most of the larger companies also have rescue equipment and organized safety crews.

STANDARDIZATION OF TRAINING METHODS

On account of the constantly increasing demand for apparatus training, the Bureau of Mines has for some time appreciated the necessity for a standardized course of such training.

Thorough and systematic training are essential to insure the safe

and economic use of the apparatus. Such training can best be insured through standardization of training methods. As a result of a standardized course, it is believed that more attention will be paid to the selection of the proper type of men for rescue crews, efficiency will be increased, and higher appreciation of the value of the apparatus will result.

The reasons for standardization are, in fact, so obvious that it hardly seems necessary to dwell further on this phase of the subject. It might be mentioned, however, that there are two essential reasons, in addition to those already mentioned, for such standardization.

(1) It is the policy of the Bureau of Mines, upon request, to give a thorough examination to men trained either at privately or State-owned rescue stations, with a view of qualifying them for mine rescue certificates issued by the Federal Government. A standard course of training would most assuredly be tremendously advantageous to both the examiner and the examined.

(2) Trained men going from one mine to another mine would be decidedly at a disadvantage when called upon to wear apparatus, assuming that the men at each mine had received a different course of instruction. This would hold true even though their training had been with the same type of apparatus. As an illustration, it has been known to occur that where one instructor would require the evacuation of the apparatus of all normal air, another would require the inflation of the breathing bag with exhaled air, while another would permit the wearer to don the same type of apparatus containing normal air. Such diversity of instruction may result in serious difficulty for the wearer.

THE PLAN

It is believed that a course similar to that pursued by the Bureau of Mines in the standardization of first-aid instruction should be followed in this case, i. e., by the wide dissemination of a publication on the subject.

I will now attempt, without going into details, to give a few of the fundamental principles that might form a basis for such a publication.

On account of the extremely hazardous work of wearing rescue apparatus in deadly atmospheres, too much attention cannot be given to the selection of an apparatus and the training of the wearer.

Many of us are inclined to think of a course in apparatus training as so many hours under oxygen in an irrespirable atmosphere. In reality, this phase of the course, though essential, is second in importance to a thorough and scientific knowledge of the use and the mechanical and physiological limitations of the apparatus.

No one should be accepted for training without first receiving a thorough physical examination by a competent physician or surgeon.

The length of the course should not be less than five periods of four hours each. At least eight hours should be spent under oxygen and in an irrespirable atmosphere. Wherever possible the apparatus work should be given underground. The course should include standard lectures on each of the several types of apparatus now in use in this country. Such

lectures should dwell at length on the various tests of the apparatus, in order that the wearer may know to a certainty that his apparatus is functioning properly before entering a zone of poisonous gases. A person to be skilled in the use of apparatus should not only have a thorough knowledge of the use and care of the apparatus and oxygen pump, but he must also have a working knowledge of mine gases, that is, he should be familiar with their methods of occurrence, physical properties, effects on man, and methods of testing for their presence, particularly those gases encountered after mine fires and explosions. Knowledge of at least two types of flame safety lamps is desirable on the part of the apparatus man trained for work in coal mines. This is not so essential in the training of metal miners. The standardized course should specify the purity and method of manufacture of oxygen to be used in the apparatus. Oxygen manufactured by the electrolytic process may contain a certain percentage of hydrogen. The Bureau of Mines has, therefore, tentatively specified to manufacturers who supply oxygen for use in mine rescue apparatus, that the oxygen shall not contain more than 2.5 per cent nitrogen nor more than 0.2 per cent hydrogen. Also the purity of the regenerating material should be specified.

In addition, the course should deal at some length with the method of procedure following mine fires and explosions, including the duties of the captain of the rescue squad.

Publication regarding such course of standardization is now contemplated by the Bureau of Mines.

The necessity for such standardization is now, I believe, universally recognized among the manufacturers and users of breathing apparatus: by the whole-hearted cooperation of apparatus manufacturers, safety engineers, and the mining public such standardized training will be established and oxygen-breathing apparatus made a safer and more efficient agent for the help of mine owner and miner in times of trouble and disaster.

CHAIRMAN TILLSON: Gentlemen, we are indebted to Dr. Knoefel for presenting this paper, and we shall be pleased to have active discussion of the points raised in it, or any other points which come to your mind in regard to the method of rescue contest which you saw take place at Pittsburgh, which probably would bring to mind any features which it might be advisable to try to improve upon, if such were possible.

DISCUSSION

PROF. R. M. RAYMOND (Columbia University, New York City): I would like to know if any here have used or heard of some one who has made use of the Gibbs apparatus. This has been found very valuable by the Bureau of Mines.

(Some one suggested that John L. Boardman, of Butte, was familiar with all the different kinds of apparatus. Mr. Boardman was not present at this time, but was sent for.)

MR. G. B. SOUTHWARD (West Virginia Coke & Coal Co., Elkins, W. Va.): While we are waiting for Mr. Boardman, there is just one point that Mr.

Parker's paper did not bring out. It seems to me that it is very important in mine-rescue training to have a recurrence of training possibly every six months. I took the training two years ago, and haven't had on a helmet since. If I had to use one today, I wouldn't know how. I think it is a very important point to be considered.

CHAIRMAN TILLSON: I think your point is very well taken, Mr. Southward. I have heard it expressed before.

MR. OSCAR A. DINGMAN (East Butte Copper Mining Co., Butte, Mont.): I might say, before Mr. Boardman gets here, that he is in charge of the party and he does most of the mine-rescue work and first-aid work in Butte. It is handled through the A. C. M., and all of the other companies follow what the A. C. M. does. This paper given here has been carried out practically to the letter.

(Mr. Boardman entered the room.)

CHAIRMAN TILLSON: Mr. Boardman, I don't know whether you have had a chance to read Mr. Parker's paper or not, but it seems as if everybody wants to hear from you in regard to Gibbs vs. Draeger apparatus.

MR. N. D. HUBBELL (W. J. Rainey, Uniontown, Pa.): We started out with the Fleuss, not the Draeger apparatus. We first picked the Fleuss as superior to the Draeger. Now we have taken the Gibbs on account of the fact that the oxygen supply is automatic. In the second place, all the apparatus is on the man's back, and in crawling over a fall of slate, getting through a comparatively small opening, it is desirable that the man have nothing on his chest that could in any way compress or shut off his breathing. You take a soft breathing bag on his chest and it is quite likely to become compressed so he is not getting a proper supply through it. The Gibbs has everything on the back and for that reason we chose the Gibbs. It is true that the Fleuss and the Draeger have a continuous flow of oxygen that has to be adjusted by the wearer. We figured that the wearer had enough on his mind without worrying about whether his oxygen supply was used up or not.

TYPES OF MINE RESCUE APPARATUS

MR. JOHN L. BOARDMAN (Anaconda Copper Mining Company, Butte): Unfortunately, I did not hear the paper, but Mr. Dingman informed me of some of the points in the paper.

In regard to the question just brought up with reference to the Gibbs as against the Draeger, I think that there is no comparison at all between the new type Gibbs and Paul and the Draeger machines, all the points being in favor of the Gibbs and Paul types for the reason that such types of machines as Draeger, Fleuss, Westphalia, and the so-called constant-feed machines are now rapidly becoming obsolete. The reason for that is that this type of apparatus gives a constant feed of from two to three or four liters of oxygen per minute. We have records of cases where a man might use as high as six liters of oxygen under certain circumstances.

The machines are now provided with a by-pass, but the by-pass always makes it necessary for the man to manipulate the machine in addition

to the work he is doing. As opposed to that machine, we have the Gibbs and Paul types, which feed the oxygen only as the man requires it. These machines have a reducing valve which reduces the oxygen pressure so that it can be easily handled by means of an admission valve.

This admission valve is controlled by the volume of oxygen in the breathing bag, so that when the breathing bag becomes partially empty, the valve admits more oxygen into the bag. This type of machine will undoubtedly take the place of all constant-feed machines within the next few months, depending, of course, upon the desire of different companies to change over from one type to another.

We have found in Butte that it is absolutely necessary that a man should take a physician's examination before he is even admitted to take mine-rescue training. Following this line of procedure, we have done more actual work with breathing apparatus in Butte in the last three years than has been done in all the rest of the United States put together, and we have lost but one man wearing breathing apparatus. We have saved quite a number of lives by taking men out of places imprisoned by gas.

In the case of the one man that was lost, since he is not here to tell us what happened, we don't know exactly, but here is what I suspect: The man was wearing a half-hour Draeger machine. He had been trained to wear both the half-hour and the two-hour Draeger types. In the two-hour Draeger type, our men are taught to inflate the breathing bag before they enter the gas. That, of course, is to give them a residual air which permits them to go immediately to work. This man knew better than to inflate the bag of the half-hour machine, but it is just presumed that he mechanically inflated the bag of the half-hour as he would the two-hour machine, and the result was that his bag was full of oxygen. He had been taught not to open the oxygen valve until the bag became flat.

You understand, in the half-hour machine, the valve must be manipulated by hand. It appears, from investigation of the accident, that this man went in alone, contrary to the orders of the boss, and walked perfectly straight for about 200 feet into the drift. He did about five minutes' work and he had used about five minutes of oxygen out of his cylinder.

He evidently then got weak or nervous and started to retrace his steps. He walked perfectly straight until he got within twenty feet of the fresh air and then fell and died. We found the man lying face down with nose clip in place, the oxygen feed turned off and no gas of any kind in the breathing bag. Death was due to lack of oxygen.

The theory that bears this supposition out is that a man inhaling and exhaling his own breath through a regenerating can, as a caustic soda can, has no desire to breathe. Respiration is caused by the irritation of carbon dioxide on the nervous system of the lungs, the respiratory nerves, and the air that this man was breathing was going in and out of the bag through the regenerator and there was no carbon dioxide, no irritation on the lung nerves. The man had no indication of distress at all. He felt

perfectly normal until the oxygen became so low that he simply collapsed, and then didn't even have strength enough to take off the nose clip. Had this man done a similar amount of work without an oxygen apparatus he never would have become unconscious.

We are making that statement from analysis of gas later which was not very strong, non-poisonous, and had enough oxygen to keep him alive for considerable longer time than he was in there.

STANDARDIZING TRAINING OF THE MEN

In regard to standardizing training, I mentioned the doctor's examination. That is the most necessary thing in beginning to train a man in mine-rescue work. We find in giving mine-rescue training that it is necessary to train about three hundred men to get from sixty to eighty good mine rescuers. The mine-rescue man has to have a mixture of several very good qualifications.

First, he must not be too large. He shouldn't weigh over 180 pounds, although there are some heavy men who are good men. He shouldn't weigh less than 130. He should be given at least a six-day course in the use and care of the machine, as a preliminary course only, and, if possible, three days of these six should be spent in actual mine-rescue work with a trained crew. We find that we get better results by giving a man three days' training in fresh air or in a smoke room and then sending him down with the regular crew to do regular mine work. We have a larger percentage of our men turn out to be good rescue men than by giving the six-day course of training without actual work, and then letting them go for a while.

The mine-rescue man has to have considerable nerve at times, although he will acquire this quality if he has a good crew with him. By all means a mine-rescue man should be almost absolutely unexcitable, under any circumstances, because there are exciting circumstances which will come up from time to time and if he is of excitable nature, he is likely to cause the crew some difficulty.

Unless a mine-rescue man, after he has received the six-day training, is put in service, he should be given one-half day or two full hours at least in the smoke room and two hours' instruction at least every three months. I should say that the longer period of inactivity would not do.

If I understand the paper correctly, the intent is to standardize mine-rescue training throughout the United States. I think that is a remarkably good idea. At the time of our North Butte fire, I presume we had twenty-five or thirty men apply at the gate for service as helmet men who had Bureau of Mines certificates. To my personal knowledge, in the early days of the Bureau of Mines, men have received certificates with one day's training, others with two days' and so on up to six. This is not a criticism on the Bureau of Mines, but more or less criticism on the impossibility of doing the work properly at that time. These men had the same certificates as men trained later by the bureau who had the full six-day course, and we had no way of telling how fit the man was.

The result was that we hired a number of men who worked two or three hours and backed out.

Personally, I believe it would be a good idea to train every man in the United States who takes up this work with exactly the same hours of training and make this ample, so that when the man leaves one camp and goes to another, this certificate would mean that that man could be relied on as a good mine-rescue man. Otherwise, we are going to have a good deal of trouble.

If a man comes out and applies for mine-rescue work in a time of disaster, it is necessary that we hire him. If he is not what his certificate represents him to be, there is a chance that he will be killed, or cause the death of some one else by being inefficient. In Butte, we are willing to cooperate with the Bureau of Mines in giving any standard course of training that they may prescribe, reserving, of course, the right to add other training to fit the man for our own peculiar needs.

I think that is about all the discussion I can give on the paper, since I haven't read it. If there are any questions about what we are doing in Butte, I should be glad to answer them.

CHAIRMAN TILLSON: We appreciate your discussion and interest, and later in the session this morning you may have a chance to glance through that paper and any further comments that come up may be brought up later.

MINE-RESCUE BONUSES

MR. N. D. HUBBELL (W. J. Rainey, Uniontown, Pa.): There is one question I would like to ask Mr. Boardman. We are rather new in mine-rescue work. We are using it for coal mines and the question has come up as to whether or not we will pay our men a set bonus or a percentage bonus of their wages, just on account of the fact that they are qualified mine-rescue men. Our men are doing other work all the time. Some are minor officials. The question comes up whether we shall pay them extra for doing their regular work merely because they are qualified as mine-rescue men, the idea being, of course, that if they did not report for mine-rescue drill once in three months or once a month on first aid, they would likely not be fit.

MR. BOARDMAN: All I can do is to tell you what we do in Butte. During the war we had twenty-eight operating mines and some of the foremen were very lax in their interest in mine-rescue work, so I asked the general superintendent to attempt to systematize the work, and we got it done in this way: All mines employing 100 men or less are required to keep a trained crew of five men working in that mine. They may work at anything that the mine affords for them to do. Mines employing over 100 men maintain a crew of ten men or more. Some of them have as high as sixty, but ten are required. These men are paid their regular wages for the time occupied in taking mine-rescue training. They are not supposed to be paid for taking first-aid training.

As soon as a man completes his training, he is given an additional duty which we call a "fire bug." He might be a repair man in the mine or work at any regular work. The other men might go to work at 8 in the

morning while he goes to work at 9. Then he acts as "fire bug" from 4 to 5. He goes through the mine on regular beats and looks for fire. He works eight hours, coming in an hour later and going home an hour later, but he is paid 50 cents extra. That has been recently raised to 75 cents. We recognize our helmet men in that way, by giving them an eight-hour shift with 75 cents extra pay, and the station men are to report a man to the regular timekeeper when he shows up for regular mine-rescue training.

We have about three hundred men drawing such mine-rescue bonuses and we have an additional three hundred, approximately, waiting for positions on the fire-bug crew. You see it will operate in this way: A man desiring that extra money will ask the foreman if he can take mine-rescue training, so he can fill in.

CHAIRMAN TILLSON: Mr. Boardman, there is one question that came to my mind and that is as to what number of rescue apparatus in your experience you consider the minimum which should be on hand for use, the number of outfits?

MINIMUM NUMBER OF SETS OF RESCUE APPARATUS

MR. BOARDMAN: I shouldn't have any equipment with less than four sets, and that is a very small number. The reason for that is that in any mine-rescue crew, working in a tunnel or mine filled with smoke or gas, a man is likely to stub his toe and fall down a hole, or a rock may fall on him and temporarily put him out of commission. That leaves only three to get him out to fresh air and if any of you men have had any experience in taking a man out of a mine, you will agree that three is about the minimum that can be used, especially if the man is delirious.

MR. SEIP: I think, Mr. Boardman, what Mr. Tillson means is where you don't have any other equipment available at short notice. I know that is the way we are situated and we would have to depend entirely, probably the first day, on our own equipment, and therefore I believe it is desirable to have enough for two crews of a minimum of four men, and preferably five.

MR. ORR WOODBURN (Globe-Miami District, Globe, Ariz.): It is rather terrifying to have to wait for one crew to go in and wait for possibly two hours, even though you have a crew waiting at the fresh-air base. We have taken care of it by pooling our equipment. The various companies of the district had twenty sets of equipment, so we have now pooled our interests on mine rescue and first aid, thereby giving each company three times the equipment available. Where there are several companies near each other, I think arrangements should be made to pool their equipment.

MR. BOARDMAN: In reply to the first question, I stated that four machines would be the absolute minimum in any installation. I agree with you if you are going to put any equipment in a remote place (and by all means get a power-driven pump, don't depend on the hand pump) you should have more equipment.

In regard to Mr. Woodburn's statement, I think he has touched upon a

very vital point. Recently, I was called upon to leave Butte and take some mine-rescue men with me and put out a fire in another mine in Idaho, a distance of about 200 or 300 miles from Butte. When we got over there we found them with nine sets of apparatus. Two of these were purchased in 1916 and had never been taken out of the packing cases. Their experience was something like this:

They put seven sets of machines on seven men, of course, and asked these men to go 1,200 feet through the gas in a drift to play a hose on a fire at the bottom of a raise. These men got in varying distances of 100 feet to 400 feet from the fire and were overcome. Other men rushed in and helped them out, put them to bed and took the apparatus, re-tested and recharged it—or thought they did—and sent in five other men.

Three of these five succeeded in getting the hose to the fire, but the others dropped along the way. They didn't get the nozzle of the hose pointed right, and two more became unconscious. The man remaining conscious dragged them 1,000 feet before he fell. Fortunately, they got them all out.

When we got down there, we found by using the bags we took from Butte, and tearing down all their apparatus, we were able to get two good machines out of their nine. Taking the three we brought from Butte with us, we had five good machines. I am only telling you this as an illustration of what might happen if you put in four sets instead of twenty, or don't keep in good condition the apparatus installed.

Up in Butte, we have 65 machines in condition to operate at all times. We have a total of about 70 machines, or 72, I think. Of course, we are figuring on 5 or 6 of these being in the shop. That gives us a constant equipment of about 65 machines. That is just the one company. The Butte Superior Black Rock mine has 12; East Butte has 6; North Butte has 8. You see we have over 100 machines in Butte.

In Butte the A. C. M. has two rescue stations and we have a man at each of the stations on each of the eight-hour shifts who does nothing else but repair machines and give them out and take them in when being used. It is criminal to put in mine-rescue equipment without making it the duty of some one to keep it in shape.

The machines should be inspected and reported on every week. Each machine we have goes on this report once a week.

CHAIRMAN TILLSON: Mr. Boardman, may I ask whether a copy of such a report can be included in the minutes? I think it would be of value as a matter of public interest. [See page 864.]

MR. WOODBURN: Mr. Boardman says to make it somebody's duty to inspect the apparatus. I happen to be one of those men whose duty it was to inspect apparatus. Of course, I had other duties and most of my time was being spent on these other duties. It is very easy to neglect this inspection. You may go in and look over the equipment, but unless you get out the things and wrestle with them and wear them, you won't be able to discover the trouble that may develop. I have had machines that would hold up fine on the weekly test, and the first time we would go out, something would go wrong.

respect to the condition of apparatus as sent out by the manufacturer. The development of mine-rescue work in the United States, as you all know, has been a development first of importation up until the war broke out, and practically all of the apparatus that was used in the United States prior to the war was made either in England or in Germany. The manufacturers, or rather the distributor, in those days had to depend very largely upon the exigencies of transportation from foreign countries to obtain rubber parts and they were, therefore, not able to know how long such equipment had been in stock prior to shipment. There were times, possibly, when parts that were distributed by the particular company with which I was affiliated at that time were in stock six months. I doubt if there were any of the parts that remained in stock longer than that in our own warerooms, but that does not say how long they might have remained in stock before they were shipped to us.

In the early days of manufacture in the United States, it was largely a matter of necessity, due to the conditions brought about by the war (at least so far as that company in which I am interested is concerned) to depend upon other companies to manufacture some of the parts and to have them assembled in our own plant. During those days it was almost impossible quickly to equip a manufacturing company for a work so entirely new in the United States, because it was a new industry and no one in the United States knew a great deal about the manufacturing of such apparatus.

The time has now come, however, when the manufacturers—I think it can safely be said—are getting their organizations more perfected; they are making the parts themselves—at least our company is. We manufacture practically all of the parts, buy the raw rubber in sheets, make the breathing bags and such other material needed in the construction of the apparatus, the same being true of many metal parts. Gauges and castings are purchased, and small stocks of parts are kept to meet the immediate requirements of the users of the apparatus.

I believe that within a very short time the condition that Mr. Reed has mentioned will largely be overcome. I think the suggestion he has made in regard to the dating of the parts when manufactured is an excellent one and I want to say that I will put that into effect within a very short time, practically immediately. I think the idea is an excellent one and I am thoroughly in accord with it.

CENTRAL RESCUE STATIONS

I would like to make a comment on a subject that was brought up a few minutes ago by Mr. Woodburn. I think it is one worthy of consideration. As distributors of apparatus, our company has at times run across the situation that small coal companies or mining companies of any kind find the investment in a rescue station a somewhat large one for the one company and occasionally a pooling of the interests of several companies in a certain district has resulted in a central rescue station. There are, I think, possibly a half dozen, so far as my knowledge carries me, that have been entirely successful in installing central rescue stations,

respect to the condition of apparatus as sent out by the manufacturer. The development of mine-rescue work in the United States, as you all know, has been a development first of importation up until the war broke out, and practically all of the apparatus that was used in the United States prior to the war was made either in England or in Germany. The manufacturers, or rather the distributor, in those days had to depend very largely upon the exigencies of transportation from foreign countries to obtain rubber parts and they were, therefore, not able to know how long such equipment had been in stock prior to shipment. There were times, possibly, when parts that were distributed by the particular company with which I was affiliated at that time were in stock six months. I doubt if there were any of the parts that remained in stock longer than that in our own warerooms, but that does not say how long they might have remained in stock before they were shipped to us.

In the early days of manufacture in the United States, it was largely a matter of necessity, due to the conditions brought about by the war (at least so far as that company in which I am interested is concerned) to depend upon other companies to manufacture some of the parts and to have them assembled in our own plant. During those days it was almost impossible quickly to equip a manufacturing company for a work so entirely new in the United States, because it was a new industry and no one in the United States knew a great deal about the manufacturing of such apparatus.

The time has now come, however, when the manufacturers—I think it can safely be said—are getting their organizations more perfected; they are making the parts themselves—at least our company is. We manufacture practically all of the parts, buy the raw rubber in sheets, make the breathing bags and such other material needed in the construction of the apparatus, the same being true of many metal parts. Gauges and castings are purchased, and small stocks of parts are kept to meet the immediate requirements of the users of the apparatus.

I believe that within a very short time the condition that Mr. Reed has mentioned will largely be overcome. I think the suggestion he has made in regard to the dating of the parts when manufactured is an excellent one and I want to say that I will put that into effect within a very short time, practically immediately. I think the idea is an excellent one and I am thoroughly in accord with it.

CENTRAL RESCUE STATIONS

I would like to make a comment on a subject that was brought up a few minutes ago by Mr. Woodburn. I think it is one worthy of consideration. As distributors of apparatus, our company has at times run across the situation that small coal companies or mining companies of any kind find the investment in a rescue station a somewhat large one for the one company and occasionally a pooling of the interests of several companies in a certain district has resulted in a central rescue station. There are, I think, possibly a half dozen, so far as my knowledge carries me, that have been entirely successful in installing central rescue stations,

respect to the condition of apparatus as sent out by the manufacturer. The development of mine-rescue work in the United States, as you all know, has been a development first of importation up until the war broke out, and practically all of the apparatus that was used in the United States prior to the war was made either in England or in Germany. The manufacturers, or rather the distributor, in those days had to depend very largely upon the exigencies of transportation from foreign countries to obtain rubber parts and they were, therefore, not able to know how long such equipment had been in stock prior to shipment. There were times, possibly, when parts that were distributed by the particular company with which I was affiliated at that time were in stock six months. I doubt if there were any of the parts that remained in stock longer than that in our own warerooms, but that does not say how long they might have remained in stock before they were shipped to us.

In the early days of manufacture in the United States, it was largely a matter of necessity, due to the conditions brought about by the war (at least so far as that company in which I am interested is concerned) to depend upon other companies to manufacture some of the parts and to have them assembled in our own plant. During those days it was almost impossible quickly to equip a manufacturing company for a work so entirely new in the United States, because it was a new industry and no one in the United States knew a great deal about the manufacturing of such apparatus.

The time has now come, however, when the manufacturers—I think it can safely be said—are getting their organizations more perfected; they are making the parts themselves—at least our company is. We manufacture practically all of the parts, buy the raw rubber in sheets, make the breathing bags and such other material needed in the construction of the apparatus, the same being true of many metal parts. Gauges and castings are purchased, and small stocks of parts are kept to meet the immediate requirements of the users of the apparatus.

I believe that within a very short time the condition that Mr. Reed has mentioned will largely be overcome. I think the suggestion he has made in regard to the dating of the parts when manufactured is an excellent one and I want to say that I will put that into effect within a very short time, practically immediately. I think the idea is an excellent one and I am thoroughly in accord with it.

CENTRAL RESCUE STATIONS

I would like to make a comment on a subject that was brought up a few minutes ago by Mr. Woodburn. I think it is one worthy of consideration. As distributors of apparatus, our company has at times run across the situation that small coal companies or mining companies of any kind find the investment in a rescue station a somewhat large one for the one company and occasionally a pooling of the interests of several companies in a certain district has resulted in a central rescue station. There are, I think, possibly a half dozen, so far as my knowledge carries me, that have been entirely successful in installing central rescue stations,

stations is one that has been put up by a few small independent operators who have pooled their interests and although we haven't any definite agreement so far as pooling goes, still there is the ordinary courtesy, and if anybody is in trouble, we all turn out with all of our apparatus. Three of the companies are equipped with Gibbs and we would have a fairly uniform set of apparatus if each station were to turn out the full set of ten apparatuses, and there would be at least twenty-five trained men, the idea being that you could get your own team in and have a crew of five on the outside until more arrive. We are going along that line, keeping one man on the outside with a helmet on for every man who is inside.

DATE OF MANUFACTURE

J. W. REED (Consolidated Coal Company, Fairmont, W. Va.): In regard to repairs of rubber portions, I think we overlook one point. We are all considering proper care of the apparatus after we receive it, and I think there is a very big point to be made in the care of the apparatus on the part of the company from whom you purchase it. I feel that they also should use the same precautions to see that the rubber portions that are furnished to the various companies on their orders are in good condition and comparatively new. Along that line I feel that it is going to be necessary at some time to require of manufacturers of breathing apparatus that the same shall be stamped and marked with the date of manufacture. Then when you purchase a thing you will have some idea of the age of it when you get it. In other words, if you purchase a breathing bag and expect to get twelve months' service out of it, and it has been in stock six months, you are purchasing defective material.

The system that we are working out is not to purchase in large quantities, but to arrange a schedule whereby all the apparatus we have on hand will have the rubber portions renewed on a certain schedule which will be approximately the same length as the life of the rubber portions and to stretch that out over the number of sets of apparatus. In other words, where there are a half dozen sets of apparatus in a small station, the rubber portions would be ordered every six months or every two months, so that in a year's time we would have new rubber portions for each of those sets of apparatus, and the other rubber parts would be thrown out after the length of service which we consider would be safe for a breathing bag.

We haven't as yet arrived at exact figures on that, but we feel from ordinary experience around laboratories, etc., on rubber, that it never has a life of over two years. Safe life on that will probably not be over a maximum of fifteen months, but I feel that we should know something about the material when we purchase it, and I would like the opinion of some of the others as to whether they should be required to date the rubber parts on manufacture. I believe that the companies perhaps would install a system of that kind if it was suggested by most of the users of the apparatus or practically demanded by them.

Mr. F. F. MORRIS (American Atmos Corporation, Pittsburgh): I assume that it might be apropos for me to add a word to Mr. Reed's comment in

stations is one that has been put up by a few small independent operators who have pooled their interests and although we haven't any definite agreement so far as pooling goes, still there is the ordinary courtesy, and if anybody is in trouble, we all turn out with all of our apparatus. Three of the companies are equipped with Gibbs and we would have a fairly uniform set of apparatus if each station were to turn out the full set of ten apparatuses, and there would be at least twenty-five trained men, the idea being that you could get your own team in and have a crew of five on the outside until more arrive. We are going along that line, keeping one man on the outside with a helmet on for every man who is inside.

DATE OF MANUFACTURE

J. W. REED (Consolidated Coal Company, Fairmont, W. Va.): In regard to repairs of rubber portions, I think we overlook one point. We are all considering proper care of the apparatus after we receive it, and I think there is a very big point to be made in the care of the apparatus on the part of the company from whom you purchase it. I feel that they also should use the same precautions to see that the rubber portions that are furnished to the various companies on their orders are in good condition and comparatively new. Along that line I feel that it is going to be necessary at some time to require of manufacturers of breathing apparatus that the same shall be stamped and marked with the date of manufacture. Then when you purchase a thing you will have some idea of the age of it when you get it. In other words, if you purchase a breathing bag and expect to get twelve months' service out of it, and it has been in stock six months, you are purchasing defective material.

The system that we are working out is not to purchase in large quantities, but to arrange a schedule whereby all the apparatus we have on hand will have the rubber portions renewed on a certain schedule which will be approximately the same length as the life of the rubber portions and to stretch that out over the number of sets of apparatus. In other words, where there are a half dozen sets of apparatus in a small station, the rubber portions would be ordered every six months or every two months, so that in a year's time we would have new rubber portions for each of those sets of apparatus, and the other rubber parts would be thrown out after the length of service which we consider would be safe for a breathing bag.

We haven't as yet arrived at exact figures on that, but we feel from ordinary experience around laboratories, etc., on rubber, that it never has a life of over two years. Safe life on that will probably not be over a maximum of fifteen months, but I feel that we should know something about the material when we purchase it, and I would like the opinion of some of the others as to whether they should be required to date the rubber parts on manufacture. I believe that the companies perhaps would install a system of that kind if it was suggested by most of the users of the apparatus or practically demanded by them.

MR. F. F. MORRIS (American Atmos Corporation, Pittsburgh): I assume that it might be apropos for me to add a word to Mr. Reed's comment in

stations is one that has been put up by a few small independent operators who have pooled their interests and although we haven't any definite agreement so far as pooling goes, still there is the ordinary courtesy, and if anybody is in trouble, we all turn out with all of our apparatus. Three of the companies are equipped with Gibbs and we would have a fairly uniform set of apparatus if each station were to turn out the full set of ten apparatuses, and there would be at least twenty-five trained men, the idea being that you could get your own team in and have a crew of five on the outside until more arrive. We are going along that line, keeping one man on the outside with a helmet on for every man who is inside.

DATE OF MANUFACTURE

J. W. REED (Consolidated Coal Company, Fairmont, W. Va.): In regard to repairs of rubber portions, I think we overlook one point. We are all considering proper care of the apparatus after we receive it, and I think there is a very big point to be made in the care of the apparatus on the part of the company from whom you purchase it. I feel that they also should use the same precautions to see that the rubber portions that are furnished to the various companies on their orders are in good condition and comparatively new. Along that line I feel that it is going to be necessary at some time to require of manufacturers of breathing apparatus that the same shall be stamped and marked with the date of manufacture. Then when you purchase a thing you will have some idea of the age of it when you get it. In other words, if you purchase a breathing bag and expect to get twelve months' service out of it, and it has been in stock six months, you are purchasing defective material.

The system that we are working out is not to purchase in large quantities, but to arrange a schedule whereby all the apparatus we have on hand will have the rubber portions renewed on a certain schedule which will be approximately the same length as the life of the rubber portions and to stretch that out over the number of sets of apparatus. In other words, where there are a half dozen sets of apparatus in a small station, the rubber portions would be ordered every six months or every two months, so that in a year's time we would have new rubber portions for each of those sets of apparatus, and the other rubber parts would be thrown out after the length of service which we consider would be safe for a breathing bag.

We haven't as yet arrived at exact figures on that, but we feel from ordinary experience around laboratories, etc., on rubber, that it never has a life of over two years. Safe life on that will probably not be over a maximum of fifteen months, but I feel that we should know something about the material when we purchase it, and I would like the opinion of some of the others as to whether they should be required to date the rubber parts on manufacture. I believe that the companies perhaps would install a system of that kind if it was suggested by most of the users of the apparatus or practically demanded by them.

MR. F. F. MORRIS (American Atmos Corporation, Pittsburgh): I assume that it might be apropos for me to add a word to Mr. Reed's comment in

stations is one that has been put up by a few small independent operators who have pooled their interests and although we haven't any definite agreement so far as pooling goes, still there is the ordinary courtesy, and if anybody is in trouble, we all turn out with all of our apparatus. Three of the companies are equipped with Gibbs and we would have a fairly uniform set of apparatus if each station were to turn out the full set of ten apparatuses, and there would be at least twenty-five trained men, the idea being that you could get your own team in and have a crew of five on the outside until more arrive. We are going along that line, keeping one man on the outside with a helmet on for every man who is inside.

DATE OF MANUFACTURE

J. W. REED (Consolidated Coal Company, Fairmont, W. Va.): In regard to repairs of rubber portions, I think we overlook one point. We are all considering proper care of the apparatus after we receive it, and I think there is a very big point to be made in the care of the apparatus on the part of the company from whom you purchase it. I feel that they also should use the same precautions to see that the rubber portions that are furnished to the various companies on their orders are in good condition and comparatively new. Along that line I feel that it is going to be necessary at some time to require of manufacturers of breathing apparatus that the same shall be stamped and marked with the date of manufacture. Then when you purchase a thing you will have some idea of the age of it when you get it. In other words, if you purchase a breathing bag and expect to get twelve months' service out of it, and it has been in stock six months, you are purchasing defective material.

The system that we are working out is not to purchase in large quantities, but to arrange a schedule whereby all the apparatus we have on hand will have the rubber portions renewed on a certain schedule which will be approximately the same length as the life of the rubber portions and to stretch that out over the number of sets of apparatus. In other words, where there are a half dozen sets of apparatus in a small station, the rubber portions would be ordered every six months or every two months, so that in a year's time we would have new rubber portions for each of those sets of apparatus, and the other rubber parts would be thrown out after the length of service which we consider would be safe for a breathing bag.

We haven't as yet arrived at exact figures on that, but we feel from ordinary experience around laboratories, etc., on rubber, that it never has a life of over two years. Safe life on that will probably not be over a maximum of fifteen months, but I feel that we should know something about the material when we purchase it, and I would like the opinion of some of the others as to whether they should be required to date the rubber parts on manufacture. I believe that the companies perhaps would install a system of that kind if it was suggested by most of the users of the apparatus or practically demanded by them.

MR. F. F. MORRIS (American Atmos Corporation, Pittsburgh): I assume that it might be apropos for me to add a word to Mr. Reed's comment in

stations is one that has been put up by a few small independent operators who have pooled their interests and although we haven't any definite agreement so far as pooling goes, still there is the ordinary courtesy, and if anybody is in trouble, we all turn out with all of our apparatus. Three of the companies are equipped with Gibbs and we would have a fairly uniform set of apparatus if each station were to turn out the full set of ten apparatuses, and there would be at least twenty-five trained men, the idea being that you could get your own team in and have a crew of five on the outside until more arrive. We are going along that line, keeping one man on the outside with a helmet on for every man who is inside.

DATE OF MANUFACTURE

J. W. REED (Consolidated Coal Company, Fairmont, W. Va.): In regard to repairs of rubber portions, I think we overlook one point. We are all considering proper care of the apparatus after we receive it, and I think there is a very big point to be made in the care of the apparatus on the part of the company from whom you purchase it. I feel that they also should use the same precautions to see that the rubber portions that are furnished to the various companies on their orders are in good condition and comparatively new. Along that line I feel that it is going to be necessary at some time to require of manufacturers of breathing apparatus that the same shall be stamped and marked with the date of manufacture. Then when you purchase a thing you will have some idea of the age of it when you get it. In other words, if you purchase a breathing bag and expect to get twelve months' service out of it, and it has been in stock six months, you are purchasing defective material.

The system that we are working out is not to purchase in large quantities, but to arrange a schedule whereby all the apparatus we have on hand will have the rubber portions renewed on a certain schedule which will be approximately the same length as the life of the rubber portions and to stretch that out over the number of sets of apparatus. In other words, where there are a half dozen sets of apparatus in a small station, the rubber portions would be ordered every six months or every two months, so that in a year's time we would have new rubber portions for each of those sets of apparatus, and the other rubber parts would be thrown out after the length of service which we consider would be safe for a breathing bag.

We haven't as yet arrived at exact figures on that, but we feel from ordinary experience around laboratories, etc., on rubber, that it never has a life of over two years. Safe life on that will probably not be over a maximum of fifteen months, but I feel that we should know something about the material when we purchase it, and I would like the opinion of some of the others as to whether they should be required to date the rubber parts on manufacture. I believe that the companies perhaps would install a system of that kind if it was suggested by most of the users of the apparatus or practically demanded by them.

MR. F. F. MORRIS (American Atmos Corporation, Pittsburgh): I assume that it might be apropos for me to add a word to Mr. Reed's comment in

MR. JOSEPH E. WATSON (Timber Butte Milling Company, Butte): Speaking of standardizing methods for the training of mine-rescue men, why not get down to some standard method for the care of apparatus? I know of one case where two sets of Draeger apparatus hung in a mine office over two years without being taken off the nail. One of those two sets of apparatus happened to be included in the nine that Mr. Boardman mentioned in the Idaho fire. If you are going to standardize the training of men for the preservation of their lives and the preservation of property, I believe really we should make some efforts to standardize the care of machines and see that the machines on hand are properly cared for.

MR. GEORGE W. RIGGS (Mine Safety Appliance Co., Pittsburgh, Pa.): It was my duty in the State of Nevada as safety engineer during the six months that I was there to take care of 64 sets of breathing apparatus. We had three kinds, Draeger, Westphalia, and Fleuss. It is a high, dry climate. When I went out there we had to buy considerable repairs. We made a dugout, where we had twenty-four sets. We kept rubber beltings, spare rubber parts for breathing apparatus, etc., in this underground dugout and also gave them a bath in lukewarm water about once a week. In that way we kept the rubber parts up in better shape than before.

MR. HUBBELL: Our idea may not be worth very much—we can't tell how it has worked out, but this is a tentative scheme as to how we are going to handle that particular problem. The room, of course, will have to be kept at living heat and we were afraid that steam heating was going to force some of the humidity out of the air. We have arranged for a metal locker which is air-tight, and we are going to do a little experimental work with some of the rubber parts to arrive at a definite humidity point and keep the locker at that point. I don't know what that will be. We haven't completed our work on it, but are working on it now. That includes just the rubber parts of the apparatus. The other will be stored.

MR. H. G. DAVIS (D. L. & W. Coal Co., Wilkes-Barre, Pa.): The railroad company coal department at their mines in Wyoming Valley in the early part of 1910, if I remember, equipped all their mines with four sets of Draeger apparatus, and also equipped a car called the rescue car with eight more sets, and I found in my experience that the rubber goods on those machines deteriorated very quickly, particularly where steam heat was used for keeping the rescue rooms and other rooms in good condition. We did away with steam heat and equipped the rescue car and stations with stoves, with the result that the rubber goods lasted much longer.

I agree with these gentlemen that four sets of apparatus is not sufficient for any place where there are not four more available. We started out with thirty-two sets. All the parties had four sets each and were within a short distance of each other. The rescue car could be brought into any of the mines in about an hour. I think it is important to have a sufficient number of sets, at least eight; more if possible.

MR. HUBBELL: Along that point, we have ten, but there are four other rescue stations within a radius of twelve or fifteen miles. One of those

MR. JOSEPH E. WATSON (Timber Butte Milling Company, Butte): Speaking of standardizing methods for the training of mine-rescue men, why not get down to some standard method for the care of apparatus? I know of one case where two sets of Draeger apparatus hung in a mine office over two years without being taken off the nail. One of those two sets of apparatus happened to be included in the nine that Mr. Boardman mentioned in the Idaho fire. If you are going to standardize the training of men for the preservation of their lives and the preservation of property, I believe really we should make some efforts to standardize the care of machines and see that the machines on hand are properly cared for.

MR. GEORGE W. RIGGS (Mine Safety Appliance Co., Pittsburgh, Pa.): It was my duty in the State of Nevada as safety engineer during the six months that I was there to take care of 64 sets of breathing apparatus. We had three kinds, Draeger, Westphalia, and Fleuss. It is a high, dry climate. When I went out there we had to buy considerable repairs. We made a dugout, where we had twenty-four sets. We kept rubber beltings, spare rubber parts for breathing apparatus, etc., in this underground dugout and also gave them a bath in lukewarm water about once a week. In that way we kept the rubber parts up in better shape than before.

MR. HUBBELL: Our idea may not be worth very much—we can't tell how it has worked out, but this is a tentative scheme as to how we are going to handle that particular problem. The room, of course, will have to be kept at living heat and we were afraid that steam heating was going to force some of the humidity out of the air. We have arranged for a metal locker which is air-tight, and we are going to do a little experimental work with some of the rubber parts to arrive at a definite humidity point and keep the locker at that point. I don't know what that will be. We haven't completed our work on it, but are working on it now. That includes just the rubber parts of the apparatus. The other will be stored.

MR. H. G. DAVIS (D. L. & W. Coal Co., Wilkes-Barre, Pa.): The railroad company coal department at their mines in Wyoming Valley in the early part of 1910, if I remember, equipped all their mines with four sets of Draeger apparatus, and also equipped a car called the rescue car with eight more sets, and I found in my experience that the rubber goods on those machines deteriorated very quickly, particularly where steam heat was used for keeping the rescue rooms and other rooms in good condition. We did away with steam heat and equipped the rescue car and stations with stoves, with the result that the rubber goods lasted much longer.

I agree with these gentlemen that four sets of apparatus is not sufficient for any place where there are not four more available. We started out with thirty-two sets. All the parties had four sets each and were within a short distance of each other. The rescue car could be brought into any of the mines in about an hour. I think it is important to have a sufficient number of sets, at least eight; more if possible.

MR. HUBBELL: Along that point, we have ten, but there are four other rescue stations within a radius of twelve or fifteen miles. One of those

MR. JOSEPH E. WATSON (Timber Butte Milling Company, Butte): Speaking of standardizing methods for the training of mine-rescue men, why not get down to some standard method for the care of apparatus? I know of one case where two sets of Draeger apparatus hung in a mine office over two years without being taken off the nail. One of those two sets of apparatus happened to be included in the nine that Mr. Boardman mentioned in the Idaho fire. If you are going to standardize the training of men for the preservation of their lives and the preservation of property, I believe really we should make some efforts to standardize the care of machines and see that the machines on hand are properly cared for.

MR. GEORGE W. RIGGS (Mine Safety Appliance Co., Pittsburgh, Pa.): It was my duty in the State of Nevada as safety engineer during the six months that I was there to take care of 64 sets of breathing apparatus. We had three kinds, Draeger, Westphalia, and Fleuss. It is a high, dry climate. When I went out there we had to buy considerable repairs. We made a dugout, where we had twenty-four sets. We kept rubber beltings, spare rubber parts for breathing apparatus, etc., in this underground dugout and also gave them a bath in lukewarm water about once a week. In that way we kept the rubber parts up in better shape than before.

MR. HUBBELL: Our idea may not be worth very much—we can't tell how it has worked out, but this is a tentative scheme as to how we are going to handle that particular problem. The room, of course, will have to be kept at living heat and we were afraid that steam heating was going to force some of the humidity out of the air. We have arranged for a metal locker which is air-tight, and we are going to do a little experimental work with some of the rubber parts to arrive at a definite humidity point and keep the locker at that point. I don't know what that will be. We haven't completed our work on it, but are working on it now. That includes just the rubber parts of the apparatus. The other will be stored.

MR. H. G. DAVIS (D. L. & W. Coal Co., Wilkes-Barre, Pa.): The railroad company coal department at their mines in Wyoming Valley in the early part of 1910, if I remember, equipped all their mines with four sets of Draeger apparatus, and also equipped a car called the rescue car with eight more sets, and I found in my experience that the rubber goods on those machines deteriorated very quickly, particularly where steam heat was used for keeping the rescue rooms and other rooms in good condition. We did away with steam heat and equipped the rescue car and stations with stoves, with the result that the rubber goods lasted much longer.

I agree with these gentlemen that four sets of apparatus is not sufficient for any place where there are not four more available. We started out with thirty-two sets. All the parties had four sets each and were within a short distance of each other. The rescue car could be brought into any of the mines in about an hour. I think it is important to have a sufficient number of sets, at least eight; more if possible.

MR. HUBBELL: Along that point, we have ten, but there are four other rescue stations within a radius of twelve or fifteen miles. One of those

MR. JOSEPH E. WATSON (Timber Butte Milling Company, Butte): Speaking of standardizing methods for the training of mine-rescue men, why not get down to some standard method for the care of apparatus? I know of one case where two sets of Draeger apparatus hung in a mine office over two years without being taken off the nail. One of those two sets of apparatus happened to be included in the nine that Mr. Boardman mentioned in the Idaho fire. If you are going to standardize the training of men for the preservation of their lives and the preservation of property, I believe really we should make some efforts to standardize the care of machines and see that the machines on hand are properly cared for.

MR. GEORGE W. RIGGS (Mine Safety Appliance Co., Pittsburgh, Pa.): It was my duty in the State of Nevada as safety engineer during the six months that I was there to take care of 64 sets of breathing apparatus. We had three kinds, Draeger, Westphalia, and Fleuss. It is a high, dry climate. When I went out there we had to buy considerable repairs. We made a dugout, where we had twenty-four sets. We kept rubber beltings, spare rubber parts for breathing apparatus, etc., in this underground dugout and also gave them a bath in lukewarm water about once a week. In that way we kept the rubber parts up in better shape than before.

MR. HUBBELL: Our idea may not be worth very much—we can't tell how it has worked out, but this is a tentative scheme as to how we are going to handle that particular problem. The room, of course, will have to be kept at living heat and we were afraid that steam heating was going to force some of the humidity out of the air. We have arranged for a metal locker which is air-tight, and we are going to do a little experimental work with some of the rubber parts to arrive at a definite humidity point and keep the locker at that point. I don't know what that will be. We haven't completed our work on it, but are working on it now. That includes just the rubber parts of the apparatus. The other will be stored.

MR. H. G. DAVIS (D. L. & W. Coal Co., Wilkes-Barre, Pa.): The railroad company coal department at their mines in Wyoming Valley in the early part of 1910, if I remember, equipped all their mines with four sets of Draeger apparatus, and also equipped a car called the rescue car with eight more sets, and I found in my experience that the rubber goods on those machines deteriorated very quickly, particularly where steam heat was used for keeping the rescue rooms and other rooms in good condition. We did away with steam heat and equipped the rescue car and stations with stoves, with the result that the rubber goods lasted much longer.

I agree with these gentlemen that four sets of apparatus is not sufficient for any place where there are not four more available. We started out with thirty-two sets. All the parties had four sets each and were within a short distance of each other. The rescue car could be brought into any of the mines in about an hour. I think it is important to have a sufficient number of sets, at least eight; more if possible.

MR. HUBBELL: Along that point, we have ten, but there are four other rescue stations within a radius of twelve or fifteen miles. One of those

MR. JOSEPH E. WATSON (Timber Butte Milling Company, Butte): Speaking of standardizing methods for the training of mine-rescue men, why not get down to some standard method for the care of apparatus? I know of one case where two sets of Draeger apparatus hung in a mine office over two years without being taken off the nail. One of those two sets of apparatus happened to be included in the nine that Mr. Boardman mentioned in the Idaho fire. If you are going to standardize the training of men for the preservation of their lives and the preservation of property, I believe really we should make some efforts to standardize the care of machines and see that the machines on hand are properly cared for.

MR. GEORGE W. RIGGS (Mine Safety Appliance Co., Pittsburgh, Pa.): It was my duty in the State of Nevada as safety engineer during the six months that I was there to take care of 64 sets of breathing apparatus. We had three kinds, Draeger, Westphalia, and Fleuss. It is a high, dry climate. When I went out there we had to buy considerable repairs. We made a dugout, where we had twenty-four sets. We kept rubber beltings, spare rubber parts for breathing apparatus, etc., in this underground dugout and also gave them a bath in lukewarm water about once a week. In that way we kept the rubber parts up in better shape than before.

MR. HUBBELL: Our idea may not be worth very much—we can't tell how it has worked out, but this is a tentative scheme as to how we are going to handle that particular problem. The room, of course, will have to be kept at living heat and we were afraid that steam heating was going to force some of the humidity out of the air. We have arranged for a metal locker which is air-tight, and we are going to do a little experimental work with some of the rubber parts to arrive at a definite humidity point and keep the locker at that point. I don't know what that will be. We haven't completed our work on it, but are working on it now. That includes just the rubber parts of the apparatus. The other will be stored.

MR. H. G. DAVIS (D. L. & W. Coal Co., Wilkes-Barre, Pa.): The railroad company coal department at their mines in Wyoming Valley in the early part of 1910, if I remember, equipped all their mines with four sets of Draeger apparatus, and also equipped a car called the rescue car with eight more sets, and I found in my experience that the rubber goods on those machines deteriorated very quickly, particularly where steam heat was used for keeping the rescue rooms and other rooms in good condition. We did away with steam heat and equipped the rescue car and stations with stoves, with the result that the rubber goods lasted much longer.

I agree with these gentlemen that four sets of apparatus is not sufficient for any place where there are not four more available. We started out with thirty-two sets. All the parties had four sets each and were within a short distance of each other. The rescue car could be brought into any of the mines in about an hour. I think it is important to have a sufficient number of sets, at least eight; more if possible.

MR. HUBBELL: Along that point, we have ten, but there are four other rescue stations within a radius of twelve or fifteen miles. One of those

Rigid and constant inspection and frequent use is the thing to keep your equipment in shape. To set a definite time for inspection is difficult. The equipment may fail only once, and that once may be any time.

MR. BOARDMAN: In reply to Mr. Woodburn, I would say that the minimum period I would let the machine go would be one week. In our country we have a very low humidity and rubber goods are hard to keep. We overcome that in a measure by scalding rubber parts. Whenever the machine becomes rigid from not being used, we simply throw all the rubber parts in a hot bath once a week and that keeps them in good shape. They are also kept in lockers.

[illegible]

Rigid and constant inspection and frequent use is the thing to keep your equipment in shape. To set a definite time for inspection is difficult. The equipment may fail only once, and that once may be any time.

MR. BOARDMAN: In reply to Mr. Woodburn, I would say that the minimum period I would let the machine go would be one week. In our country we have a very low humidity and rubber goods are hard to keep. We overcome that in a measure by scalding rubber parts. Whenever the machine becomes rigid from not being used, we simply throw all the rubber parts in a hot bath once a week and that keeps them in good shape. They are also kept in lockers.

[illegible]

Rigid and constant inspection and frequent use is the thing to keep your equipment in shape. To set a definite time for inspection is difficult. The equipment may fail only once, and that once may be any time.

MR. BOARDMAN: In reply to Mr. Woodburn, I would say that the minimum period I would let the machine go would be one week. In our country we have a very low humidity and rubber goods are hard to keep. We overcome that in a measure by scalding rubber parts. Whenever the machine becomes rigid from not being used, we simply throw all the rubber parts in a hot bath once a week and that keeps them in good shape. They are also kept in lockers.

MR. BOARDMAN: We had one case 130.

MR. MORRIS: I would like to emphasize the point I made at first in regard to the contributing conditions that exist in the use of rescue apparatus as limiting the distance that a man may go or a group of men may go and the importance of taking those conditions into consideration, that I believe it is an unfortunate thing to attempt to make any estimate of distances that a man may go into fire areas with rescue apparatus on. Those conditions vary so widely, in respect to the conditions of the entries, the temperature and the humidity, and the progress of the work, that it must be left entirely to the judgment—and it must be good judgment—of the man in charge of the crew.

VICE-CHAIRMAN DAVIS: I wish to state that, having had charge of this rescue work, I arbitrarily fixed the distances that those men should travel, knowing the ground over which they did travel. I would say, "Now, you go to such and such a place. We will give you so much time and if you are not back by that time, there will be a crew looking for you."

I think that can be done if you know the ground. Of course, it cannot be done in a strange country. In a country with which I am familiar, I would fix the crew's distances, and, of course, keep moving your base forward as much as possible at all times.

MR. WOODBURN: My question as to whether or not it is advisable to carry the stretcher at all times has not been answered.

MR. RIGGS: There is a stretcher on the market now, the Wind-flex, that weighs three and a half pounds. You fold it up until it is three feet in length and from the experience I have had, I would not go in without some stretcher, or an improvised stretcher, whether that be a piece of pipe that we can thread together and put a canvas over, or something else. Mr. Boardman has a very good rescue stretcher.

MR. WOODBURN: It wasn't so much the kind of stretcher that I am interested in, but the question as to whether we shall carry one. I have always instructed my men to pick up empty cars, and desert those as soon as others are found. They can always put anything heavy on this car, pushing it ahead, and then, anyway, a car is better than a stretcher. It is much easier to transport a man that is down on a car than on a stretcher.

SHOULD A STRETCHER BE CARRIED?

MR. RIGGS: From my experience, I would take a stretcher.

MR. BOARDMAN: We expect to train our crews so they can take care of themselves. When we send a crew into the mine we have no reason to expect that anything is going to happen. It sometimes happens, it is true, but our men are instructed to watch their crew sufficiently to be able to get a man out to fresh air before he is unable to walk. Of course, it might happen that the man might not be able to walk. I wouldn't send a stretcher with a crew unless it is definitely known that you are going after men.

MR. WOODBURN: Men sometimes go down when they are working in a

hazardous place, where they are liable to injury, outside of the use of their equipment. I was wondering whether or not it would be advisable to carry the stretcher.

MR. BOARDMAN: I don't think it is necessary for the rescue crew to take a stretcher when going on ordinary work.

MR. WOODBURN: Do you think it advisable to carry an extra piece of equipment (a half-hour machine) for the protection of your crew?

MR. BOARDMAN: We usually carry an extra two-hour machine and hang it up near where the work is going on.

MR. WOODBURN: I take exception to carrying equipment any great distance. Just three weeks ago tonight, we had a fire and I helped carry in extra equipment. We had plenty of helmets. We were simply carrying in the machines. I carried two, and, of course, it was an emergency and we went at practically a dog-trot, but you dog-trot half a mile with 86 pounds and the next morning you will know that you've been somewhere.

MR. WATSON: I might say for the benefit of the members present that Mr. Boardman's statements are accurate. He is fighting fires day in and day out. In the coal-mining districts you have a fire every few years, but Mr. Boardman's crews are fighting fires day in and day out.

CHAIRMAN TILLSON: Gentlemen, we have one more fire to fight this morning, and we are getting along well, too. I mean we are having lots of good discussion, and I want to compliment you. Somebody said that the Mining Section was the liveliest bunch in the whole convention.

There is one other thing on the program. We had hoped to tackle it this morning. That is a Safe Practices pamphlet which has been prepared and was retained from distribution awaiting discussion by this Section. This pamphlet is in regard to Mine Car Haulage and there are copies here for distribution. I am open to the opinion of those of us assembled as to when we want to tackle this, whether you want to postpone your lunch to a later hour, or whether you would really like to hold a later session and come back after lunch.

We have one more paper on the program, "Fire Prevention in Anthracite Coal Mines and Necessary Equipment for Fighting Mine Fires," Mr. M. W. Price.

(Mr. Price was absent, so Mr. Tillson read his paper.)

FIRE PREVENTION IN ANTHRACITE COAL MINES AND NECESSARY EQUIPMENT FOR FIGHTING MINE FIRES

M. W. PRICE, EFFICIENCY ENGINEER, G. B. MARKLE COMPANY, JEDDO, PA.

The prevention of fires, the necessary fighting equipment, and the best ways of extinguishing mine fires, on account of the various conditions under which they occur and the hazardous work connected with them, together with the loss of life and destruction to property, furnish a topic for discussion among mining men, which, it seems to me, is not surpassed by any other subject in mining.

The prevention of mine fires necessitates a careful and constant examination of some sections in the Anthracite mines due to physical condi-

tions over which no control can be had. The elimination of wooden structures in the mines has been the means of preventing numerous fires, and permits more time and thought to be spent in trying to prevent fires in heavily timbered sections and in sections where the "robbing of pillars" is being done. Workmen engaged in timbering should not be permitted to use the common oil lamp on account of sparks and the careless manner in which old wick (cotton) is thrown around when it becomes necessary to put a new wick (cotton) in lamp. The careless manner of handling oil which is used in lamps quite often causes timber to become saturated and is the means of causing disastrous fires. Again, I have seen night patrolmen using the common oil lamp while making their examinations. This seems to me, a grave mistake. They should be furnished with an improved electric lamp and also have a safety lamp of the modern type; thus equipped, they will be prepared to perform their duties in a proper manner.

The "robbing of pillars," especially in the Mammoth Vein, on account of its great thickness and by its continuous crushing, generates a heat which causes everything to become so dry that a very disastrous fire will develop in a short time. Added to this risk is the possibility of encountering methane (marsh gas) while driving up chutes in the pillars. In sections like this, where the fire risk is so great, I have seen careless workmen engaged in timbering add to this risk by permitting a trolley wire to touch the timber instead of having the wire hangers properly support the wire. In sections of this nature a water line on the gangway with branch connections arranged about 200 feet apart with a 50-foot section of fire hose placed at each branch, will enable a person discovering a fire to apply water on it in a very short time. This method of "fire lines," as it is called, will be of vital importance to the patrolman by night who, upon his examinations, discovers a fire and is forced by lack of system to travel a considerable distance for equipment and help.

ORGANIZE MEN FOR FIGHTING FIRE

Various methods have been advanced for extinguishing a mine fire, setting forth good results obtained such as flooding and smothering sections affected, depending upon conditions; and while numerous discussions have taken place describing in detail the methods used at various fires, and carefully noting the results, there seems to be very little said about having men properly organized for this particular kind of work. The results of poor organizations have been demonstrated where the work at small mine fires, improperly directed in the beginning, has been the cause of large disastrous fires. The importance of the mine foreman in some instances is not properly realized or appreciated. His thorough knowledge of the mine, for instance, the circulation of air currents and the quickest way and place in which they can be changed to bring about results, together with the exact conditions of each working place—whether or not it happens to be a place which is giving off gas or a place with a dangerous roof—makes him the most valuable man available. The delay which will be caused by an accident happening to the foreman under such

circumstances does not seem to be realized, since, invariably, he is the one man who can always be found in the most dangerous place. Then again, it is no uncommon sight to see the Superintendent right in the most dangerous place. I fully realize the anxiety which is caused by a mine fire, but nevertheless I maintain that the proper place for the directing heads is a safe distance back from the scene of the fire, where they can think and properly direct the work, for there is nothing which spells disaster at such times like losing the directing heads.

The extinguishing of a mine fire today in the older mines of the Anthracite region requires keen thought and especially prompt action. The virgin mining being finished, the reclaim or "pillar robbing" being done very rapidly, makes it difficult for even the most efficient mining men to control the air currents. Air being a predominating factor in performing work at a mine fire, it can, therefore, be readily understood that the conditions of a mine govern the method which can best be used.

I have had the opportunity to assist in the work of extinguishing quite a number of mine fires, some of which were of an exceptionally serious nature, and have seen various methods used with very good results. Owing to "pillar robbing," causing in some places the strata to be crushed and broken, it becomes a very difficult proposition to flood or smother a fire in some sections without seriously affecting several sections, which is quite different from what it was in former years, in the Anthracite region. In seams where the coal is of a soft and shelly nature and fire occurs, which causes caves to develop, thus preventing direct work, good results have been obtained by taking a piece of 2-inch or 2½-inch wrought iron pipe and closing the one end in the form of a pick point after which the pipe is drilled with ⅜-inch holes in a spiral manner the entire length of the pipe. This drilling is continued until the entire pipe is reasonably filled with holes. The pipe is then forced through the caved or loose ground after which a hose is attached to the open end of the pipe. In this manner water can be forced onto the fire thereby extinguishing it and cooling the material so that it can be loaded into cars. This spray method can also be used in and around burning timber to very good advantage.

Bore holes are sometimes drilled for the purpose of running water down on to fires, and while this will be the means of extinguishing some fire, still it does not accomplish very great results due to the fact that the water takes a natural course and by not being able to increase the original supply through the hole the results are not what is expected. Good results were obtained at a large fire, which had burned up into a caved section where "pillar robbing" had been done by placing on the surface a large tank which had a capacity of about 60,000 gallons. Two large mine pumps discharged their water into the tank and the gate was opened by a mine locomotive pulling on a tackle which had been properly arranged. This large quantity of water was run into the caves and on account of the measures being all broken permitted the water to pass down over the fire. In this manner considerable fire was extinguished which, on account of caved conditions, would have been very difficult to reach from the inside.

VALUE OF MINE RESCUE APPARATUS

Mine rescue apparatus that is available today permits men to penetrate fire zones and lay water lines from which hose can be used, to apply fire extinguishers directly on the fire, and to build air brattices for the establishment of necessary ventilation, and to do various other underground work. Thus we are able to perform what might be termed direct fire fighting which seems to be the right procedure, in that you are in a position to note the progress and changes which are constantly taking place at a mine fire.

This brings out the importance of a mine rescue equipment and the vital necessity for the proper training of men to use it, since the work performed by a well-trained corps of men in the use of the apparatus at the beginning of a fire will prevent both the possible loss of life and the great destruction of property.

The establishing of a fire equipment to consist of fittings, pipe, hose, nails, brattice cloth, boards, tools, telephone, and a fire pump, which should be kept intact at all times, is a valuable asset to all mining properties; and again quite often steam and air lines, coming from the surface into the mines, can be converted into water lines in a very short time. By taking advantage of such conditions and thus securing a supply of water quickly has been the prevention of what might have been very disastrous fires. Available lines of this description are sometimes overlooked due to the excitement caused by a fire and the lack of a proper organization.

In conclusion, I would say that the organization should be such that when a mine fire does occur, each man will fully understand his duties thereby preventing dangerous delays in making up an organization at the beginning of a fire.

DISCUSSION

VICE-CHAIRMAN DAVIS: I want to take exception to some of the things Mr. Price has said. He refers to putting out a fire by the use of a tank and flushing from that tank, filling the tank full of 60,000 gallons and letting that go down the mines.

In 1910, I had an experience of that kind in Wyoming Valley, and I found the plan adopted had carried the fire down 1500 feet, and before we got down to the point where it had been carried by these floods, it had extended about 900 feet. You can't fight a fire down here in Cleveland. You have got to be on the ground. Maybe that worked when Mr. Price used it, but in the particular case to which I referred, it was a failure.

I think Mr. Price touched upon some very good points in connection with fighting mine fires. In the anthracite coal regions we get one fire in six months, perhaps, but I want to tell you that fires in the Wyoming Valley are of almost daily occurrence, particularly where coal is being blasted by black powder. Since the companies have used permissible powder, the fires have been less frequent.

I notice that Mr. Price didn't touch on the effect and use of chemical

extinguishers. The D. L. & W. has an additional chemical engine. This is on a truck. It has two tanks of about 80 gallons capacity each. Attached, there are three lengths of hose, 50 feet long. This engine has been used in putting out fires in their incipiency.

We can't say that that apparatus is the proper thing for fighting mine fires, but when your fire lines are back, we are positive that there are fire lines on all the gangways. We have a fire car which contains pipe, hose, canvas, and every conceivable thing that you would need to fight a mine fire. This is brought to the mine just as soon as the fire is first announced.

(Mr. Tillson resumed the Chair.)

MR. ROBERTS: I want to take exception to what was said a while ago in regard to having no fires in coal mines. I want to state that in the northern fields of coal, I will venture to say that there isn't a single place where there isn't a fire existing continuously.

USE OF PORTABLE FANS IN FIGHTING FIRE

MR. WOODBURN: There is one point in that paper that I was watching for that was not mentioned—the use of portable fans in connection with fighting fires. I should like to have the experiences of some of you men in regard to the matter. We are purchasing a portable disk fan to be connected to the electric wiring in the mine, where we want to use it, where the wire is already strung.

MR. DAVIS: I want to say I have used electric fans in connection with mine fires, but I wouldn't want to recommend them.

MR. WOODBURN: I mean temporarily.

MR. DAVIS: I was very much surprised at one place, to see a foreman connect a fan where the discharge end was only a six-inch pipe. I found that it gave a splendid current of air and helped us materially.

Have any of you gentlemen ever used inert gases in putting out fires? I saw an article in the "Coal Industry"—the September number—on that written by Mine Inspector Joseph J. Walsh of Wilkes-Barre.

PROFESSOR F. W. SPERR (Michigan College of Mines, Houghton, Mich.): I think the Calumet and Hecla Company used carbon dioxide quite extensively in attempting to put out a fire about twenty-five or thirty years ago, before I went up there, and part of the apparatus was still there on the shaft a short time ago when I happened to pass there. I have no doubt that their experience has been published, but I can't recall now what the results were.

MR. ROBERTS: I have known of a number of people who have tried carbon dioxide or sulphur dioxide, but I never knew of a case where fire was put out with it. If you could keep it tight, so that the carbon dioxide would get into contact with the fire, it would do it, but there are always leakages, and it is impossible to hold the gases in contact with the fire long enough to put it out.

MR. WOODBURN: Isn't that what we are trying to do with our sealings?

I had occasion at a recent mine fire to get to a raise that was off of a sub-level and it was on fire. We couldn't remain there long, and it was

connected up with the sub-level below. That was where we believed the main part of the fire to be, so just for good measure, we did take down five gallons of Pyrene (carbon tetra chloride). We dumped it in the top of this raise and three weeks after, we were able to get to the top of that raise and the timbers had just burned about half way through. Why it went out, I can't see any reason except the Pyrene. That was just an experiment.

MR. BOARDMAN: The title of the paper seems to be "Prevention of Fires" but I see the author digresses to organization and training for fires. A little over-zealousness on the part of a foreman of ours, one time nearly caused trouble. We had a fire in the West Calusa Mine. (I don't want the impression to get out that Butte is such a fire-trap. We have had two or three fires there that were started by leasers and a few from the Heinze quarrel that has been more or less continued for a number of years. Our new fires are very scarce.)

We had twelve fires in 1918 and eight were new fires and seven of these were caused by poor electric installations. In 1919 we have had only five new fires and they were all extinguished within the first few minutes after they were discovered, some by the use of breathing apparatus, and some without. The time to fight a fire is within the first three minutes after the fire starts and if you can get there, of course, you have done well.

In this instance, two young mining engineers went into a part of a mine which they believed to be free from gas. The foreman discovered that part of the mine was not free from gas, and told them that they should lay off and not go in. However, they went in, contrary to instructions. They went on the ten-hundred level, where they felt the effects of gas. One of them, the boss of the crew, crawled through to the ninth, and the others started back. This man who got through to the ninth, was just able to crawl up the shaft and there gave the alarm before he became completely unconscious.

The mine foreman made the mistake of rushing in to do this work. He summoned six men, I believe, and with waste over their noses, they rushed over the ninth level and attempted to climb where the man went back. They got down two floors when the man ahead became unconscious. The next two men succeeded in placing a chain about his chest and tying the chain to the rope in the timber slide, and then they came back to the ninth level again, and were so nearly overcome that they all had to navigate on their hands and knees. A hurry call was sent to the rescue station for some apparatus.

The foreman had gathered up four shift bosses and a couple of other men and had rushed in to try to get this man out before he died, leaving everybody outside without any supervision. They succeeded in getting the man out, also the rest of the crew. The foreman should never take his organization and rush in to do a thing with his own hands that he has equipment for doing otherwise.

USES OF CHEMICAL EXTINGUISHERS

In regard to the use of chemical extinguishers: We had a fire in Fleming, Kansas. The fire was in the face of the drift, and the fan was deliv-

ering 8,000 feet of air through the drift, twenty feet back from the face of the drift.

The over-lying strata there is of such a nature that steam or high humidity will cause it to slack, a sort of fire-clay. Where fires of this kind have been fought with water, this sloughing of the roof has caused trouble. Realizing this, we used Pyrene. The thing was very hot; in fact, about ten feet of that entry was incandescent, and so hot that one of the men had blisters all over his face when he got out.

We used ten gallons of Pyrene at intervals of five minutes. We succeeded in charring the face of this burning coal to such an extent that when we got the fire out the roof did not slack enough to cave. We had only a small fall. It did not hurt any one. The Pyrene gas filled the mine so full that it very nearly killed a mule that they kept to use in hauling in water. They just barely got him out in time.

In using a chemical extinguisher, care must be taken, if there is improper ventilation, that the fumes do not overcome the crew.

Mr. WOODBURN: About your smoking underground, the Miami Mine prohibits smoking underground. In the Old Dominion Mine, they permit smoking underground. It is my opinion that it is safe to smoke where you use open lights. The Miami has had several fires that have started presumably from smoking on the sly, and giving a flip to the cigarette or match when they saw somebody coming.

I would say that the chemical extinguisher is the most valuable thing we have in our metal mines, and I would like to see one in everybody's reach. If you can get action on your fire immediately, you can put it out. There is no deterioration and if you should want to dismantle your mine, you have something to sell. We have had a great deal of success with it.

In one of our mines we were a little slow in providing these extinguishers. Finally, we had nineteen put in. That was done on Thursday and on Sunday, we put out what might have been a very terrible fire.

There is another thing that I would urge particularly in the metal mines, and that is, that you get an inspection after every shift comes off. We had an eight-day fire in our district due to lack of proper inspection following the men's coming out. The fire was not discovered until nine o'clock at night. At 11 much harm had been done, at 12, the men threw up their hands. It was 1:30 before we were called, and had men on the ground, and it was morning before we had the fire under control.

The Miami Mine is very careful to work three shifts so that you always have a shift relieving another shift. I don't believe it is too strong to recommend that that be done as it is the best investment you can make.

Mr. SEIR: I would like to ask Mr. McLeod about their sprinkler system.

Mr. ANGUS McLEOD (Butte & Superior Mining Co., Butte): The shafts are both equipped with rings of pipe about every two or three hundred feet—the metal open-head sprinkler. The control valve is on the surface. Every four hundred feet going through the shaft—eight, twelve, and sixteen hundred. There is a shut-off valve for the purpose of being used in case of fires. You can go to twelve and shut off the valve and you get the

force of your water to the twelfth, and the water going on down the shaft would keep the rest of the shaft in shape.

DEAD ENDS FOR PROTECTION OF MEN

There is another thing that I haven't heard much about here. In the metal mines, whenever we have a fire, it seems that a bunch of men are lost before we can get down to the first level. The gas spreads so quickly that no matter what the opportunity is to get out, they don't seem to get away. We have established a rule to put in dead ends on every side and level.

These dead ends are 250 feet. There is a cement door 10x10 by 30 inches thick. Then there is a metal lathing over that and that makes a solid steel door. It can be chinked in a minute's time through that bulkhead above. There is a water barrel and in case of a fire, your men can flock in to those dead ends.

There have been fires in which from three to one hundred twenty-one men have been lost, when if there had been dead ends to get into, the majority would have been saved. We have provided these dead ends and have used the flash system for flashing danger signals. We have signs posted, stating that so many flashes, following the flash of a level, indicates a fire in a certain place, telling the men just where the fire is, whether they will have to hurry to get to the dead ends.

We also have inter-communicating telephone systems so that you can throw a switch and communicate to different parts of the mine. There are so many places in a metal mine that you want to send warnings to where the signals don't extend to your workings.

We have another signal, although we have never had occasion to use it. We took a common oil cup, going into the air line. We took valeric acid and put it in the oil cup and in forty seconds after we turned it in they have had the smell of the acid, very noticeable, on the eighteen hundred level. Inside of two minutes after the acid has been turned loose in the air receiver, it penetrates every corner of the mine. That is printed on the signs to make everybody in the mine acquainted with the warning.

Several fires have been caused by fires going down the shaft. We have made iron casings, used a little sheet iron, something medium heavy, and we have the wires go down through this sheet iron because it burns out there and does not come into contact with the timber.

Those are some of the things that we are working on. None of them are completed, but we know they are going to be successful. The value of having these dead ends is very great. It is in the first few hours of a fire that we lose our men.

MR. GEORGE SWAN (Davis Daly Copper Mining Co., Butte): Have you had any actual fire experience since you have put in these dead ends?

MR. McLEOD: No, we haven't had any actual experience. We have experimented by going in and pulling the doors shut. We have fans installed on trucks either as blowers or suction—it can be used either way—and we have pulled those up and blown gases in, and not a thing ever went through.

PROFESSOR SPERR: The difficulty they have had in the mines in some of

our districts, is that where they have put in the same kind of bulk heads, when they got a fire, the smoke went around through the rock.

MR. McLEOD: We have never had that experience. We haven't had a door yet, up to the time I left, through which the gas penetrated, and we had tested seventeen. One was tested six months after installation. We turned the fan on and the men inside couldn't notice a thing. These doors close as solid as this wall.

CHAIRMAN TILLSON: If there is no more discussion on this paper, Major Arthur S. Dwight, who is attending the Mining Section meeting as the direct representative of the American Institute of Mining and Metallurgical Engineers, has a discussion of the proposed Safe Practices pamphlet on "Underground Mine Cars, and Haulage."

(Major Dwight read the comments of Mr. Hugh Archbald, of Scranton, Pa., on the proposed pamphlet, and these were referred to the Safe Practices Committee for consideration.)

CHAIRMAN TILLSON: While listening to Major Dwight, the thought struck me that if you are agreeable, it might be wise if you would all take the time between now and tomorrow morning to go over this paper and jot down your comments opposite each paragraph, sign your name to it, and if we get crowded tomorrow morning, you will be prepared to leave your copy of the paper with the signed comments for the use of the National Safety Council. In making your revisions, I trust you will take notice of the attached papers, which are the criticisms and suggestions of some of those to whom the pamphlet was sent before this meeting. At least, indicate whether you agree or not with their comments.

If you can cite some illustration or say you can furnish some illustration that would indicate a better practice or design of equipment, why note that, and then reply to the request for that information when it comes from headquarters.

I don't think I am asking too much of you. I think that this will possibly be one of the first pamphlets as a direct technical function, and I trust it will be something that we will be able to hold as a standard.

You will find attached, at my request, a Safe Practices pamphlet, which was issued by the National Safety Council, covering the subject of manila and wire rope. I asked that this be done. If any of you whose interests are so vitally correlated with the use of rope find something in this Safe Practices pamphlet with which you differ, now is a good time for us to get your views, either orally or written, so that whenever this pamphlet is to be revised, it may be revised with those views under consideration.

Adjournment.

SATURDAY MORNING SESSION

THE meeting convened at 9:45 A. M., Mr. B. F. Tillson, Chairman, presiding.

CHAIRMAN TILLSON: Gentlemen, even though we are not all assembled, I think we had better start in with our program, as we will have plenty to do. Mr. Mitke not being present, I will read his paper at this time.

A COMPILATION OF CHUTE TYPES FOR LOADING ORE INTO TRAM CARS IN METAL MINES

CHARLES A. MITKE, MINING ENGINEER, PHELPS-DODGE CORPORATION,
BISBEE, ARIZ.

CHUTES

Chutes are used principally for passing ore and waste to different levels in a mine. They are also used for storage, and frequently, when not necessary for ore or waste, are kept open entirely for ventilation.

In general, chutes are 100 feet high (the usual distance between levels). Some exceptional chutes are much longer, while others are shorter than this figure. When a raise is driven, it is customarily divided into two compartments, one for the manway and timber-way, and the other (the chute) for the passage of ore or waste.

The various types of raises which are commonly used are as follows:

TWO-COMPARTMENT RAISES (one for chute and the other for men and timber).

6-post, square set raise, generally used in square set stopes in medium ground.

4-post, square set raise, occasionally used in caving methods. This raise is similar to the 6-post raise, with the exception that the compartments are much smaller.

Crib raise, used in square set, top-slice, cut and fill, and shrinkage stopes in heavy or broken ground.

Raw chute, usually oblong in shape, about 4 feet x 7 feet, with no timber except a partition between the chute and manway. Used only in hard ground mined by cut and fill, shrinkage, and to some extent by caving methods.

ONE-COMPARTMENT RAISES (Chute only)

4-post, raise, used in caving methods in medium ground.

Crib raise, used in heavy ground mined by caving methods. In rare cases angle iron is used in its construction to prevent excessive wear.

Raw chute, or "finger raise," circular, about 3 feet in diameter, no timber employed in its construction. Used only in medium or fairly hard ground.

Rock built chute. Constructed in the shape of a well, generally about 6 feet in diameter. This class of chute is built in loose ground.

Concrete chute. For heavy ground. Usually circular. Used where there is a great deal of wear in a chute.

REQUISITES FOR A STANDARD CHUTE

The requisites for a standard chute are:

Safety in location and operation.

Efficiency in handling ore and waste.

Economical construction and upkeep.

SAFETY

Formerly, chutes were located in the center of drifts, so as to facilitate the dumping arrangements and permit the use of end-dump cars. While this was a great convenience from the haulage point of view, it carried with it the constant danger of men falling into the chute. Boards were to be laid over these openings and to be removed when cars were dumped. Frequently, however, miners would forget to replace them when the cars were empty and many a man has lost his life by falling into an opening of this character. In some states this practice is now prohibited, the law stipulating that the chute shall come up at the side instead of in the center of the drift.

The manway, adjacent to a chute, should be located far enough from the haulage track so that the men climbing up and down the ladderway will not step directly in front of a moving train.

One of the principal things to be avoided is the "hanging up" of a chute. It is usually a dangerous procedure for a runner to bring down a chute which has been choked or "hung up." Should this occur some distance up, for instance 80 to 100 feet, it may cause an air blast, which would break the chute and injure the trammer.

Clearance for cars. The chute mouth should be high enough so that a man will not have his fingers caught between chute and car. This is very difficult at present as there are mines where five different kinds and sizes of cars are used, all being loaded from the same chute. Such a diversity in sizes of cars naturally results in insufficient clearance for the larger ones and too great a clearance for the small cars. This latter condition, in itself, creates a danger, as, when small cars are used, the ore, dropping from a distance at high speed may injure the runner, especially when the car is about full and it is necessary for him to close the chute gate immediately.

Trolley wire. In all average drifts having electric haulage, the trolley wire is immediately above the mouth of the chute. The larger drifts have the advantage of an extra set above the trolley wire, upon which the chute runner works, there being a flooring between him and the wire, thus preventing his coming in contact with the electric current.

Some provision must always be made in the smaller drifts to protect the runner from the trolley wire. In some instances, the live wire is insulated and carried along the opposite side of the drift, the overhead wire being dead for a distance of about ten feet and acting merely as a guide for the trolley wheel. In other cases, the overhead live wire is boxed in with boards on the sides and has a hinged door beneath, which can be pulled up and hooked, in this way completely isolating the trolley wire. Another practice is to have a switch near the chute so that the current in this section of the wire can be turned off and on at will. In exceptional cases the trolley wire is cut about five feet on each side of the chute mouth, and may be detached and moved away bodily. This, however, involves considerable trouble.

Clearance for chute runner. A by-pass is frequently made by taking out a half set of ground immediately opposite the chute and a bench is

provided upon which the runner stands. This should be high enough to enable him to reach across and tap the chute and also to use a picky-poke to advantage in loosening the large boulders which frequently clog up the mouth. The by-pass is a great safety provision in that it gives the operator an opportunity to step out of the way in case there is an unexpected rush of ore out of the chute. In caving methods, where there are lines of chutes on both sides of the drift, a by-pass is impossible and the runner must load his cars by standing at the side of the particular chute which he is drawing.

EFFICIENCY

It is important that all chutes be properly located with respect to the levels above and beneath the stope through which they pass. Upon the location of the chute depends the convenience of the stoping arrangement as well as the tramping distance.

A chute should be adapted to the particular needs of the ore body in question. In certain classes of ore large chutes are necessary, while in others smaller ones may be used to advantage. In some cases a great many thousand tons of ore must pass through before the chute is finally abandoned, and the tonnage grades down from this to but a few tons in other cases, consequently, the construction of the chute in the first instance must be stronger, more lasting, and naturally more expensive than the type of chute which would do in the second place.

The construction of a chute should also be such that the ore will flow readily into the cars. One of the difficulties with chutes that has not yet been overcome is the fact that all ore has a tendency to "hang up," or stick in the chute. A suggestion which has been made and tried out is to have a breaker staggered on each set right down the chute. The ore, on being dumped into the chute on the level above, strikes the first breaker and is thrown across onto the breaker on the other side, and from there zig-zags down the entire length without stopping until it gets near the chute mouth. These breakers impede the progress of the ore and prevent it from packing solid in the bottom of the chute. Naturally, the chute is less liable to "hang up." Very good results were obtained from a trial of this chute, the only objection being the extra cost of construction in placing the breakers on the sides.

The inclination of the chute mouth has a great deal to do with its efficient operation, as certain classes of ore run much more readily than others. The character of the ore, therefore, must be taken into account before adopting a standard chute and mouth.

ECONOMY

The cost of constructing chutes should be kept at a minimum. It would be a waste of money to have a chute constructed to last far longer than the life of the stope. While, on the other hand, it would also be poor economy to have a chute so lightly constructed that it will need constant repairs long before that section of the stope has been abandoned.

Formerly, chutes were made having a wooden bottom and the ore taken

out immediately beneath the chute mouth. As a consequence, the ore dropping down the chute soon wore out the bottom and then filled in the sides of the drift. As a matter of fact, this is still practiced in a number of districts, even though it involves an unnecessary expense to the company for upkeep and repairs. This practice is obsolete in the most up-to-date mines.

Wherever possible, the bottom of the chute should be in the solid ore or rock, so as to decrease the cost of upkeep, as ore striking on a wooden bottom would soon cut through.

When the size and character of the chute, with due reference to the class of ore, has been worked out and decided upon, it is then economical to have the timbers selected and cut to measure on surface, so that the total number of pieces necessary for its construction can be sent down at any time and the chute mouth installed without any additional cutting underground.

VARIOUS KINDS OF CHUTES, DOORS, ETC., IN USE AT PRESENT

(With a critical discussion of each type)

HAND TRAMMING DRIFTS

Figures 1 and 1a represent a chute mouth used for loading small cars from stopes containing high grade ore which are operated by the square set method, or in stopes mined by caving methods where frequent blasting is done.

The chute mouth is made of 3-inch boards, having the proper inclina-

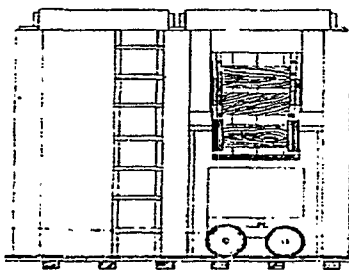


FIG. 1. FRONT VIEW OF CHUTE MOUTH AND LOCATION OF CAR

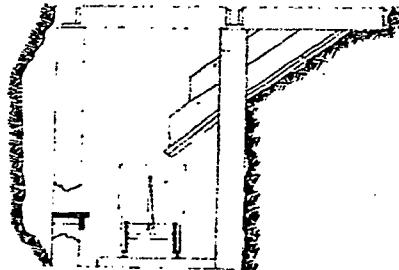


FIG. 1a. SIDE VIEW Post cut away to show loading platform

tion and a clearance of approximately 4 inches should be allowed between the chute mouth and car. The door which controls the flow, consists of three boards, operating in slots which are parallel to each other. The mouth of the chute is about $4\frac{1}{2}$ feet long and the ore dropping down the raise strikes on the hard rock which has been left there for the purpose, and then runs toward the car as the chute is drawn off.

Figure 1 shows the front view of the chute mouth, location of car, etc., while Fig. 1a gives the side view of chute and end view of car.

This type of chute mouth is generally used in small drifts ranging from 3 feet x 6 feet up to 5 feet x 7 feet in the clear.

In drifts, where ore is drawn from square set stopes, the chute runner usually loads his car by standing on a bench opposite the chute mouth. Sufficient ground behind him has been taken out beyond the regular drift set so as to allow a certain amount of room for him to step aside in case of an unexpected run of ore from the chute.

In caving methods, however, he loads his car by standing at the side of the chute instead of in front as, owing to the chutes being so numerous, they are generally placed opposite each other and there is no room for a bench.

In loading, he uses a 5-foot iron bar to pry up the three boards and allow the ore to run into the cars. In case a boulder should get fast in the chute and hold up the ore, he uses his bar to dislodge it. Should he be unsuccessful, he must then get powder, tie it to the end of a stick and put it near the boulder. After the shot is fired, the boulder is usually broken and the ore continues to run down the chute. When the car is full he uses the bar to strike each board in succession and cause them to drop, thus cutting off the flowing ore. In the event of one of the boards sticking fast and refusing to drop, enough of the chute mouth will be covered by the other two to stop the ore from running.

Another type of door is that shown in Fig. 2, which has an iron gate bolted to the sides of the chute. This iron gate operates similarly to the boards, with the exception that it has a handle so that it may be raised

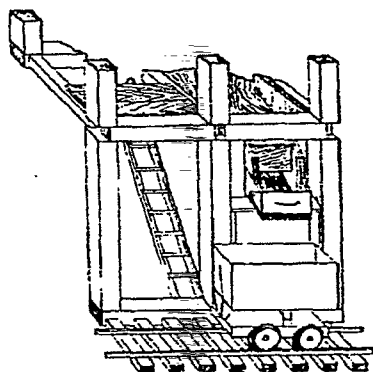


FIG. 2

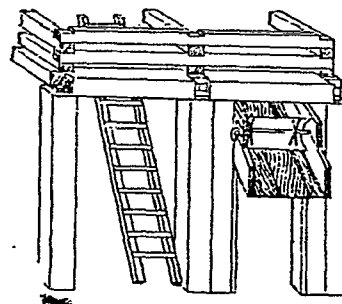


FIG. 3.

by the man getting up on the car and taking hold of the handle, or by standing on the track and using the bar to pry it up. This gate has a bolt on each end and operates on hinges, as shown in the drawing.

MULE, ELECTRIC, AND AIR HAULAGE

In drifts of this character larger cars are used, the area of the drifts are larger than those of hand tramming, and the chutes are either operated from the drift or from the extra pony set above the drift. The chute

and chute mouth shown in Fig. 1 are frequently used in drifts of this character, being, of course, built in proportion to the size of the drift.

Fig. 3 is the same kind of a chute and chute mouth as those shown in the preceding illustrations, but has a different type of door. This door is built in the form of a sector, made of iron, and has a handle. A piece of iron pipe may be used on the handle in order to give the operator greater power. Built to a smaller scale, this chute mouth and gate is occasionally used in hand tramping drifts in square set stopes, but more frequently in the larger drifts with, of course, proportionately greater dimensions. This door may be operated either from the level, in a hand tramping drift, or from the floor above in a motor haulage drift. In the latter case, the chute door is, of course, high enough so that the operator can open it by standing in the pony set and also punch the chute from that floor. This class of door is in common use on main haulage drifts where block caving is the mining method employed. However, the chutes leading directly on to the main haulage level are usually located in ground that is not very heavy and will therefore not be subject to change.

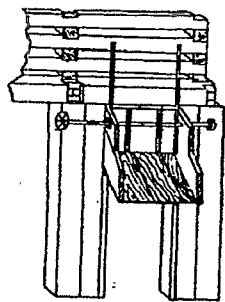


FIG. 4.

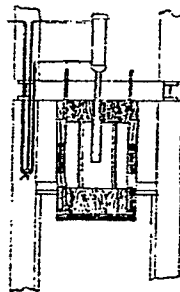


FIG. 5.

Fig. 4 represents an iron door which is operated with a slide and small gear wheels on the ends with a larger wheel to give the operator more power. By turning the larger wheel the small gears run up a geared track and raise the iron slide. When operating this wheel the operator stands to one side of the chute.

Fig. 5. The construction of this door is similar to that shown in Fig. 4 with the difference that it is operated by a compressed air cylinder. The operator merely turns a compressed air lever, which raises the slide and allows the ore to run. When the car is full and he desires to close the chute, he turns off the compressed air by reversing this lever, and turns on a second (lever) which forces air into the rear end of the cylinder and closes the door. If a boulder should get caught it may then be necessary for him to open and close this door several times in order to dislodge it.

COMMENTS

The principle in the construction and operation of both the chutes shown in Figs. 1 and 2, for use in hand-tramping drifts, is practically the same.

Both have rock bottoms and the raises (which include chute and manway) are not immediately over the drift, but off at the side. Sufficient ground has been taken out under the manway compartment so that the ladderway will be far enough from the drift to prevent a man from stepping out in front of a car. The door in one chute is of boards, while the other is of iron. Fig. 1 illustrates the chute and door in use at most of the mines where block caving methods are used, while Fig. 2 is used principally in top-slice stopes and not so frequently in other caving methods, the reason being that the drifts in which Fig. 1 is used become very heavy, the chutes soon go out of shape and require a change made in the size of the door, which can easily be done by cutting the wooden gates to suit the changes caused by crushing, whereas an iron door could not be so readily adapted.

These represent two of the best types of chute mouths and gates for use in hand tramming drifts. They are economical, durable, and, if the bar is employed and the men use care, they are comparatively safe.

It is often found advisable to use the wooden door, shown in Fig. 1, in large chutes on mule, electric, or air haulage drifts, where the ground is heavy and the chutes are apt to lose their shape, because as mentioned previously, the boards can be cut down to meet the circumstances, whereas the iron doors are not so adaptable.

Of the three iron doors shown in Figs. 3, 4, and 5, the last is far superior to the other two and can be used in every instance where these other doors are used. It is absolutely safe in operation and requires very little repairing. The amount of compressed air used is also small. Its cost, as compared to the other doors, is, of course, somewhat higher, but is justified in places where a large amount of ore must be handled.

The matter of clearance for safety depends entirely on the type and height of car. As stated before, in one of the most up-to-date mines five different types and heights of cars are used, all loading from the same chute. In this instance it would be very difficult to specify what amount of clearance between the chute and the car should be adopted as standard. Therefore, before a standard clearance can be decided upon, first of all it is necessary to decide upon the standard size and height of car which is to be used on that particular level.

The clearance between cars should be sufficient to permit of a man's passing between them.

The discussion of a standard car raises at once the question of a standard gauge. The 18-inch to 22-inch is still the practice and a standard gauge of about 20 inches should be maintained in practically all metal mines. In deciding on a standard gauge, the main point to be borne in mind is that it must be suitable for the size of drift or tunnel which has been found to be the most practicable and economical for prospect work. The larger gauge of 24 inches to 30 inches is of course used on main haulage drifts, where the ore has already been proved up and the expense of driving the large tunnel for the haulage train is absolutely justified. It would, however, be entirely out of the question to ask operators to drive large tunnels of this character for prospect work merely to standardize on the gauge.

In general, a large number of companies use two gauges, the 20-inch for all prospect and ordinary working drifts, and a larger gauge, about 30-inch, for the main extraction tunnels only. At the present time there are mines in the Southwest which have already standardized on the gauge and type of car. In one particular mine, the 18-inch gauge is used throughout the entire mine, with only two types of cars, both being the same height, which simplifies the matter of chutes and chute doors, the chute mouth shown in Fig. 1 being used throughout. It might well be said that this company has standardized on gauge, cars, chute, chute door, and clearance.

Standardization of methods of haulage is therefore a very important consideration in metal mining, where the prime requisites are safe and efficient operation coupled with economical construction and maintenance.

CHAIRMAN TILLSON: Discussion on the paper is now open, I would call your attention to illustrated dump covering door and also to a system

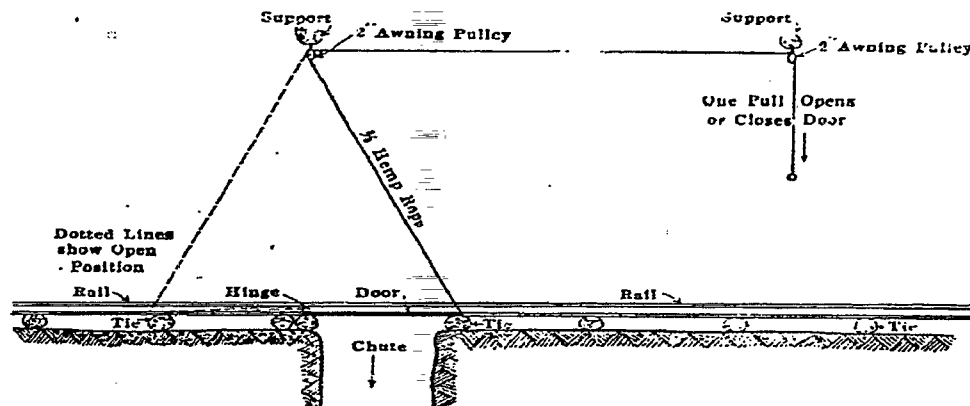


FIG. 6. SCHEME FOR OPENING DOOR COVERING DUMP IN CENTER OF TRAVELING WAY

of timbering to keep travel of man away from electric haulage. (Figs. 6 and 7.)

DISCUSSION

MR. A. H. TRESTRAIL (Pickands Mather, Palatka, Mich.): In the paper the statement was made that state laws required the opening to raises to be put on the side of the drift or sub-level, and it says that previously the opening was made in the center of the drift, in order to allow the use of end dump cars. In our property we place our raises at the side of drifts, and we use the end dump car. Simply have the car run right into the little cut-out, and we are able to dump right down the chute.

It is pretty hard underground to have all the room you want, especially if the ground is of a nature that breaks readily, but I think one way that that will help, is instead of having the ladder come down directly on track, have it placed sideways, then in order to get on the track a man

be almost by deliberately pushing his bar in between this small opening.

CHAIRMAN TILLSON: In answering Mr. Boardman about the relative size of the chunks of ore to the size of chute, I may say in the ore with which I am familiar in New Jersey, the grizzlies have an opening of twelve by fifteen inches. Our experience in the past has been there is a strong tendency to use for chutes, raises that are too small for the purpose, and we drive the small raises first and strip them up to larger size and save a whole lot of money in the course of a few years.

MR. R. D. HALL ("Coal Age," New York City): Would you please give the size of those raises?

CHAIRMAN TILLSON: Eight by eight feet.

PROF. F. W. SPERR (Michigan College of Mines, Houghton, Mich.): That would have to be worked out for each separate ore—the relative sizes as between the pieces and the chute.

CHAIRMAN TILLSON: Well, I don't know that you need any refinement. I believe if you had an eight by eight chute in most ores, that you'd have comparatively little trouble unless you have an ore with distinctly cementing qualities or mixed with clay and had lain there for about six months.

PROF. SPERR: Are you considering inclined or vertical?

CHAIRMAN TILLSON: Ours are all inclined. The flattest which we deem it advisable to operate is 50 degrees, and we believe that somewhere about 50 degrees works out the best. In other words, the flatter you can run your raise, the less trouble you will have of blocking. The steeper it is, you get the jamming and arching effect in your raises.

MR. A. H. TRESTRAIL (Pickands Mather, Palatka, Mich.): I want to ask Professor Sperr in regard to breakers in the raise. How are they put in?

PROF. SPERR: Make offsets.

MR. BOARDMAN: In regard to inclined raises, don't you think in properties where the ore has a tendency to cleave and slip off, you have to have the offsets more prominent?

(The Chairman and Mr. Boardman at the blackboard.)

CHAIRMAN TILLSON: You probably see Mr. Boardman's sketch of the common way on the left, and the way he suggested on the right.

MR. BOARDMAN: This (indicating common way, Fig. 8a) is the ordinary trolley boxing in which the wire is straight up between the boards. On this side we have the right angle trolley boxing (Fig. 8b). This is what we sometimes call the back or timber across here. Now, the trolley pole is simply swung in there, and the wheel put in contact with the trolley wire.

In case this is on the side of the drift opposite the chute, the man has his back against this board here. For instance, if I were loading a chute here, the chute would be on this side, and this board would be at my back, so it would be impossible to push a bar in there. On the other hand, should the trolley wire be on the same side as the chute, or under or above the chute, which is very uncommon, you might possibly get the

chute bar in that slot but it is almost a deliberate act if you do so.

MR. A. H. TRESTRAIL (Pickands Mather, Palatka, Mich.): In regard to this right angle arrangement, is not the trolley wheel and the arm on the swivel, so you could have one chute on one side and another on the other in many levels?

MR. BOARDMAN: The swivel is here in connection with the pole. That is right at the head.

MR. TRESTRAIL: Do your miners wear heavy rubber boots?

MR. BOARDMAN: Some of them do, but not very many.

MR. J. W. REED (Consolidated Coal Co., Fairmont, W. Va.): Would that

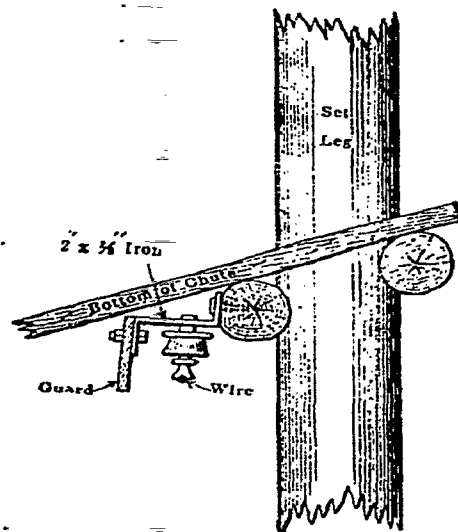


FIG 5c. SUPPORT OF TROLLEY WIRE UNDER A CHUTE AS USED BY N. J. ZINC CO.

type of pole give any trouble in keeping the trolley wheel on the wire when you are going over a trolley frog?

MR. BOARDMAN: Doesn't give any trouble at all.

MR. REED: It looks to me like it would have a tendency to pull the wheel back.

CHAIRMAN TILLSON: You have a swivel up here on the goose-neck, haven't you, Mr. Boardman? I imagine there is a swivel here as well as here.

MR. BOARDMAN: Yes, you are right; the sketch isn't very plain there. I just got the information from Mr. Concannon here that the kind of joints used on the trolley wheels are the ball joints—a small ball joint on a pin under the wheel, and then the swivel on the pole.

CHAIRMAN TILLSON: I want to call your attention to a plan for the chute mouth. I think all of you have seen the plan in Mr. Mitke's paper. He mentioned different types of chutes in which there were boards fitted

in slots between the two chute sides, and which required to be barred up. It seems to me that that type of chute is very awkward, inefficient, and a very dangerous type of chute to use. If you have a chute mouth with cleats and a board fitting between you can readily see that in barring that up you would have one side tending to jam. You are in continual difficulty with that type of door.

Your next step is to make the corners of those boards slightly rounded in order to try and avoid that, but still you have the tendency for jamming, for a man with his bar doesn't always get in the dead center, or the friction of a shunk against it will hold it back at one point and the other side is free, and there is always considerable difficulty in shutting off the flow of ore when you want to, and there is also the tendency for the ore to flow over and drop on somebody's foot.

Now, the other type of chute which Mr. Mitke mentioned; namely, an arc gate swinging down this way from below, has some difficulties too, because if there is a big chunk of ore and a small chunk of ore, when that gate comes down on the big chunk it is blocked and the rest of the material runs out on your car and overflows on the track.

For that reason I want to call your attention to a type of chute gate which we not only know is practically correct, but it seems

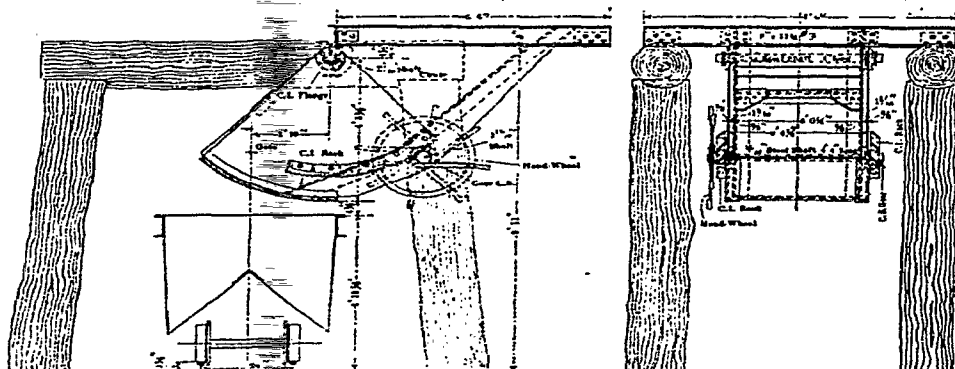


FIG. 9. CHUTE GATES USED BY N. J. ZINC CO. WITH ELECTRIC HAULAGE

to be theoretically correct. That is an arc gate which is underslung, it being supported from some point above or at the side of the chute. (Fig. 9.) Now, the effect of that gate is, in opening the gate it swings down and lets the ore gradually flow over the top of the gate. In other words, the ore in the chute has come up to its angle of repose, in which the fraction upon it does not permit it to flow any longer. The moment you drop that gate, you come below that angle, and it starts to run out slowly.

When you are raising that mass of ore up to its angle of repose there is nothing in the world that can block the delivery and control at the chute's mouth. So far as the control of the chute gate is concerned, it

seems both practically and theoretically correct, and I would highly commend it to your attention for any installations which would be in service long enough to warrant the installation of metal chutes. We have found that it is possible to so proportion the weight of those parts that as you operate you raise the center of gravity and then upon releasing it you get very prompt and immediate action. It swings down to position possibly two-thirds closed and requires then a few turns to bring it up to the closed position. So you get very prompt effect in controlling the delivery of your ore.

MR. W. D. SCHOFIELD (Inspiration Consolidated Copper Co., Inspiration, Ariz.): What is to prevent your stuff from bouncing over?

CHAIRMAN TILLSON: Actually the top comes in here a little further. From that point out here is flatter than the angle of repose, and it won't flow over.

MR. SCHOFIELD: It doesn't now, but if your chute is empty you have a tendency of bouncing over.

CHAIRMAN TILLSON: You should never empty your chute. Any empty chute will cause you trouble.

PROF. SPERR: The trouble with this chute here is that you are using it the wrong way. Now, Mr. William Kelly described that chute and its use in the report of the Lake Superior Mining Institute about twenty-five years ago.

(The chairman rearranged the sketch.)

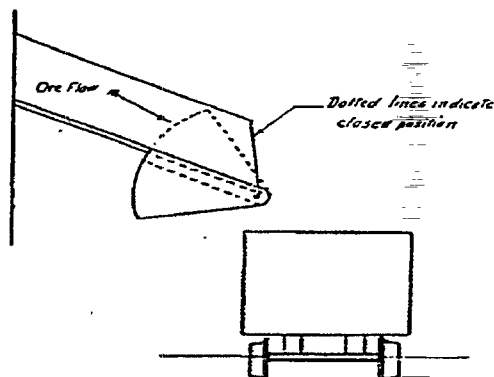


FIG. 10

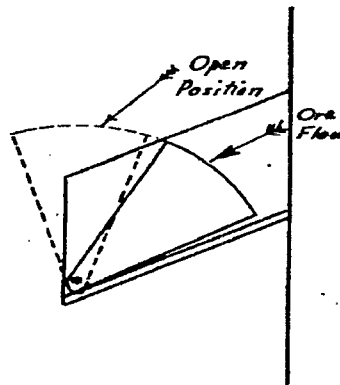


FIG. 11

PROF. SPERR: Now you've got it. By closing the door down, as in Fig. 11, a lump of ore is liable to catch under the door and prevent it from closing the chute entirely. In Fig. 10 the door closes upward so no lump of ore can prevent its closing. We use that type of chute, and when the handles go down it comes up just as he illustrates it there.

CHAIRMAN TILLSON: That is the very common way of using it, but I maintain that is the wrong way.

PROF. SPERR: Well, the reason we do that is because we want everything above the car and nothing below, so the car goes under the lip. In order to get it above we sacrifice the ease with which you work the chute.

MR. W. W. GIDLEY (Phelps Dodge Corporation, Bisbee, Ariz.): I think we have all entirely the wrong idea of Mr. Mitke's illustration here. This illustration is taken from the standard door that is used now by the Phelps Dodge people. It is taken right from the mines in Bisbee, and is the type of chute door adopted as a standard. It works very successfully.

In regard to what the Chairman said a few moments ago, it doesn't project down below the chute lip at all.

In addition to the door there is also a little board that is commonly known as the tail board, used in case of a run of ore, and in studying out the different types of doors in order to arrive at a standard, many different designs were tried and considerable time devoted to it. The result was that this iron door was adopted as a standard, and is now being used in every chute in the Phelps Dodge works in Bisbee. We found it to be the most practical chute door in use.

Another feature about the door, as you will notice, is the handles on the side, which practically compels the man to stand at one side of his car in order to work the lever. In case he is required to use the tail board, he uses it with his right hand. All of us who are interested in safety know that our most frequent accidents occur from loading. Men get their hands bruised or fingers smashed, especially those who haven't had a great deal of experience in loading. You may have all the side boards or protection you wish, but it is almost impossible to get the ordinary loader to use them. So by having this door with a handle on the side, it practically compels the loader to stand at one side of the car.

We had a very serious accident in Bisbee caused by a boulder striking a man, and we are working on an arrangement to have a baffle down in front of the chute made of steel, so that the loader will be compelled to stand behind it. It is an experiment, and we haven't thoroughly tried it out yet, but I am convinced from the experience I have had that that is a very practical kind of chute door.

Another word in regard to the trolley wire. All of our trolley wires on main haulage chutes are by-passed. We have no overhead trolley, no live wire at all over the chute when the loader is loading. We have a block signal system established in the main haulage drifts. All our ore on the Phelps Dodge properties in Bisbee is hoisted through one shaft over conveyor belts automatically, and when the motor leaves this particular shaft on the main line back through the main drift, it automatically turns on the red light.

There is a red light at every junction of all the lateral drifts throughout the line, and as soon as they see this red light they know that the motor on the main line is approaching. It works very satisfactorily.

CHAIRMAN TILLSON: Do you consider that first type of trolley guarding unsafe? How is a man going to get his bar against it?

MR. GIDLEY: We use that a great deal. We have many very heavy drifts, and drifts that require a great deal of timber, and which are constantly settling. We use those guards wherever our trolley wires are at all low. But I do believe it is much safer and more practical to have the trolley wires by-passed.

PROF. SPERR: (Michigan College of Mines, Houghton, Mich.): Let us again refer to the method of stopping the flow of ore from chutes. It is a common practice in many mines to use boards which fit in slots in the chute.

In regard to this method of stopping the chute boards, I wonder whether the people who use it never thought of cutting off their chute right there (illustrating by sketch), and dropping the boards in here, and letting them stick through.

CHAIRMAN TILLSON: I was going to draw a sketch of that. (Figs. 12a,

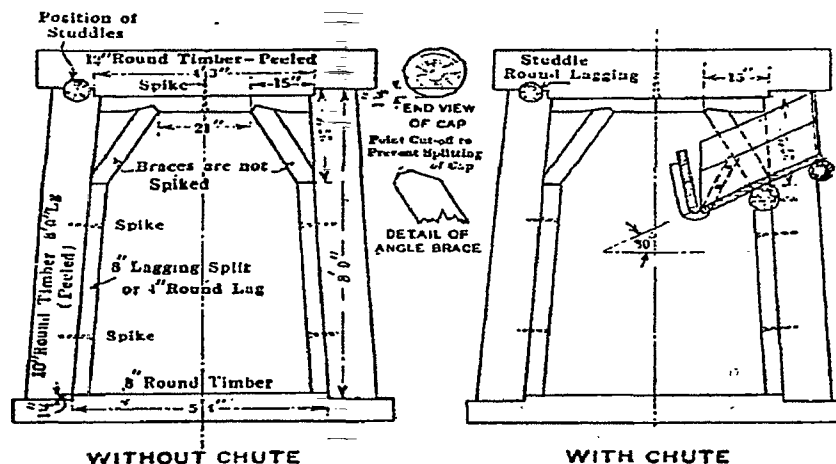


FIG. 12a. DETAILS OF STOPE SETS

12b, and 12c.) That hasn't any of the objections I mentioned for the other chute door.

PROF. SPERR: And you can either have one hook here or a succession of hooks for each board to hold the boards one on top of the other.

CHAIRMAN TILLSON: They may be hooked separately on the side, or placed one on top of the other. That brings up the other question that is mentioned in the paper, where in certain instances the chutes are fixed so that men will load from the side—from the end of the car or side of the chute—and the question I want to ask Mr. Gidley, who is acquainted with that practice, is why that isn't required in all instances. Isn't that the safest way to load a car—from the side of the chute or end of the car?

MR. GIDLEY: I don't quite understand your question. You mean that a loader should always stand at the end of the car?

CHAIRMAN TILLSON: Whenever the chute loads from the side of the car.

MR. GIDLEY: It is almost impossible for a loader to do that if he is loading out of an ordinary wooden door. He practically has to stand in front of a chute, particularly if he has ore that is inclined to be sticky.

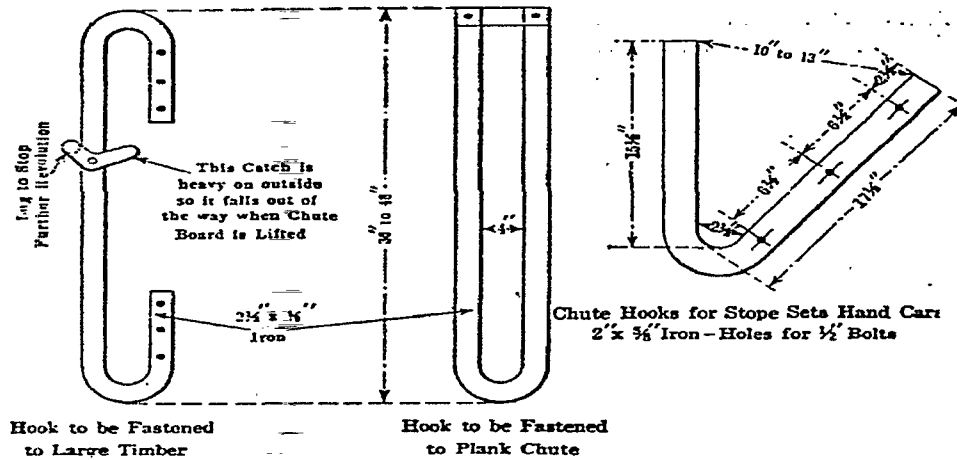


FIG. 12b. TYPES OF CHUTE HOOKS

CHAIRMAN TILLSON: In order to raise these boards?

MR. GIDLEY: No, in order to take his bar and have free access of the

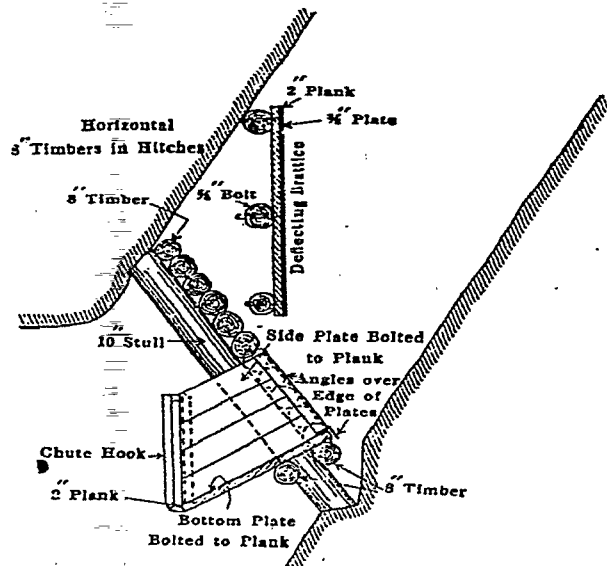


FIG. 12c. PLATING AND BRATTICING CHUTE

chute. He practically has to stand right in front of the door in order to load with the old type of wooden doors.

CHAIRMAN TILLSON: If you made the wooden doors of that type with

planks sticking out of the side of the chute and cut your planks down a little at each end so he couldn't pinch his fingers; one plank rests on another one beneath it. The side of the chute comes down to here, and the loader stands on the side and can handle those planks without prying up his boards. The men can stand at the end of the car here, and reach over the end or around back here and bar up the planks, and if anything happens, if the bar sticks, leave it there; and all they have to do is to step back out of the way of the flow of ore, and there is no difficulty in handling the material or barring the chute.

I speak by virtue of the fact that we have operated entirely that way for a great many years. And I have noticed in the past there have been many illustrations. I have seen some western mining practice, in which they have made all sorts of arrangements permitting the man to stand in front of his chute and bar it out, and the only condition in which we have to practice standing in front of a chute is where it happens to be a dead-end drift due to the slope of the ore. The chute comes in the end of the drift and has to be loaded from the end of the car. Then if that is cramped too much, he may have to be in front.

MR. GIDLEY: Wherever a main haulage chute is built in the Phelps Dodge properties our safety rules compel them to have six feet in front of every chute. In the past we have had serious, and in fact, fatal accidents, from men being buried by chutes running away, and if there is not sufficient room behind a car, why, it is more or less difficult for him to make his escape should the chute start suddenly to run, but if he has plenty of room it is almost certain he will get out of the way.

Of course, in loading a car in the end of a drift conditions very often demand that chutes be built that way. In the end of the drift perhaps they may be following a string of ore or something that wouldn't justify a great deal of expense in building the regular type of chute, and in that case some small chute, commonly termed a "joke chute" is erected in the end of the drift, and loading is done in the end of the car.

But there is one thing Mr. Mitke speaks of—that is when the chute hangs up the loader would have to take powder and blast it out. I want to say that he would practice that about once in a mine of mine. The thing of allowing the loader or any green man to handle powder to blast the chute is absolutely out of the question in these days of safety. If it is necessary to blast a chute, why, we have rules governing that. The loader notifies the nearest miner, who comes, and if necessary does the blasting—but not the loader. It would never do to have a loader blast a chute.

MR. BOARDMAN: One thing in regard to loading the chute I'd like to bring out here. Up in our mines we have a number of accidents caused by men loading from the opposite side of the car. They lean over the car in this manner, and the car catches them right where it shouldn't. In leaning over the car they sometimes forget to put their board in between their body and the car, and of course the fleshy part of the thighs and some other things get across the top of the car, and the ore spills down and catches them. We have had some very serious accidents in that manner, and I think in that case it is necessary to load from the side of

the car, but there should be very stringent rules requiring men to place boards between them and the car.

MR. A. H. TRESTRAIL (Pickands Mather, Palatka, Mich): We have both those installations Professor Sperr spoke about, where you have a bar on the outside of each chute and boarding across, and we also have the arrangement where the man stands in front and blocks the chute from the front. If you have chunks, then I think it is pretty nearly impossible to work a chute without having a man in front with a bar, or at least on one side of the front to pry down the dirt, and keep it running.

I think the paper spoke about the building of a platform on the side of a car so the men could get up and have plenty of room, and a chance to jump to one side in case of a run of ore.

Sometimes in our dirt there will be fine stuff and rocks mixed, and it is necessary if it starts to run to bring that board down pretty fast. So the fellows used to grasp the board on the top and get their fingers caught. So we tried to experiment by putting the handles on the outside of the chute board, and then he wouldn't have to put his fingers over the top. First we put them this way, and that didn't give them any leverage, so we turned it around so he could grasp it at a side angle and save his fingers.

CHAIRMAN TILSON: Couldn't they stop the flow of the ore with boards on chute-hooks in the front?

MR. TRESTRAIL: We have that installation, but I stopped at that particular property just before I came down here, and watched them load several cars, and they still had to get around in front with their pryrs and loosen it up. They used bars, standing back to one side, to pry it up. If it doesn't run, they have to get powder. And in regard to a loader blasting a chute, I agree with Mr. Gidley that that is out of the question. They have an experienced man to look after that part of the work.

PROF. SPERR: With that type of a chute board, when you have to bar your chute you will always have at least one board over the top where you are barring, and if a rush starts you drop it quickly and there is absolutely no danger, even if standing in front of the chute.

MR. TRESTRAIL: As a rule they generally leave the cross bar on top.

PROF. SPERR: Yes, one board, and another is up at the top to stop it. Then instead of having one hook for all the chutes, I have seen a succession of hooks used. The first hook, you see, stops the rush, and then there will be hooks inside that you can drop boards into lightly.

MR. TRESTRAIL: Instead of the boards we use the cleat.

PROF. SPERR: But, first of all, will be a hook.

MR. TRESTRAIL: Yes.

MR. W. W. GIDLEY: During the Spanish-American War, in 1898, I was employed in Butte, and in speaking of the hanging of chutes, there was a method in vogue there at that time—it wasn't used at all of the chutes, but it was in occasional use in various places—where we used to have a chain strung through the chute from the collar top of the chute to the door. The ore, while often it was wet, was not sticky, but the hanging of the chute was usually caused by the arching of boulders. If you'd take hold of that chain at the bottom and give it a little shake, invariably it

would start the chute to running. It worked very successfully. I don't know whether they are still using it in Butte or not.

MR. J. C. CONCANNON (Anaconda Copper Mining Co., Butte, Mont.): I think the talks we have heard this morning are something very enlightening. Now, I have been a loader for the A. C. M. Company for quite a while, and this is my idea of a perfect chute—where I think I would get the greatest returns without going into great risks to the men. This is how I would do it: A chute of a hundred feet should have three setoffs, but not too wide for the chute to hang up on.

This chute should have an angle of 45 degrees. Now, when it comes to the loading, what I would advocate is this: Have a controlling door for each of those three offsets. This controlling door is about half an inch thick and covers the entire breadth of the chute. That is worked by a lever from the man who stands on the platform at the side of the chute.

I would also say that a man should never stand in front of a car, or sit down on it and put his legs across the car, because he is liable to be hit below the belt if he ever did that.

MR. R. D. HALL ("Coal Age," New York City): As a coal miner, I hesitate to get into the discussion at all, but it seems to me when we come to talk about wires, it might be a good suggestion to leave them out altogether. It seems pretty hard to induce anything in the way of a storage battery locomotive, but it does seem to me that will be the ultimate result, and of course it might be a combination of both trolley and storage battery; the storage batteries being used where there are chutes, and the trolley being used where there are no chutes.

It seems to me that matter ought to be looked into because it offers a great possibility of getting rid of the wires. I also think that hardly any matter would be more prolific of good than a bulletin issued by the National Safety Council on chute doors. It seems to me when you have solved that matter of mining cars as best you can, with the present state of knowledge, then you might take up the matter of chute doors to great advantage. Being used in the anthracite region, it really is a matter which interests the coal-mine man just as it does the metal-mine man. However, the former has the advantage of knowing just about what he is after, and making his installations without any question about the probability of their being used to a large or small extent.

MR. R. H. GUERRANT (National Safety Council, Chicago): In regard to chutes becoming blocked, I picked up an idea from the Oliver Iron Mining Company. They provide a room at the side of each chute for barring down the ore if it gets blocked over the chute entrance. I will make a sketch of the arrangement. (Fig. 13.)

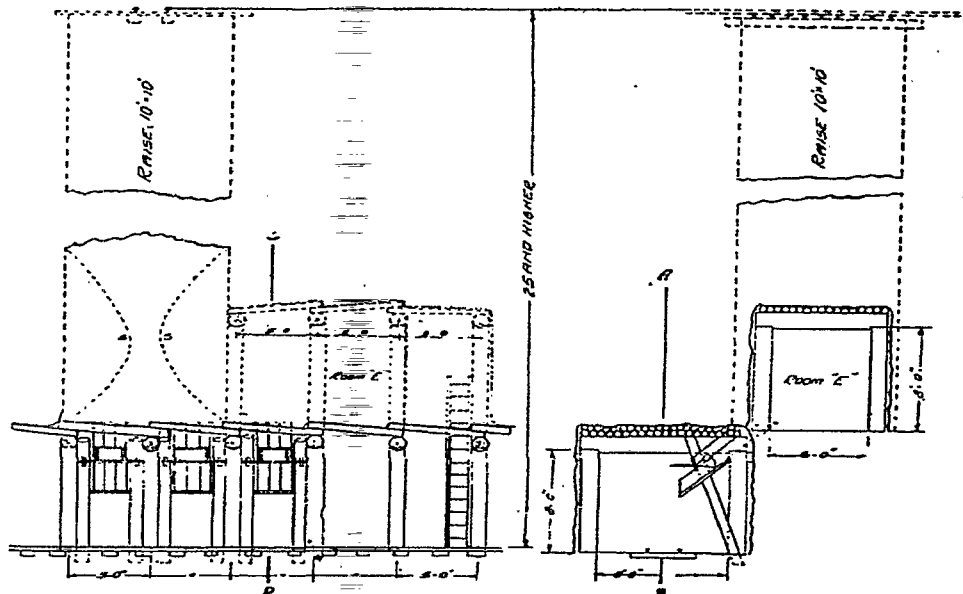
In their main haulage ways they have some trouble in loosening the ore, so their general manager conceived this idea: At the bottom of the chute they have dug out a room ten feet long. A man can climb up into this room and loosen the ore with a bar, and he is not in danger of being crushed. Where they recently loosened it through the chute, they experienced much trouble. They claim this is an ideal way of loosening

ore. The floor of the room is on a level with the bottom of the chute.

MR. A. H. TRESTRAIL: If the man can get in there to work there must be an opening.

MR. GUERRANT: He goes up at the ladder at the far end of the room.

CHAIRMAN TILLSON: We could spend the whole day on chutes, but I will ask for the paper on "The Importance of Safety Measures to the Miner," which is to be presented by Major Arthur S. Dwight, who comes to us, we are very much pleased to say, as a representative of the American Institute of Mining and Metallurgical Engineers. This is the first



Courtesy, Oliver Iron Mining Company

FIG. 13. A SAFE ARRANGEMENT TO PERMIT DISLODGING WEDGED ORE IN CHUTES

time the Board of Directors of the American Institute of Mining and Metallurgical Engineers has officially sent a delegate to address the Mining Section of the National Safety Council. We hope it is an omen of the closer cooperation to take place between those two famous bodies. Major Dwight.

THE IMPORTANCE OF SAFETY MEASURES TO THE MINER

MAJOR ARTHUR S. DWIGHT

CHAIRMAN, INDUSTRIAL ORGANIZATION COMMITTEE,
AMERICAN INSTITUTE OF MINING ENGINEERS, NEW YORK CITY.

There is no calling that is more vitally interested in safety measures than that of the miner. He faces continually the perils of falling rock,

caving ground, high explosives, poisoned air, gas explosions, fire, flood, high tension electrical currents, besides all the ordinary dangers of machinery made doubly perilous by the darkness and the discomfort in which he often works. The calling has always been a perilous one and necessarily, in order to exist at all, the miner had a safety code, the proper understanding of which was a very important part of the skilled miner's equipment. In the old world, mining was from ancient times an hereditary occupation which developed its own traditional methods and rules to suit the special conditions found in the several mining districts, and these rules were handed down from father to son.

As the New World began to open up its mineral treasures, skilled miners from these old mining communities of Europe were attracted, and brought with them their old country methods, and their unwritten rules of safety underground which had been developed in the centuries of experience in the mines of Cornwall, Devon, Saxony, and Bohemia. These ancient unwritten rules are still the basis of underground practice today, though obscured somewhat by the multitude of "don'ts" that have come in as modern engineering has replaced the simpler implements of the ancient miner with power drills, high explosives and powerful hoisting, pumping, ventilating and transportation machinery. Moreover, the old breed of miner has mostly disappeared, and the unwritten laws of safety underground have been largely forgotten, because unwritten. With us, the miner is seldom born to the business; he has to be shown.

It is my purpose to discuss here only metal mining. The coal miner was early confronted by certain hazardous conditions peculiarly his own, explosive gas and fire danger, and was long ago forced to adopt safety measures on a large scale, and not only to codify his safety rules, but to establish a system of rigid inspection to enforce them. The metal miner is perhaps the one that now most needs enlightenment and cooperation. It is necessary that the unwritten law of safety underground be written, and incidentally written in all languages under the sun to reach our present complex mining population, and then backed up by a good Anglo-Saxon punch.

COMMITTEE APPOINTED TO DRAFT SAFETY CODE FOR METAL MINERS

The need for a safety code for metal miners to meet this situation of increased occupational complexities with diminished skill in the miner, came to a head at the 1906 meeting of the American Mining Congress, at Denver, Colorado, and a committee of five eminent mining engineers was appointed to study the situation and draft "a modern law governing quarrying and metalliferous mining," which could be recommended to the several states for adoption, in the hope that the passage of a uniform law by the mining states would tend to lower the number of fatal and serious accidents. The engineers composing the committee were Walter R. Ingalls (chairman), the late James Douglas, James R. Finlay, J. Parke Channing, and John Hays Hammond. Much valuable preliminary work was done and discussion in the technical press awakened, and in 1909, the American Institute of Mining Engineers, and the Mining and Metallurgical Society of America became interested, and asked to participate in

but they are certainly on the right track, and Mr. Fay's statistics will doubtless show steady improvement year by year.

The next thing is to reach the proprietors of the small mines, and induce them to adopt safe methods. The work of the big companies will in time have its effect on the smaller operators, but other steps should be taken. The most effective, of course, is the adoption of well-drawn state laws, adequately backed up by generous appropriations for adequate inspection of the workings, and prosecution of those who violate the law. That may come in time, but meantime it is believed that the principles of safety should be inculcated not only from the top down, but from the bottom up; in other words, some form of educational campaign might be started that would appeal in the first place to the small mine proprietor who employs only a handful of miners, and in the second place to the itinerant miners who largely make up this class of employees. I shall not attempt to suggest the means of doing this, realizing that the experience already gained by the National Safety Council along this line is worth more than any ideas of mine. The records of the U. S. Bureau of Mines would doubtless furnish a valuable mailing list for reaching these small operators.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS

The American Institute of Mining and Metallurgical Engineers is glad to cooperate with the National Safety Council in promoting safety methods in the mining industry. Perhaps we have been slow in giving official recognition to the movement. Except for the work of the Committee on Mining Safety Law, already mentioned, which began in 1906, and was formally endorsed by the Institute in 1909, practically nothing was done in the way of safety activities until 1914, when the Museum of Safety was officially recognized by the appointment of a Consultation Committee. In 1918, a Committee on Industrial Organization was appointed with nine sub-committees, one being the sub-committee on safety, for cooperation with the National Safety Council, and it is to be hoped that this community of interest may result in lasting good to the mining industry.

The American Institute held a meeting in Chicago last week. There was an attendance of 700 at the Banquet, and it is significant of the present trend of thought in the profession, that every one of the speakers that evening, each in his own way, led up to the one all-absorbing topic which Mr. Charles M. Schwab, one of the speakers, aptly referred to as "Human Engineering." The subject is presented to us now as never before, and the conservation of human life is the first element in that plan. That is the noble purpose for which you are striving, and you may be assured of the sympathy and cooperation of the mining profession.

CHAIRMAN TILLSON: We are greatly indebted to Major Dwight for his paper, and discussion on the subject is now very welcome.

DISCUSSION

MR. A. H. TRESTRAIL (Picands Mather, Palatka, Mich.): In regard to the statement about the itinerant miners of small mining companies not

using safety standards, does not that seem to indicate that the itinerant miner is a dangerous man, and from the fact that he works, as a rule, for these small companies, why, the small mines would have a larger disability or fatality rate on account of the kind of help that naturally goes there for employment? The company that employs the safety standards as a rule has a steadier force of men, because men knowing the dangers of the occupation prefer to work in a mine where things are well regulated.

COMPARISON OF EUROPEAN FATALITIES WITH THIS COUNTRY

In regard to the comparison of European fatalities with this country, is it not a fact that in this country the stress has been laid upon the number of tons per man, and I believe in one of our previous conventions it was shown the production in this country was very much greater per man than in the European countries. In Duluth that point was brought out by a practical man from Europe who stated the production in this country per man was greater than in Europe.

COMPARISON OF LARGER WITH SMALLER COMPANIES

MR. M. J. FLYZIK (State Safety Board, Olympia, Wash.): Our experience in Washington has been somewhat different relating to the small companies. The Medical Department of the Industrial Commission has tabulated the last five years' contribution to their Department, and we find that the larger companies in the state are contributing more to the Medical Department, as a result of a greater percentage of accidents, than the smaller companies. For instance, there is a mine employing about seven hundred men. They have injured for the year 1916, 33 per cent of their total force. Another and smaller mine employing but one-half the number of men only injured about 26 per cent of their total daily force. What is true of the coal mines, I am informed is also true of the shingle mills of that state. Our experience shows that the smaller plants, operating with smaller numbers of men, are far ahead of the larger employers, so far as the Medical Department is concerned.

Now, in that state the workmen contribute one-half, and the employer one-half of the actual day's work for medical treatment. We only have a seven-day waiting period, which perhaps knocks off about 10 to 12 per cent of our trivial accidents. But we get our figures very accurately from injuries that go over this seven-day duration. I am only speaking from our experience in the state of Washington.

CHAIRMAN TILLSON: Mr. Flyzik, do both the large and small plants have the same number of working days in each year?

MR. FLYZIK: Practically so. In fact, we find that the smaller plants operate more days than the larger ones, due to the fact that the railroads purchase their coal.

MR. TRESTRAIL: I know it is a fact if you take the small property for or six years?

MR. FLYZIK: I am speaking for that one year, but at the end of December, 1919, we expect to have complete data for the five years.

MR. A. H. TRESTRAIL: How long a period was that comparison—five

one year it may run along with a very nice percentage for that one year, but in the next year if they have one accident of maybe fifty to a hundred days' disability, that property's record is ruined for the year. The small accidents in a big property mean a very trivial thing, whereas in small properties as affecting their percentage, why, it runs up. For instance, in one case a small property had a percentage of .2 of a day in every hundred days' work, and a large property had a percentage of .4 in every hundred days' work. But in the succeeding year the small property, through one accident that was calculated a thirty-day disability period based on a hundred days, why, its percentage ran away up.

MR. FLYZIK: If you take your figures on a percentage basis, based on the number of men employed and the actual days worked each year, that shouldn't vary with a thousand or a hundred men—as long as you have based your statistics on that principle.

MR. TRESTRAIL: The only variance would be in which mine operated the more safely. The statement has been made in this paper that the small mine was the more dangerous mine to work in, and the only difference in the figures would be as to which mine had the safest schedule of figures. That is the proper way, according to my notion, to figure it out. If the small mine is more unsafe to work in than a large one, the small one is going to have the larger percentage of disability. That is what I was getting at.

MR. J. W. REED (Consolidated Coal Co., Fairmont, W. Va.): I believe the gentlemen are all right, but I think the figures, if compounded on a few small mines, will be very misleading. It is about the same proposition I am up against in working out individual records for single mines as compared with the total records for our company as a whole.

Now, as regards the small mines and the large mines, I am in a position to say something, having been a state mining inspector for some time and having had about a hundred and some mines under my inspection at one time. I find that the small mine and the small organization is in some instances a great deal safer from the fact that perhaps the president of the company or the owners are directly in touch with the interior of the mine and get in there. Then if there is something that comes up which must have attention, why, the man who owns the pocketbook and has charge of the purse strings is able to open it up and go ahead and do it or not do it; while in your larger organization you continually get further and further away from the man who holds the purse strings, and improvements have to go through a number of different channels to reach him, and you have a longer length of time elapsing.

But when your large organization becomes interested in safety, and makes it its business to go down through the mines and improve the conditions, I believe it is a hard thing for the small mine to equal the conditions for safety that the larger organization can produce. That in general, was my experience in Kentucky. We had a number of small mines under small ownership, and I don't think I ever in my life saw mines which were kept in better shape and were safer than those small operations. We also had larger companies, and their mines were in equally good condition, but we had in-between companies where the conditions

would vary from good to bad. So that when you come to a final summing up of the thing, I believe that your small intermediate organization will be equally as good, depending on the man in actual charge of the work. There isn't any line which can be drawn to say the small man works under dangerous conditions, and I don't think you can say that the larger operator always has good conditions. He may want to have them, but perhaps the man he puts in charge of the mine is not getting the service he thinks he is.

EDUCATION OF THE MEN AND THEIR FACULTIES OF IMAGINATION

MR. J. E. WATSON (Timber Milling Co., Butte, Mont.): A great many of the companies throughout the country today are publishing and editing papers that are distributed among men on safety work, and safety measures are being put into use at the different mines. We have a paper out in Butte, that got to almost all the employees a short time back, in which was an article that dealt with imagination and its bearing upon safety work.

If you have a man, no matter how many safeguards you throw around him, or no matter how many installations you may make to take care of his health and welfare, if he doesn't have his imagination educated so he can see what might happen to him if he does a certain thing, your safeguards are not going to work out very well. If you have a man with a vivid imagination, who knows he is doing something that may result in a broken arm if he continues that thing, he will try to take care of himself, and you will have a great deal less danger from him than from the one with little imagination as to his welfare but with numbers of safeguards about him.

I think the education in safety of the men working in the plant is one of the important issues—not only the installation of safety devices, but education of the men and their faculties of imagination.

MR. A. H. TRESTRAIL: Along the line of education of the men, a great many of the mining companies have found it a reasonable thing to go even a little farther and try to educate that man's family. That is, they realize the mental condition of the working man is largely affected by the home conditions, such as the kind of food he eats, the sanitary condition of his home—and as a result of that they have a visiting nurse who calls regularly at those homes, which they find is an important part of their safety work. As a consequence, they endeavor to make that part of his life brighter because if it is so he is a much more efficient man when on the job.

THE GIVING OF PRIZES

MR. C. W. GOODALE (Anacóna Copper Mining Co., Butte, Mont.): Several years ago the company put up a considerable bonus for the foremen who went through the year with the least number of accidents. One thousand dollars was given by the company—\$750 to the foreman showing the best record, and \$250 to the foreman showing the next best. Now, the mines on our properties vary considerably. Some of them are large, with

perhaps 20,000 shifts in a month, and others are small with not over five thousand shifts in a month.

We soon found that the larger mines, regarding each man as a risk, were not drawing any of the prizes at all. In one certain case one of the larger crew drew a second prize, but in no case did one of the larger draw a first prize. That led to some dissatisfaction, and the foremen of the larger mines said, "What's the use? We've got 20,000 risks against 5,000." So the company gave up that plan of offering the foremen a bonus or reward for a good accident record.

But some little evil crept in. For instance, the accident rate was based upon the State Compensation Law, which allowed fourteen days. If a man was injured, perhaps seriously, we found in some instances where the foreman had practically chased him out of the hospital in order to get him back within the fourteen days, which was rather a serious objection to it. Sometimes they were unfit to go to work after the fourteen-day period, and then should they go on the job they would be liable to another accident or to infection.

PLAN OF MERITS GIVEN TO FOREMEN

I don't know whether any of the members of the Mining Section have given attention to the paper written by Mr. Evanson of the U. S. Coal and Coke Company of West Virginia, but he had a very thorough paper about five years ago in the transaction of the American Institute of Mining, outlining a plan of merits given to foremen with good records. It was based on the system that if a foreman got through a month without an accident he was awarded \$5.00 added to his pay for that month. After he had gone six months without an accident he got \$10.00 a month in addition to the \$5.00 as long as he kept that record up. In one case I saw a record of a foreman who had gone thirty months without a serious accident under his supervision. In that case for twenty-four months he had been drawing \$15.00 a month in addition to his regular pay. In that case it was perhaps somewhat easy because the number of his men was not less than twenty nor more than twenty-five. However, this was true of the other foremen competing with him at that time.

In the case of our Butte mines in many instances one shift boss can look after fifty or sixty men at a time, so we found it rather difficult to apply that system of awards or merits or additional compensation. Mr. Evanson had a record there before he started this system of 100,000 tons of coal mined per fatal accident. In the course of five years that had increased to 500,000 tons per fatal accident, and he attributed it largely to the system he had inaugurated.

Any one can see that the effect of that would be this: If a foreman sees something that is not quite safe, instead of merely standing there and telling the man to do thus and so, he will stay there until it is done that way. He knows his pay is going to be increased if he gets through the month without accident. But when you do have an accident, it is sometimes very difficult to run down the responsibility, and in the case of the U. S. Coal and Coke Company there were many accidents where the foreman simply had to say, "Well, that's my bad luck."

I'd like to inquire if that system has ever been applied, or is now used in any other coal or metal mines.

MR. N. D. HUBBELL (W. J. Rainey, Uniontown, Pa.): I might give you a few facts. I am sorry I haven't the figures here. Such things as that I usually carry around in a bag instead of my head. For the past three and a half years, almost four years, there has been considerable interest on the part of our company in safety work and reducing accidents.

We have nine mines operating. Four of them are comparatively large bituminous coal mines, and the other five are comparatively small. The situation is a little bit different from the small mine as we speak of it out West. As a matter of fact, they were large mines in the beginning, but we mined out on the retreating system, and along toward the end of the mine it begins to get in nearer the pit mouth, and as a general rule you have a class of employees in the small mines who are the old timers, who have been there for some time. Now, these miners know the work, and have had, some of them, twenty-five and thirty years' of experience in this same mine. So there is an element entering into the safety factor there that would be a little different.

We started out with a first, second, and third prize for lowest compensation liability, and we ran into all sorts of trouble, as you would readily realize. That was based on the compensation liability for a six-month period. The second period it was based on a small factor of the number of weeks' liability incurred, but we divided it into two classes. We gave first and second prizes for rectangular or larger plants, and a first and second prize for the beehive.

Now, the most interesting thing in connection with the effect on accidents was this: We had five curves along for the same period; one representing the fatal accidents, one representing non-fatal accidents, another representing compensatable accidents, that is, accidents in which the lost time was more than fourteen days called for by the Pennsylvania State Law, and one for time lost but not compensatable, lost time, but less than fourteen days, and still another representing no lost time.

The two curves that worried us most—the fatal accidents, and the compensatable accidents—showed a slight decrease in 1917 compared with the 1916 figures. Nineteen eighteen showed a slight decrease compared with the 1917 figures, and 1919 so far seems to be running neck and neck with 1918.

On the other hand, the two curves—lost time, but non-compensatable, and no lost time accidents—showed a decided decrease. I dare say our figures for 1919 will be less than 20 per cent of the 1916 accidents in those two classes.

Just what we are going to base the prizes on next year I don't know. We are going to change the basis, and try to involve new factors: One, the number of days lost on account of accidents in proportion to the total number of days' work; and the other, the number of days lost on account of accidents in proportion to the total number of tons of coal mined. I am trying to work out a scheme that will work in these two, to give us some kind of an average representing the two factors we are most interested in.

MR. A. H. FAY (Bureau of Mines, Washington, D. C.): The small mines Mr. Goodale referred to I don't think are a good comparison to the small mines to which Major Dwight referred in his paper, for the former have all the advantages of modern equipment and engineering experience and hospitals and doctors that are available for his largest mine. These small mines to which Major Dwight refers are those small gold mines, lead, tungsten, etc., in the far West, fifty miles from a hospital; some of them have no mine doctor, and their equipment is not what Mr. Goodale referred to in case of his small mines. Mr. Goodale represents twenty-five or thirty mines in the Butte district, but in my tabulation it is called one—the Anaconda Copper Mining Company. I have kept all records from what you might call the standpoint of management instead of mines. So when Major Dwight referred to some two hundred mines, employing some eighty or ninety men in each, it is very different from the small mine in the Western states employing ten or fifteen men, which is about the average for the majority of the gold mines. Some of them are simply prospects out in the hills with half a dozen men, and every one of those men handle the powder. They all do the blacksmithing work. Every one is an all-around man, and there is no specialist there on the job. The hoisting equipment is sometimes of the very poorest. Sometimes there are no cages, and perhaps no guides on the cages, if they do have any.

This is shown very plainly in the Joplin district. There are very few cages in the Joplin district, and not only few cages but few guides to take care of the buckets going down a two-hundred-fifty-foot shaft.

SAFETY IN THE SMALL MINE

In 1911 I picked out those companies on our tabulations employing ten men or less. I counted up the fatalities on that group as compared with the ones employing more than ten men. I found in that bunch of the small mines, twenty-five fatalities, which represented a fatality rate of almost 8 per cent of the men employed, as compared with about 4 per cent for the other group. The fatality rate for the United States that year was 4.41 per cent of the men employed. I am inclined to think that the small mine, as a rule, is more dangerous than the larger mine, but there are conditions in the small mine which may be considered safer than in the larger operations. For instance, take a small gold mine with a vein two, three, or four feet thick—there is not as much chance of danger for a body of ore to come down as there is in some of these Michigan iron mines and large copper mines in the West, where they are fifty or a hundred feet wide, and give room for a large fall or a roof cave-in of the entire mine.

Another condition which also tends toward safety in the small mine, is that if the superintendent has any scruples at all he is there on the job, and he can look after it and follow up. But from my experience around the mines, they have not done this as well as they do in the larger properties.

In my work, for the last four years, I have been able to pick out com-

panies and tabulate their accidents by mining methods, and in each of my reports for the last four years there are details given of the caving method, overhand stoping, room and pillar, and door mining, and if any one is interested in those, they need only to send for a copy of the reports. I can't keep all those figures in my head, but I do remember in those companies I have tabulated (about 250 or 75 each year) in the four methods of mining operations there were about 330 non-fatals per year: while the records for those small mines to which Mr. Dwight referred show about 150, or approximately half.

I have a reason for believing that the accident rate as tabulated under the mining methods group is about complete, because these companies are rendering complete reports, and I applied that to the official returns I got from the state of California, and I find that the returns of these returns of the larger companies as compared with the actual returns from the state of California check up about even. I found when the figures of California did come in they checked to within 13 out of 6,000 accidents. So that we can feel pretty safe that 330 is not far wrong on non-fatal injuries of duration of one day or more.

MAJOR A. S. DWIGHT (American Institute of Mining and Metallurgical Engineers, New York City): It is very gratifying that Mr. Fay did not entirely repudiate the conclusions which I drew from his figures in his annual report, which were made up entirely on my own interpretation of his figures, and which were not intended to show that the small mine per se was more dangerous than the large one, because the reverse is true, generally on account of conditions prevailing, and the ability of the proprietor himself to give personal attention to the safety of his mine. But my purpose was to call attention to the fact that in spite of that advantage which the small mine has, the statistics show it is more dangerous to work in the small than the large mine, and thereby to express the hope that the National Safety Council in its efforts to carry on a campaign of education would give attention to these small mines which are not directly reached as are the large mines.

Now, most of the representatives in the Mining Section in this room are representatives of those large mines that have had the broad vision and have seen the business necessity for taking extraordinary measures to study and devise plans for considering the life of their operators. But the small mines in out-of-the-way places are up to the present time almost forgotten. They will be reached in course of time by the state laws, which perhaps will be gradually improved and brought to bear more and more from time to time to control the operations in those cases, but at present they are almost out of reach of the campaign of education which has done so much to improve the conditions for safety in the large mines, where the dangers are really greater than in the small mines.

CHAIRMAN TILLSON: Major Dwight has fittingly led up to a subject mentioned in the paper which is to follow and which has been delayed on the program, so if it meets with your approval the Chair will rule that we proceed with our program and consider the subject, "The Need for a Definite Technical Service in the Mining Section of the National Safety

Council." Major Dwight's comments referred to the need of development of interest of the small mines in safety work.

This subject now in hand, I may say for the benefit of some of the mining members, is rather close to the hearts of some of the other sections, and to the Executive Committee of the National Safety Council. The consideration of this in the various activities of the National Safety Council as it applies to these other sections is a problem which is now calling for some attention.

NEED FOR A DEFINITE TECHNICAL SERVICE IN THE MINING SECTION OF THE NATIONAL SAFETY COUNCIL

BENJAMIN F. TILLSON, CHAIRMAN MINING SECTION, NATIONAL SAFETY COUNCIL; ASSISTANT SUPERINTENDENT, NEW JERSEY ZINC COMPANY, FRANKLIN, NEW JERSEY.

To attain real efficiency in safety work we must *keep our men interested*, and this requires persistent work and ingenuity in sustaining their support and enthusiasm. No one safety engineer can think of enough "stunts" to last 365 days in the year and the realization of this has drawn us together from many different industries to one central coöperative organization—the National Safety Council. We whose interests lie within the field of one of the most important industrial groups of this country—Mining—were desirous of concentrating our attention upon our specific problems at the same time we profited by the broadening influence of the experience of the other industries and we therefore formed the Mining Section as a part of the National Safety Council.

What has it profited us? What are our future needs, and how may they best be met?

A resumé of the service rendered by the National Safety Council at large and the Mining Section in particular in the past should indicate the lines along which an analysis of our own advance in safety work would show a profit from this association.

BULLETINS

The National Safety Council as a whole has provided a weekly service of bulletins of which about 840 have been on general topics of safety, welfare, and health and suitable for our plant bulletin boards; in addition there have been about 160 Mining Bulletins dealing with both coal and metal practices. Even the largest of us would not have felt we could devote the time, money, and attention to have produced this bulletin service for direct appeal to our workmen. Only one other section, the Electric Railway, can compare in specific sectional bulletin service. It has issued about 20 more bulletins, but the rest of the sections have only from 15 per cent to 75 per cent of the number which has been received by members of the Mining Section. However, if our interests are so ramified as to make the activities of other particular

sections of service we have at our disposal some 700 additional bulletins issued by nine other sections.

WEEKLY LETTERS AND EXECUTIVES' BULLETINS

We, as executives and safety engineers, have further profited by having our attention called each week to the experiences and successes of others in Safety Work; and this stimulation to our interest and enthusiasm is vital but incalculable. This has been accomplished by some 300 "weekly letters" and 150 Executive Series Bulletins which have come to us without the asking or any effort on our part. These have also kept us in touch with the times in regard to labor relations, employment problems, and welfare work. How else could we have obtained this service?

SAFE PRACTICES PAMPHLETS

Some 27 different pamphlets have already been printed to give us the authoritative information we needed in regard to the safe construction and operation of different elements common to most of our plants, such as ladders, stairs, boiler rooms, cranes, belts, shafting, engine guarding, oiling devices, knots and slings, floors, scaffolds, grinding wheels, goggles, etc.; and two pamphlets produced have been very pertinent to mining, namely—Ropes, and Mine Car Haulage. Only one other section has had a safe practices pamphlet prepared for it. In these pamphlets we have the collaboration of some of the best engineers of the country who have thought along Safety lines, and nowhere else is similar information available.

ANNUAL CONGRESS AND ITS PROCEEDINGS

Finally, we had the privilege of associating with each other at the Annual Congress, and we have thus rubbed shoulders, compared notes, and argued our mutual problems in Safety, Health, and Welfare with men in whose veins flows the virile blood of the day—men whose duties have brought them in contact with problems similar to ours and whose viewpoints vary from that of the workman to that of the foreman, safety engineer, executive, insurance agent, doctor, teacher, lawyer, or other professional man. Not only have we been able to concentrate our discussions upon our peculiar problems by reason of our grouping together as the Mining Section but our programs have also been arranged so that we might join in more general discussions with representatives of other industries and furthermore could attend the sessions of other sections (such as the Health Section) whose interests would supplement our own.

He who has never attended one of these Congresses may wrongly think of it in terms of the occasional engineering or business convention where there is but little tendency for the attendants to speak freely and fully of their experiences, where formal, innocuous, boring papers are written in so historical a manner as to produce no discussion, and where questions from the floor elicit no satisfactory replies. If such an impression exists it may readily be refuted to the satisfac-

tion of even a stranger to the meetings of the Mining Section, for the extensive printed transactions record that *over one third* of the information presented during the last three congresses was developed in the discussions.

Perhaps the *Round Table* is a new idea to some of us. If so, it must be experienced to be appreciated—unless we think in terms of the exciting conferences we have held with our confreres at which we have participated in informal discussions of ways and means for accomplishing some object of mutual interest and have defended our views and "hobbies." A Round Table Session is like that, "only more so", for the Chairman with watch in hand is forced to limit an individual's remarks to three minutes in order to give an equal opportunity to all, and his gavel may fall in the midst of our "one last thought". Such a session is provocative of clear, concise thinking and produces that nervous tension so necessary to stimulate the enthusiasm which makes us tenacious of our ideal plans and smoothes the rough drudgery necessary for their consummation. These Round Table Sessions are held not only as a part of the Mining Section meetings but also in the general meetings of the National Safety Council, and we all enjoy the privilege of profiting by the experiences of others and gratifying our own modesty by proclaiming our successes or seeking the solutions for our unsolved problems.

However, if business or other conditions prevent our attendance at the Annual Congress we still may profit by its Proceedings. Nowhere else is there so encyclopedic a source of authoritative information in regard to the problems of Safety, Health, and Welfare as is presented in the published proceedings of the National Safety Council since its inception in 1912. They comprise over 5800 pages, 6x9 inches in size, of which about 680 pages are devoted particularly to the mining industry. Perhaps the summation of the last three year's proceedings is more indicative of the amount of information now annually being made available for reference. The total for these years was about 4200 pages of which 550 pages were the proceedings of the Mining Section. It should furthermore be born in mind that this literature is the coöperative effort of individuals, representatives of both large and small industrial organizations, Federal and State agencies, and engineering and other societies.

Perhaps it has not been amiss to enumerate thus the activities of the National Safety Council and its Mining Section; for its benefits are dispensed so continuously that we may have come to receive them thoughtlessly and so have lost the perspective which is given us when we ponder upon the subject as a whole; and we should not fail to add as a benefit the opportunity which exists any day for us to present our special problem to the competent engineering and executive staff of safety specialists at National Safety Council headquarters, who have at their convenience an exhaustive library and file of information and who stand ready to share it with us. So much for what we have or should have received if we had sought it.

WHAT ARE OUR FUTURE NEEDS?

Our work and our life is yearly becoming more technical and general information must be supplemented with specific knowledge in order that it may be practically applied. We are living in an era when specialists are a necessity and we all require the services of a Mining Safety Engineer if we intend to make any considerable progress in the reduction of accidents. Compensation laws, insurance ratings, and general safety propaganda have made it plain to us that *safety pays*, both for employer and employee, but both are prone to forgetfulness in the matter and require continual reminders.

EDUCATIONAL SERVICE

With some concerns the size of their operations makes an extensive safety organization feasible, and they may therefore feel that they can "go it alone" as they would have more to give to such an organization as the National Safety Council than they would receive in return. It would be wise for them, however, to consider several things. Are not their safety engineers so tied down to plant details that they find it difficult to get away and have the entree to other plants for observation of the problems and solutions of others; and would not many of these other plants be so remote that they could not spare sufficient time or money to visit them? Does not the continual educational campaign which it is necessary to have for the workmen, whether by bulletins, lectures, courses of study, or moving pictures, require resources outside of those available in the operations of any one company, in order that the reiteration of advised safe practices may be made attractive by their novelty of presentation? Does not the giving out of information devoid of trade secrets pay, both by reason of our own analysis and more thorough understanding of that which we desire to make clear to others, and also because our generosity begets a similar attitude in others and we receive much value from the coöperative effort produced? If so, no company is too large to receive adequate benefit from their coöperative support of a skilled technical man who could put at their disposal, in proper shape for them to use, the information, bulletins, etc., which he had gleaned from others, and who also would make it possible for them to reciprocate with the least effort. Let the doubting Thomas try but one experiment, namely to plan a program for 100 meetings of his safety committees which will so hold the interest of his men as to induce them to attend without pay and which will also show value in accident reduction. It will destroy any feeling of self-sufficiency and indicate that his safety engineer who may be responsible for many more of such meetings deserves all of the outside aid that he can obtain and that the efficiency of his plants is well worthy of such help. Remember, we are considering *Definite Technical Services*—for general information might here be an entirely different story.

On the other hand there are thousands of small plants who can not see where their operations could stand the expense of a man devoting

all his time to safety work. With some the Safety Spirit may be present and with others lacking. The former may not require the general information but they both will need specific help, not only in regard to the proper practices in design and operation to overcome their hazards, but also with respect to prepared educational matter for inaugurating and maintaining a safety campaign.

Even more for these small companies than the larger and wealthier ones is it imperative for them to receive the intensive technical service which will show immediate marked results in accident reduction and correspondingly lower costs in production and insurance ratings, for they cannot afford to make a "long swing" investment in Safety with faith in the ultimate profit, as their resources might be dissipated before the time for reaping the profits.

REPORTORIAL SERVICE

Most of us desire to respond generously to appeals from others as to how they can better conserve human life and endeavor, but the urgency of our duties and pleasures mightily interferes with our preparation of complete and technical descriptions and illustrations of the methods we have used and the results we have produced. No, it is not because of a lack of willingness that we have not helped each other more in the safety movement; it is because of the lack of a suitable agency. Writing or dictation is laborious because it requires the logical correlation of our ideas with much data which is not carried in our memories, and because it is performed in an office or home environment where we cannot reap the benefit of contact with physical conditions in stimulating our memories by the association of ideas. If a trained safety engineer should visit us, look around the plant, and consult our records and drawings, he would acquire a vastly greater fund of information from our casual and disconnected conversation as elicited by his inquiries, or our observations if we should happen personally to show him about, than we should probably ever attempt to write down even though we did take time from our other activities with the intent of presenting the subject in the form of a letter or address. Why? Because he would make it his business to do this one thing and it alone, while we could not avoid the distractions of other duties. Also, we should have become so familiar with many of our old practices that we should not appreciate the novelty and interest they might have for others and so we should neglect to mention them unless they were called to our attention by a stranger.

Is it not clear that if no other purpose were accomplished than to send a capable man around to various mining properties, to dig out information for them and for others as to what they are doing that would increase safety, it would warrant a considerable expenditure by each of us?

PUBLICITY AND MEMBERSHIP SOLICITATION

When can we expect the greatest potential returns from our member-

ship in the Mining Section? Is it not when we have every mine in the country an ardent supporter? Then let us increase the value of membership through the service we render to such a degree that no company will fail to realize that they can't afford to neglect the opportunity for joining our ranks. Will not the travelling of a keen and technical executive secretary on his visits to various mining camps and his personal contact with representatives of various mining companies give us greater and more valuable publicity than could be obtained in any other way? Should not his conversation and presence be more effective than any solicitation by correspondence? If so, the benefits accruing from increased and more representative membership would warrant our making an additional investment for such a worthy object.

FORMULATION OF STANDARDS

We are in an era of diverse and profuse legislation—so much so that it seems as though almost every one else knew more about how we should conduct our affairs than we do, and desired to make us follow their beliefs or fancies. Foolish as this may sound, it seems to be a reality; and if by chance we do not know how to conduct our business with greatest economy in material and human factors, we should make haste in learning if we hope to survive industrially; while if we do know, we should so formulate our practices as plainly to demonstrate that fact, or else we may suffer from ignorant or mischievous legislation. The principal ingredient for a cure of either alternative is a complete code of safety standards in respect to mining. The apparent object of most of the mine laws and regulations upon the statute books of various states is the protection of the lives and unimpaired health of the workmen and the public at large. The Mining Section has the same objects in view—but what are we accomplishing in that direction? True, we are originating and assembling much valuable information and recommendations, but are we doing it in a systematic, painstaking, and final manner—let us be honest and properly say *technical* manner? No, not as we should. Then what is wrong? It seems astonishing for a chairman of a section so to flaunt his incompetency, if he is truly responsible for this state of affairs. Generously grant that the chairman and his executive associates have not failed in the duties which could be expected of them, and consider the organization as a whole in order to see whether anything else might be responsible for this deficiency. You find a section more highly organized than any other of the National Safety Council, with its officers and committeemen well representing the different phases of the mining industry both geographically and industrially. You note an extensive organization of committees—Executive, Membership, and Publicity, Standardization, Accident Statistics, Ropes and Safety Devices in Hoisting and Haulage, Mine Hygiene and Sanitation, Mine Fire Prevention and Fighting, Mine Rescue and First Aid Contests, Program and Publication. You also find that their functions and activities have been thoroughly outlined and correlated. Then what

is lacking? Naturally and properly the members of these committees are widely separated geographically and are men of affairs with absorbing business interests. If their time was not of considerable value to their industries their opinions would not be worth so much to the Mining Section or to you as a participating member. Such time as they can devote to the interests of the Mining Section should be utilized with the greatest economy and this would be accomplished by removing from them all routine labor. This is no more than your company's practice towards its own executives. Would you not feel more tempted to serve on these committees if you knew that your knowledge and ability would be drawn upon in an advisory capacity without your being expected to steal extra time for petty details and drudgery? That situation can be met only by the employment of an Executive Secretary for the Mining Section, who will make it his business to reduce the amount of correspondence between officers and committeemen and prepare inquiries in such form as to permit their knowledge and experience to be available with the least expenditure of time and effort on their part. He would outline the general features of Safe Practices pamphlets, which would ultimately become a code of Standards, and would utilize these committees in an advisory capacity to fill in the essential details which could be obtained in no other way than from the store of such varied experience; and the seal of approval of such advisory committeemen would be a respected guarantee of the recommendations made. That is why we have not achieved more in these essentials—because we had no funds to pay for such Technical Executive Secretary.

Other expenses also will naturally be involved in the production of such Safe Practices pamphlets or standards. From time to time the settlement of a question will involve research work, and while this probably could be "farmed out" to some industry whose interests would parallel ours, yet we should be in a position to assume any contingent expenses or in some cases all of the expenses. A technical man as secretary would also be required in the follow-up of such work.

COÖPERATION WITH ENGINEERING SOCIETIES

The profession of mining is an extremely broad one as it requires knowledge not only in the specific field of mining engineering but also in other engineering fields, such as, mechanical, electrical, civil, and sanitary engineering. The problems of safety, health, and welfare in mining require coördination with the activities in these other branches of engineering. In the national engineering societies representing all of these branches considerable attention is naturally devoted to the same or kindred subjects which are before us in the mining section of the National Safety Council, and standards committees in these other societies will also consider standards to meet the needs we will strive to meet. It is therefore highly important that there should be close coöperation between all of these agencies; and to be efficient, this service should be performed by one who is devoting all his time to the

activities of the Mining Section. Again we find need for a Technical Executive Secretary.

COURSES OF INSTRUCTION

Our present foreman and miners, as well as the present and coming generation of mining engineers, need definite and concrete courses of instruction in the "hows" and "whys" of safe mining practices. But how are they going to get this information? There are no schools and colleges prepared to teach it, nor books from which they can find a thorough or able presentation of this information. Must they all learn in the rough and expensive school of experience, or shall we aid them by preparing such courses of instruction which may be used in the schools and by classes at our plants? If we do we are engaging in a task which we could never hope to complete properly through the sole agency of volunteered services. We must be prepared to pay for the outlining, editing, writing, and publication of such a work and wait and wait for our returns at a later date from its sale and use. Again we find a need for definite paid technical service.

To the writer the reasons for this need seem legion. If the few he has presented do not demonstrate the fact incontrovertibly, it would be useless for him to attempt further to demonstrate a theory which seems to him axiomatic, and he will rest his case with the observation that no engineering society of prominence, including the National Safety Council, attempts to operate without a paid, technical, executive secretary. When we consider that the wealth involved in the mining industry exceeds \$5,000,000,000 and the labor involved exceeds 2,000,000 persons, it appears that the Mining Section of the National Safety Council has been given responsibilities in assuming a prominent position in the promotion of safety, health, and welfare measures in the conduct of this industry. Are we going to meet our obligations? If so we must render more and more service and to be true service it must be technical.

FINANCIAL RESOURCES

How can we finance the demands made by a more technical service? The answer is extremely simple—by increasing the dues of mining members, and we might well call the increase a surtax if that term had not achieved unpopularity from its association with our income taxes.

For the conservative growth represented by the engagement of an experienced mining and safety engineer as our technical and executive secretary in the Mining Section, for his travelling expenses, and for other expenses contingent to his work and that of the volunteering officers and committeemen we should have an additional yearly income of about \$10,000. The necessary office and clerical assistance might properly be expected from the National Safety Council Headquarters, with the same bulletin, printing, and other service which we have been receiving, in return for the regular dues which we are now paying.

Although the Mining Section and the Metals Section stand on a par as the two largest sections of the National Safety Council yet the membership and dues for each amount to only 7 or 8 per cent of the whole Council. Our membership on August 1, 1919 was 253, of which 165 were coal mining and 88 metal mining companies, and paying in dues respectively \$6,532.50 and \$3,877.50, or a total of \$10,410. The largest amount paid by any company is \$157.50 per year and the average is \$41. Of course more than half of the membership pays less than this average.

In view of the fact that the maximum amount involved for any one company seems to me slight compared with the benefits which should accrue, and the average amount involved for each company is so small, I strongly urge the members of the Mining Section to increase their dues to double those they are now paying to the National Council, with the understanding that the excess above their present dues be devoted to the specific activities of the Mining Section.

I trust that there will be a free expression of opinion as to the need and advisability of this step, and an authoritative communication from the various individuals and companies who are members, as to whether they would approve and support such action.

Gentlemen, this paper was sent out at a late date, owing to the fact that it took time to get it printed. Up to date there have been a few replies which arrived at my office before I had to come to this conference. All of those replies—some of them coming from coal-mining companies ranging from West Virginia to Pennsylvania, and some from metal-mining companies—were strong endorsements of this policy. The members stated their complete willingness to pay double their dues for such definite service, providing that was the desire of the other members of the Mining Section. Some comments were made in these letters. One, from one of the large companies, paying dues nearly the maximum limit paid by any member of the Mining Section, was to the effect, in short, "Pay enough to make it worth while or don't pay anything."

Another large coal-mining company in the anthracite district stated they considered it of vital importance that a practical mining man should visit the various plants; and a metal-mining company stated they highly approved of the plan, and that committees in that section should be advisory, that the plan of safety pamphlets would require a man, and furthermore, they strongly endorsed that policy. One of the bituminous coal companies in the Pittsburgh district stated this feature was much needed.

I may further say that before leaving Pittsburgh I had discussion with Mr. George S. Rice, the Chief Engineer of the Bureau of Mines, in regard to his opinion in this matter, and asked his presence at this meeting in order that we should have his advice and coöperation of the United States Bureau of Mines in any steps which might be decided upon. Before leaving, Mr. Rice gave me a letter which I will read to you, and I might state I had the opportunity of presenting this letter to Mr. Manning, the Director of the United States Bureau of Mines, who, upon reading it, said he most heartily endorsed the views as expressed therein. So that this letter means the opinion of our federal agency along mining lines.

DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
EXPERIMENT STATION, PITTSBURGH, PA.

October 1, 1919.

"Mr. B. F. Tillson,
"New Jersey Zinc Company,
"National Safety Council,
"Cleveland, Ohio.

"Dear Mr. Tillson:

"I much regret my inability to attend the National Safety Council meeting at Cleveland. As I mentioned to you the Bureau has assembled all of its mining engineers from various parts of the country in Pittsburgh for the First-aid and Rescue Competition, also to attend a business conference regarding plans for the present fiscal year. As the head of the Mining Division, I cannot therefore be absent from the Bureau conference.

"As concerns the proposition that you expected particularly to discuss—To increase the usefulness of the mining section of the Safety Council—I feel very sympathetic toward anything that can be done in that matter. It is evident that a great field of usefulness can be accomplished by concentrating the attention on the specific needs of the mines and the safety problems connected therewith and the standardization of safe practices. While the work is parallel to part of the work of the Bureau of Mines, the National Safety Council is not limited in its recommendations of specific things in the way that the Bureau is often limited; that is the Bureau of Mines says what should not be done but it is not always able to say what is the best thing to do where there are a number of ways which might be held to be permissible.

"I heartily hope you will meet with success in your endeavors to increase the usefulness of the Mining Section.

"Yours very truly,
"(Signed) Geo. S. Rice,
"Chief Mining Engineer."

CHAIRMAN TILLSON: Gentlemen, this paper is open for discussion. I trust you will all give your viewpoints very freely and openly.

DISCUSSION

MR. S. J. WILLIAMS (Secretary and Chief Engineer, National Safety Council, Chicago): May I ask as a matter of information how many replies you succeeded in getting to your inquiry? I know how difficult it is to get replies from that sort of thing.

CHAIRMAN TILLSON: I have had eleven replies so far.

MR. WILLIAMS: Have you anything on which to base an opinion as to the sentiment of the remaining hundred and fifty?

CHAIRMAN TILLSON: I hope we shall have that from the representatives here at this meeting.

MR. JOHN BOARDMAN (Anaconda Copper Mining Co., Butte, Mont.): I

of the National Safety Council and affiliate if possible this First-aid Society, already in existence, with it. Now, if the Mining Section of the National Safety Council would consent to become a governing head for such a Society, and the co-operation of the Bureau of Mines could be secured, I think by combining all of these organizations under the head of the Mining Section of the National Safety Council we could make considerable progress, and the value received from that would be to get the miners themselves interested in safety work.

Safety engineers, of course, are necessary, and most of them are very efficient, but an investigation of conditions prevailing will show you that most safety devices and most safety ideas—that is, most of the safety ideas that result in good, originated with the miner himself. The reason for that is that although the safety engineer might be efficient and intelligent, and his ideas are usually good, they are looked upon with more or less skepticism by the operating heads. They think he is a sort of dreamer, while, on the other hand, the practical miner will develop an idea and put it into practice before he says anything to anybody about it, and the operating official then comes along, sees this thing, and says, "That's a fine thing. Just look what I did!"

In that way, by getting these miners to belong to the Mining Section of the National Safety Council as individual members, through the locals of course, we will get them to present their ideas to the Mining Section of the National Safety Council, and we will be able to do a great deal of good in having those ideas adopted and keeping the interest of the miners.

DISCUSSION OF PERMANENT SECRETARY FOR MINING SECTION

MR. VAN SCHAAK: Mr. Chairman, without attempting to suggest the course which this meeting should follow, I would like to say if the Mining Section decides upon employing a permanent secretary, or sectional engineer, or whatever he may be called, the Aetna Life Insurance Company will do its full share of financial support.

MR. J. W. REED (Consolidated Coal Co., Fairmont, W. Va.): I feel that specialized service for the Mining Section is necessary. In fact, we have to have it if we are going to get anywhere with it. However, I feel the means adopted to finance and get the specialized service are something which require very careful consideration as to the future effect upon the growth of the Mining Section. If we double the dues in the Mining Section, and then establish mining locals in the various communities, which are to be supported—if they are supported in the same way as the Pittsburgh local chapter is at the present time—by the payment of dues equivalent to your original dues; that will mean the members of the Mining Section will be paying three times the dues of the ordinary member.

Now, as far as any present member of the Mining Section is concerned, I don't believe it will make the least difference to him if he pays the present dues or two or three times the present dues, but I do feel it may make a considerable difference in getting in new members, especially the

smaller man who was mentioned earlier in the day as being a very important portion of our membership we should go after.

I feel a great deal of good can be done in mining communities by local councils in their neighborhood, and I am going to assist as far as I am able towards organizing some locals of that sort in the region where our mines operate. At the present time we intend to affiliate with the Pittsburgh Chapter, which will take care of about twenty of our mines in Pennsylvania. In fact, we have already had a little experience in connection with the secretary of the Pittsburgh Chapter, who has assisted us in some very live safety work in one of our mining camps, and while the mining members may think that a safety rally around a mining camp must be limited to the number of men around that camp, I will say that in a certain part of Pennsylvania where there are no railroads or trolley cars, we held a rally at a mine which employs about two hundred men, which is rather centralized in a mining group within ten or twenty miles of other mines surrounding it, and from fifteen hundred to two thousand men attended. So it shows that regardless of there being but a small number of men at the mine, you can get other men to come, and all you have to do is interest the people by letting them know you have something there that will be interesting and of benefit to them, and the coal miner of today is fortunate in that he has his own means of transportation, or his neighbor has, and he will get there some way, even if he has to walk.

So I think a great deal of good can be done by the section of a local chapter; a great deal more than we anticipate, because you will not have to limit the service to the community but will be able to figure on men from a circle of perhaps twenty or thirty miles coming to take part in such an affair.

I am especially interested in the increased technical service, and I hope that some means will be worked out whereby we can get it. I don't feel—I am not speaking only from the opinion of my own company, but I mean from the Mining Section as a whole—I don't feel that the increased dues will cover the thing. I believe that such technical service should not only be in the section, but should be extended to all sections of the National Safety Council wherever it can be, and that body should give as much service as possible, and if it is simply a matter of dollars and cents I believe the body as a whole will see its way clear to divide with the bunch to produce the technical service in all branches. In other words, I would approve a raise of dues from the entire association until adequate service along all lines can be given to all sections, but if we can't get that, why, I guess we'll have to take what we can get.

We will have to take the lead in this movement, even though it is going to make membership a little harder, and should increase our own membership dues until we can take care of the work as we think it should be done, and perhaps by that time we can convince the rest of the sections we are on the right track and they will fall in line and bring the dues of the entire body up to a sufficient amount to give everybody adequate safety service.

MR. BOARDMAN: I am afraid we have digressed from the subject under

discussion. But I think the easiest way in which the Mining Section could give this technical service, and the way in which it could do the most good, would be the organization of locals of mining sections, requiring each of those locals to pay at least as much dues as the individual corporation pays. I believe should an organization of this kind be formed in Butte, that we could pay a hundred dollars a year dues to this section, and if you had, say, two or three of those locals over the mining country, your financial support would be there. I know we have no difficulty whatever in getting \$3,000 a year to spend on the miners' picnic, and the First-aid Society has no trouble in getting \$200 or \$300 for a dance whenever it wants it. I feel that the mining communities throughout the country are able to pay the amount which would be required for those things.

CHAIRMAN TILLSON: Mr. Boardman, I feel that that is a coming thing, and will come one of these days. The object is to sell the idea from the executives down to the miners in the various sections of our country in order to have the material with which to build up those locals.

MR. BOARDMAN: The experience of the First-aid Society has been this: We had no finances to start with, either, but we have initiated a large number of members who are continually writing back to get copies of rules and by-laws to organize similar societies in other mining camps, and I think all we have to do is to start.

MR. R. D. HALL ("Coal Age," New York City): Mr. Boardman's suggestion is an extremely unjust one. Mr. Boardman's company is very willing, possibly, to accept that injustice as against a company, but because they have a local section they are going to contribute to the Mining Section of the National Safety Council in support of its work. If they didn't have a local they would escape entirely that obligation. Now, it seems to me there are lots of us not going to have the benefit of that local and we are going to escape paying anything to the Mining Section of the National Safety Council beyond our regular dues.

It seems to me it should go all over the country. If a man belongs to a local, he shouldn't have to pay additional to the Mining Section just simply because he is in the local. Of course it wouldn't come in direct, but through the local. It would seem highly unjust that they should pay such a contribution. It seems to me we should pay it as members of the whole Mining Section of the National Safety Council. It is unjust for those in the locals to pay for the dues of those who do not have local councils. They are doing more for the safety movement than anybody else, and it seems to me they shouldn't be called upon to pay for the deficiency of the other people.

MR. BOARDMAN: The reason we want local sections is because we want our men to be tied to some national body; keeping them interested in their work, and the purpose in paying these dues is to pay for a technical secretary. It would be up to the locals to use up the time of that technical secretary, and we'd certainly see that we used up our share of his time.

MR. C. W. GOODALE (Anaconda Copper Mining Co., Butte, Mont.): It

occurs to me that for the first year the local section would get some support from the National Council fund, and that we might attempt to organize a local that would include not only the mining people, but public utilities and other concerns that are really interested in the matter, and at least we can try it out for one year and see how it works.

For the first year we might undertake to have our expenses nominal and try to get enough enthusiasm to start it up and then let the secretary try to finance it in some other way. As I understand it, 20 per cent of the first year's dues go to the local section.

CHAIRMAN TILLSON: What would be your official vote in regard to the Anaconda Company's paying double dues for the proposition?

MR. GOODALE: I am quite sure they will be willing to pay it.

MR. R. D. HALL ("Coal Age," New York City): I think Mr. Goodale has made it even plainer that there is an injustice, because the public service corporations would be paying additional dues to the Mining Section, and they would feel that their money was given to some specific object and the Mining Section would be getting more out of it than they themselves.

MR. O. A. DINGMAN (East Butte Copper Co., Butte, Mont.): Why, I think, if I understand correctly, that the Mining Section sees the need of a technical secretary in order to stimulate membership and to give better service to the association. Now, the plan is offered that in order to pay this man and pay his expenses they double the dues, and that is a means toward that end. If they want to go ahead and form these local sections to create local interest, that will offer a place for this secretary to go and begin his work. It seems to me that what they want in this paper is the secretary, and if we want to go ahead and form these local societies, well and good, but what the Section wants to know is whether or not we want the secretary. Isn't that it?

CHAIRMAN TILLSON: That is the question.

MR. DINGMAN: So it seems to me we ought to decide whether or not we want the secretary. If we do want him, have that increase in dues as a means to pay him, and the locals then can form as they see fit.

MR. C. H. WILSON (Utah Copper Co., Garfield, Utah): Do I understand we have sent communications out to all of the members of the Mining Section—that is, the companies themselves?

CHAIRMAN TILLSON: Yes.

MR. WILSON: Soliciting their support in the appointment of a secretary?

CHAIRMAN TILLSON: That is right, Mr. Wilson.

MR. WILSON: The point I want to make is this: Probably there are very few of us here that can pledge the companies we represent as to how far they will go. Now, the company I represent pays perhaps one of the maximum amounts in the National Safety Council, and no doubt the management will be influenced or governed by the recommendations of their representatives who have come to this meeting, and I think we could well have some time set for making a report to the Mining Section as to what the attitude of the companies would be.

Personally, I would have to go back and make a report on the recommendations that have been brought up here, and make a further recommendation as to whether or not we should be in favor of that. As for myself, I assure you I will do everything possible to get our company to go as far as any one will, and up to this time we have never had any difficulty in getting appropriations for any of this work. I feel satisfied that the Utah Copper Company will go the limit, but perhaps that is what we are all up against, more or less. There are very few of us here who can pledge our company and say that we will do so-and-so without having the approval of the management. I couldn't do that, although I feel positive there will be no difficulty in getting that appropriation. The company appreciates the service we are getting, and the increased benefits we will get surely will be worth the increased amount of dues.

MR. J. O. DURKEE ("The Coal Industry," Pittsburgh): In case a mining section is established with the dues increased it may be possible in some of our locals for members still to retain their membership in the Mining Section and still not support this technical service. I don't say that it will be done, but it may be done where members belong to the National Council without reference to whether they have paid for a secretary, and they also get service from this paid secretary without supporting him if that could be the case.

Will it be the definite plan of the National Safety Council to have all members come in on the same rate? If they do, then some persons will be receiving this technical service without paying the pro rata share.

CHAIRMAN TILLSON:—I don't see how any scheme could be satisfactory which did not require all to come in on the same basis. There could be no discrimination. It would require a corps of clerks to decide whether they received any more service than another man. It would have to be a sound basis of everybody in this section joining in the support of it.

MR. VAN SCHAAK:—Might I make a suggestion to the meeting, that probably a great many men here can state now whether they are in favor of this idea of a technical executive secretary. Now, would it be possible for the Chair to receive assurances from them that they would go back and do their best to get the companies to agree to this, and then either the Chairman or some committee communicate with the men who actively represent the members of this section, who could go to the executive officers and see what their attitude was? It seems to me that would facilitate matters.

I take it that from the failure of but three or four of us to express our views it is because they are not in a position to make any pledge, while if this meeting knew that the men here were in favor of it themselves, and would go back with the assurance in getting their executive officers actually to say they would agree to it, we could then get the final pledge by correspondence with the representatives. I think we could get a general expression of opinion as to their support or non-support at this time.

MR. ORR WOODBURN (Globe-Miami District, First Aid Association, Globe, Ariz.): Just to bring this thing to some head, I would like to make a motion that we go on record—those of us present—as being heartily in

favor of your plan as outlined, Mr. Chairman, and would be willing to give it our backing when we return to our respective companies.

(The motion was duly seconded.)

MR. F. P. SINN (New Jersey Zinc Co., New York City): Just before a vote is taken, I want to say that work which a local does is the work of stimulating personal interest and getting the different men in the community to go to work on the safety problem. It doesn't seem to me it will be economical in the long run for any local to give technical service—real technical service—which is to be for the benefit for all members interested, which in this particular case would be all members of the Mining Section. In voting on this question it seems to me it is a question of giving all the mining members technical service, and Mr. Goodale made a very strong point, I think, and that is when you form a local it is much better to form a local of the whole National Safety Council to cover all of the National Safety Council's interests in that community.

MR. H. G. DAVIS (D. L. & W. Coal Co., Wilkesbarre, Pa.): While this association is essentially an employers' organization, yet I have been a member of it for several years, and I would gladly vote today my personal vote for the employment of a technical secretary, but the company I represent here today has only been a member of the Council for the past three months or so. I can't pledge their support and vote for the matter. For that reason I think it would be advisable from my viewpoint to lay this matter on the table until our next meeting, and that everybody in the meantime use their influence to bring about this increase in dues.

As I said before, I am willing to pay double the amount I am now paying, which would be \$15.00 instead of \$7.50, as far as I personally am concerned.

MR. WOODBURN: My idea in putting this motion was that we don't have the power to pledge our companies, and the only thing we can do is to offer our influence and to go on record as being heartily in favor of the plan, and then it remains to be seen whether or not our companies will sanction it. If they do not sanction it then the thing falls through and it will have to lay for another vote but let us go on record as being heartily in favor of endorsing the plan.

MR. C. H. WILSON (Lead Company's Representative): It seems to me it would be a mistake to lay this on the table. I am heartily in favor of the paid secretary. I think we have some good reasons for it. There are so many that there shouldn't be any question about it. I would like to see some date set, if possible, that we could make it a point to get our report in to the Mining Section as to the attitude of our companies. Personally, I can't help but feel that every company should be very much in favor of it.

MR. VAN SCHLAACK: It seems to me the motion made by the gentleman does not propose laying this on the table at all, but it simply suggests one means of finding out whether it is going to become an active thing or not at the earliest possible moment, and having found that out, a meeting can be called to approve or disapprove such plans as may be made for carrying out the proposition in regard to this technical secretary. It

seems to me that will facilitate matters, rather than laying it on the table.

DR. A. F. KNOEFEL (U. S. Bureau of Mines, Terre Haute, Ind.): This matter may be settled by January 1, giving them two months and a half.

CHAIRMAN TILLSON: Dr. Knoefel, don't you think anybody can make up his mind before two and a half months?

DR. KNOEFEL: I was trying to bring a happy medium between Lehigh and Utah. (Laughter).

CHAIRMAN TILLSON: Here is an extract of the letter sent out to all of the companies:

"On the mornings of October 2, 3, and 4, the Mining Section of the National Safety Council will hold its meetings, as a part of the Annual Congress of its parent body, in the Hotel Statler, Cleveland, Ohio, and it is hoped that your company will have a representative present to participate in the varied discussions pertinent to mining practices, and qualified to advise in regard to the attitude of your company when the subject, 'The need for a Definite Technical Service in the Mining Section of the National Safety Council,' is presented on the morning of Saturday, October 4. You of course realize the desirability of a presentation of the replies to this canvass at that time."

Another paragraph of that letter states:

"Where there is insufficient time for the transmission of word by mail, a telegraphic response would be greatly appreciated."

The replies were requested to be in prior to September 24, but unfortunately there have been only eleven that have reached my office. I was supposed to have received a telegram from my office giving the synopsis of a number of replies received and votes "Yes" and "No," but I fear that the telegraphic service or Hotel Statler service, which I would be quite willing to suspect of inefficiency, has made that telegram entirely lacking at this time.

This letter was sent out on September 19.

MR. VAN SCHAAK: To whom was the letter addressed in the various companies?

CHAIRMAN TILLSON: The opening paragraph is this:

"It is to be hoped that this communication will be brought to the attention of the safety engineer for his comments and recommendations, and that as a result the managing executive will take definite action and will advise the writer at the earliest date practicable, and at the latest, prior to September 24, of the decision reached, together with any approved suggestions or recommendations."

MR. VAN SCHAAK: If the executives haven't brought it to the attention of their safety men, let's get the safety men to bring it to the attention of their executives.

CHAIRMAN TILLSON: That was my idea—if we didn't get it one way we'd get it the other.

Is there any further discussion on the motion? If not, will those in favor of the motion signify by saying "Aye"?

(The motion was unanimously carried.)

CHAIRMAN TILLSON: Is there any choice in the time at which we should expect the letter ballot to be returnable for definite action by the Executive Committee of the National Safety Council?

MR. C. H. WILSON (Utah Copper Co., Bingham, Utah): Say the fifteenth of November—surely that would give everybody plenty of time. I make a motion that we set the date for having the replies in as November 15.

CHAIRMAN TILLSON: I think it might be wise to include something about definite action being taken as a result of the proportion of replies for or against the proposition.

MR. WILSON: I will include that the majority of the members you have heard from at that time will be the governing factor.

MR. R. D. HALL: ("Coal Age," New York City): That might better be in the form of a ballot than anything else. Why not send them a ballot?

CHAIRMAN TILLSON: Would you care to amend that by having another copy of this paper sent with that ballot, as a reminder?

MR. WOODBURN: It is my opinion that we are doing a lot of worrying about this. I don't think any of the companies are going to block this thing. If it requires double the fee, I feel sure there isn't a company in our district but what would be glad to make that contribution. I think we are worrying about something that is unnecessary.

MR. REED: There isn't any doubt as to what the Consolidated Coal Company will do. As I stated before, I don't think any company will refuse to come across. They will all pay. I think the only place there is any question at all is to what effect the increase will have on future members. And if the present members will get out and explain to the other fellow and bring him in, we won't have any trouble there, but if we get a little careless about telling our neighbors what the benefits to be derived are, your secretary will probably have a little bit of trouble in increased dues. That is the reason I am not so much in favor of it. I would sooner see that extra amount of money come by getting five times the present membership, and then saying to the National, "Now that we have gotten all of these new members, won't you kindly pay our secretary?"

MR. WILLIAMS: Every new member that comes in gets back more than half of his membership dues just in stationery, stamps, etc., let alone anything else, and there is not much surplus left.

MR. REED: Well, I made a suggestion that if your dues are not sufficient, put them up.

MR. WILLIAMS: You have outlined the very course I think will have to come. This section will set the pace and then other sections will unquestionably see the advantages and take it up.

MR. WOODBURN: This isn't going to interfere with future membership. If we are going to provide a definite, positive and first class service, it is going to tend to bring in the members. Our service now is more or less questionable, so if we provide the best service, it certainly will bring in new members.

DR. A. F. KNOEFEL (U. S. Bureau of Mines, Terre Haute, Ind.): Some of you may know, or if you don't know you ought to, that there has been a bolsheviki movement to revive the American Mine Safety Association (and I am not guilty, or I wouldn't have mentioned it) and the reason given is lack of service. Now, if these men—bolshevists—want service, why, they will expect to pay for it, because I have an indistinct memory that this American Mine Safety service could have been very much improved upon.

CHAIRMAN TILLSON: May I not ask if you weren't the past president of the American Mine Safety Association?

DR. KNOEFEL: I was. (Laughter).

MR. H. G. DAVIS (D. L. & W. Coal Co., Wilkesbarre, Pa.): Mr. Chairman, I am sorry it is getting so late. This subject ought to have been taken up and discussed before. As a rule, the bolshevists and the likes of them are generally kept out of such movements, but in this particular case they seem to be highly honored. I am the only one here who was present at their meeting, and I think it was an outrage.

CHAIRMAN TILLSON: We have a motion before the house, and if there is no further discussion I will ask the question. The motion was that a ballot vote be taken, sending a copy of this present paper to all of the members again, and making our decision on the majority vote at that time as to the increase of the dues. What is your pleasure in regard to the motion?

(The motion was unanimously carried.)

The election of officers is next. I will ask Mr. Hall, the chairman of the Nominating Committee, to kindly report the suggestions that they have to make in regard to officers of your section for the coming year. In doing so, I will call your attention to the fact that nominations from the floor will be equally well received. The Nominating Committee's function is merely to see that somebody is nominated.

REPORT OF NOMINATING COMMITTEE

MR. R. D. HALL ("Coal Age," New York City): The nominations have been somewhat equally balanced. While the suggestion for chairman is a metal-mining man, the first vice-chairman is a coal-mining man, the second vice-chairman is a coal-mining man, and the third vice-chairman is a metal-mining man. So I think it has been pretty well divided.

Your Nominating Committee respectfully submits the following for the officers of the Mining Section of the National Safety Council for the ensuing year: For Chairman, B. F. Tillson, Franklin, N. J.; first Vice-chairman, H. G. Davis, Wilkesbarre, Pa.; A. F. Knoefel, Terre Haute, Ind., second Vice-chairman; C. A. Mitke, Bisbee, Ariz., third Vice-chairman; and W. H. Shearman, New York City, Secretary.

CHAIRMAN TILLSON: Gentlemen, This is a situation which makes it incumbent on your Chairman to express his great appreciation of the honor which your Nominating Committee has done him in suggesting that his tenure of office should not be ended, and in view of the fact I consider it an honor because of the unsatisfactory nature that the service of the Mining Section has been to all of us. It is only natural that the

present Chairman who has served several years should appreciate being relieved of the responsibilities of further service. It is furthermore only natural that he should also take considerable interest in seeing the Section progress along these advocated lines of technical service which has been his hobby, and which he has felt it necessary to have discussed during the past three years.

He would much rather some one else would take up the reins of government and instill new blood and life into the organization, so as to dispose of any criticism to the effect it was a life job for one man. I would therefore strongly urge upon you to nominate some one else for that position. Of course, if no other names are offered, why, your present Chairman has the interests of the mining safety movement sufficiently at heart not only to appreciate the honor, but to see that the void is filled.

I now request further nominations from the floor in addition to the slate as suggested by your Nominating Committee.

MR. A. H. FAY (Bureau of Mines, Washington, D. C.): Mr. Chairman, I think our present Chairman is making a mistake when he says the Section has not progressed. I think the Section has progressed, and wonderfully! I therefore move that the recommendation of the Nominating Committee be adopted.

(Prof. Sperr seconded the motion.)

(Vice-Chairman Davis took the chair.)

VICE-CHAIRMAN DAVIS: Gentlemen, you have heard the motion that the report be adopted. What is your pleasure?

(The motion was unanimously carried.)

VICE-CHAIRMAN DAVIS: I want to say I appreciate the honor of being recommended for the Vice-chairmanship, but I would prefer to see some other younger fellow in that position. I am getting old now, and I'd like to see some one else nominated to fill that place.

MR. VAN SCHAAK: I move the nominations for first Vice-chairman be closed, and the Secretary cast a unanimous ballot for Mr. Davis.

(Mr. Wilson seconded the motion, and it was unanimously carried.)

MR. WOODBURN: Just to prevent any further speaking in apologetic tones on the part of any of the recommended officers, and in appreciation of their efforts of those who have served us so well, I would suggest that our Nominating Committee has used very good judgment, and I would like to make a motion that we accept their nominations, and they stand closed as they are.

(Mr. Reed seconded the motion and it was unanimously carried.)

CHAIRMAN TILLSON: Gentlemen, there is little I can say, except that this is your Section. It doesn't belong to your Chairman or any of its Executive Committee. They are merely your servants, and this Section is not what they make it, but what you make it—and "Inasmuch as ye give, so shall ye also receive." If you will take that to your hearts and remember it three hundred and sixty-five days in the year, and give and do nothing but give, your Executive Committee will do its best to correlate your giving so that it will be of greatest value not only to you but to the others in your profession. In such a manner may we hope to grow

into the true importance which the mining industry is properly deserving of.

In that respect, I would call your attention to the fact that the income tax returns for the year 1917 showed that the mining industry was responsible, next to the railroad industry, for paying the largest income returns to the government. And the only reason that the railroad industry partly surpassed the mining industry was that the mining industry shipped four million tons of its product daily over the railroads, and that amount was twice the total amount of freight from every other industry. So you see you have a responsibility on your hands, although the group is small, in pushing it on to a successful conclusion.

"UNDERGROUND MINE CARS AND HAULAGE"

MR. GOODALE: In regard to your suggestion about the discussion on this paper or pamphlet on "Underground Mine Cars and Haulage," I think that all of us perhaps are a little tired or don't care to attend an afternoon session, so I would suggest that this having now been submitted, it be requested that the comments be put in writing and sent in to the Secretary.

CHAIRMAN TILLSON: There is one other thing we should think of at this time. A former member of the Executive Committee of the Mining Section, and Chairman of the Program and Publications Committee has passed into the new world of greater joy. I refer to Mr. John P. Reese, of the Superior Coal Company, Gillespie, Illinois. I think it would be highly fitting for this body here assembled to send a properly written tribute to Mr. Reese's family, expressing the sorrow which we all feel at losing so strong and ardent a supporter of not only the Mining Section but of the Safety Movement in general as it applied to mining.

MR. H. G. DAVIS: I move you that the Secretary send to the bereaved family of Mr. Reese an appropriate expression of sympathy.

(The motion was duly seconded and unanimously carried.)

CHAIRMAN TILLSON: Is there any new business?

DR. A. F. KNOEFEL (U. S. Bureau of Mines, Terre Haute, Ind.): I don't know whether any of you gentlemen have attended any of the other sections, but this morning I cavorted over to the Health Section, and was rather discouraged. I heard two excellent papers, but on the first paper there was one discussion, and on the second there were two discussions, and I want to express my gratitude to the Mining Section for the excellent discussion that prevails at your meetings.

MR. DAVIS: I want to say that the papers read here on the first day have not as yet been discussed. We could discuss these questions for another week.

CHAIRMAN TILLSON: In that respect, I may say there has been considerable expression of opinion in that the men from the mining districts come a long distance to attend these sections, and that is the reason why we are small in number, and although we have representatives here from Montana, Washington, Utah, Nevada, and over to the Eastern shores of our country, New Jersey, but the desire is very strong that we spend more time than we have for discussion. We should like to devote three long

half days to our discussions, and if that can be arranged in the future Congresses, I think it will have a strong appeal to and have the support of the companies that are paying considerable, to send delegates to get down into the really practical subjects which we need.

PROGRAM FOR NINTH ANNUAL CONGRESS

PRESIDENT RICHARDS: Well, I'd like to say, if I may have the privilege, that it seems to me that before the program for the Ninth Annual Congress has been prepared there ought to be a meeting of the chairmen of the various sections for the express purpose of outlining a program and finding out how much time each section wants. Then when we find out how much time each section wants, to arrange to give them that time regardless of other meetings, because really we come here as mining men, or steel men, or railroad men, and what we want to hear more than anything else is something about our own industry that is going to help us in carrying on our work.

I think there ought to be time given for that purpose regardless of whether or not it may interfere with a general session. That, it seems to me, is a question that can be well decided by the chairmen of the various sections when they get together for that purpose.

(The motion was unanimously carried.)

If I may be allowed to make the suggestion, if such a meeting as that is not decided upon favorably by the Executive Committee, as I am only one of that Committee, it seems to me that here is one thing we ought to impress upon everybody, and that is there ought to be a limit to the time any man should have to read a paper. I think of what Mr. Brown said last night, that "No souls are saved after twenty minutes," and that is very apropos. While most of us exceeded twenty minutes last night, it seems to me any paper that takes more than twenty minutes is taking too much time of the section in which it is read, and that the real thing we get at these meetings is not what may be said in the paper, but the discussion that the paper brings out. So we ought to have more time for discussion and less time for papers.

If all the chairmen of the various sections feel that way about it perhaps we can arrange some standard plan by which the chairman will be excused from feeling he is being put in a difficult position by saying merely that it is the general rule.

MR. WILLIAMS: Mr. Chairman, in sending out the invitations this year we specified definitely that every speaker was to be limited to twenty minutes, with the exception of one or two cases in the general sections. My only excuse for getting up now is that I don't get to meet in this section very often, and I want to say that you'd be absolutely in line with the policy of the headquarters office if you strictly cut the people off after twenty minutes. We have been told in some cases that men could not say what they wanted to in that time. Of course they could have more space in the proceedings, but when it came to reading the paper, they were simply to leave out some of the details and limit the actual presentation to twenty minutes. We tried to do it this year, Mr. Richards, and

with your help and the help of the chairmen of the sections, we will do it a little better next year.

CHAIRMAN TILLSON: For the information of those present, I may say that your Chairman has kept time on every paper presented during this section's sessions this year, and there was only one paper that exceeded twenty minutes in its presentation. The discussions have been long, but the Chairman has permitted the discussions to run over a long period of time because he felt that that is what we have come here for, and that it was only by free discussion and an interchanging of ideas and suggestions that we develop.

SUBJECTS FOR DISCUSSION

Now, it would be in accordance with our action last year to make suggestions as to what subjects are of most vital interest for consideration in the preparation for safe practices pamphlets during this coming year. Your Chairman calls your attention to the fact that this year we had with us in our second meeting probably one of the most representative groups of experienced mining men who have dealt with the problem of mine fires and their prevention and recovery. I would therefore suggest that that topic might well be covered in the safe practices pamphlet. Another subject has been suggested, I think at this meeting, in regard to the arrangement and loading of ore into cars from chutes.

MR. GOODALE: It would seem to me as a matter of logical sequence that that perhaps would be a very natural topic to take up the next time. We would have the transportation of mine car haulage in this pamphlet, and it looks to me as if the matter of chutes would come next. Another topic is that of mine signals underground. That is a very important matter.

MR. FAY: In the coal mines about 45 to 48 per cent of the fatalities are due to falls of roof; in the metal mines, about 35 per cent. I think there is a chance to reduce accidents, by attacking the largest item in the whole series of causes. That might be well to lay on the slate for consideration. Possibly somebody might be able to prepare a good paper on that particular thing.

MR. WOODBURN: The falls of roots are undoubtedly constituting the greater number of our accidents, but at the same time of great importance is the prevention of fire and such disaster, and the recovery of the wounded, burned, etc. Personally, I would say there are several of us here who make a specialty of mine rescue and recovery, and while we are interested in all of the other phases, we'd like especially to pick up all the data we can along those lines. I have talked with several members about the feasibility of providing a little more time; either that, or say we had a special session for this, and those who are interested in it could attend in an afternoon period when there was something of a general session that we didn't care so much about. I would like very much to see papers brought out on that line because it concerns everybody to more or less degree, and many of us especially.

CHAIRMAN TILLSON: I think the questionnaire sent out on mine fires

will receive a very cordial support from those who are present at this meeting.

MR. REED: In regard to subjects, I would like to remind the members at the present time that the subject of explosives, their handling and transportation and uses, is rather vividly before the mining industry, especially in the Eastern portion of the United States, and it is a subject upon which there is a great deal of argument as to what are safe practices and what are permissible in the way of handling explosives. I think that subject might profitably be given some consideration by this body.

SECRETARY SHEARMAN: I would like to suggest that the men here send in any suggestions for our next annual meeting as soon as possible so we can line up some papers, and also with the suggestion of a subject, also suggest the name of the person you think best qualified to present the paper.

CHAIRMAN TILLSON: Before closing the meeting, I want to request that Major Dwight do what he can—which I know he will be glad to do—to bring some definite results in seeing that the size of these meetings will be increased considerably by the attendance of many other engineers of the American Institute of Mining and Metallurgical Engineers.

MAJOR DWIGHT: I can assure the Chairman I will consider myself as an enthusiastic convert to the new principles and will do all I can to spread the doctrine throughout the Institute.

MR. GOODALE: We haven't come to any decision in regard to this paper on "Underground Mine Cars and Haulage."

CHAIRMAN TILLSON: Does any one wish to remain for an afternoon session?

A motion was made, seconded and carried to adjourn, it being decided that those to whom a copy of the proposed pamphlet was given should review it and send it in to the National Safety Council headquarters with any comments.

Adjournment.

LIST OF MEDALS FOR "FIRST-AID CONTEST". 1919

Kansas State Contest.....	June 7, 1919
State Wide First-Aid Contest.....	July 26, 1919
Bertha Coal Company First-Aid Meet.....	September 1, 1919
Pikesville, Kentucky, Contest.....	July 4, 1919
Pond Creek First-Aid Contest.....	August 10, 1919
National Contest in Pittsburgh.....	September 30, 1919
Norton, Virginia, First-Aid Contest.....	July 26, 1919

Meat Packers' Section

October 2 and 3, 1919

A. B. DRUMMOND, Chairman

Wilson and Company, Union Stock Yards, Chicago

G. L. MALLERY, Secretary

Swift and Company, Chicago

MINUTES

THURSDAY MORNING SESSION

THE permanent organization of the Meat Packer's Section was completed at the National Safety Congress at Cleveland, October 1 to 4, 1919, and if the interest shown by the several delegates present indicates the manner in which the idea is being absorbed, surely this organization will be a power for good, and reflect much credit upon itself, its individual members, the firms they represent, and the National Safety Council.

The meeting was called to order at 9:30 A. M. Thursday, October 2, by the temporary Chairman A. B. Drummond of Wilson & Co., Chicago, with Mr. G. L. Mallery, Swift & Co., Chicago, acting as temporary Secretary. The Chairman opened the meeting with a very brief resumé of the organization meeting which was held in Chicago in July of 1919. As the need of a section of this kind was thoroughly understood by the delegates no time was lost in explaining the purposes of the organization.

The Chairman appointed Mr. T. K. Lowry of Armour Mechanical Co., Chicago, Mr. Schuler, Swift & Co., of East St. Louis, and Mr. Faulkner of Morris & Co., Chicago, to act as the Nominating Committee. The meeting then swung into a round-table discussion of the many accident problems peculiar to the Packing Industry.

ROUND-TABLE DISCUSSION

KNIFE CUTS AND THEIR PREVENTION

The first subject for discussion was Knife Cuts and their Prevention. Many interesting and ingenious means of overcoming this most common

accident cost were brought out. Mr. W. F. McClellan of Armour & Company, Chicago, exhibited a number of knives, showing the guards which they had installed as a result of their experience. Mr. Mallery of Swift and Company spoke on the knife question. The discussion brought out that about 30 per cent of the accidents occurring in the packing industry were knife cuts, and that about every sixth knife cut resulted in a permanent injury. Mr. Mallery stated that they have been very successful in getting the men in their plants to use the type of guards exhibited by Mr. McClellan. He also spoke of a method of guarding the handle of sharpening steels by means of a leather disc slipped over the handle, and stated that they were using this guard on most of the cutting floors throughout the plant.

BURNS AND SCALDS

Burns and scalds was the next subject for discussion. The experiences of different firms were related. It was agreed that the injuries for the most part, were caused by repair jobs and emergency work, as the plant is usually well protected. The development of an automatic ice puller by Morris and Company, was reported to have eliminated the hazards of burns and scalds in thawing ice cans. Mr. Schuler reported that at the East St. Louis Plant, Swift and Company, they have developed an automatic door-closing device which eliminates any possible danger of the operator falling into the thaw box. It was agreed that the hazard of scalds and burns was that which is usual to other industries and could be overcome by closer supervision and mechanical changes.

FREIGHT ELEVATOR HAZARDS

Mr. Faulkner, Morris & Co., Chicago, gave a talk on freight elevator hazards which was very interesting. The doors and vestibules of the St. Paul Plant of Armour and Company came in for quite a bit of praise. Swift and Company said that they test their elevators by cutting the ropes, allowing the elevator to drop about eight inches. Morris and Company are using an elevator inspection form which is filled out weekly by the elevator operator and an inspector from the mechanical department. They also stated that they have a triple inspection of cables. Swift and Company claim they have eliminated the wood-guide strip and substituted a steel type of guide rail.

The following recommendations were referred to the Standardization Committee: That all wire cable ends be shackled and babbitted and that all counter balance weights be equipped with a double eye bolt draw bar. That steps should be taken to discontinue the practice of giving elevator operator jobs to old and crippled employees, as a recognition of long and loyal service, and make the elevator man's job one requiring young men of an intelligent and efficient class, having the job graded on a higher wage basis than the ordinary laborer's job. That elevator gates be automatic in closing.

A representative of the Government Bureau of Standardization gave

an interesting discussion on the value of inter-locks. He quoted some statistics showing the value of those already installed.

At 12:30 P. M. the meeting adjourned until 9:30 A. M. Friday.

FRIDAY MORNING SESSION

THE meeting called to order by Chairman Drummond who asked for the report of the Nominating Committee. Mr. Faulkner reported as follows:

REPORT OF NOMINATING COMMITTEE

For Chairman, 1919-1920, A. B. Drummond, Wilson and Company; Vice-chairman, W. W. Pierce, Morris and Company; Secretary, G. L. Mallery, Swift and Company.

No other nominations were made and upon motion duly made and seconded it was carried, that the officers selected by the Nominating Committee, were elected unanimously.

The Chair appointed Mr. G. L. Raymer of Cudahy Company, Chicago, Chairman of the Membership Committee; Mr. A. D. Russell, Cudahy Company, Kansas City, Chairman of the Bulletin Committee; Mr. H. G. Ellerd, Armour and Company, Chicago, Chairman of the Standardization Committee; Mr. J. M. Eaton, Libby, McNeill and Libby, Chicago, Chairman of the Educational and Publicity Committee; and Mr. F. L. Faulkner, Morris and Company, Chicago, Chairman of the Program Committee

SAFE-GUARDING PACKING HOUSE MACHINERY

The round-table begun at the first session was resumed. The first subject considered was The Hazards of the Machinery Peculiar to the Packing Industry. After much discussion, it was agreed that most of the hazards of this class of machinery were common to machinery in general, but the subject was so big that no definite action could be taken at this meeting and that a special Standardized Committee be appointed to prepare a Safe Practices pamphlet, that should be distributed to all members of the Section covering the mechanical safe guarding and the elimination of unsafe operations.

LOADING AND TRUCKING HAZARDS

The Hazards in connection with Loading and Trucking. While much interesting data was given as to past experiences, it was decided that much better progress could be made by turning the subject over to the Standardization Committee for full supervision.

SLIPPING AND TRIPPING HAZARDS

The Unusual Number and Results of the Accidents due to Slipping and Tripping on Floors and Stairways of Packing Houses were discussed, but nothing of much value was brought out. The consensus of opinion

seemed to be that a cement or concrete floor with a roughened surface would show better results in point of service and efficiency than the brick or wooden floors commonly used. A great deal of discussion took place regarding foremen who were lax in allowing the men to do work in their own way, without seeing that all possible safe guards had been placed around the operation. Chairman Drummond stated that any discipline would have to come from the top, and that Superintendents and General Superintendents must be behind the safety men at all times when questions of safety arise. He also suggested that perhaps a system of charging the cost of medical care and the cost of compensation directly to the department, would probably make the foreman take more notice of safety matters. He quoted the results of the "No Accident Week" in the Wilson and Company plants, showing that eight plants came through the "No Accident Week" without a single lost-time accident.

Safety Committee plans were discussed freely and all present agreed that a Plant Safety Committee to consist of the Superintendent, Master Mechanic, Fire Marshal, and other men of authority, should act as a Clearing House for the consideration of all matters affecting safety conditions.

The meeting adjourned at 12:30 P. M.

The delegation left feeling amply rewarded for their trip on account of the great educational advantages accruing to those present at the meeting, and with a determination to do everything in their power to impress the Safety thought upon the minds of those responsible for the operation of their several plants, and to interest those not yet affiliated with the National Safety Council with a view to a larger representation at the next Packers' Sectional Meeting.

Paper and Pulp Section

October 2 and 3, 1919

A. P. COSTIGANE, Chairman

Ontario Pulp and Paper Makers' Safety Association, Toronto, Canada

C. E. JACKSON, Vice Chairman

Consolidated Water Power and Paper Company, Grand Rapids, Wis.

C. B. MILNER, Secretary

Hammermill Paper Company, Erie, Pa.

THURSDAY MORNING SESSION

THE meeting was called to order at 9:30 A. M. by the Chairman, Mr. A. P. Costigane, Ontario Pulp and Paper Makers' Safety Association, Toronto, Canada.

DELEGATES ATTENDING SESSION

N. S. Stone, Wausau Sulphate Fibre Co., Mosinee, Wis.

Thos. Frost, Eastman Kodak Co., Rochester, N. Y.

G. E. Morgan, Employers' Mutual Insurance Co., of New York, Buffalo, N. Y.

H. H. Matthieson, Crown Willamette Paper Co., Portland, Ore.

E. C. Gildenzopf, York Haven Paper Co., York Haven, Pa.

David Miller, York Haven Paper Co., York Haven, Pa.

H. J. Myers, York Haven Paper Co., York Haven, Pa.

C. B. Milner, Hammermill Paper Co., Erie, Pa.

H. St. J. Jarvis, Don Valley Paper Co., Toronto, Ont.

C. Nelson Gain, Don Valley Paper Co., Toronto, Ont.

A. P. Costigane, Ontario Pulp & Paper Makers' Safety Association, Toronto, Ont.

Erling Riis, Wausau Sulphate Fibre Co., Mosinee, Wis.

John F. McElgin, Carthage Sulphite Pulp & Paper Co., Carthage, N. Y.

Ira Wyman, Strathmore Paper Co., Mittineague, Mass.

Clarence E. Jackson, Consolidated Water Power and Paper Co., Grand Rapids, Wis.
 F. P. Young, Interlake Pulp & Paper Co., Appleton, Wis.
 M. J. Foster, Consolidated Water Power & Paper Co., Stevens Point, Wis.
 F. H. Eberhardt, Consolidated Water Power and Paper Co., Grand Rapids, Wis.
 Charles Fangfish, York Haven Paper Co., York Co., Pa.
 J. C. Youmans, Employers' Mutual Liability Ins. Co., Wausau, Wis.
 G. A. Umberham, Northern Paper Mills, Green Bay, Wis.
 A. T. Buckhout, American Writing Paper Co., Holyoke, Mass.
 Al. Kroes, Employers' Mutual Liability Ins. Co., Wausau, Wis.
 Nesta C. Edwards, Consultant Industrial Service Work, Chicago, Ill.
 R. B. Woolson, General Casualty & Surety Co., Detroit, Mich.
 Fred A. Feller, Employers' Mutual Liability Ins. Co., Milwaukee, Wis.
 W. S. Brown, General Casualty & Surety Co., Detroit, Mich.
 G. R. Huggins, Finch Pruyn Co., Inc., Glens Falls, N. Y.
 A. G. Richardson, Laurentide Co., Ltd., Grand Mere, Quebec.
 I. L. Lockney, Chief Safety Engineer, State Safety Board, Olympia, Wash.
 G. W. Dickson, Riordan Pulp & Paper Co., Hawkesbury, Ont.
 Robert M. Altman, Marathon Paper Mills Co., Wausau, Wis.
 S. F. Shattuck, Kimberly-Clark Co., Neenah, Wis.
 James L. Kerr, E. I. du Pont de Nemours & Co., Wilmington, Del.
 Wm. Powell, International Harvester Co., Chicago, Ill.
 Carl E. Gebhardt, Champion Coated Paper Co., Hamilton, Ont.
 M. G. Hoyman, Kimberly-Clark Co., Neenah, Wis.
 Virginia H. Evans, Kimberly-Clark Co., Neenah, Wis.
 Paul M. Bowen, Standard Accident Ins. Co., Detroit, Mich.
 O. F. Behm, Standard Accident Ins. Co., Detroit, Mich.
 E. S. Willis, Safety First Supply Co., Pittsburgh, Pa.

REPORT OF CHAIRMAN

CHAIRMAN COSTIGANE: In opening the sessions of the Paper and Pulp Section, it gives me great pleasure to extend to you all on behalf of the National Safety Council, a warm and sincere welcome. To those of you who have attended these conventions during the last two or three years I need say nothing of the benefits to be derived—the fact that you have come back is proof of a consciousness on your part that such conventions are of great value. To those of you who are here for the first time we hope that all you see and hear and all that you learn will so enthrall you that you will return home with such a glowing report that the companies you represent will realize they cannot afford to allow any future convention to pass without having a representative present. On behalf of the National Safety Council, it is my privilege to convey to you all a very hearty greeting.

Your Chairman during the last twelve months has kept in as close touch as possible with the activities of the section by attending whenever possible meetings of the Executive Committee of the Council. As soon as possible after the Congress last year at St. Louis, the chairmen of the

various committees were appointed and the detail work of the Section was entered upon with enthusiasm. The chairmen and members of the committees I desire to thank sincerely for their support and advice and also for the earnest way they have carried on the committee work. The reports of these committees will be submitted to the meeting later and you will have an opportunity of judging of the extent and excellence of the work done.

The Paper and Pulp industry of the United States and Canada is one of the largest, wealthiest, and most influential industries of the countries mentioned, and the Paper and Pulp Section of the National Safety Council should, therefore, take a correspondingly important place in the Council. Unfortunately this is not the case. What is the cause of this condition of affairs? Does the fault lie with us? We are all disciples in this humanitarian movement. Are we individually doing all we can to carry the gospel far afield? We all know of some one in the industry who has not come into the fold. Do we tackle such people in a determined but friendly way, and do not rest content until we have made a convert? Numerous letters have been sent out by the Council in connection with membership drives, with a certain amount of success, but far greater results can be obtained by interested members pointing out to friends who have not yet become members, the benefits, not only moral, but financial, to be derived therefrom.

If every one of us present today makes a resolution to secure at least one new member during the year, enthusiasm will develop which will soon place the Paper and Pulp Section in the position of importance in the Council which it should occupy.

I am sure the Executive Officers of the Section will have the coöperation and support of every member in bringing to a successful issue our program for increased membership.

We will now have the report of the Secretary. Mr. Milner.

REPORT OF THE SECRETARY

During the past year the membership of this section has been increased to one hundred eighty four. However, our membership has not increased to the extent it should have this year for this section has a very extensive field to work representing large and progressive industries.

I have been informed by the National Safety Council that they have appointed two assistant Field Secretaries, who will divide the territory, probably East of the Mississippi River, between them, and both of these men will be actually in the field all the time.

I would like to suggest that a mid-year meeting be held in some central location so as to enable the Chairman, Secretary and the Chairman of the various committees to get together to discuss various plans for their work. I am sure in this way we would be able to outline some very valuable ideas which would materially assist this section.

Respectfully submitted,

C. B. Milner, Secretary.

(On motion the report was adopted.)

CHAIRMAN COSTIGANE:—We should like to have the report of the Chairman of the Program Committee, Mr. Jackson.

REPORT OF PROGRAM COMMITTEE

MR. C. E. JACKSON: I have no written report. I do have, however, some voluminous correspondence in my files that will perhaps serve as a permanent monument to my efforts during the past year. My heart goes out in sympathy to the former chairmen of the various Program Committees that have acted in years gone by and I can more than appreciate the trials and tribulations under which they worked.

I am gratified, however, to say that the men that I have succeeded in placing upon this program are not only widely known but have the confidence of every member of this Section. I wrote about thirty letters, asking men if they could appear on the program. I extended no definite invitation, but I merely wanted to take an inventory of the situation. I received fourteen replies out of which there were four or five that were favorable and the men whom I did acquire are the ones I really wanted in the first place.

That brings to mind, three years ago I was invited to read a paper at a Congress, which was held at the Statler Hotel in Detroit. Being three years younger at that time and at my first meeting I felt a distinct honor had been given me. I feel now, however, that I was the last resort and the feeling I had for myself has diminished.

We should have at least seventy-five men in this room. Perhaps the reason we haven't seventy-five is that there isn't room, but next year we should, by all means, at least double our membership.

The absent ones don't realize that the ideas exchanged are valuable not only to themselves in their work, but valuable to the men whose work they are directing, and to those whose welfare and safety they have at heart. It has been shown by statistics that between 75 and 85 per cent of all accidents are due to personal carelessness of the workmen, so the Safety Engineer has rested on his oars somewhat and he has passed the buck to the workmen. In a discussion this morning at the "Round-Table" Session, it was contended that 75 to 85 per cent of all accidents are not due to the personal carelessness of the workmen, but are due primarily to the management.

If an accident is due to carelessness on the part of the workman, we might very legitimately ask ourselves, "Why is that workman careless? Isn't it because he was made careless by his own negligence?" So, I think any Safety Engineer or any person whose function it is in any industry to look after the lives of the workmen are neglecting their duty by not attending the Safety Congress if they can possibly come.

You know if you give me a dollar, you don't have the dollar any more, but if you give me an idea, you still have it. We can give things without losing them and we can take things without taking them away from anybody else. So, we may come to this meeting where there are sixty men present with one idea each, and go away sixty times as well educated in safety as we were when we came here.

This safety business is not a spasmodic proposition. It is continuous or there wouldn't be any results at all. This session is merely a breathing spell, an exchange of ideas so that we can go back to our work with renewed vigor and enthusiasm. I wish to urge the members here to follow out the Section's suggestions and not forget next year's Congress, and make an extreme effort to get others interested and get new members for the Council, because we must make a better showing than we have in the past.

(The report was accepted.)

CHAIRMAN COSTIGANE: In the absence of Mr. Phillips, Chairman of the Bulletin Committee, we will ask Mr. Altman, Chairman of the Safe Practices Committee, for the report of his committee:

REPORT OF SAFE PRACTICES COMMITTEE

R. M. ALTMAN: Immediately upon my appointment as Chairman of the Safe Practices Committee, I set about the task of selecting a working committee, and due to good fortune rather than good judgment on my part, I met with success. The members of the 1919 committee were workers and it is their energy, desire for coöperation, and willingness to work that has helped make my association with them this past year most pleasant and interesting.

The committee as originally chosen consisted of C. E. Jackson, Consolidated Water Power and Paper Company, of Grand Rapids, Wis., F. H. Rosebush, Nekoosa-Edwards Paper Company, of Port Edwards, Wis., Erling Riis, Wausau Sulphate Fibre Company, Wausau, Wis., Mr. Wood Champion Fibre Company, Canton, N. C., and your chairman. Due to the inability of Mr. Wood to attend meetings or to give us any other help, Mr. Eberhardt, of Grand Rapids, Wis., was selected to take his place.

The first meeting of this committee was held at the office of the Marathon Paper Mills Co. at Rothschild, Wis., March 24, 1919. Three weeks earlier I mailed to each, copies of outlines of the work to be covered so that when the committee met each member had an inkling of what was required. The outline was thoroughly discussed, and the various subjects to be covered were selected and assigned to members. The meeting was held in connection with the Wisconsin River Valley Readjustment Convention which was in session at Wausau. Since the subjects discussed at this convention were readjustment subjects most interesting to the safety worker, the committee members were well repaid for their time and trouble in coming to Wausau.

On April 4, lists of mills members of the National Safety Council, were furnished the committee and numerous letters were written requesting material for the proposed pamphlet, but with one or two exceptions these letters were not even answered.

On April 28, the Second Annual Industrial Conference was held at Milwaukee under the auspices of the Industrial Commission of Wisconsin, and your committee took this opportunity of meeting with the State's deputies, and safety engineers and thoroughly discussing safety problems in paper mills that had come to the notice of the deputies. The dis-

cated by a green cross. There are certain restrictions as to the use of the red cross, so it is well to be familiar with them before adopting this sign. Ordinary signs or notices giving such information as "Office," "Stores," "Exit," etc., may be carried out in white letters on a blue ground. These suggestions will serve to illustrate the basis on which a system of signs may be built up, and may be amplified to suit the conditions.

By adopting some such standards as these we are but carrying out the same idea as is used in advertising. Many a successful business is built up about a striking design or slogan. It is identified with the product and advertised in every magazine that you pick up. It makes no conscious effect on us when we see it, so we think, but when we need a certain article the advertisement of a certain brand immediately presents itself to our minds. Whatever be the psychology of this, let us apply it to our danger signs. Every day we may pass a red sign lettered in white. "Fire Hose" or "Hydrant." Now if our danger sign system is correct, the first thing you will do when you hear the fire alarm will be to "beat it" for that sign. The color or design of that sign was impressing itself on your sub-conscious mind every time you walked past it. So, I would say keep to standards, have a design or a color or both to express one idea.

SIGNS FOR PROTECTION OF EMPLOYER

There is another class of sign to be considered—the ones placed for the employer's protection. Take two examples, a railroad right-of-way is generally protected at crossings by a "No Trespassing" sign. Or again, there is a sign mounted on a certain machine "It is forbidden to oil this machine or to throw belts on or off while it is in motion." Now there always will be a certain group of venturesome citizens, and they are usually of an energetic disposition, who conclude that these signs are out of date and the methods recommended are too slow. They are willing to take a chance, generally realizing that they are taking the full responsibility on their own shoulders. Unless we are prepared to carry out the above signs to the letter, that is, fine or imprison trespassers on the railroad track, and discharge the man who oils his machine while it is running, might we not better put these signs in more truthful form? We might say "All persons walking on the railroad property do so entirely at their own risk." And the same thing might be addressed to the machine operator—he is doing it entirely at his own risk. He probably knows this when he sees the sign forbidding him oiling the machine while it is running. The question is: which sign will affect him most directly, to be forbidden to do a thing, or permitted to do it at his own peril. It is to be hoped that the discussion will bring out some opinions on this point.

SPECIAL "DANGER" SIGNS

Another group of danger signs are only displayed at certain times. When a man goes into a boiler for repairs he hangs a "Danger, Man in

Boiler" sign on the steam- and blow-off-valves. A lineman goes to work on a circuit protecting himself with a "Danger, Working on Line" sign hung on the open switch. This should be warning enough to fellow-employees of ordinary intelligence, but the protection may be made complete by locking the valve or switch with a padlock and chain.

A handy method of keeping such danger signs ready for immediate use is to have a pocket holding the sign set up at the point in question. When required, the sign is taken from the pocket and hung with a wire loop or hook on the valve wheel or switch handle. This is shown by accompanying slides.

When the hazard is great, and absolute security is demanded, as, for example, when men are charging acid towers, it is well, in addition to the danger sign, for the man in charge to lock the switch of the gas fan, and carry the key until the towers are again closed. A home-made lock is shown as applied to a Gen. Elec. K-20 switch.

As to the materials used for danger signs—it seldom pays to paint a few words on a piece of tin or on a board. Permanent signs, enamelled on steel plate, are a good investment. They can always be cleaned to look like new, and are more likely to attract attention than a faded, poorly lettered, home-made sign. Makers now carry signs in stock with almost any wording and in almost any language, so that it is seldom necessary to go to the expense of having special signs made up. For electrical work the fiber sign is preferable to the enamelled steel sign, as it is not liable to form a short if inadvertently placed across switch terminals.

Slide 1 shows an ordinary starting panel for a mill motor with a danger sign in bracket for use of men who may open switches.

(Showing Slide 2) That is the second position. The switch is open and the "Danger" sign is hung on the switch handle.

(Showing Slide 3) The K-20 type of switch in addition to which we put a small attachment or trigger that slides in behind the handle so that when the switch is open, the handle of the switch cannot be thrown in. The trigger is held in position by a padlock which locks the switch open when the men are charging the acid towers. This switch operates the gas fans. The motor is shut down and the switch is locked open in that position. The men who are charging the acid towers bring the key back with them and unlock the switch.

(Showing Slide 4) This shows our method of locking the blow-off valves on digester when men are working in the blow-pits. When the men go to work in the blow-pit they lock the blow-off valve, take the key into the blow-pit with them and it remains locked until they come out of the blow-pit again.

(Showing Slide 5) There is another application of the danger sign. The men were changing a cable on the elevator, the "Danger" was hung on the elevator gate.

CHAIRMAN COSTIGANE: We have all listened with great pleasure to Mr. Dickson's paper and as it is a subject that lends itself to a good discussion, you will now be given the opportunity.

I am sure some one present must have had experience in danger signs. Tells us of your experiences.

DISCUSSION

MR. JACKSON: We heard yesterday about industrial autocracy and we can perhaps apply that to safety work particularly in the matter of putting up signs. I agree that one outstanding fact is this: There are always a certain number of employees who either carelessly or maliciously disregard safety signs and it seems necessary for the company to make threats perhaps of a mild nature, or perhaps make a ruling that if certain regulations are disregarded employees will be discharged. I think, however, in putting up signs, instead of making them threatening, it would be better if we would substitute something like this: "If such and such a thing is done, you are not only endangering your life but lives of other members." I think that appeals to men more than that they will be discharged. It may also take away the desire of the young employees to see if they can do things perhaps of a malicious nature and get away with them. The sign will be a constant incentive to them to do the right thing, if we put it up to their own honor.

MR. A. KROES (Employers' Mutual Liability Insurance Company): A good point brought out here this morning in the nature of signs, is the steel enameled surface of the sign.

In my trips to mills I see signs of all descriptions, some even made of cardboard. These get dirty very easily, and torn down, so that steel enameled signs are more preferable.

They always look neat. Sometimes, of course, they get grimy and dirty and what Mr. Dickson said about cleaning them is very important. If the sign is neglected, you, as safety engineers, are also neglecting your work in the workman's estimation. So, to keep a sign clean is about the same thing as putting up a new sign.

CHAIRMAN COSTIGANE: I would like to take up one point that Mr. Jackson has already touched upon, the point of giving men the option of doing things at their own risk. As far as we in Ontario are concerned, that is not a solution of the problem because under the "Workman's Compensation Act" it is specifically stated that no matter when, where, or how a man is injured in the discharge of his duty, he is entitled to compensation.

If there is no further discussion, we will now take up the paper on "Sulphate and Sulphite Hazards" by Mr. Erling Riis.

MR. E. RIIS: I have been fortunate enough to be on Mr. Altman's Safe Practices Committee. Mr. Altman as a good leader assigned special duties to the different men on this Committee. I am a sulphate man, and he delegated to me to prepare the sulphate part of the pamphlet.

SULPHATE AND SULPHITE HAZARDS

ERLING RIIS, WAUSAU SULPHATE FIBRE COMPANY, MOSINEE, WIS.

The hazards in the sulphate and sulphite pulp mill are very similar although the principles on which the chemical process is based are exactly the reverse. We will therefore treat them together up to the point where

there really is a marked difference where the sulphate and sulphite hazards will be treated separately.

The logical way to treat the subject would be to follow the manufacturing process from the time the logs enter into your pulp yards until the pulp is delivered as a finished product.

THE PULPWOOD YARD

The place in the pulp mill that has the most accidents is the yard. This has its reason in the following two factors: First, there is a greater labor turnover in the yard than in the interior plant, consequently you are always employing men with less experience than you do in the rest of the mill; second, even in the best organized pulpwood yard there are certain hazards which it is practically impossible to overcome.

Pulpwood is unloaded from the cars either by cranes or by hand. The pulpwood which comes to the mill loaded on flat cars or gondolas is always held in place by means of car stakes which are wired together. Before the cars can be unloaded these wires have to be cut which always is more or less of a dangerous operation. Of course, patent car stakes have been introduced and are used to a great extent within the mill yards but very seldom used by the railroads. This has its reason not only in the fact that the safety movement has not boosted them sufficiently but also in the fact that the railroads claim they have a tendency to come loose and therefore are very dangerous on long traffic. The cutting of the ordinary stake and the clipping of the wire must therefore be mentioned as a great hazard.

We will not dwell on this subject here as it will be fully covered in the safe practices pamphlet which Mr. Altman will deliver in a few minutes.

If the wood is unloaded by hand it is generally because it has been shipped in box cars where cranes cannot be used. A runway must then be staged from the car to the pile. Men carry the logs and bolts and of course there is danger of stumbling when climbing the piles. In picking up the logs or bolts it is necessary to use hooks. As the work is very monotonous the attention of the workmen is quite frequently divided between their work and conversation. This leads to the two most common

TWO COMMON CAUSES OF ACCIDENTS

causes of accidents in unloading wood in this manner; where the hook, not being securely fastened into the log, slips out; or where the workman while jabbing the hook in the log hooks in a different direction and misses his log, the hook flies by it and generally hits him in the left knee or thigh or hits his fellow workman.

Many things have been done and many others suggested to minimize the accidents from these causes but the only suggestion that really has proved of great value is education. Education by direct contact with the men, by publication, by lectures, and last but not least by bulletin boards. The heavier logs, when being unloaded by hand, must be handled by two men, the lighter logs by one man; but whether the log is being carried by one or two men the carriers are always exposed to the danger of stumbling

while walking on the log piles. It is general practice to form terraces from the car to the piles most remote from the track so that the piles take the appearance of a stairway from the car and back. The safe practice, of course, is to lay the logs perpendicular to the tracks and if 4- or 8-foot lengths are used, there will be vertical air spaces every 4 or 8 feet from the first tier and back. If the men are very careful about piling the logs neatly there will be no danger of a man getting his foot down in these spaces but if the greatest care is not taken, here is a very common cause for a broken leg, or a sprained ankle.

Regardless of how strongly you impress upon the man who delivers your pulpwood that you will not accept 4- and 8-foot lengths in the same car, he is apt to ship you wood mixed in this way. As two 4-foot tiers will take up more space than can be covered by the length of one 8-foot log when the wood is mixed in this manner, it is plainly to be seen that here is another great danger for a man to get his foot caught.

If the wood comes in gondolas or on flat cars, it is generally unloaded by a crane. Presupposing that skillful men handle the crane, that the cables are always being watched, brake bands kept in good condition, buckets inspected for cracks, etc., the handling of cranes is always a dangerous operation and here as well as with unloading by hand the danger is multiplied when logs of various lengths come in the same car, because a longer log sticking out farther is apt to slip out of the bucket without being noticed by the man on the pile. Many an accident has been caused in this manner.

These same hazards which we have in unloading the wood, we also have in reloading it on cars from the yard. But in the pulpwood yard the car with the safety stake should be used exclusively not only because it is safe but because of the great financial saving affected in unloading the car at the sawmill platform.

SLASHER MILL

In the sawmill or slashing mill of a sulphate or sulphite factory the hazards were numerous but it is very interesting to see how in later years they have decreased, merely due to the fact that unguarded saws, carriages without railings, etc., are hardly ever to be found any more.

The wood rooms are of the most varied construction. The object of a wood room is always the same, i. e., to remove the bark from the wood and chip the wood into chips of the desired size. The chips are now screened, the screenings rechipped or conveyed to the boiler room for fuel.

There are three types of barkers: The knife barker which is operated either by hand or machinery, the periodic barking drum, and the continuous barking drum.

The knife barker operated by hand has led to many accidents although they are generally minor accidents such as the cutting off of the tips of fingers. The knife barker has been equipped with an attachment to revolve the logs while the bark is being removed which has minimized this danger and on some barkers in fact entirely removed it.

The continuous barking drum is operated in such a manner that the bolts come into one end of the revolving drum and out of the other. Some bolts, however, will not be completely barked and have to be returned by a special conveyor and re-fed in the drum. The danger of accidents is very small and the accidents generally result in a slight squeeze or bruise. If, however, a man should fall into the barking drum death is almost certain.

The periodic barker requires a hopper above the barking drum of a construction similar to a chip bin over a digester. This hopper is filled by means of a conveyor. The hazards here are smaller than with either of the other two methods of barking and as the barking drum stands still at the time it is being filled and the continuous barker is always rather small, seldom more than 8 ft. by 8 ft., the danger if a man should fall into the drum is not very great and the probabilities of falling in the drum are also very small.

The hazards on the chipper are mainly the jumping back of the bolts from the chipper spout. The operator should therefore have an opportunity to stand somewhat on the side of the spout while feeding the chipper. A shield of steel or 2-inch plank hung in front of the chipper in such a manner that it acts as baffle plate for these articles will fully protect the crew in the wood room. Most chippers are belt driven and have tight and loose pulleys or they are belted direct from an individual motor. However, in some mills we find them belted from the main drive shaft of the wood room without tight and loose pulleys so that when knives have to be changed in the chipper the whole wood room has to be shut down. When the disk has to be turned in order to change knives, the fly wheel of the steam engine driving the wood room must be turned in similar manner. This is a dangerous practice as there is always a danger of misunderstanding the signals and this has been the cause for many a lost finger or hand. Whichever arrangement a wood room has, there are always a good many conveyors and there have been numerous accidents due to men being caught in conveyors or being hit by bolts falling from the conveyors. These things should always be investigated. The switches, if the conveyors are motor driven, should be easily accessible so that any conveyor can be shut down on a moment's notice.

Where pulp is being made from slabs, it is customary to make the chips by means of a hog. The chute leading from the conveyor into this hog will always have a tendency to clog up. Great care should be taken that the men are instructed never to descend into the chute to unplug this while the hog is in motion. One very great hazard wherever a hog is being used is the danger of the disk exploding, especially where this is made of cast iron without wrought iron bands surrounding it.

THE CHIP BIN

From the wood room the chips are carried by means of conveyors to the chip bin from which they are put into the digesters. A properly constructed chip bin is not a dangerous place for a man to work. How-

ever, the majority of chip bins throughout the country are constructed in such a manner that a man has to go up into the chip bin in order to pick the chips loose to make them slide down into the digesters. There has been a case of a man losing his hold, going with the chips into the digester and being smothered to death. When chip bins are so constructed, steam pipes or compressed air pipes should lead into the chip bin to break down the arches of chips which form while filling the digester. This minimizes the danger to the man.

DIGESTING

The cooking process is somewhat different in the sulphate and sulphite digester and will therefore be handled separately.

1. *Sulphate Cooking:*

The sulphate digester is generally a small digester yielding from two to three tons of pulp. It may be a tumbling digester or stationary. It should always be welded seamless and not be riveted as no riveted digester will stand up under the strains of expansion and compression without commencing to leak and as the cooking pressure in the sulphate process generally is very high, 100 to 175 pounds, the liquor will invariably squirt out through the leaks and if anybody is hit by the liquor he will be severely burned. If the leak is very small a fine spray will come from a digester as a fog that can hardly be detected but the fine particles of liquor and steam will be flying around in the air and these particles are very injurious to the eyes.

As the liquor used in a sulphate process does not attack iron to any great extent, the digesters need no lining and do not offer much chance for explosion. Where tumbling digesters are used, the steam line enters the digester through the trunnions. There is then always a danger of this steam line breaking which is one of the greatest hazards in the digester room of a sulphate mill. The operating floor of the digester room should therefore have plenty of exits. If the boiler pressure is higher than the pressure allowed on the digester, a steam reducing valve should be placed on the high pressure steam line where this enters the digester room. There should also be all iron check valves on each branch of the steam line of the digesters and on the main line right behind the steam reducing valve preventing black liquor from backing out of the digester into the steam line and back to the boiler room.

Samples of the pulp have to be taken out of the digesters while this is under full pressure and in most mills this is done in a very primitive manner by blowing the pulp into a barrel or a box with some sacks or old paper mill felt wrapped around it. This seems to be traditional and few mills have been willing to install a cabinet with baffle plates, etc., into which their samples could be blown overcoming the danger of splashing liquor on the operator and wasting it on the floor. As this substance is very slippery there is always a danger of slipping on a concrete floor full of liquor and if a man falls in it he might be severely burned.

When a sulphate digester is to be blown into a diffuser, a system of signals is generally used between the digester man and the diffuser man so that the latter is aware of the fact that blowing is about to take place and he can take the necessary precautions. The digester man, however, should never blow until he has received the return signal to go ahead. Even with this precaution there is danger that the blow pipe is connected up to a wrong diffuser and the pulp is being blown into the diffuser which is in the process of being emptied with the result that the man on the bottom floor is badly burned.

2. Sulphite Cooking:

In the sulphite process the digesters are generally larger than in a sulphate mill, in fact five to ten times as large. The liquor used in this process releases the gases of sulphur dioxide which are very offensive and choking. The liquor should therefore not be filled into a sulphite digester from the top in the same manner as is used in the case of a sulphate mill but should, after the chips are in the digester, be pumped in from the bottom. Also here samples are taken as in the sulphate digester but with this difference that if the liquor splashes on a man's hand or clothing, it does not affect him. What does affect him however is the strong gas. The greatest danger in the digester room of a sulphite mill is the blowing of a digester. The valve might burst and the man operating the valve will be scalded. Remote control of the digester valve is recommended and where it is absolutely impossible to install this, a strong partition between the valve and the hand wheel of the valve should be installed. This danger is generally recognized by all sulphite men as the greatest danger in the sulphite mill and should be given due consideration by everybody in authority to improve this condition.

WET MACHINES, ETC.

After the stock has been washed in the blow pits or the diffusers it is handled in the same manner in both the sulphite and sulphate mills either over deckers, wet machines, or dry pulp machines. Pulp from the wet machines or dry pulp machines has to be trucked and as simple as this operation seems to be it is peculiar to note how many accidents occur during trucking. This, however, does not seem to result from any other cause than the fact that truckers very often are young men who have just commenced to work and still like to play and ride the trucks or they overload the trucks so badly that the loads tip over on them. The handling of wet machines must be considered as a rather safe operation while the dry pulp machines offer a few more dangers more similar to those on a slow running paper machine.

We have now covered the manufacture of the pulp throughout, starting with the logs, and will next turn our attention to the manufacture of cooking liquor.

LIQUOR MAKING

1. Sulphate:

The cooking liquor in the sulphate mill is a mixture of sodium hydroxide, sodium carbonate, and sodium sulphide. The liquor is originally

made in the causticizer room where the solution of sodium carbonate is causticized by means of quick lime. In putting the lime in the causticizer there is always danger of splashing and as the liquor besides being highly caustic also is extremely hot, these burns are very disagreeable. A bottle of acid acetic should always be kept on hand for immediate application which minimizes the danger.

The handling of lime is an exceptionally disagreeable job especially in hot weather and the lime bin should be well ventilated and the dust sucked right out. Even at that the lime dust in itself will always attack a man's skin. The men should therefore be instructed to have their jackets buttoned tightly around their waists, a muffler around their neck, and wear muzzles.

After the lime sludge has settled to the bottom of the causticizer, the clear liquor is drawn off by means of a siphon pipe and used directly in the digester.

The sulphate mills always recover their liquor. The process which takes place in the recovery is primarily a process of evaporation, secondarily purification and in the third place dissolving.

The first step of evaporation is with a vacuum evaporator such as the Swenson, Scott, or Webre evaporators with multiple effects. These evaporators have been known to explode and burn the operators severely. This is, however, something which happens very rarely. The main danger in the evaporator room of a sulphate mill is from the escaping gasses which have a tendency to injure the eyes. The sulphate men have never succeeded entirely in overcoming this danger but have in later years reduced it to a minimum by piping all condensed water into enclosed sewers outdoors. From vacuum evaporators the liquor passes to the disc evaporator which is nothing but a big pan in which are revolving large steel disc plates. The whole thing is entirely enclosed and really offers no danger to anybody.

From the disc evaporator the liquor runs into the rotary furnace. The dangers in the rotary furnace are the forming of rings of black ash within the rotary stopping the liquor from getting towards the front end while the heat from the smelting furnaces will have a tendency to ignite and melt the black ash which is in this end. When ultimately a ring breaks and the liquor runs into the molten soda ash in the rotary explosions are very apt to happen. When the liquor has passed through the rotary furnace it falls out on the floor in a dry state as black ash and the process of evaporation is completed. This black ash contains the sodium salts from the cooking liquor with the lignin from the wood. This is with salt cake shoveled into the smelting surface where, upon being ignited the lignin will burn and smelt the sodium salts which purified will drop into molten form as so-called melt down into the dissolving tanks, where it is dissolved and pumped into the causticizer room.

There are certain trade hazards connected with a smelting furnace. These are blast furnaces and the blast pipes have water cooled nozzles. At times these nozzles burn out and the water will run into the melt

and cause terrific explosions. Furthermore, these smelting furnaces at times have a tendency to clog up at the bottom so that all the melt which is being made in the furnace does not run out but accumulates. If the operator does not detect this immediately a good deal of melt will have a chance to accumulate before he gets a chance to run a steel rod in through the opening and unplug same. When he does this the melt will rush out with terrific force and in striking the solution of liquor in the dissolving tank, there will be minor explosions with sparks flying in all directions. It is then up to the man to be on the lookout so that he can get out of the way before the melt has had time to reach the tank. It appears plainly that the main thing is to have well-trained and experienced men to do this work. It is also recommended that in each soda recovery there should only be one man designated to handle the water valves for the blow nozzles so that these never run dry and give chances for explosions.

2. Sulphite:

In the sulphite mills the cooking liquor is very seldom totally recovered but new liquor is always being made. Cooking liquor is here calcium bisulphite. Some mills use pyrites but the most commonly used is sulphur. This is burned in sulphur ovens either stationary or rotary to sulphur dioxide gas. With the drafts properly manipulated there is very little chance of any gas here escaping so the dangers are very small indeed. This gas passes through a cooling plant. During the operation of this cooling plant there is very little danger of accidents happening to the men due to the nature of the process. When the plant is shut down, however, and the cooling system has to be cleaned the gasses really are very strong and men have been known to be overcome. These gasses pass through high towers filled with limestone meeting a stream of water or weak acid which absorb the gasses making the acid. The sulphite mill operated by the tower system must have at least two towers, a weak and a strong liquor tower. The strong liquor tower must be tightly sealed at the top while the weak liquor tower may be left open at the top as long as there is a steam jet to take care of the SO_2 and CO_2 gasses, this tower being filled with limestone. The greatest danger here is that in unsealing a tower for filling it with limestone, a man might make a mistake of unsealing the strong liquor tower which will expose him to the danger of being overcome by gas. As these towers are very high and limestone has to be carried to the top, they are always equipped with an elevator. These should always be furnished with a locking device so that nobody can lower the elevator while the operator is on top.

When the acid has been made in the towers it is generally weak, a test of approximately 3 to 3½ per cent. It is, however, before being used in the digesters, strengthened in a series of tanks by means of the gas-off coming from the digesters. Here as through the rest of the acid plant there is really only one danger and that is the escaping of gas.

CHAIRMAN COSTIGANE: Are there any questions any one would like to put to Mr. Riis on this interesting subject?

MR. ALTMAN: If there are no questions, I would like to ask the members out of curiosity, how many representatives we have here of the sulphate process besides the Mosinee people?

CHAIRMAN COSTIGANE: I see no hand. I guess that answers your question.

It occurs to me that in the sulphite process there is considerable danger at the top of the tower by men being overcome by acid fumes; I would like very much for any one present to give us their experience, and tell how the danger is overcome. I am sure some one has had such experience.

DISCUSSION

MR. DICKSON: Mr. Chairman, we have had some experience along that line in the top of the tower in the acid process. When the gas fans are in operation and the gas is circulated through the towers, if the top of the tower is unsealed and more limestone is put in there certainly is a very great chance for an accident. In fact, we have had our lesson.

One scheme is to have an emergency switch extended to the top of the tower so that you can throw off the gas fan from that point. That can be done by having an additional switch with a long distance control, either with light chains attached to it, or light wire cables, or it can be done by running a loop from the low voltage release of the controller so that when you open the switch at the top of the tower, it shuts down the tower by throwing the low voltage release.

GAS MASKS

CHAIRMAN COSTIGANE: There is a point that occurs to me, regarding which Mr. Riis might give us a little more information. He mentioned incidentally gas masks. Will you tell us, Mr. Riis, what type of gas masks you found most efficient?

MR. RIIS: I think Mr. Altman knows more about that than I do. He has some new masks at the Marathon Paper Mills.

MR. ALTMAN: We have the regular army gas masks, secured from the Ordnance Department. The chemists in the mill have been able to fill the canisters to offset either the sulphurous gas or the chlorine. In other words, we have three or four canisters for each gas mask, so that whenever a millwright goes either in the digester or in cleaning up the storage acid gas tanks, he has a proper mask to use.

MR. RIIS: Are those masks with or without mouth pieces?

MR. ALTMAN: They are the regular army gas masks, with mouth-piece.

CHAIRMAN COSTIGANE: I will now ask Mr. Altman for particulars on the Safe Practices pamphlet with a view to opening a discussion on this topic.

"Safe Practices" is interesting and vital to every one of us connected with this industry and I am sure that there should be a great number of good suggestions come from this meeting today. These suggestions I am asking for with a very conscious idea of the work that has been put through by the Safe Practices Committee because I sat on the same Committee the year previous and it is no light job. I am sure the Safe

Practices Committee will welcome any suggestions that can be included in the pamphlet.

SAFE PRACTICES PAMPHLET

MR. ALTMAN: [After reading the prepared copy of the pamphlet which will be issued as the second in the series of Safe Practices pamphlets for the Paper and Pulp Section] While I don't pretend to answer all questions, I hope with the help of the men who helped me get this up, we will be able to answer most questions. I have a number of photographs here on display for any one wishing to see them.

MR. JACKSON: Has anybody here had experience in connection with reversing of the reels when the machines run more than say 475 or 500 feet per minute, and what difficulties were encountered in introducing the system? Can you reverse the direction of the reel on a fast speed and get the same results?

MR. ALTMAN: We haven't done it on our machines though it is one of the Industrial Commission's orders. Some of us in Wisconsin find that it is impracticable to comply with two or three of these orders.

MR. JACKSON: It is easy enough to change the mechanism but it is a question of how to handle the paper after you have the machine changed over—to feed the paper on the reel.

MR. ALTMAN: There are a number of things that machine hands will complain of at the time, but later on they are perfectly willing to try out. You haven't had a chance to try it yet. You haven't changed those drives.

MR. KROES: In Paragraph 1, you speak of annealing chains. Have you any method to suggest in which way to anneal them?

You remember in former years there was quite a discussion of how to anneal chains. Wouldn't it be well to add suggestions on this?

MR. ALTMAN: We want to put in additions and if any criticisms are necessary we are perfectly willing to make them. It is for that purpose that we put this upon the program.

MR. KROES: I would think that only additions are needed—like annealing of chains. Mr. Lockney is here. Maybe he can give us some information.

MR. I. L. LOCKNEY (Chief Safety Engineer, State Safety Board, Olympia, Wash.): I would suggest that if you want to insert anything in the copy at all, you say that if any one wishes to get information regarding the correct methods, or most improved methods of annealing chains to consult the National Safety Council because they have a lot of information regarding that for the purpose of distribution.

MR. S. F. SHATTUCK (Kimberly-Clark Company): Paragraph 9, relating to unloading lime. I just got the information the other day through Miss Edwards that one mill in the East, in unloading lime, had a barrel of vaseline handy and the men were encouraged to smear themselves with vaseline and that offered an absolute protection against the injurious effect.

Page 5, Paragraph 11 on the stacking of pulp: I imagine most mills have had accidents from this cause. We have signs printed to hang on the

face of a pile of pulp. It gives instructions on how the stack is taken down, so when a man goes there he has his instructions and because these instructions are there they can't help but be seen; we have also a warning sign that we make a reduction of 15 per cent in compensation if those instructions are not followed.

CHAIRMAN COSTIGANE: Do you have power to do that?

MR. SHATTUCK: We have investigated that and find we are within the state law. That is perfectly true in Wisconsin, the Commission will reduce the compensation 15 per cent.

CHAIRMAN COSTIGANE: I understand that does apply to the compensation law in some of the states, but it does not apply to the compensation law in Canada. There can be no reduction in compensation there.

MR. ALTMAN: The sign simply giving instructions on taking the pile down should be valuable, although it may not be absolutely fool-proof. It would give the workmen a warning of the danger in unloading, even if you do not add the reduction in compensation. However, the reduction would be a very good thing to add where allowed.

CHAIRMAN COSTIGANE: Do you have these signs in English, or do you use other languages also?

MR. SHATTUCK: We have always used only one language, English.

CHAIRMAN COSTIGANE: The whole idea of submitting this pamphlet to the meeting is with a view of having a keen discussion and to get ideas which may be better than those in the pamphlet before having the pamphlet printed.

We want to guard against the possibility of suggesting to mills methods which may already have been put out of date by some better methods. We want to know the best methods being used in the talks so that they can be embodied in this pamphlet.

MR. KROES: What do you do about the old wire laying around the place? This forms tripping hazards.

MR. ALTMAN: As far as we are concerned, we have a man with a team going around and picking up the old wire and selling it. I think it sells for about the cost of gathering.

MR. KROES: In addition to your splendid paper, could something be said about elevators?

MR. ALTMAN: That is just the point, we don't want to digress into various subjects such as elevators and annealing, because we have a pamphlet already issued by the National Safety Council on "Elevators." When anything is to be said in regard to elevators we can refer to this pamphlet.

CHAIRMAN COSTIGANE: Instead of repeating what is already in print it is intended to refer to existing publications covering that subject.

MR. E. C. GILDENZOFF (York Haven Paper Company): Page 9, regarding Chip Bins: Our sulphite digester room and blow-pit room is all one room which isn't the case in the more modern mills. We had two men up in the chip rooms and the men blowing off the digesters neglected to close the manhole door and also to close the doors of the wet room.

Of course, when the blow-off lines were used the gases got all through the digester room and up into the chip room.

The two men working there were shifting chips from one bin to another. A warning was given them by means of a bell that we have installed. When that bell was rung they knew what it was of course, but they thought there was no danger from gas up there. One got out all right but the other was overcome with gas, because there was no way of getting down out of the chip bin except down the stairway through the digester room. We have since made an exit, on each end of the monitor on top of the digester room and have placed a platform from the end of the monitor out to the digester room with a safety ladder attachment.

We have built a platform from the end of each monitor. In our case, a wood room is on one end and an acid room on the other, so one doesn't have to go down through the digester room to get out. In more modern mills, in case a blow-pit is left open it would make no difference because they have several blow-pit rooms. But in our case suppose a gas valve or gas pipe should burst while men are up there, the same condition arises; they now have no trouble in getting out.

CHAIRMAN COSTIGANE: Have you a platform at the point from which the ladder starts so that a man who is overcome by the gas can rest in the open air?

MR. GILDENZOPF: Yes.

MR. G. A. UMBERHAM (Northern Paper Mills): On account of a recent accident at our mill, when a helper was caught between a bottom felt and a crush roll the Safety Committee attempted to overcome the crush roll. I was wondering if any one had any suggestions on this point. There doesn't seem to be any way to do without this crush roll.

MR. ALTMAN: Is it a frequent practice to get underneath to scrape the roll?

MR. UMBERHAM: Some would say, "Shut the machinery down." But generally we do not shut a machine down so the fellow crawls under and scrapes off the roll.

MR. RIIS: When the pulp or paper stock slips off a felt like that, it is generally due to the felt not containing the right amount of moisture. Some mills have tried to overcome it by a hot-air blast on to the felt. Probably some one else can give additional information as to what experience they have had with paper sticking on the felt, and what results they get from the hot-air blast.

MR. UMBERHAM: Bear in mind that this was a new felt, just put on.

MR. RIIS: Well, then wash your felts better.

MR. KROES: On Page 7, the Slasher Mill: In the sentence, "If the walk is inclined, the flooring should have cleats to prevent slipping." Nothing is said here about the railing or toe-board.

MR. ALTMAN: It is well known that any of these walks should have toe-boards and railings, but cleats may not have been considered. Reference to toe-boards and railings will be made in the pamphlet.

MR. ALTMAN: In connection with the dryers and the danger of burns, I remember when burns used to be a very frequent occurrence and I have

been wondering if any one here is using the Sheahan rope carrier over the dryer.

MR. F. J. Mc ELGIN (Carthage Sulphite Pulp and Paper Company, Carthage, N. Y.): I have seen several used.

MR. ALTMAN: I think it is one of the best devices we have. It not only eliminates danger so far as burns are concerned but it is a sure carrier.

MR. A. G. RICHARDSON (Laurentide Company, Limited): We have six of these in operation, and have found them very satisfactory.

MR. GILDENZOFF: Will they work on heavy paper as well?

MR. ALTMAN: I recommended that to the Cornell Wood-Board. They are manufacturing a board like beaver board. I haven't heard whether they have installed one or not. I have asked them to install one for trial and if it worked to let me know, so I could give this information to any one who has a board machine.

We have a cylinder machine, also, used as a board machine. The material on our Fourdrinier is sometimes sixty-five and seventy pound stock and it carries that satisfactorily.

MR. GILDENZOFF: I understand it saves the paper from following the dryers around. How does it work in the case that the paper breaks?

MR. ALTMAN: It depends where it breaks. If it started on the first dryer, it would continue right along like a new sheet should.

MR. Mc ELGIN: Will there be a hazard in spearing it off the dryers?

MR. ALTMAN: I have never seen that occur. The arrangements of the ropes would make that impossible.

MR. Mc ELGIN: I have seen it carried all the way up to the dryers in the hanging paper. If it breaks before it gets on the dryers, it drops there.

MR. RUS: There is nothing that will stop the paper from winding around the dryer at times and I thought you meant, Mr. Gildenzoff, would the rope be in the way of getting it out. I can tell you it is not. It is right behind the frame and does not interfere with that part of it.

MR. JACKSON: Isn't your machine at the Mosinee carrying a device to take the paper through the calender?

MR. RUS: Not through the calender.

MR. LOCKNEY: There is one point not well taken. You advise painting obstructions white so that people will not run into them. It is a good thing to make black stripes around them. A white background can't be seen. If you have black stripes, they bring it out stronger.

MR. KROES: If you mention gas masks, wouldn't it be well to mention the kind you use?

MR. ALTMAN: We once used a Burrel, and it isn't as satisfactory as the regular army gas mask. A list was sent in by the Ordnance Department and a gas mask was selected.

SECRETARY JACKSON: The Mine Safety Appliance Company are making a mask similar to the army gas mask without the mouthpiece and they furnish canisters for different gases and different acids.

MR. ALTMAN: I don't think too much good can be said about these army masks, especially for cleaning acid storage tanks.

MR. GILDENZOFF: We have a mask on the order of a diving helmet but

I can't remember where we got it. A hose connected to a blower is attached. You can't give a man too much air. After a certain determined pressure is reached, a valve opens and permits the excess air to escape. We have had very good success with it.

The other day our acid pump went wrong. This pump is located in a very close place, little if any air gets to it. A man wearing the mask repaired the pump and was not troubled with the sulphurous gas surrounding him. This gas, as you know, quickly burns the eyes.

MR. ALTMAN: Your hose has to be long enough to serve every purpose. That is the reason your canister mask is the better, because the man carried the entire equipment with him all the time.

Adjournment.

FRIDAY MORNING SESSION

CHAIRMAN COSTIGANE: The Chairman of the Bulletin Committee, Mr. Phillips, is not able to be present and I have just received a letter from him this morning enclosing his report. I will ask the Secretary to read this report.

REPORT OF BULLETIN COMMITTEE

Your committee, composed of Mr. G. W. Dickson, Rlordon Pulp and Paper Company, Hawkesbury, Canada, Mr. Harry Ballou, Manasha Paper Company, Ladysmith, Wis., Mr. A. G. Richardson, Laurentide Paper Company, Grand Mere, Quebec, and myself being so widely separated geographically, were unable to get together in conference.

Since the meeting of the Section one year ago, however, bulletins have been issued regularly by the National Safety Council, every two weeks and distributed to the members of the Paper and Pulp Section. These bulletins covered the various hazards of the Paper and Pulp Industry, and the most of them were illustrated by photographs and cartoons.

We have, however, found it no easy task to procure suitable material, that is ideas for good live safety pictures illustrating the hazards peculiar to the Paper and Pulp industry.

Your Committee feels very grateful to Mr. Fullum of the International Paper Company for the excellent cartoons which he sent us.

As some of you know, especially those who have served on the Bulletin Committee what a problem it is to get up bulletin material, bearing specifically on hazards existing in the Paper and Pulp industry, I suggest for the benefit of the Committee which shall be appointed at this conference for the ensuing year, that every member of the Paper and Pulp Section be requested by the Bulletin Committee of the National Safety Council, to submit a list of danger points and bulletin subjects, covering the important and hazardous operations peculiar to the Paper and Pulp Industry, and a list of these suggestions to be sent to the Chairman of the Bulletin Committee of this section.

Respectfully submitted,

G. W. PHILLIPS, Chairman.

(On motion the report was accepted.)

REPORT OF NOMINATING COMMITTEE

CHAIRMAN COSTIGANE: I will now ask Mr. Riis, Chairman of the Nominating Committee, to make their report.

MR. RIIS: The Nominating Committee has met and decided on the following gentlemen to fill the positions of Chairman, Vice-Chairman, and Secretary:

Chairman, R. M. Altman, Marathon Paper Mills.

Vice-Chairman, G. W. Dickson, Riordan Pulp & Paper Company.

Secretary, N. S. Stone, Wausau Sulphate Fibre Company.

(These men were elected.)

CHAIRMAN COSTIGANE: I have pleasure indeed in vacating the chair in favor of Mr. Altman. I have known Mr. Altman for some time and I know the affairs of this Section will be in first class hands. He will not suffer under the same drawback as I did, having been so far away. I think that one of the points made by Mr. Riis is very good that the nucleus of the organization should be fairly close together, so that the officers can meet together from time to time, have a heart to heart talk, make suggestions and proposals, meet with other people and get all the information possible to make the meeting of this Section of the National Safety Council as interesting and effective as possible.

MR. ALTMAN: I want to thank you gentlemen for the honor that has been bestowed upon me. I don't feel that I should thank the Nominating Committee. (Laughter.) I know exactly what the proposition is but I will say this, seeing that I am to take the part, I will do the best I can and trust that every one present here today will cooperate with me in making the meeting next year as successful, if not more successful than it has been in the past.

There is just one point that I wish all you members would bear in mind before you leave today, that is to work for a larger representation next year. Let's see if we can't have one of the big sectional meetings here, instead of a meeting of thirty, forty or fifty members. I heard yesterday the Paper and Pulp Section has about 184 members and that our efforts should be to increase the membership. I think the better policy, is to see that all the 184 members send representatives to the next congress.

CHAIRMAN COSTIGANE: We will now ask Mr. H. H. Matthieson to give us his paper.

SOME UNSAFE PRACTICES IN PAPER MILLS—THEIR COST IN MONEY AND MEN

H. H. MATTHIESON, SAFETY DIRECTOR, CROWN WILLAMETTE PAPER COMPANY,
PORTLAND, ORE.

Unsafe practices or, if you please, "sins" against safety and common sense, are quite as prevalent in Pulp and Paper Mills as in any other branch of industry and, perhaps due to the varied and peculiar conditions

under which these operations are carried on, certain of these practices are even more prevalent in our Industry than in any other. In considering this subject, one's mind at once begins to enumerate a list of forbidden unsafe practices, with which we are all quite familiar and against which we are all continually combatting. Such unsafe practices, for the most part, produce 80 per cent of the accidents with which the Industry is charged.

In passing, however, permit me to mention a few common, every-day, unsafe practices which are continually coming to our attention, and more particularly prevalent in the Paper Industry, such, for example, as the wearing of loose, ragged clothing while working around machinery; not using safeguards or leaving them out of place; poor housekeeping; horse-play and scuffling; throwing pulp balls; burrowing "tunnels" in wood piles; not wearing goggles while doing work which is dangerous to the eyes; dropping wood and other materials on the hands or feet. In studying these several unsafe practices, let us re-classify them, listing them, if you please, under some physical or mental condition of the individual himself,—such as "Thoughtlessness," "Inattention," "Indifference," "Ignorance," and "Chance-taking,"—and to ascertain, if possible, what may be done through safety training or other means, really to reach the individual workman and, by neutralizing or eradicating these causes, get at the root of our accidents and thus eliminate them. These "sins" against safety and common-sense are the underlying elements of all unsafe practices, and unsafe practices are the primary cause of accidents.

You will note, in passing, that in the various causes listed above, I have omitted the term "Carelessness." This was intentional. I do not like the word "Carelessness" as so often applied to the causes of accidents because of its misuse. It so easily covers such a wide field that we are all apt to use it inadvertently, and the mere statement that "Carelessness" is the cause of a certain accident covers the whole field, leaving no further investigation or inquiry necessary. The mere fact that a man is "Careless" closes the chapter. Carelessness is merely an excuse, or rather a very handy way of shifting responsibility. I fear that this word is too freely used and that, were it not so commonly used, and a little more effort and thought put toward carefully investigating the real causes of accidents, we might discover more ways and means of avoiding many of the accidents which we now have. A thorough investigation will often reveal some other cause than "Carelessness" and often one which will suggest a remedy. The word "Carelessness" should be used with greater caution and reserve than is commonly done.

With your kind permission, let us now endeavor to develop this subject in a broader and more comprehensive sense,—to cover, in a more general way, some of the unsafe practices occurring in industry as a whole,—and discover, if possible, some efficient, effective, and practical methods of dealing with these unsafe practices and causes of accidents, with a view to making them so unpopular as to reduce their frequency and thus reduce our accidents to a minimum. We will thus divert our attention somewhat and study this subject of unsafe practices from the angle of complete elimination thereof through safety training.

Let us first assume, therefore, an ideal condition in our plants all over the country; that is, a complete practical safeguarding of all dangerous parts and machinery. In fact, safety work, in so far as safeguards are concerned, because of the passage of the various state laws, because of regulations laid down by insurance companies, and because of public sentiment, the safeguarding of dangerous parts has been so featured that now the unguarded plant is becoming the exception rather than the rule, and everybody, everywhere, is demanding safe working places and safe working conditions. The problem, then, of really getting results in accident-prevention work, has shifted from the safeguarding problem to that problem sometimes called "Human Engineering," which tends to enlist the interest, help, and coöperation of the individual workman, his family, and the whole community by instilling into their lives and make-up what is known as the "Safety Spirit."

DEVELOP PUBLIC SAFETY SPIRIT

The Spirit of Safety must become popularized and be made a public proposition. The Safety Spirit should be so propagated that the Public as a whole, will know it, believe in it, and consider it in the same way and the same class as they consider the Red Cross, Pure Milk, Public Health, or any other necessary proposition. Safety must be made a part of the public make-up and so thoroughly known and believed in as to be a part of every man's, woman's, and child's inner life. This, to my mind, is the Safety Man's mission; it is his opportunity; it is 80 per cent of the battle of really getting results and eliminating accidents.

The question then arises: how to develop this Safety Spirit and how actually to sell it to the workmen and the people at large.

Much has been written and much study given to the subject of how to sell safety to the management, to the superintendent, and to the foreman,—but, how about the workman? He, too, has an individuality and must be sold, too, for he, after all, is the man we really have to reach.

Do not misunderstand me—that I am under-estimating the necessity of selling safety to the "big boss"; such is not the case, but I often feel that many of us think, when this is done, the whole problem is solved. Gaining the backing and coöperation of the higher-ups is only the first important stepping stone. There is an old saying "You can lead a horse to water but you cannot make him drink unless he wants to" and it sometimes appears that we are trying to make the workman "take" this safety propaganda whether he wants to or not. He has an individuality: he must be "sold" Safety, just the same as any one else.

The Safety Committee is recognized by all, as the very best means of enlivening this interest in the workman. It is a well-known fact in the political world that in order to get one's interest in a political proposition: you must give him something to do; therefore the practical politician arranges to enlist the services of as many voters as possible by placing them on committees and giving them a part to perform. The workmen likewise should be given something to do in the safety world. He does not want this Safety Spirit forced upon him from "above." He wants

to be a part of it; he wants to help prevent accidents in his plant and community; he wants to consider it his business, too.

Do not try to sell safety to your man as a charity or a welfare proposition, nor to make it appear wholly for his individual benefit. Aside from the humanitarian standpoint there is also a commercial and patriotic standpoint to Safety. He is aware of this fact just as well as you are, so do not try to deceive him; be frank and truthful with him. He appreciates frankness and only in this way can you gain his confidence and get his loyal support.

We must extend this work even beyond the Safety Committees and endeavor, through personal contact and personal interest, through the foreman, through the plant publications, through safety motion pictures, through bulletins, through daily messages on a conspicuous blackboard, and through the schools, the churches, the newspapers and local ordinances, to get this man, his wife, and his children, to consider the safety idea as an integral part of their lives and to consider it as such, rather than a mere necessity or philosophy which is forced upon him by the foreman or by the Company for which he is working.

I sometimes think that we have been trying to bombard the workman's position with reference to safety for so long a time, along the same lines and methods, that a change of attack and new ideas and new methods are necessary now to make greater progress. More attention must be given to developing safety as a community proposition as outlined above and in the endeavor to interest the individual citizen, his children, his wife, and his whole family in habits of safe practices. Safety is everybody's problem; it is everybody's business.

COST OF ACCIDENTS--IN MEN

Aside from considering the humanitarian side of accident prevention work, that is, the pain, suffering, and misery caused thereby, accidents are an economic and commercial loss, not alone to the individual and to industry, but also, to the nation. The great war has taught us that the man power of a nation is without doubt, the greatest asset it has, and anything which tends to deplete or undermine a nation's man power is striking at the very heart of that Nation. Unsafe practices and their resulting accidents are annually injuring, maiming, and killing thousands of our people. Accident prevention activities then, become a patriotic proposition which can best be demonstrated by the following statistics:

During the great war just closed, the United States' fatality loss in France amounted to 56,227 men killed. During these same nineteen months, while we were engaged in war, back here at home, many miles away from the bloody conflict, something over 126,000 men, women, and children met violent deaths in the United States because of accidents; that is on an average, 220 accidental deaths every day for the nineteen months we were in the war, nearly two and a half times as many people killed by accidents as by war.

During these same nineteen months, over 200,000 of our soldiers were

injured or wounded in battle. At the same time at home over 2,000,000 of our people were injured by accidents (though not fatally) but so badly injured that they were disabled for four weeks or longer; ten times as many injured at home by accident as were disabled by war. This, Gentlemen, is the cost of unsafe practices and their resultant accidents in man-power of this country of ours. This is a loss which I am positive that systematic, thorough safety work can reduce many fold, in fact, some of the most optimistic of us believe it can be reduced thereby, over 75 per cent as approximately this proportion of our accidents are directly traceable to unsafe practices and acts in our every-day life.

An accident should be considered as a terrible calamity, and we should learn to look at unsafe practices and their resultant accidents as one of the Nation's great curses, and to endeavor to imprint in our minds and on the minds of the people of this Nation, the awfulness of the crime of "Carelessness."

THE COST OF ACCIDENTS—IN MONEY

In addition to the great cost of accidents in man-power, accidents also cost money. This is the commercial side of safety. I once had occasion, in a plant where I was employed, to ascertain the average cost of each time-lost accident occurring in that plant. From the records we ascertained the number of accidents occurring over a certain period of time, comprising all classes of accidents, including fatalities; we first compiled the compensation payments, funeral expenses, and other expenses connected with these accidents (not including the medical cost nor the loss of wages). We allowed an estimated cost of \$30.00 per man for replacing the injured men with new men, which, by the way, is a very conservative estimate; compiling these figures, we found that 292 accidents covering this period, cost our industry \$46,758.35, or an average of \$160.14 for each and every lost-time accident occurring during that period. This was the average cost per lost-time accident to the industry only; in addition to this, we estimated a total loss of \$22,708.00 in wages lost, because of these 292 accidents, over and above what the compensation of that State allowed for such injuries, and a like amount for the medical care of these 292 injured men. Taking the sum total of all these items into consideration, the cost of these 292 accidents amounted to \$92,174.35 or an average total cost of each accident, amounting to \$315.66. This sum, Gentlemen, was the average total cost of each lost-time accident to that particular industry and the community at large. These figures may perhaps vary somewhat for the various industries, the various state laws, and the particular experience of each individual industry, but when the cost of your accidents is calculated on this basis, the figures will astound you.

Taking, for example, the above average cost as the cost of each disabling accident, to Society and to Industry, and considering the millions of accidents which occur in the United States every year, the greater majority of which might be eliminated by proper safety training; the wastage, the total cost and the loss occasioned thereby, if saved, would retire our National debt in a comparatively short time.

I may have wandered somewhat from my original subject, but when we stop to consider that the unsafe practices enumerated above are in a measure, the cause of 80 per cent of this outlay of human life and enormous cost in men and in money, we realize perhaps more than ever before, the great opportunity which is afforded us in endeavoring to spread the Safety Spirit to all, thus not only performing a humanitarian duty but a patriotic and an economic one as well. Safety should be handled just as we handle the production end of industry,—as a good sound business proposition. It should be given a dignified place as an indispensable part of an efficient organization. Do this and we will succeed; go at it half-heartedly and we will fail.

As a result of these efforts,—namely, to make Safety a by-word of every man, woman, and child in the Nation, permit me to paint before you, a picture in words, showing the contrast between the old conditions of a few years ago, the "Plant of Yesterday," and the new ideals of the future, the "Plant of Tomorrow":

In the Plant of Yesterday, there was little or no thought given to accident prevention work; safety ideas were ridiculed and considered lightly, as a joke, or passed by with scorn. Unsafe practices and chance-taking were prevalent and quite permissible,—passed by with a shrug of the shoulders—and accidents were considered a necessity to industry and to production. Men were killed, maimed, and injured, for lack of proper safeguards and proper safety training. We seemed to be in the business of producing widows, orphans, cripples, and suffering. The ambulance was a frequent visitor at the front gate to haul away the poor unfortunates whose broken bodies in many cases were cast out on the scrap heap of humanity as a by-product of industry.

But a new era has dawned on the horizon; some one had a vision that accidents were unnecessary to production, that they were a humanitarian and an economic waste, and that they could be entirely eliminated by proper safeguards and safety training,—a vision which was put into practical effect; thus, the Plant of Yesterday fades into the Plant of Tomorrow:

In the Plant of Tomorrow we shall know nothing of industrial accidents, for every plant will be completely and practically safeguarded; unsafe practices, chance-taking, and carelessness become so unpopular as to be looked upon with scorn by all and be considered as criminal acts; every person in industry, from the President to the humblest employee, will be imbued with the Safety Spirit, and safe practices, safe thoughts, and safe acts will have become a habit with all, and all will have come to believe that the safety way of performing work is the best way. In this plant, through frequent Safety Committee meetings, the employer and the employee will "get together" and become acquainted with each other and find that each is human, that each is "his brother's keeper," and that each is not such a bad fellow after all, and, all working together, hand in hand, will ultimately win the battle for Industrial Democracy.

That, Gentlemen, is our opportunity; that, is the ultimate goal of Safety.

CHAIRMAN COSTIGANE: Would any one present like to ask Mr. Matthieson any questions on his paper? His paper covers a very broad subject and should lend itself to an animated discussion.

DISCUSSION

MR. DICKSON: I would like to ask Mr. Matthieson in referring to the safe practices as more of the spirit and education, if it has been his experience, or if it is possible to commence that safety education in the homes or in the schools, and if he is able to give us any information about that?

MR. MATTHIESON: I might answer that question from a personal experience I had in my safety work in various localities. We have been trying to bombard the man for so long and from different angles, I believe that the new way is through the home. I am using moving pictures, sending circular letters to the homes so that the home folks will be brought to the realization that safety is their business.

I well remember an experience I recently had. We got certain safety films from the National Safety Council. I got in touch with the School Board and told them what I proposed to do; they called the Superintendent and told him to close the schools and send all the children to the free moving picture show. We had 2,000 little folks from all grades to the high school. We showed them safety pictures and talked to them on safety.

I told the boys and girls we were trying to make the mill safe and have no accidents, but that my job was too big and asked if they all wanted to be Safety Scouts and help me. They all held up their hands.

Next day a man came to me in the mill and said, "What was this stuff you told the children yesterday in the moving picture show?" Well, I didn't know what was coming. But this man said, "Well, my boy told me last night, and the little fellow crawled up in my lap, and he said, 'There's a Safety-first man down there at the show this afternoon and I want you to go tonight and see the pictures. He told me about the mill. It is quite dangerous and men get hurt quite often and, Daddy, I got to thinkin' what would happen to me and sister and mother if something happened to you. And, Daddy, I want you to be careful for my sake.'"

Then this man said to me, "Matthieson, that little boy's talk did me more good than all the preaching in a year."

MR. RUS: You mention that tunnels were being made in piles and pulp balls were thrown, etc. Do you mean that there is more horse-playing and more unsafe practices going on in the pulp and paper industry than in any other industry?

MR. MATTHIESON: I might answer that, by yes and no. Yes, because in the paper and pulp industry there are so many various lines of work carried on. We start right out in the woods in the logging operation; we have railroading; we have the sawing operations; we have transportation and we then have the various operations in the manufacture of paper.

Around the paper mill proper, as you know, a great many operators have a lot of time on their hands and they seem to have to do something

with their reserve energy. That is what brings up the horse-play, throwing pulp balls, etc., but take the industry as a whole, I think we can safely say there is a greater variety of sins against safety committed in that industry than in any other.

MR. I. WYMAN (Strathmore Paper Company): Mr. Matthieson brought up the question of old clothing and also falling objects. What has been done in the past to remedy that question? Ninety per cent of our accidents last year were caused by falling objects and by falls.

MR. MATTHIESON: The first question about ragged clothing. We made it so unpopular to work around the machine with ragged clothing that the men will not permit one of the fellows to wear ragged clothes.

Falling objects—that is a personal question. The only thing you can get, in my opinion, to counteract this influence, is through very intensive safety training. You can't safeguard a man's toes very well, to resist a block of wood, or his fingers against knocks, but if you will analyze those accidents there is a personal influence we must get at and try to make the safety idea so prevalent in the plant that men talk about it among themselves.

Last night I was taking a car ride out on the East side to visit some friends, and our car collided with a Ford. It broke up the street-car pretty badly but didn't hurt the Ford. I went out to size up the situation and found no one was hurt, so I started to go back to the car and it was so congested at the door of the car I couldn't get in. A fellow on the car said, "Don't you know this is Safety week? What are you trying to do, allowing the people to get on that way?"

If you could get every man in the mill to exhibit the spirit of the man on the car, you are going to get at and stop the men throwing things on hands and feet.

CHAIRMAN COSTIGANE: This is an interesting topic, gentlemen, I am sure there are some other questions you would like to put.

I would like to ask Mr. Matthieson if he has dealt with the term "carelessness" as far as accidents are concerned. I think the trend of his remarks is to show that the word "carelessness" should not be used. It might not be entirely eliminated but the use of the word might be largely decreased.

I have quite a lot of statistics to make up in connection with the paper and pulp mills of Ontario. I would like to ask Mr. Matthieson as to what term in making up those statistics I may use in exchange for the word "carelessness."

MR. MATTHIESON: I don't want you to think I mean entirely to eliminate the use of the word for I used it in my paper but I do think we use it far too freely.

I once made inspections for an insurance company and would go to a plant and have a talk with the superintendent or manager and almost invariably he would say something like this, "We don't have many accidents here. They are all caused by carelessness."

I would say to him, "What do you mean by carelessness?"

He would start to tell me how a man was injured in a certain way. I would say, "That man wasn't careless. You're at fault."

"No, he was just careless."

I would say, "You never did anything to train him, or to change the conditions."

You see that man said the word "carelessness," closed the deal, relieved himself of all blame and put the full burden on the injured man.

I have made statistics. The very first thing I did was to sit down and take all the accidents and study them carefully. I resolved that I would use the word "carelessness" just as carefully as I could and I studied every one of them over and I want to tell you it took a lot of investigation to get around that resolution. I was forced to charge five or six to carelessness.

I sometimes found on the face of the report "Carelessness" written very boldly, but if I took plenty of time to study out each one of those accidents, I found some other very good cause for the accident.

I find that if an accident is caused by chance taking, there's our chance for educational work. If it is caused by indifference, there's a chance for educational work, but if it is caused by carelessness, there is no chance to do anything.

CHAIRMAN COSTIGANE: I thank you. I'm convinced that we shall still have use for the word, not in a loose way, but a little more specifically and possibly with a little more information behind it.

We will now close the discussion on this paper and pass to the paper by Mr. S. F. Shattuck of the Kimberly-Clark Company, Neenah, Wisconsin, on "How to Make Safety Meetings Interesting."

MR. SHATTUCK: I am expecting some back-fire on this because we, not knowing we were exceptional at all, have made at least a temporary change in our safety policy which for the time being eliminates the usual type of Safety Committee. This was done since I promised to give this paper back in early July.

HOW TO MAKE SAFETY MEETINGS INTERESTING

S. F. SHATTUCK, KIMBERLY-CLARK COMPANY, NEENAH, WIS.

This subject, regardless of the form of safety organization employed, is vital to an enthusiastic and successful safety program. A dead or uninteresting safety meeting sends a thinking man back to his work with a case of brain fog and such a mental attitude tends to anything but safety.

At the present time, in our organization, we are varying our safety program by the abandonment of the usual type of safety committee and centering all responsibility on the foreman of each shift or department. This plan contemplates periodic meetings of foremen instead of the former elected or appointed safety committee. It was at a meeting of foremen that this plan was suggested and evolved. The sentiment was strongly voiced that the safety of a department is "up to" the foreman, and our

comparative results since July 15, when this new order of things went into effect, have abundantly justified the change.

FOREMEN ASSUMED RESPONSIBILITY

This incident and its results point the way to the secret of interest in safety or safety meetings. Our foremen have taken the initiative, have assumed a responsibility, and are now proving up by lowering a previous record. Pride in, and record of achievement are vital factors in maintaining interest in safety meetings or any safety program.

Along with this must go a system for providing each foreman with his record of achievement in comparison with other foremen. We have hit upon the simple psychology of giving each foreman each week a record of man days elapsed since the last accident within his jurisdiction. In addition, this record goes onto the desk of every officer of the company and proper publicity is given to this fact. The reaction on both sides is wholesome and the effect upon the safety record has been the constant widening of clean spots.

The sporting element is also a valuable factor if properly utilized. We have pulled off almost every conceivable form of safety contest between our several mills and departments and the relative standings are, of course, features of the safety meetings.

To bring before a safety meeting all possible new safety ideas in tangible form helps to fix interest. For instance, when one of our mechanics developed a foot brake for two-wheeled trucks, we had this device demonstrated, prior to adoption, before several of our safety committees. For years, in paper and pulp mills, men have stumbled over the handles of four-wheel trucks. Recently, one of our men invented a handle that, as soon as it touches the floor, will spring back to an upright position. This idea was demonstrated before the plant safety committee and is now under observation.

A campaign for clean toilets, elimination of horse play, and new schemes for advertising the safety program have their logical inception and periodic boosts in meetings of safety committees.

INVITE INJURED MEN TO MEET WITH PLANT SAFETY COMMITTEE

We have tried the idea of inviting injured men to meet with a plant safety committee. If these men are treated with just the right tact and consideration, this practice is good and lends a genuine interest to the meeting. Much depends upon the attitude and personality of the chairmen. If the injured man can be placed at his ease and robbed of the embarrassment which may well attend an invitation, which amounts to a summons, to appear before the committee, much good may result through getting the first-hand views of the injured man, and causing him to feel that his misfortune is being used to a constructive end. But if such meetings are conducted along inquisitorial lines, the sooner this feature is dropped the better for the good of all concerned.

For some years we have had, as the executive center of our safety pro-

gram, a monthly or quarterly meeting of department heads—men whose chief concern is production. The source of sustained interest in such a group, granting that all are well sold on the safety proposition, is definite responsibility. Recommendations of the Safety Director are here brought up for approval or disapproval. If approved, responsibility for execution is placed and an accounting is subsequently called for. Interest with men of this type is the kind of interest that obtains in the carrying forward of any necessary or important phase of manufacture. Furthermore, the steady backing of such a group may be counted upon provided the Safety Director conducts his program in a sane, cooperative spirit.

SAFETY MASS MEETING

In our Company, we hold annually a Safety Mass Meeting to which wives and sweethearts are welcome, and nothing is left undone to make them "regular" events. Advance advertising, free transportation, admission by ticket, and plenty of delegated responsibility are the advance agents of an interesting meeting. Such meetings, staged on right lines, may do much to develop a family feeling through an organization and it is this feeling that industry is so sadly in need of these days.

For the "family reunion" of our Fox River Valley mills this year, we secured the new chapel of Lawrence College, seating approximately 1,800 people. This auditorium contains a magnificent pipe organ and we engaged the services of the best organist in the state for an organ recital to precede our regular program. Then followed a community sing, which was a joy forever. The volume and quality of the singing was the surprise of the meeting. Most folks like to sing when they are not embarrassed by the sound of their own voice and few influences weld a large body of people into oneness of feeling like song, properly conducted and heartily entered into.

A simple and impressive feature of our program was an idea, presumably borrowed, as are most of our good ideas, from some good friend in the safety game, namely, "A Procession of the Blind Man and His Friends." A blind man is led onto the stage by a little child; behind him follow at intervals a dozen varieties of cripples. When all have reached the far end of the stage, they turn their backs to the audience and upon the back of each cripple is a placard, "I was careless"—"I didn't think"—"I forgot"—"I didn't know it was loaded", etc. Any safety committee can readily find willing "victims" for such a stunt and a point of contact with an industrial audience is instantly established. We have always tried on these occasions to have one or more addresses by men capable of getting home with their messages. The homlier the message and the more simple the mode of address, the better.

Thus far, the movie has closed every program, and even though everybody is now well "fed up" on movies, a good safety film never fails to hold its own. At such mass meetings, any new phase of the safety program or anything akin to it may be touched upon with good grace. For instance, when dentistry was about to be instituted in our mills, we took occasion to give one of our company dentists a place on the program and

there is little question that the smoothness and enthusiasm with which this service moved off had its roots in the favorable impression given at the safety meeting.

Our mass meetings are invariably held on a Sunday afternoon, a proper time for such a gathering. It has also seemed to us appropriate to invite a local pastor or priest to open the session with prayer.

To summarize, I would say that our experience has made clear seven factors making for sustained interest in safety meetings:

FACTORS MAKING FOR SUSTAINED INTEREST IN SAFETY MEETINGS

1. Develop a personal and group pride and initiative.
2. Provide foremen and groups with comparative records of accomplishment.
3. Utilize the sporting element.
4. Bring into the meeting as much tangible illustrative material as possible.
5. Make the committees development centers for new ideas.
6. Conduct meetings in a business-like manner and localize responsibility.
7. Occasionally inject the inspirational element to maintain the tone of the organization.

DISCUSSION

CHAIRMAN COSTIGANE: Are there any questions?

MR. JAMES L. KERR (E. I. du Pont de Nemours & Company): I want to know if I understood you correctly. Have your safety committees been abandoned?

MR. SHATTUCK: Yes, temporarily. We will go back to the other, but we wanted to get a change of atmosphere, a change of outlook and wanted to make the foremen feel the responsibility more.

MR. KERR: We have also come to the conclusion that a safety committee does not get to the right point in safety work. Our foremen are the men we wanted to get at and make them responsible for their own department. By putting the work in the safety committee's hands, we took away from the foremen part of that responsibility.

In another plant, we utilized a safety committee in this way. We had a foremen's committee and a safety committee go around and make their inspection. The superintendent utilized the recommendations of the safety committee to impress on the foremen that they should have found those hazards themselves. In this way we have to get the foremen to watch out for safety in their own department.

MR. SHATTUCK: That method of procedure contemplates a Foremen's Club of the Safety Committee.

CHAIRMAN COSTIGANE: Are there any further questions?

MR. SHATTUCK: Mr. Hoyman, our new Safety Director, is here and has brought a chart that we have placed near the time clocks.

MR. M. G. HOYMAN (Kimberly-Clark Company): The chart is placed on a solid background and we move those flags every day. In some places

we use the name of the foreman or the name of the room. We try to place the chart where all men have to pass it and they watch it closely. The way to find out is to slip a red flag when there was no accident. Not only the foremen watch but the men are very anxious to see that no red flag is posted against their department.

We also get out a weekly bulletin and post it on the bulletin boards. We attach a great deal of importance to the bulletin boards and have them placed in each department. Our weekly accident record gives not only the name of the department, but the name of the foreman and shows how many men there are under them, how many accidents occurred during the week, the percentage, and how each accident occurred. I go around, talk to the foreman when an accident occurs, get the foreman's explanation of how it happened as well as the man's and see if he cannot suggest some way to eliminate a like happening in the future. I find the foremen are much interested.

The foremen are keen men and so far this plan has proven very successful because accidents have been decreased about 65 per cent in the last three months. The large drop may be due partly to luck but I have given the foremen the credit. I credit them with good records and don't dwell too much on the bad ones. I find the foreman is like any other man, he likes a pat on the back and it is working out fine.

MR. DICKSON: One more word about the foremen's meeting. The foremen as a rule are pretty hard men to get hold of. The foremen were here before the safety engineers and I think have a certain sense of resentment, feeling that the safety men are to a certain extent undermining their authority. Some foremen are a little suspicious that perhaps they are getting knocked, but if you can get them to understand what you are striving for, you will get good support and you will get their confidence.

MR. MATTHIESON: How to make safety committees interesting? I think that is a question each one of you here, perhaps every safety man in the land, works overtime on—to find out ways and means to make safety meetings interesting.

I know you will agree with me that the safety committee meeting is the most important, and vital organization we have in safety and the thing we have to get at is not to make safety the safety man's business, and the superintendent's business, but everybody's business. In order to do that you have to give everybody something to do, advertising it that everybody in that plant is on a safety committee.

I have stopped asking for suggestions in safety committee meetings. You will waste too much time telling about the way a nail is put in the top of the sulphite department. Though it may sound a little bit radical, I think it is better not to waste a lot of time in committee meetings on minor suggestions but get right down to studying ways and means of preventing accidents and the suggestions will take care of themselves.

I once heard of a young pastor talking to one of his parishioners. He had just come out of college and he said, "It's easy to get up and preach. I just get up there and open my mouth and talk." The old man said, "Well, your sermons sound like it."

Too often we go into a safety committee meeting and the safety man is

trying to do it all. I tell the fellow the reason I am fat is because I let the other fellow do the work. When you get somebody else to do something for Safety, you are accomplishing something. I know the minute when I get a man to do something for Safety, I've got him. If I can get a man to turn down a nail without being told to do it, he is on my side of the fence. That is what your safety meetings are for. You can't do it by preaching. You can't do it by asking for a few suggestions. You want to get right down to brass tacks and study ways and means for preventing accidents.

I have found in foremen's meetings, it is better for me to sit in the background. I let the foremen do the work and let the fellows handle their own safety committee meetings and let them think they are doing it all. At our Workmen's Committee, I generally preside at the first two or three meetings. Our meetings run for three months. I pick out one man among them to preside. You want to get a man who can talk. I have seen some men who can talk in a group but put him up in a meeting and he can't, but get a man who can preside at a workman's meeting and you will have the best safety committee meeting you ever had. Give the men something to do. Appoint a sub-committee in that meeting to inspect the plant and bring back a report. Get the fellows to do something.

I might mention a little incident. We appointed a new committee the first of the year in one of our mills. I prevailed upon the Superintendent to start the thing off. We appointed an old man to preside. Everybody liked the old gentleman and he was just the ideal man to preside. He liked to do it so well, he kept on coming to preside. He liked the job. He called the roll one night and he said, "Mr. Secretary, how many men are supposed to be in this meeting?" I said, "Thirty." We counted and found there were thirty-three.

We asked one fellow why he was there and he said, "I am on the night shift and just thought I would come over an hour earlier this afternoon."

We asked another fellow why he was there and he said, "I am on the midnight shift—the grave-yard shift—but I liked that committee so well that I just came in here."

Another said, "I'm not on duty now but I felt I was still on the Safety Committee."

I think those meetings were interesting or those three men wouldn't have come on their own time without being invited.

MR. ALTMAN: There is one more little point that I think is worth while mentioning in the foremen and safety committee meetings. How to get into the Safety game the foreman who thinks he knows it all and is not pliable enough to take interest in a new game like Safety.

I have one man in mind we have in our mill, who has been in the business for twenty-four years—finishing foreman. We couldn't go out and tell him anything in regard to certain safety essentials that were necessary because he had been in the business for twenty-four years and he knew how to run the safety room. It is the usual thing in paper mills especially, when a man in charge of one department not to really get in touch with other foremen of other departments and see what is being done. They are in their own department the entire day and when they

get through they are ready to go home and not think of the matters in their department until the next morning.

I had the opportunity of getting this man in the safety meeting and he saw from the various talks of the other foremen that they were interested in the safety work. It was wonderful to have seen the change in the four or five meetings he attended until now I find that he is dreading an accident in his department, for the reason that he doesn't want his department to stand out as the department that has many accidents. He did have them but he doesn't have many now because he is looking after his department more carefully.

This is a matter that doesn't apply so much to those mills where the safety work has been going on for some time, but more especially to those starting out on it.

MR. RUS: This is a very important thing and I have been waiting for somebody to touch upon the subject of how many should constitute a workman's committee. Mr. Matthieson mentioned thirty.

I would like to have that point brought out a little clearer. How many ought there to be on a safety committee? How many departments are represented when you have thirty representatives, and how many have others found as a good number for a safety committee? The number constituting a safety committee is a very important factor and I would like to have some more light on it.

MR. MATTHIESON: I may differ from some of you on my opinion of a safety committee. I believe a safety committee is a safety school and if I can get a bunch of men, one from each department, perhaps two from the large departments, to meet, I will have thirty men and at the end of the year I will have four times thirty who will be on the job for Safety to eliminate accidents.

In order to do that you have to get every man of every nationality in your plant fully conversant with the safety proposition. You can't reach a man very well if you have four or five men on a committee. Give me a man from every department. When I mentioned the number of thirty in that particular mill, we had two men out of a saw-mill of about 1,000 employees, one from every shift of the pulp mill and went right through the plant taking one man from each department. We had eight machines in that mill and a man from each machine. We had a representative from the office, a representative from the hotel. Every department in that mill was represented in the safety committee.

We have a safety school also. We are studying how to eliminate accidents. I am not the teacher, those men are the teachers. I tell them when they graduate from the safety school, every one is a safety instructor.

CHAIRMAN COSTIGANE: We have consumed the time for discussion of this paper and will now pass on to a paper entitled, "Poster Talk" by Al Kroes, Employers' Mutual Liability Insurance Company, Wausau, Wisconsin.

POSTER TALK ON SAFETY

AL KROES, SAFETY ENGINEER, EMPLOYERS' MUTUAL LIABILITY INSURANCE COMPANY, OF WAUSAU, WIS.

I am exceedingly glad of this opportunity to discuss with you the important subject of safety. Of course, the very best I can do in the time allotted, is to handle this on the skip-stop plan. Indeed I can only present to you in part the method used by our company to get close to the men, and I may say at the outset that I never lacked an audience or never failed to get the strictest attention. And while these words are not directed to you, it is still possible to pick up a seed here and there which I hope you may take home with you and plant in some fertile corner of your mill.

Gatherings of this kind are and always have been the national stepping stones on the stream of safety and the National Safety Council deserves great praise for their policy of engineering these better every year. What can do more for all-around efficiency than for a number of paper-mill superintendents of different states, to come together in brotherly fashion and exchange ideas on their chosen profession? The younger men are rubbing elbows with the veterans, gaining valuable knowledge, and the older fellow gets some up-to-the-minute stuff from the newly appointed, and from that crucible the real facts come to all of you.

I am intensely interested in this work of reducing the horrible toll of accidents everywhere throughout our beloved country. For some years back I have come to the conclusion, that after all is said and done, the most important cog in the whole safety movement is "to get close to the men." Now these six words and what they imply seem simple enough, but mind you, they constitute "some job," big enough and worthy enough for the best man in your midst.

Speaking to men of qualified leadership, men of authority, I came here to tell you, that to get close to the men is distinctly *your job*. Furthermore the responsibility of accidents in your mill is yours. Don't try to shift the burden, don't pass the buck. It's yours, and without your coöperation the safety movement becomes a dead issue.

Army officers are held to strict accountability for the safety of their men; a captain of a ship feels responsible for the comfort and lives entrusted to his care; a railroad engineer with keen eye is watching the signals by day or in the dead of night. He feels keenly that upon him depend the lives of his passengers and crew. Why then, my friends, should a superintendent neglect his men and their comfort, not to mention the resulting horror of a home destroyed.

That, my friends, is the heritage of being a leader of men; and this splendid Congress is to be congratulated, for including in their various discussions the great worth-while subject of safety in paper mills, in separate sessions.

Superintendents or safety engineers must be safety enthusiasts and I am sure they will be, if they tackle this safety movement from the right angle.

adding happiness to the home of your fellow workers. For every man with red blood and a normal heartbeat, will do the safe thing for home and mother and for the kiddies who are waiting by the gate to welcome Daddy, when the day's work is done.

And right there, my friends, you are reaping your reward. All of you curse the accident after it happens. I know that your heart is in the right place—like the engineer on the speeding train and the captain of the great ocean liner you will feel the great responsibility in caring for the men in your charge.

And in conclusion I will say that I am not blind to the shortcomings of these workmen—In the daily panorama of shop life the utter indifference to safety of most of them is amazing. But still, deep in men's hearts lies the desire to do right. To awaken that spirit and steer it in the channels of safety is your, almost sacred duty.

MR. E. S. WILLIS (Safety First Supply Company, Pittsburgh, Pennsylvania): After hearing Mr. Kroes' speech, I would like to ask that a rising vote of thanks be given Mr. Kroes.

MR. ALTMAN: We are very much indebted to Mr. Kroes today. I take great pleasure indeed in expressing to Mr. Kroes the appreciation of this meeting.

(A rising vote of thanks was given Mr. Kroes.)

CHAIRMAN COSTIGANE: The discussion is now open on Mr. Kroes' paper and I hope it will be as vigorous as his own presentation of the subject.

DISCUSSION

MR. JACKSON: I would like to ask Mr. Kroes just what has been his experience in presenting illustrations. We discussed that last year and there was quite a difference of opinion. Some thought that the gruesome illustrations had a better effect on the average workman.

GRUESOME BULLETINS

MR. KROES: That is another part of my work, to make bulletins, and we have made a lot of them of various kinds. Some real scarecrows in the line of blood-poisoning but in some plants the managers don't want them up. That is a personal feeling. Some don't like to have them on the bulletin boards.

I am a sort of a detective. I like to ask the men what they think. One fellow said, "That's a mighty good thing. These guys don't know enough to go to the first aid. They ought to be tied to a chair and made look at them for two hours."

Another fellow said, "They're all right but we don't want them up there too long."

A very gruesome picture of a blood-poisoned hand or any other part of the body is repulsive but if you can't bring it home to the fellow in any other way, let him walk past that for a while.

I think the opinion of most of the men I have talk to was that they would just as soon have them there. Most of the managers, if they don't have any personal feeling in the matter, don't care.

I had one man say, "My men will look at that stuff, and the first thing you know they will have it."

So, I think it is a matter of education, but I don't like too many of the terrible ones myself. Does that answer the question?

MR. JACKSON: By individual detective work you might find in the shop, from the men themselves an idea of what they like or don't like.

I remember the National Safety Council had a bulletin not long ago, showing an arm, something like the one you showed us, but it was a horrible picture. I think that particular one was not well executed. It looked like the arm was afire. That was really a horrible thing. While I have got all respect for the National Safety Council, still if they make posters too terrible I think they are taboo.

MR. RYAN: I would like to ask what you think about certain of the Council's bulletins that I have torn up immediately. One that I thought would antagonize more than it would do any good, was the bulletin of Mars standing behind capital and Labor and Capital says, "Good morning, sir, I thought you wore a club," and Labor says, "Good morning, sir, I thought you wore a silk hat."

In my mind, such things would tend to create discontent and antagonize, consequently we did not put up those bulletins and there have been others which have come from the Department of Labor which we did not put up. I would like to hear what the rest of the men think about these bulletins. If they think they are worth having or not.

MR. JACKSON: I will confess that I use about one-third of the bulletins that I receive. It might be because these bulletins are not all of them applicable to our particular industry, it might be because I think some are not very well gotten up. I think you have to study the character of your men. Certain industries have a certain type of men and the bulletins might not do good but do harm.

We receive bulletins from the National Safety Council, and we have received bulletins from the government, Department of Labor, for the last eight months periodically but I haven't used one of them, and the reason has been it seemed that those bulletins appealed to a class of men who perhaps are more ignorant than the ordinary. They seemed to appeal to his sense of loyalty and assume that he wasn't loyal, and while it might be true that they would appeal to other classes of men, I didn't use them at all. You have to study the help you have in the shop and make it apply if you can.

MR. WILLIS: Are there any of the men here who give their safety committees, or the men in the plant, a chance to pass on these bulletins as to which ones should go up?

CHAIRMAN COSTIGANE: Speaking for the mills in Ontario, I don't think there are any such privileges extended to the men, though it may be through the safety committees. The usual practice there is for the bulletins to be handed to the safety committee, discussed and the best ones put on the bulletin board. I don't know if that is the general practice or not.

MR. KROES: This is not the bulletin party but so long as we are speaking on bulletins, I want to say too many of them hang around in the

office. I am not saying this as especially complimentary to Mr. Shattuck, but in an organization like theirs or in any other well-organized mill I know of, those things do not happen. The bulletins get to the right place, to the safety engineer, or the man in the office who opens the mail distributes them where they belong.

In so many mills, it is left to the judgment of the office mail opener. If they don't look good to him—zing! Into the waste-basket they go! There is a point that should be eliminated. Call the office mail opener's attention to the fact that they are valuable.

The safety committee is not always the committee that might have the balance of judging power, but I believe if you get to the safety engineer, or the safety man and let him judge, he will find the right place.

CHAIRMAN COSTIGANE: In using a general term for the safety committees, I have in mind the plan we have adopted in Ontario. The safety committee is divided into departmental committees, and each department is responsible for its accidents. The chairmen of each of these departmental committees are members automatically of a central committee which represents the whole of that plant. On that central committee there are also representatives appointed by the management so that such a committee is perfectly able to judge as to the nature of the bulletins and which are the proper bulletins to distribute through the factory, because of the viewpoints given from both the management and the direct representation of the employees.

Are there any other questions, gentlemen?

MR. KROES: Just one more minute because I am going to that Bulletin Luncheon. I have a bulletin here that I would like to have your opinion on. Some years ago in the Judge magazine I saw a little picture of a man kicking himself. I read the picture and being somewhat of a cartoonist, I drew it on a piece of cardboard and had a cut made and used it on a bulletin (showing the bulletin). We had some vigorous kicks from a fellow and he tore the bulletins up in disgust. He said we proposed to make his bulletin board a comic supplement and that we needn't send any more. I want to have your opinion on that as to whether a bulletin of that kind is offensive. I would trust your judgment more than I would this fellow's.

Here is another one of a different nature. I thought after that something must happen to balance this up. (Shows bulletin.)

The oil-can with the oil dripping down, and the safety man. (Reading from the bulletin.) "Two of a kind. The shop oiler keeping the machinery in fighting trim. When he stops oiling, the equipment goes to pieces and production stops. The safety man supplies the oil for the safety movement. When he stops oiling, accidents will occur and you may be the goat. Stand by these men. They are mighty factors in your shop. When both do their duty everything will go smoothly. You are interested in that kind of oil. It is far better than having an oil well with some fancy name."

I did that to counteract the "kick" from the "self-kicker". I just wanted to know if that fellow was warranted in writing such a letter. One fellow said, "That's the stuff. I wish I had a model of it." And others

say, "That's all right." This is just an incident. I really wanted to get your opinion.

If any of you gentlemen want some of those bulletins we would be pleased to send them to you, whether you belong to the company or not.

MR. ALTMAN: I know the time Mr. Kroes came out to our mill, we had a noon talk. When the time approached for one o'clock, our General Manager happened to be in at the meeting and he sent word not to have the whistle blown until Mr. Kroes was through talking.

MR. RUS: There is one thing I think we all here ought to do before we part and that is to thank Mr. Jackson for the program he was able to get up. Mr. Altman yesterday, Mr. Kroes today, Mr. Shattuck, Mr. Matthieson, and others have proven that a better program could not have been gotten up and I think we all ought to offer Mr. Jackson our hearty thanks.

MR. JACKSON: I would like to add another vote of thanks and recognition to Mr. Costigane. I think that I can infer from the correspondence I have had from him that he has had his mind on this Section for the entire past year and his efforts have been sincere and have been productive of results. I move that we extend to Mr. Costigane a vote of appreciation for his work.

MR. KROES: I want to amend that motion by a standing vote of thanks to Mr. Costigane.

(A rising vote of thanks was given Mr. Costigane.)

CHAIRMAN COSTIGANE: I appreciate, very much indeed, the kindly feelings you have expressed in that motion. I may say that the work of this Section has not been a task, not by any means. It has been a pleasure. It has taken a little time. Perhaps I have not been able to devote as much time to it as I should have done to make it even more efficient than what it has been during the last twelve months, and I am sure with the change of officers, the executive officers being closer together, there will be even greater interest in our convention next year. I am looking forward to a bumper gathering at our next Congress.

I hope that every gentleman here today will make it a point to come back next year. By so doing, your motion of thanks will take practical form that will appeal very strongly to me. Thank you very much for this expression of appreciation.

We have completed our program and if there is nothing else, a motion for adjournment is in order.

Adjournment.

Public Safety Section

October 3 and 4, 1919

C. M. TALBERT, Chairman

Director, Department of Streets and Sewers, St. Louis, Mo.

J. H. HARVEY, Vice-Chairman

The Bracken Company, Kansas City, Mo.

DR. WILLIAM BURGESS, Secretary

—Chicago

FRIDAY MORNING SESSION

THE election of officers for the ensuing year was the first order of business, and the following officers were elected:

Chairman, C. M. Talbert, Director, Department of Streets and Sewers, St. Louis, Mo.—reëlected.

Vice-Chairman, J. H. Harvey, The Bracken Company, Kansas City, Mo.—reëlected.

Secretary, Carl L. Smith.

CHAIRMAN TALBERT: In the absence of Dr. Wm. Burgess, our Secretary, I will ask Dr. C. B. Scott to read the Secretary's report.

SECRETARY'S REPORT

The following brief paper is offered as observations which the office of secretary seemed to suggest.

The value of the safety movement in industrial service can hardly be over-estimated. But thus far the problem of public safety remains untouched except for two or three notable examples and experiments.

If life is of more value than material resources the fact that more than 50,000 deaths occur annually in the United States from accidental causes is one of the most appalling of the records of government mortality statistics.

And yet that the recklessness and irresponsible carelessness and in-

difference which result in such loss is amenable to education and regulation has been established.

Remarkable gains were shown in the Safety Week conducted by the National Safety Council at Rochester in 1917 and at St. Louis last year.

I was for 4½ years executive secretary of the Public Safety Commission of Chicago. In one year we showed a reduction of 464 coroner's cases of death by accident. We had four definite departments of service.

(1) *A Complaint Department* which served as a clearing house for reports of dangerous conditions, such as speeding, lawless driving, broken tracks and sidewalks, street obstructions, unprotected cellarways and coal holes, defective crossings, broken signs, gates, doorways, stairways, streets or slippery hazards of any kind, unguarded street repairs, inefficient or careless elevator service, overcrowding exits or other provision in public buildings. Thousands of such complaints came to us.

(2) *An Investigation Department* for inquiry into dangerous points and conditions of street and railway crossings, public buildings, factories, bathing places, school zones, etc.

(3) *Educational Department*. This work was carried on by campaigns in schools, clubs and churches, and by printed bulletins, danger signs, slogans, etc.

(4) *Legislation and Law Enforcement*; cooperating for legal enactments and with all departments of civic authority—of police, fire, health.

The financial support must come from a public educated to feel responsibility for its own interests. In Chicago a county appropriation was made annually for three years in support of its work. But this appropriation in course of time involved certain elements of patronage.

In Chicago there is a body of good men now planning an organization to be supported by public subscription and which will, I think, embrace the lines of service suggested here.

CHAIRMAN TALBERT: I will now ask Mr. Frederick S. Crum, Chairman of the Statistical Committee, to submit his report. Following is the report:

REPORT OF THE STATISTICAL COMMITTEE

The first task in connection with the attempt of the National Safety Council to have ultimately a nation-wide uniform reporting of public accidents is to prepare the blanks to be used as a first record of each public accident. The second task is to prepare a booklet of instructions, definitions, and uniform provisions to be followed in answering the questions contained in the report blank. The third task is to code and tabulate all of these original accident reports, at some central point. The fourth task is to classify and tabulate the accidents and injuries.

The sub-committee has first of all divided all public accidents into five groups as follows:

1. Accidents Peculiar to Public Highways
 - (a) those involving vehicles (except aircraft) and animals
 - (b) those not involving vehicles and animals
2. Water Transportation
3. Aircraft Accidents

4. Accidents Peculiar to Buildings and Other Structures (not home or industrial accidents)
5. General Accidents

A separate report blank is deemed advisable for each of these divisions. These report blanks will be filled out in every city where the statistics are to be kept, by whoever is designated to investigate and report on accidents. Presumably these reports or copies of same will be forwarded to the National Safety Council or other designated central authority or organization for coding and compilation purposes.

The following is a list of the questions and notations which have been prepared tentatively for use in Report Blank Number 1, Highway Vehicular Accidents:

REPORT BLANK FOR HIGHWAY VEHICULAR ACCIDENTS

A note to the following effect should be placed near the top of the blank:

"Write plainly in ink, as this is a permanent record."

Reference should be made to the manual of instructions and definitions. The following questions should be answered:

1. Kind of Accident
Be brief but follow instructions in booklet as to primary and secondary causes and types of vehicles involved.
 - (a) Type of Vehicle
 - (b) Kind of Accident
 - (c) Cause
 - Primary
 - Contributory
2. Time
Date, Day of Week, Hour of Day
3. Place of Accident
 - (a) State, County, municipality (village or city, taking 10,000 as minimum city population), open country.
 - (b) Did accident occur in public or private park, fair or exhibition grounds, cemetery, on bridge or viaduct, in tunnel, on factory premises, institutional premises, docks or piers, railroad premises, Government premises, or in congested business sections, non-congested business sections, congested residential sections, or non-congested residential or rural sections.
 - (c) Kind of pavement, whether concrete, brick, wood, stone, or other permanent pavement; or shell road, macadam, corduroy, dirt, sand or other temporary surface.
 - (d) Condition of road—snowy, slippery, muddy, very rough, rough, or smooth.
 - (e) Did accident occur at street crossing (rounding corner to right, rounding corner to left, or moving straight ahead) or in middle of block (on curve or straightaway).
 - (f) Did accident occur on side of highway or middle of highway.
 - (g) Was it within 300 feet of school building?
- (4) Speed of each vehicle involved in the accident.
- (5) Weather conditions—Clear, foggy, cloudy, rain, snow, not stated.

- (6) Give the name, sex, age, color, or race, nativity, and marital condition of the operator of each vehicle involved in the accident, whether injured or not. Was operator licensed or unlicensed.
- (7) State number of persons injured and the number of persons killed.
- (8) Estimate the property damage to vehicles involved in the accident. Estimate the damage to all other property. Note: If any one of the injured persons is apt to die before seven days elapse after the time of the accident, this report should be held up until the seven day period has elapsed; otherwise the report can be sent in immediately after the particulars are obtained.
- (9) For every person injured or killed, get the following information: Name, address, color, sex, age, marital condition, regular occupation or business, if any (use Industrial Occupational Code), was he or she operator, passenger or pedestrian. Could he speak English? Was he a naturalized citizen? Weight. Height. What physical disabilities did he have before the accident. Extent of injury (in accordance with Industrial Statistical Plan). Time laid up on account of injury. The number of dependents. Was competent first-aid promptly administered?
- (10) Names and addresses of witnesses.

Signed.....

Date of Report.....

Report blanks have not been prepared as yet for the other divisions of public accidents but the outline made use of for Highway Vehicular accidents will be closely followed for each of the others.

BOOKLET OF INSTRUCTIONS ON HOW TO REPORT PUBLIC ACCIDENTS

Every person who undertakes to investigate and fill out a report blank for any public accident should be equipped with a booklet of instructions. This booklet should go into detail respecting the classification of accidents. It should also outline in full the proper way to answer each question so that there can be no doubt as to any phase of the accident when it comes time for the accident to be properly coded. The committee has not as yet prepared the material for this booklet.

CODING OF ACCIDENTS

As report blanks are sent in from various parts of the country to some central organization, same will have to be properly coded. The committee has not as yet gone into the matter of coding but does not anticipate any serious difficulty in drawing up proper cards and series of codes that will adequately take care of all public accidents reported. The committee makes the suggestion that possibly some large insurance company would be willing to do this work for the National Safety Council at the start.

The final task of this sub-committee has to do with the ultimate tabulation of public accidents. The committee appreciates that there is practically no limit to the number of tables that can be prepared. A separate memorandum attached hereto outlines merely in a tentative manner the

substance-matter for the tables which will probably best serve the purposes of the National Safety Council.

Note: The sub-committee is at work on this last task and already has prepared a tentative or trial classification covering seventeen type-written pages. This is still too imperfect to submit at this time, but it will be improved at once by the sub-committee, multigraphed, and copies sent to several persons qualified by experience and special interest to give the sub-committee valuable advice and aid. When these criticisms and suggestions have been received the subcommittee will call a Round Table Conference of carefully selected advisors to meet in New York City, probably the latter part of November, for the purpose of perfecting the blank forms for original accident reports. The Conference will also carefully consider the probable primary classifications and more essential tabulations.

Immediately subsequent to this Conference these blank forms, some six or seven in number, will be multigraphed and sent to every member of the Public Safety Section of the National Safety Council. Our committee has had the invaluable assistance of Messrs. Ryder and Meltzer of the National Workmen's Compensation Service Bureau, of New York City.

We submit only a trial blank form for Highway accident reporting. Some six or seven other forms, corresponding to the main group classifications or divisions of public accidents, are being prepared. We do not anticipate any insuperable difficulties as the public and its representatives need just the data that we are seeking to secure. The need is visualized in the fact that about 45,000 fatal public accidents and about 5,000,000 non-fatal injuries by public accident are occurring annually in the United States.

CHAIRMAN TALBERT: I am going to ask Dr. E. George Payne of St. Louis if he will make a brief statement of the work done on safety education in the schools.

SAFETY EDUCATION IN THE SCHOOLS

DR. PAYNE: I think that we all recognize that the most fundamental element in the whole safety movement is education, and that the most fundamental and important part of the education is public school education. When we began to study accidents with reference to the schools, we found that there were only a limited number of situations in which accidents occur. The reasons for those accidents from the point of view of the educator are very clear. One is, that the child has not developed proper habits, and another is, that he hasn't the proper attitude, knowledge, or ideals about accidents, or about safety.

Now, what we have attempted to do is to go through the different grades and adapt the formation of these habits with reference to accident situations to the various grades, from the kindergarten throughout the school career of the child. Not only have we attempted to do that, but we have done it, knowing that accident instruction wouldn't get a "look in" if we added it as a special subject to the curriculum, because there are already about twenty subjects in the curriculum, and that is more than can be handled. At the same time, we discovered that it was

dren were more impressed with the pictures than anything else; and we did not have an accident to a child of school age during three months.

LIEUT. H. A. LEWIS (Portland, Ore.): We even go further than just showing the film. We take the children out on the street, and act the film first so that they know what causes the accident, to begin with. They see the film acted on the street, and just what leads up to the cause of the accident. In this way, the child will get experience. If you show him what roller skating in certain places, for instance, will do to him, you can teach him to avoid such places; but if you are going to leave it for him to get that experience, then it is no use, because the child might be killed by that time.

CHAIRMAN TALBERT: Mr. Barclay, Director of Education, Boy Scouts of America, New York City, is the first on the program, and I will now call on him.

L. W. BARCLAY: What I have to say now will deal more with the problems that are immediately facing our country in regard to Safety First and boys. Let me say in beginning, that it is a real pleasure to come out here as a representative of the Boy Scouts of America, as a fraternal delegate, to express in physical form our coöperation, our interest and our activity in education in a safety sense. In other words, that is what we are trying to do in this country as far as the Safety First movement is concerned. We are trying to develop a safety sense in the American people. As many of you know, the Scouts have done a great deal in that line, and we are doing a great deal more. I have with me manuscripts of two books which will be printed, one on Safety First for Scouts, and another on Firemanship. These books will be of great significance in the educational field.

WHAT BOY SCOUTS CAN DO FOR SAFETY

LORNE W. BARCLAY, DIRECTOR OF EDUCATION, BOY SCOUTS OF AMERICA,
NEW YORK CITY

The advantage of utilizing such an organization as the Boy Scouts of America, with its membership of half a million boys trained to personal efficiency and resourcefulness, in the furtherance of any movement, is apparent.

First aid, or knowledge of what to do *after* the accident occurs, has from the first been a requirement for the degrees of second and first class scout, and instruction in first aid has formed an important part of the training of each member of this great organization.

Perhaps we may seem to have stressed this "pound of cure" at the expense of the "ounce of prevention", inasmuch as specific instruction in safety first has not been made a matter of requirement; but as a matter of fact, scoutmasters, generally, have devoted much attention to safety instruction, impressing every lesson of chance opportunity, and identifying their troops actively with local campaigns in the interest of prevention, whether of disease, accident, or other destructive force.

SAFETY AN IMPORTANT PART OF SCOUT'S INSTRUCTION

Moreover, among the merit badge subjects open to scouts, safety first holds a conspicuous place, and scoutmasters are urging their troop members to qualify for this badge. National headquarters of the Boy Scouts of America is publishing a pamphlet for the aid of scouts who wish to qualify for this merit badge. The pamphlet has been prepared under the direction of Mr. Lew R. Palmer, Director of the Department of Safety and Personnel of the Equitable Life Assurance Society. A wealth of material was furnished by the National Safety Council and the National Board of Fire Underwriters, which, under the able editorship of Mr. L. R. Palmer, makes the monograph a most important addition to the literature of the Boy Scout movement. The issuing of the pamphlet in an edition running into the thousands will tend to focus the attention of the organization upon the importance of safety propaganda, and we may at this time expect a revival of safety instruction in boy scout troops as a logical reaction. *SCOUTING*, the official organ of the movement, will publish excerpts from the pamphlet and from other safety first literature, and will advocate an active campaign in safety instruction throughout the organization. To say that the National Safety Congress has the active coöperation of the Boy Scouts of America in the promotion of its program of prevention, is to state the case conservatively.

So much for our attitude on this most important subject. Now, as to the question, "What can scouts do for safety?"—the inquiry at once calls to mind such a multiplicity of instances of what scouts have done, that it becomes rather a question of selecting a few illustrations from the material available, as suggestive of the manifold ramifications of scout activity in the interest of accident prevention.

In an important city where the growth in population has exceeded the development of carrying facilities, at times of special congestion in the streets, as for example the fortnight preceding Christmas, it has been customary for scouts to assist the traffic police at the points of greatest congestion. Divisions of the troop, lining up on the four corners of a dangerous crossing, at the turn of the "Stop" signal by the traffic policemen quickly form a chain by clasping hands and throw this live line across the pavement thereby restraining the foot passengers until the turn of the "Go" signal releases the stream and transfers the line of scouts to a similar position of defense on the cross street. This maneuver is reinforced by the presence of other scouts carrying placards, "Keep to the Right" and "Help the Traffic Policeman—Wait for the 'Go' Signal."

TRAINING IN LEADERSHIP

The need for leadership in a fire crisis is met by training, of which the following illustration is typical: Fire drill is held at troop headquarters. This drill includes a study of all the fire prevention facilities of the environment, the location of fire escapes and the nearest fire alarm box, and the rehearsal of procedure under all the different conditions which might arise in case of fire. With this instruction as a guide, the

scout is sent back home to study all the conditions to be met in case of fire there and to work out, with the assistance of the other members of the family group, the fire drill under these conditions. This study of local conditions has even been extended to the study of the houses of the neighbors on either side, for in the case of fire (as in many another menace) responsibility extends beyond the individual home, and each is, in truth, his neighbor's keeper.

The point of emphasis in scout instruction is that, first of all, the proper authorities be notified. In the case of fire this means turning in the alarm. In the case of physical injury, notifying a physician or calling a hospital ambulance. In every case it means doing the thing which must be done pending the arrival of the expert. Scouts are trained to act promptly, efficiently, and intelligently in crises. "Safety" training means the use of the same powers and resources for prevention. It tends to increase the sense of individual responsibility.

I recall a case where many persons passing a building noted the odor of escaping gas, but it was a boy scout who stopped to investigate and discovered the janitor of the building unconscious from the fumes. To the scout, the odor was a challenge. It was his job to trace the result to its cause, and report.

To my mind, the chief contribution that scouting can make to the cause of safety first or any other movement, rests in this fact, namely, that scouts are trained to assume responsibility and to act.

In schools, safety patrols of scouts are organized to lead in fire drills or other emergency drills. Their precision and decisiveness impart promptitude and orderliness to other children and, in time of real danger, inspire courage.

The United States Bureau of Education has provided 20,000 copies of a fire prevention manual for the use of boy scouts.

STUDYING FIREMANSHIP

Just in passing, it may be well to call attention to the fact that firemanship is among the subjects which scouts can take up as a sort of elective course in scouting, thereby qualifying for merit badges in recognition of efficiency. Quoting from the Handbook for Boys:

"To obtain a merit badge for firemanship, a scout must:

- "1. Know how to turn in an alarm of fire.
- "2. Know how to enter burning buildings.
- "3. Know how to prevent panics and the spread of fire.
- "4. Understand the use of hose—unrolling, joining up, connecting to hydrant, use of nozzle, etc.
- "5. Understand the use of scapes, ladders, and chutes, and know the location of exits in buildings which he frequents.
- "6. Know how to improvise ropes and nets.
- "7. Explain what to do in case of panic, understand the fireman's lift and drag, and know how to work in fumes.
- "8. Understand how to use fire extinguishers; how to rescue animals;

how to save property; how to organize a bucket brigade; and how to aid the police in keeping back crowds."

The motto of the Boy Scouts of America is "Be Prepared." It is impossible to tell where or when a fire is going to start.

But if every boy of scout age were enrolled in the movement, fewer fires would get under headway, and life and property would be safer throughout the nation.

The practical application of the fire prevention instruction of the Boy Scouts has been productive of excellent results. Recently in Spokane, Washington, the members of the local council of the Boy Scouts were organized with the cooperation of Fire Chief A. L. Weeks, and the municipal authorities, into a brigade that covered the city in a thorough campaign of fire prevention.

The scouts were required to pass a written examination before they were enrolled as "firemen." They were questioned as to the proper way to send in an alarm, as to correcting the ordinary fire hazards of the home, and were generally quizzed along the lines of fire protection. Some of the answers received were amusing. One boy, for example, declared that gasoline was "dangruser than damanite." As he evidently meant dynamite and clearly realized the hazard of careless handling of gasoline, he was marked "correct" upon this question.

The boys who were appointed to constitute the fire prevention force, besides cleaning up rubbish, also distributed questionnaires throughout the city, together with a folder containing cautionary data. The questionnaires were printed upon cardboard, and householders were asked to hang them up as constant reminders of the danger of oil lamps and stoves, gas appliances, matches, oily rags, and the rest of the common hazards.

The cards were provided with a stub which was torn off by the scouts and returned as a report form. Altogether fourteen prizes and one hundred badges were distributed as rewards for the scouts who displayed the greatest interest and activity in the work.

HELPING IN EMERGENCIES

On another occasion boy scouts proved valuable aids as an auxiliary fire force in protecting a large city under unusual circumstances. This was at the time of the Cincinnati fire department strike. A great deal of trouble and confusion was caused during that period by the ringing of false alarms. The few volunteers who were manning the fire houses had all they could do to take care of actual blazes without having their energies dissipated by answering bogus calls, and it was realized that something must be done. The boy scouts thereupon stepped into the breach and stood guard over the alarm boxes until normal conditions were restored.

Incidentally, during this trouble the possibilities of carefulness as a fire preventive were shown in a striking manner. The word was sent broadcast urging every one in the city to exercise extraordinary precautions to prevent fires, as in the event of a large fire getting started a con-

flagration might ensue that would wipe out a portion of the city. The result of the appeal was remarkable. During the eight days of the strike Cincinnati's fire loss amounted to \$500, as against \$20,670 during the corresponding period of the previous year.

REQUIREMENTS FOR SAFETY FIRST BADGE

It is believed that a first class scout, expert in first aid as a requisite for this rank in scouting, and holding the merit badge in firemanship and safety first, will be recognized by a prospective employer as one trained for leadership in emergencies and therefore more valuable to the factory or shop.

Let us look for a moment at the requirements for the safety first merit badge. Quoting from the Boy Scouts' Handbook, page 61, we read:

"To obtain a merit badge for safety first, a scout must:

"1. State four or more dangerous conditions in the average home and indicate what steps should be taken to correct these conditions.

"2. Produce satisfactory evidence that he is personally responsible for the application of at least two constructive safety first principles in his own home.

"3. Name the most serious violation of public safety principles which has come under his observation and produce satisfactory evidence that he has done all within his power to correct the same.

"4. State in writing at least six of the most important regulations covering street safety to meet the conditions of the neighborhood in which he lives.

"5. State in writing at least six of the most important regulations covering street safety to meet the conditions of the school he last attended.

"6. Submit in writing an outline of his own plan for a school fire drill and explain the method of properly carrying it into effect.

"7. State in writing at least six violations of safety first principles which are responsible for accidents in connection with railroads.

"8. Stand a satisfactory examination showing a knowledge of the importance of the safety first movement and the most important principles it involves, and satisfactorily demonstrate his ability to assume leadership in case of a fire, panic, or other disaster."

To give an idea of the character of the instruction given in the pamphlet already referred to, which is just being issued by the national headquarters for the guidance of scouts qualifying for this merit badge, I quote the following passages:

"For the most part the scout is dealing with familiar subjects, in trying to win this merit badge. He starts right at home, for the first requirement is as follows:

"1. State four or more dangerous conditions in the average home and indicate what steps should be taken to correct these conditions.

"Your first move should be to make a list of your own of conditions in your home and in such other houses as you can learn about, that seem to you dangerous. Then bring your list back to this page without having

first gone any further in your reading, and check it back with the dangerous conditions named below as found in the average home. You may have some or all of these, or even others, on your list.

Dangerous Conditions in the Average Home

A		
Presence of flies		"Lost" pins and needles
Inadequate ventilation especially at night		Sharp knives and tools
Exposed garbage		Broken glassware
Exposed food		D
Rats and mice		Disposal of hot ashes
Presence of contagious disease		Christmas trees
B		Open fire places
Unprotected gas jets		Cooking in grease
Improper electric wiring		Boiling water
Use of kerosene and gasoline		Articles left on steps
Use of celluloid articles		Disposal of old rags and paper
Improperly constructed flues and chimneys		Refuse in dumbwaiter shaft
Improperly placed furnace		E
C		Lack of headroom in stairways
Use of matches		Gas leaks
Medicines and poisons		Back drafts in stoves and furnaces

"From this list, or your own, or both, select four or more conditions and indicate what steps should be taken to correct them. This implies some knowledge of safety first principles. For the most part, these principles are based on common sense, and if you will employ common sense in thinking how to correct the dangerous conditions that you select for your merit badge test, you will be on fairly safe ground. But you should make sure by proper inquiry of older persons, whether the steps that you would take would really correct the dangerous conditions that you intend to correct"

Look out for Dangers Like These

"You know that epidemics of typhoid fever, for example, can start from rotting garbage exposed in a public street, and that fine ashes blown about can ruin not only clothes but also eyesight, and can even carry with them disease germs. Whether or not there is any town regulation against exposed garbage or the carting of ashes in uncovered carts, if such things occur in your town, they are serious violations of public safety principles.

"The same thing is true of the omission of lights on vehicles at night: town rule or no town rule, a safety first principle is violated by such omission. Under other requirements, you will get acquainted with the traffic rules of your town and other street regulations. It is for you to decide whether the violation of one or another of these rules is a serious violation of public safety principles. For example, would you consider the omission of a red flag, or, at night, of a red light, on a load that

extends beyond the rear of the vehicle carrying it, a serious violation of a public safety principle? If so, why?

"Perhaps that last question will suggest how necessary it is for you to get all the fundamental facts that you can, and then carry your case to your parents or your scout-master, or a lawyer friend, or a physician, or a member of the town health board, or the police force, and obtain advice. But in the end you must use your own judgment based on all the information you can get."

We see from even so meagre a quotation from the safety first pamphlet that the presentation of the subject is essentially practical. It is hoped and believed that there will be at this time an awakening of the entire scout organization to the realization of the great service which can be rendered to communities and individuals by focusing attention upon safety first principles and instruction, and on behalf of the Boy Scouts of America I pledge that service.

(Mr. Arthur T. Morey, St. Louis, took the Chairman's place temporarily at this time.)

DISCUSSION

ACTING CHAIRMAN MOREY: I would like to ask Mr. Barclay if the National Safety Council was able to coöperate in getting out this new Safety First book for boys.

MR. BARCLAY: It was practically gotten out by the National Safety Council. The safety engineer of the Metropolitan Life Insurance Company really did most of the work on it.

HOMER J. HODSON (East St. Louis, Ill.): You all noticed in the first issue of the Congress News, the scheme which was promoted by the business men and the E. St. Louis Council of Boy Scouts, with reference to choosing the best scout out of three hundred who might deliver a lecture on scouting and safety. Gentlemen, I can think of nothing more inspiring than at next year's Congress to see every large city of any size, which has a Boy Scout Council, do the same thing. I have with me today Carl E. Wiemken, the Scout who will be used when we return to E. St. Louis for the purpose of lecturing before the Rotary Club, the Chamber of Commerce, and we have arranged through the Superintendent of Schools to have him deliver Friday afternoon lectures. I am going to ask Mr. Barclay what he thinks of the idea.

MR. BARCLAY: I think your plan would be a fine thing. A boy learns leadership by leading. He will learn Safety First by participating in Safety First activities. I can't think of anything that would be more inspiring than to bring 450 Boy Scouts from 450 different cities to this Congress and give them a Boy Scout session where they would all go back with the inspiration they would get from associating with men like you.

INSPECTOR E. H. MAY (Cleveland, Ohio): I don't know whether you would be interested in knowing what the Cleveland Police Department thinks of the Boy Scouts, but we have encouraged them on every possible occasion. We think, from a safety point of view, that it is the best thing

we can do. Not from the standpoint of safety from accidents so much as safety from crime.

ACTING CHAIRMAN MOREY: I want to introduce to you gentlemen, Mr. John R. Doan, the Boy Scout Executive of Cleveland.

MR. DOAN: The President of our university here is having us organize along that line to prevent the thing that brings about the spirit that is back of the thing we are trying to kill here today, and that is recklessness. That is what is the matter with America, we are utterly abandoning our attitude toward life. My object is not only to prevent crime and accidents, but to develop good citizenship by having the boys take part in proper activities. Seventy per cent of our boys in Cleveland are foreign born, and I believe that in their homes their parents' attitude is against the government. We have recently had here a great Bolshevik trial, and the reason for that was that the foreign element did not understand. They look upon the man with the uniform as the government, and as the big blue-coated enemy. If we can line up the boys to the understanding that they are working with the man in uniform as a friend and a citizen, when the boy goes back to that home and the door is shut, and they are back in the foreign land and atmosphere, the boy is in position to try to open the door and really do some good work in Americanization, as well as to teach them to be careful and to be alert.

ACTING CHAIRMAN MOREY: I wish now to introduce to you, Mr. Dana Webster, Safety Inspector, Aetna Life Insurance Company, Indianapolis, Ind., who will read a paper on "Elevator Hazards Affecting the General Public."

I want to say that the Aetna Life Insurance Company, which Mr. Webster represents, has certainly shown wonderful coöperation throughout this whole safety movement, and it is a pleasure to have with us one of their representatives. They have not only been big students of this problem, but have been very generous with their ideas. The elevator hazard in St. Louis is tremendous. Thirty-five deaths last year resulted from elevator accidents, and up until the first of September this year there were about twenty-two.

ELEVATOR HAZARDS AFFECTING THE GENERAL PUBLIC

DANA WEBSTER, SAFETY INSPECTOR, AETNA LIFE INSURANCE COMPANY,
INDIANAPOLIS, IND.

Before making any remarks on the safety of elevators, it might be interesting to cover briefly the gradual development in the manufacture of mechanical lifting devices.

MECHANICAL LIFTING DEVICES

Lifting devices were undoubtedly used by Julius Caesar, as far back as 256 B. C. as history mentions their lifting animals from the dens to the arena in the Coliseum of Rome. About the middle of the Nineteenth

Century, platforms or cable hoisted elevators were first installed in New York and Boston, but were not provided with any kind of safety devices, and strange to say you can find a few elevators without safety devices at the present time.

A few years later elevators were equipped with safety devices of such type that it was necessary for the hoist cable to break before the safety could actuate. There are a great many of this type of safety in use today, but with the introduction of high speed elevators, which were required to meet the demands of the public, quite naturally it necessitated a much better type of safety apparatus and a multiplicity of cables.

Accidents could and did occur from over-speeding elevators caused by disarrangement of controlling apparatus, and it became necessary to provide safety devices that would actuate should the elevator speed increase beyond a predetermined number of feet per minute.

The most essential elements of safety are the prevention of excessive speed from any cause, the over-running of the limits of travel at top and bottom, safe protection at the landing entrances to the elevator, and a regular examination of the cables and all parts of the elevator equipments.

CAR SAFETY DEVICE

The early type of the *safety device* was designed to stop the car instantaneously. This served the purpose satisfactorily for slow speed but was not adequate for the higher speed of 400 to 700 feet per minute. It, therefore, became necessary to provide a safety device that would stop the car with an easy and gradual stop. This is accomplished by the friction clamp safety which is actuated by a safety speed governor, usually set to trip at 40 per cent above regular speed. This governor will act should the hoist cable break, allowing the car to drop, or should the car over-speed from some defect in the machinery after the governor trips and the car has dropped far enough to take up the clearance of the safety jaws. The jaws are forced hard against the guide rail (like a vise), and the car will continue to slide until the friction is enough to stop the car entirely. The distance the car will slide after the safety takes hold, depends upon the load; but the farther the car slides the tighter the safety grips the rail. Usually a car will drop about six feet after the governor trips and clamps the governor cable.

OVER-RUNNING OF LIMIT STOP

The machine of all power-operated elevators should be equipped with automatic limit stops: that is, a device that will stop the elevator at the top and bottom limit of travel, regardless of the operator.

On *Drum* machines, the *Automatic Limit Stop* should be built with and made a part of the machine.

On *Hydraulic* elevators, the *Automatic Limit Stop* should consist of a *Cut Off Valve*, either in the to-and-from pipe, or in both the supply and discharge pipe.

On *Traction* type of elevators, the *Automatic Limit Stops* must be lo-

cated in the hoistway, and the power cut off by the travel of the car. As there is more or less slippage of the hoist cables on the drive sheave, a machine automatic would not be dependable. In addition to automatic limit stops on electric elevators, there are hoistway limit switches located so that should the car travel a certain distance by the automatic limit stop, the car would open a switch, thus cutting off the power and stopping the machine.

SAFE PROTECTION AT LANDINGS

The early types of passenger elevators—and in fact most elevators up to the present time,—are provided with landing doors equipped with a catch located on the inside so that the door can only be opened by the operator. The operator, however, in order to make speed,—and the public is partly to blame for this—starts the elevator before the door is closed, and quite often the door does not fully close and latch, thus providing a very dangerous condition. Many persons have opened the door when finding it ajar, and looking in the hoistway have either fallen or have been knocked down the hoistway by the car and severely injured or killed. I might say right here that statistics show that 85 to 90 per cent of all elevator accidents occur at the landing doors. Therefore, it has become necessary to provide the landing doors with a locking device that prevents the doors from being opened, unless the car is at the landing; also prevents the car from being removed away from the landing until the landing doors are closed. This is termed the *Interlocking Device*, or *Interlocks for Landing Doors*. While I believe all landing doors of passenger elevators and gates for freight elevators should be equipped with interlocks, I am sorry to say that at the present time only a small percentage of elevators are equipped with this device, although they are becoming more and more in general use.

CABLES

The *Cables* are the most essential parts of the elevator equipment, and their number and size should be equal to the load with a good factor of safety. The *sheave* should be of ample size and placed in alignment to prevent chaffing of the cables on the sides.

Great credit must be given to the manufacturers for the high state of perfection to which these devices have been brought. This fact must be admitted when considering the few accidents on elevators, compared to the large number of passengers carried. Statistics show that 10,000,000 passengers are carried in the Borough of Manhattan daily, and it is said that this number exceeds the number of passengers that ride on all the surface, elevated, and subway cars; in other words—more people ride vertically than horizontally.

A great many elevator accidents are not due to faulty design in construction, machinery, or safety device, but to the carelessness of the injured party. It, therefore, becomes necessary for the City or State to enact Ordinances and Laws regulating the construction of elevators, and enforcing their equipment with effective safety devices, in the interest of

accident prevention; that is to say—to prevent a person from being injured by his own carelessness, or by the carelessness of the operator.

ELEVATOR INSPECTION

ARE THE SAFETY DEVICES KEPT IN PROPER CONDITION? is one important question. The only way this can be accomplished is by having the elevator regularly inspected by a competent elevator inspector, who should inspect all the different safety devices, machinery, cables, etc., in fact, everything pertaining to the elevator. The landing doors should be tried to determine whether they can be opened from the outside. The car safety device should be tested to be sure that it would actuate and hold the car from falling, should the cable break. The automatic limit stops should be tested so as to be sure the car will not over-run and strike the overhead beams or bumpers. The slack cable device should be tested to be positive the power would be cut off, should the cables slacken. The brake should be examined to be sure there is no slippage. The cables should be examined very carefully for defects, as there is no part of an elevator that requires the exercise of more good judgment than the examination of the cables. It is just as essential that the safety devices, and all parts of the elevator, be kept in good working order, as it is that they should be installed in the first place. After an inspection has been made, the owner should proceed immediately to install safeguards and remedy any defects reported.

The elevator should be oiled and greased regularly by the engineer and looked over carefully for any defects at intervals between the visits of the official inspector. Oftentimes the engineer will discover some little defect which if fixed immediately may avoid a serious accident.

There is another feature that I wish to mention before closing; that is the elimination of mirrors, in fact all glass, from the passenger cars (except the electric light bulbs), not only because of the fact that they are liable to cause injury to passengers by getting broken, but also because of their attraction, which results in passengers failing to notify the operator promptly as to their destination. This necessitates a stop between floors, and a trip back to let them off. They also have a tendency to retard the loading and unloading of the cars.

DISCUSSION

ACTING CHAIRMAN MOREY: If an elevator began to fall, thirty or forty feet up, would the "safety" work?

MR. WEBSTER: That question has been discussed time and time again. No man can tell when a cable is safe or unsafe. One day you may see a cable with perhaps only one broken wire and the next day you will hear that the elevator has dropped. There are certain methods used whereby serious injury or possible fatalities are averted by the use of bumpers, when the car only falls 8 or 10 feet or even 30 feet. However, the safety, to work right, wants to have a distance to work in.

CHARLES ELLABES (Indianapolis, Ind.): I believe I can answer that question more fully. It can be proven by mathematical analysis that the

distance required even up to 800 feet per minute, for a safety to actuate is only about six inches. The velocity from rest to six inches will increase it.

One other point I would like to make in reference to Mr. Webster's paper, is the question of automatic stops. Automatic limit stops are most desirable but they are not always required. The architect of today is not inclined to give the elevator construction all the headway it should have at the top of the elevator. In other words, the head drums of the passenger elevator of today vary from three feet to six or seven feet. That amount of room is not enough in which to stop high speed elevators going 800 feet or more per minute, so the manufacturers have gone a step farther and provided slow-down switches at a certain distance below the top landing. They have put in a switch which will automatically decrease the speed of the car to a given amount. If necessary, they put in two of those so that at the approach of the landing the speed is decreased to about 100 or 250 feet per minute, so that if the car passes the last landing it will trip these automatic devices on the hoist limited switches and come to a full stop within the six feet which the architect has given us.

ELEVATOR SAFETY CODE

One other point, the Bureau of Weights and Standards has been coöperating with the American Society of Mechanical Engineers in the development of an elevator safety code which I believe is the very best which has been put out up to the present time. It is highly important that a code of this kind be formulated at once. We do not only want to see that the engineering principles in the thing are right, but we should see that the men administer the laws properly. We also want to see that the city officials get an idea of the engineering principles involved. We, at the Bureau of Standards, will be delighted to give any information we can on the subject.

MR. WEBSTER: Mr. Chairman, I wish you would call on Mr. Greenleaf, of the State Industrial Board of Indiana. I think he would have something to say along this line.

GEO. W. GREENLEAF (Indianapolis, Ind.): I don't know of any way to get at that proposition thoroughly unless it would be through a Federal law that would require a universal standard for elevators throughout the country. There is just one safeguard on which I think more stress should be laid and that is the question of a door on the passenger elevator car. On one of the hotel elevators this morning I stood with just about 4 inches clearance between my body and the floor projections of the elevator shaft. The slightest movement of someone back of me in the packed car would have thrown me over so that my chin would have caught on one of the floors, and part of me would have been up there now and the rest of me would be in the elevator pit. While I don't think it is necessary to close the car door on all occasions, I do think that when an elevator car is packed like that one was this morning and as they frequently are, that there should be doors on the cars, and those doors should be closed before the elevator is put into operation.

DAN L. ROYER (Ocean Accident & Guarantee Corp., N. Y.): Until you can get the public educated to the point where they are willing to slow down and admit of a perfectly guarded car, we are going to have the present situation. I am convinced that on passenger elevators we will have to come to the adoption of a perfectly guarded car with interlocking doors and inner-locking car gates, because as long as you have the human element to contend with in the operators, you will have exposures.

ELEVATORS SHOULD BE PROVIDED WITH SIDE AND TOP DOORS

MR. WEBSTER: There are other things of which I might have spoken in my paper. For instance all elevators should be provided with side and top doors. I know of a case where seven ladies were compelled to stay in an elevator car for nine hours because of the fact that no one there knew how to move the car, and there was no way for them to get out. If there had been a door either in the top or side they could have gotten them out that way.

Then also there is the question of toe guards which should be of metal instead of wood.

CHARLES ELLABES (Bureau of Standards, Indianapolis, Ind.): Mr. Greenleaf mentioned the question of a Federal law. I am connected with the Bureau of Standards. We have been working five hours on national electric safety codes, and we absolutely are opposed to a national law governing safety. That is a question of purely states' right, and the only way it is going to be worked out is by coöperation. The only way you will ever get it is by having your engineers, your public officials, your Federal officials and your insurance companies sit around a table like we did at Indianapolis at the National Society of Mechanical Engineers six different times for four days at a time, and iron the thing out.

MR. GREENLEAF: I cannot concede that I am entirely wrong in regard to the effect of a Federal law. This whole question of States' Rights has been thrashed out along a good many lines, and a good many things are being done through federal enactments which a few years ago were considered strictly a question of States' Right. For instance the child labor proposition was considered that way, but it has been taken up by the Federal Government. They didn't hit it right the first time and they tried again, and if they haven't it right this time they will probably try it again until they do get it right. I can see that probably it will not be possible for the federal government to enforce an elevator code throughout the United States, but they could proceed along the lines they have in other matters, and that is to provide that an elevator could not be shipped in inter-state transportation unless it was so and so. I think that would bring all the elevator manufacturers to the adoption of that code, because there are very few of them who confine their activities to any one state.

On the question of slowing down the speed of travel and that sort of thing, we have simply got to go back to the slogan of "Safety First". The elevator must be safe at any cost, and if it requires the installation of more elevators, then that is the solution.

LIEUT. H. A. LEWIS (Traffic Division, Portland, Ore.): As regards a Federal law, I don't think it is the intention to have the law enforced by the Government, but to have a foundation laid by the federal government for all state laws, not only in regard to elevator safe guards, but all safe guards. Unless we standardize all the way through, not only as regards elevator laws, but traffic and other laws as well, we are always going to have trouble.

(Mr. C. M. Talbert returned to the room and assumed the duties of Chairman.)

CHAIRMAN TALBERT: The next paper scheduled is one by Mr. J. M. Quigley, Chief of Police, Rochester, N. Y., on the "Proper Personnel of a Public Safety Committee." (Chief Quigley's paper was not read but was sent in for publication in the Proceedings.)

PROPER PERSONNEL OF A PUBLIC SAFETY COMMITTEE

JOSEPH M. QUIGLEY, CHIEF OF POLICE, ROCHESTER, N. Y.

When considering the matter of the forming of a committee which will assume the function of a study of accidents involving bodily injury or loss of life, we must first find out why we want to prevent such occurrences, and then select a personnel that will represent every phase of interest, particularly those most vital to the family, the community, and human economy.

The depth of the grief suffered by one's own kin when the life of a beloved father, mother, or child is snuffed out prematurely by accident cannot be measured by any human standard of value. Money cannot compensate a mother for the life of her dear child or the family for the loss of a devoted father or a loving mother. Yet there is something that will and does alleviate sorrow, and helps us to bear the burden of grief, namely, human sympathy, expressed in emotion and words and acts of kindness. The knowledge that our grief is shared by others seems to make us feel that our loss is not an individual deprivation only, but that it affects others as well, and to what extent depends upon the social relationship of the departed one.

Their taking away may be a community calamity too according to the extent one may have been interested in community activities or interests. Then again the sudden death of one skilled in mechanics and upon whom the direction of large numbers of co-workers has devolved, may and does cause an economic loss, at times so great as to be keenly felt by many who cannot afford to lose the time and consequent money loss occasioned by the stoppage for a temporary period of a great industry.

When death results from natural causes, there is always ample warning given of the approach of dissolution, and provision for any interruption of business can be anticipated, but not so in the case of accidental death, for seldom if ever do we learn of one so wise or prudent as to have prepared for the carrying on of his or her life's work in case of death by accident.

Every person is of value to the community in which they live, and their

death, if sudden, is a loss in proportion to the extent the community has leaned on the individual. And though the community as a whole will not in every case be conscious of the fact, yet the void has the effect to impair to a greater or lesser extent the equilibrium of the social and business affairs of the community. In large cities the taking away of an individual is not felt generally, and a human life as a consequence is not estimated at its true value.

I have thought that if an instrument could be constructed that would record publicly the loss of every life by accident as they occur and show in dollars and cents the actual loss to the community, we might arouse the people to a realization of the importance of accident prevention. How often do we hear it said by those who have been dependent on one who has met a sudden death, "I do not know what I am going to do. I must start all over again, for I left everything to him and never dreamed even that he would be taken away suddenly, and I have made no provision for such a contingency."

It is an awful affliction to have one on whom you depended almost wholly killed instantly, for in addition to the anguish suffered, there is always a financial loss, which may entail the deprivation of comforts that had been hoped for, if they had only been spared for the term of a natural life.

THE HUMANE EMPLOYER

The humane employer is solicitous for the safety and comfort of his employees, and will mourn with their associates when misfortune comes upon them in the form of an accident resulting in death or injury, because he looks upon them as members of his business family who share with him the vicissitudes and trials of commercial life, suffering or rejoicing as failure or success comes to him. And again he regrets because their removal permanently or temporarily means a financial loss to him according to the position they held in his business.

It is necessary, therefore, for him to protect his employees from accidents which may result in removing them from active participation in his enterprise, entailing a financial loss, as well as the inconvenience, delay, and often the suspension of work in other factories; on public works; and on farms, which may be dependent upon the production of the factory for material necessary in the manufacture of goods, the construction of buildings, or the cultivation of the soil.

I can recall instances when mercantile business was suspended, ships were unable to leave port, farmers were prevented from harvesting grains, and important public work delayed because of accident to employees; factories were hindered in the production of goods necessary for the merchant, the mariner, the farmer, and the builder to carry on trade, commerce, cultivation of the soil, and the construction of buildings.

In the extending of civilization the ingenuity of the inventor has been directed in a great measure toward the development of vehicles for rapid transportation of men and material, and though speed has been the aim, safety has been the paramount factor. Yet much risk is indulged in by over-anxious and reckless persons who would stake everything on chance.

And while it may often appear that rapid progress has been made regardless of care, yet it has been proved that where caution and temperate action has been exercised the greatest success has been attained.

RAPID TRANSPORTATION

The principal agents of commerce today are the railroads. By them goods and persons are transported great distances in an amazing short space of time, but often travel is interrupted and the delivery of goods is delayed in arriving at destinations by the intervention of accident. The destruction of life at times has been appalling, while the financial loss has been incalculable. And why? Because some one had neglected to apply caution in the prosecution of their work, or had for a moment probably allowed their mind to wander from the thing upon which it should have been concentrated, or recklessly took a chance and lost out.

Within the past twenty years there has taken place a wonderful change in the character of vehicles commonly used by man on the highway. The ox cart and the horse-drawn vehicle have been superseded almost entirely by the gas motor vehicle, which is constructed for comfortable and rapid travel. And because of these advantages over the primitive vehicle travel, transportation by automobile has grown rapidly in favor until our roadways teem with pleasure and commercial cars.

Improved roads permit of fast driving without hardship, which is an incentive to indulge in speeding. Therefore, travel on our highways has become extremely hazardous. Accidents by which persons have suffered bodily injury or death have been so numerous the public has become seriously concerned with the problem of preventing them. Laws have been enacted restricting the use of the roadways and regulating the operation of vehicles on them.

Such measures have been taken because the public has demanded that reckless driving on the public highways shall cease, and the slaughter of human beings from that cause shall be stopped.

We have investigated many so called accidents, and I can safely say that 80 per cent of them were not accidents but were the result of recklessness, carelessness or willful distraction, and could have been prevented. An accident we cannot prevent. I may be severely technical in defining the word "accident," but when the casualties on our highways have outnumbered by three to one those occurring in our army on the battlefields of France, is it not time to become exacting?

When we come to consider that the bodies of those persons killed in vehicular accidents on our highways in this country in one day, if laid side by side, would form a line over one mile in length, does it not require of us that we be more technical in the determining of what occurrences are accidents. I am inclined to insist that in every case where the facts will prove that an occurrence could have been prevented, it be reported as a preventable occurrence and the responsibility for it fixed.

Now it often happens that some one besides the principal in an occurrence may have done something indirectly which contributed to the cause of a casualty: For example; If one who deals in or uses dynamite or gun

or blasting powder, carelessly leaves such explosives where they may come into the possession of persons ignorant of their character, or if an inexperienced person is permitted to drive a locomotive or an automobile, or if an employer encourages or compels an employee to work until he becomes over-fatigued, or without sufficient light when operating machinery in a factory; and loss of life or property results, can such occurrence be termed an accident?

Let us not be too much inclined to condone lack of caution, for so long as we do, accidents (so called) will multiply.

FIRE PREVENTION

Little attention is given to accidental fires, except by the insurance companies; the average citizen never gives a thought to the matter of the cause of a fire, except when an appalling loss of life has resulted. The financial loss, he seems to think, is borne by the insurance companies, which is not the fact. All business men do or should know that every person who carries insurance on his property is one of the guarantors against loss by fire and helps to pay the loss. The people at large suffer in proportion to the extent of the interruption to business, of the unemployment and the poverty brought about by such occurrences.

Fire prevention is essentially a public duty, and if assumed and carried on in the proper spirit, 80 per cent of the fire loss of the present day can be saved; this estimate I am sure is not excessive. Why then delay the enactment of laws penalizing carelessness in the disposal of rubbish, hot ashes, oily rags and waste; and the storage of highly combustible materials; and providing for a board of fire investigators whose duty will be to discover, if possible, the cause of fires, fix the blame and suggest measures for prevention of the reoccurrence of happenings, resulting from neglect of caution.

Accidents in the home are numerous and are due in nearly every instance to lack of caution and are therefore preventable, but it seems that some serious mishap must occur now and then, in order that we may be brought to a realization of the necessity for caution. The match box, carbolic acid, the hot poker and sharp knife have not been put out of reach of the babies, and open stairways and windows are left unguarded. Mothers should practice the doing of these preventive things constantly, until it becomes a habit, then household accidents will become rare and much pain and sorrow will be averted.

APPLY THE GOLDEN RULE

A review of the causes of accidents convinces us of the necessity for the devising of methods of prevention which will be effective in constantly keeping before the people that fact that we are seldom, if ever, where we can be considered safe from accidental injury or death. Those who are careless of their own safety and that of others seem to be everywhere. Everybody at some time or other indulges in recklessness hoping thereby to win applause or gain some selfish end or advantage over his fellow man, and occasionally failing, not only loses all for himself but brings injury,

sorrow, and suffering to his neighbor. It is imperative, therefore, that in accident prevention work, the golden rule shall apply. Always keeping in mind the rights of our neighbor, conceding, if need be, some of our own rights, if by so doing we may avert a disaster.

When making up your committee, therefore, let the personnel represent the family, the school, the employer and the worker, an attorney, a doctor, and a clergyman, who will consult and advise with a public safety committee appointed by the Mayor of a City. Such a committee will, I think, represent every phase of interest, and having official powers, may be able to compel strict observance of safety rules.

In this short paper I think I have shown that persons in every walk of life and of varied interests should become concerned in safety work, and if I may be permitted to say so, it is a duty which no one can justly avoid and yet claim to be a good neighbor, a considerate employer, a faithful employee, a cautious parent, or a good citizen.

Caution should be the watchword of all; in planning be cautious and do not hazard too much for the sake of haste or excessive production; be content with reasonable accomplishment and you will become a true apostle of safety.

DISCUSSION

CHAIRMAN TALBERT: In view of the fact that Chief Quigley is not present this morning I will say a word in this connection.

The entire committee of the Public Safety Section has endeavored during the past year, to work out a comprehensive plan of public safety, and that work had been tried in three cities. It was tried first in St. Louis to a certain extent, carried a little further in Pittsburgh, and now is being tried out in Cleveland. The coördinating of the matters found in those three cities has brought us to a fairly definite program for public safety work, and we have on the table here copies of the program which I will be glad to give to those who are interested. We will set two o'clock as the definite time to discuss the traffic question. Inasmuch as we have thirty or forty minutes left this morning, I would suggest that we go on with our informal discussion and continue this as a business meeting.

MR. COFFIN: I believe that the plan proposed by Mr. Crum is altogether too complicated to put into practical use. It is all right to get these statistics, but the simpler they are, the better.

CHAIRMAN TALBERT: At my suggestion, Dr. Vitt, the Coroner of St. Louis, in conjunction with the public safety campaign has made a thorough study in regard to the matter of statistics, and has developed a lot of information we didn't know could be had from his records. I asked him yesterday if he would not take up Mr. Crum's paper and make a study of it and then give us the results of his study during the past 24 hours. I am going to ask him now to give us his idea of what it contains and its value.

FORM FOR REPORTING ACCIDENTS

DR. R. S. VITT (Coroner, St. Louis, Mo.): It certainly was quite a pleasure to review with Mr. Crum and Mr. Ryder the work they had been

doing for months. I was amazed how thoroughly they had covered all the accidents and deaths. I do not believe that the form they have presented is too complicated. I rather think additions will be made. The only difficulty that I see in connection with the use of the form, and I don't think that is a serious one, is the question of locating the proper person in each locality to whom to make these reports.

CHAIRMAN TALBERT: The only question in my mind, Mr. Crum, is whether or not the report might be too complicated for the use of the average policeman or traffic officer who has to fill out the report?

MR. CRUM: I think you are under a misapprehension if you think the form is too complex. If you will go into the latter part of the report, it may appear complex, but accidents only find a place for tabulation in certain parts of the report. Policemen are intelligent people and know how to make reports. It is really very simple. If all the information is not given on the report a member of the Police Board, some clerk or assistant should follow the thing up and go right back to the man who made the report and get the information wanted. That information should be gotten immediately while the matter is hot, and not several weeks afterwards or a year afterwards when the thing is forgotten.

DR. VITT: I think we ought to decide where these reports should go. I think Mr. Crum's office would be the logical central bureau.

CHAIRMAN TALBERT: Does your scheme, Mr. Crum, provide for the codification of these statistics after they are received? What method would there be for accumulating this information?

MR. CRUM: They should go to some central organization, either one supported or organized by the National Safety Council, or to some voluntary agency to start with. I doubt that those forms will be in use next year in more than a half dozen large cities. I am quite sure that if no one else will do it, that our company will finance the printing of the forms and take care of the mechanical end of coding and tabulating it. I don't see how we could possibly spend money in a more serviceable way.

CHAIRMAN TALBERT: I will ask the committee then to devise some way, before leaving, of getting the reports back to some central point where they can be compared and tabulated.

FREDERICK S. CRUM: We may not be able to decide it here, but we will take care of that question.

INSPECTOR MAY: It seems that everything finally winds up in the standardization of accident reports and laws, and so I advocate standardization.

I have just finished a tour of the principal cities of the United States for the purpose of trying to learn what could be done to make Cleveland safer for the pedestrian and the careful driver.

One of the questions I went into was the use of accident reports used by the various cities. A good many cities follow the New York plan, but some of them have a form which doesn't mean anything. I think New York uses a good form, but Coroner Hoffman of Chicago gave me the best I saw. It all resolves it into this, that the fellow who makes the report is the one who makes the guess. Sixty-five per cent of automobile accidents are due to carelessness of the pedestrian. Some say 55 per cent and others 75 per cent, and it is a question of whether one can guess better

than the other. The man who makes the report should have certain things to answer. In fact, everything should be in there, as Mr. Crum has said.

CHAIRMAN TALBERT: Mr. DeArmand, the chairman of the publicity committee of the public safety section, will now make his report.

REPORT OF PUBLICITY COMMITTEE

LOUIS G. DEARMAND (Commissioner of Public Safety, Davenport, Ia.): The Publicity Committee assumes that we have a commodity to sell, safety to the public in public places. There is no need to go into details as to the methods to be used.

We carried on an investigation during the last three or four months in some thirty of the largest cities throughout the United States, and found that Detroit, St. Louis, Pittsburgh and Cleveland have done constructive work in publicity. That is, they have gotten what they went out to get, which was publicity without paying for it. It was found however that a great number of towns had no idea of how to get publicity on public safety work.

Now it is our idea that this committee should formulate a plan just as some manufacturer, department or retail store would do in advertising.

We are going to give equal attention to free publicity and paid publicity, with the idea that if a community is sincere in its endeavor to make the streets and highways and other public places safe for the public, that it ought to be sufficiently interested to raise money with which to pay for part of the publicity.

CHAIRMAN TALBERT: To my mind, that is one of the biggest things we have to work on. I am sure that a great many of you have some very definite ideas on publicity and how best to get it, so I am going to ask Mr. DeArmand to select three or four men from among you who will act as a sort of an advisory committee and coöperate with him during the year. The men selected should be fairly well scattered throughout the country. Mr. H. W. Mowery has a paper to read on the pedestrian hazard.

MR. MOWERY (American Abrasive Metals Co., New York City): Measured in terms of fatalities, the automobile or vehicular hazard is unquestionably in a class by itself. It surpasses all the other causes of casualties in its number. Closely following is the pedestrian hazard, which is due to the conditions of the walkways, and those two so far surpass any other form of casualty in public safety work, which are worthy of particular attention. Last year this committee prepared a paper on pedestrian hazards which was entitled "Making Walking Places Safe." This paper was presented to the meeting. The committee subsequently appointed to investigate pedestrian hazards met just once, the appointment being made only about six weeks ago, and that left us no time in which to do a great deal of work. However, reference was made to the paper presented last year, and upon reviewing it, it was the consensus of opinion in the committee that nothing better could be reported than to refer again to that paper and the recommendations with which it was closed. I will repeat.

(See Proceedings, Seventh Safety Congress, St. Louis, 1918, p. 385.)

We have gotten to that point in this work where some real constructive action is necessary. I think it would be well if some definite constructive action to enforce those recommendations could be taken.

CHAIRMAN TALBERT: I want to say that Mr. Mowery presented last year, one of the most exhaustive papers that it has been my pleasure to hear or to read, and it was included in last year's proceedings in full. Unless there is something else to come up now I am going to suggest that we adjourn.

(On motion made and duly seconded, the meeting adjourned.)

Adjournment.

FRIDAY AFTERNOON SESSION

THE meeting was called to order at 2:30 P. M., Mr. C. M. Talbert presiding.

CHAIRMAN TALBERT: Here is the particular thing for this afternoon, the question of considering whether the Traffic Code put out by the National Council of Defense and the publication called their Code should be adopted

NATIONAL TRAFFIC CODE

by this body. The code has been prepared by Mr. W. P. Eno of Washington, D. C. Mr. Eno is probably the best informed man on the traffic situation in the country, being the first man to take it up as a serious matter and to systematize it and to put it into effect. He wrote a number of pamphlets on it and made a trip or two to London and Paris where his lines of traffic control were adopted. He has never, however, to my knowledge, affiliated himself with this organization or any organization of this sort.

I say this at the outset, because we ought to give to Mr. Eno all the credit we possibly can for being the originator and the first in the field to attempt to put into definite form, traffic rules and regulations. This work of his dates back over the last ten or twelve years.

Some six months ago the National Council of Defense sent out a number of letters to a list of organizations, among which was the National Safety Council, suggesting taking up the matter of traffic regulations with the idea of formulating some that might be taken as a national code. They asked us to criticize this letter and return it to them. It happened at that time there was a meeting of the Executive Committee in Washington and I was not able to be there. Mr. Cameron was designated to represent the Council at that meeting and I emphasized to him the things that ought to be taken up in connection with this proposed regulation. Unfortunately Mr. Cameron wasn't there for some reason and that left the Council without representation. Having missed the first meeting it is rather difficult to get in touch with the question again, and, of course, no criticism was sent. This particular letter which I am going to read to

you now from Mr. Eno will give you the present status of the case, so far as the Council is concerned.

"COUNCIL OF NATIONAL DEFENSE

"Highways Transport Committee

"Washington, September 26, 1919

"Mr. S. J. Williams,

"National Safety Council,

"168 North Michigan Avenue,

"Chicago, Illinois

"My Dear Sir:

"I am sending you herewith my file of correspondence with you, dating from April until the present time. I am also enclosing a self addressed franked envelope for the return of this correspondence when you are through with it. I thought this would be the easiest way to bring the matter before you so that you could see at a glance where we stand. I am sorry I can not be at the meeting this year and therefore take this other method of again bringing to your attention the desirability and necessity of standardized Traffic Regulations.

"From the time we began our work last November, the National Safety Council was kept posted by circular letter of all our activities but did not apparently interest itself in doing anything towards assisting us either by suggestions or recommendations although from all over the country we received suggestions and recommendations and letters of approval in our efforts to bring about safety on the roads.

"I am also sending you a dozen of the General Highway Traffic Regulations adopted for standardization by the Council of National Defense on May 8th together with a dozen pamphlets which were sent out with these Regulations. These I send you for the use of your committee and would beg of you to approve of the regulations as they now stand.

"I think I explained to you before the plan of the Council of National Defense was to annually invite suggestions and recommendations and to pass upon whether they should be adopted or rejected.

"This has been a most strenuous campaign, involving continuous labor from November until the Regulations were adopted on May 8th. I hope I am not asking too much when I earnestly request your prompt coöperation at the present time.

"I deeply regret that I am not able to be present at the meeting this year. I shall never forget the conference I attended in Detroit some years ago and I am a great admirer of the good work your Council has been doing.

"Very sincerely yours,

"(Signed) W. P. Eno."

You observed in his letter he states particularly— "These I send you for the use of your committee and would beg of you to approve of the regulations as they now stand." The question is, shall we approve them as they stand?

Mr. COFFIN: I have had a copy of these General Highway Traffic Regu-

lations, for some time, and I cannot in justice to everything, vote to accept these regulations as they stand. They are not applicable to all parts of the country, in the first place. In the second place, some articles are rather antiquated. The State of New York follows these suggestions of Mr. Eno, and we used them to a large extent in drawing up the new State law of Oregon. I am heartily in favor of a standardization of traffic laws throughout the country. But I think it should be left to a committee to go over the existing conditions throughout the country, take them all into consideration, report back to the National Safety Council, and then through the various Legislatures ask that it be adopted as a general program.

LIEUT. LEWIS: As far as that Code goes, it is all right, but it doesn't go far enough. I think it would be foolish for this Council at the present time to approve something we are bound to change within a year or six months. We should go further into the matter and get a more complete code before we approve anything at all.

MR. MAY: I don't think we ought to flounder on this thing at all. I think we ought to take up each article separately and see whether it is practical for the whole country. We have to have certain regulations in certain places to cover special conditions.

CHAIRMAN TALBERT: In taking up these discussions, we must take them up by section; if we need a license law that question would become an argument by itself. The question now is, whether or not we approve them as they stand.

INSPECTOR MAY: I don't see any provision here for a license law, but Mr. Eno and his committee assume that there should be such a license law. I don't see anything in Section 1, that is not practical and wouldn't be a good thing.

CHAIRMAN TALBERT: The question is, is this traffic regulation a proper one?

INSPECTOR MAY: I move that Section 1, of this Article be adopted.

SERGEANT BLECKE (Cleveland): I second the motion.

MR. DEARMAND: I don't think we ought to adopt Section 1, on account of that last clause—"When for any other reason not competent to drive properly." We don't state what the reason is to drive properly, whether every driver should be licensed or only employed drivers, in other words chauffeurs.

LIEUT. LEWIS: Before we go any further, what would be the effect of the adoption by this Council of these regulations? Does that make the foundation of all traffic laws?

CHAIRMAN TALBERT: No, it is merely an endorsement of that particular part of the code as devised by the Council of National Defense. There is no official connection with that, as I know of. I don't see the connection between the National Council of Defense, which was a war measure, and the standardization of traffic regulations throughout the country. Nevertheless, they have undertaken it and it is a question whether we adopt their plan.

MR. COFFIN: I believe that a Committee should be appointed of the best men available in this country to take up the general rules and regu-

lations, and any other rules and regulations that may come before them, and draft a suitable standard code that can be brought back to this National Council next year. If this is done we will have a year to study this thing over and put it into practical shape. If we start to take and endorse this by section, it will take us a month of discussions as to whether it is proper or not. If we leave it to a committee which we know has the qualifications to draw up a suitable proposition we will get suitable and practical results.

CHAIRMAN TALBERT: It seems quite evident there will be opposition on this. Mr. Eno in his letter asked for a unanimous approval, and it is evident it is not the unanimous opinion of those here that we adopt at once the code proposed to us.

MR. C. HOWARD STEWART (LaCledé Gas Light Company, St. Louis): I have had the opportunity to glance through this code, and I can see no objection to approving it.

I heartily approve Mr. Coffin's suggestion, however, that a permanent committee be appointed to work out a code. Mr. Eno has simply asked us to endorse the work as far as it has progressed, that doesn't obligate the National Safety Council to take this code and accept it in its entirety.

CHAIRMAN TALBERT: Yes, that is what it would mean. We endorse it or we don't. If we do endorse it we become a part of it and endorse it as our code. Now, if we don't do it that way, we may on the other hand, accept it and offer to coöperate with them and endeavor to devise one that we will endorse. Certainly from the tone of the talk now and this morning, we are all for a standardized code. Then a theory of a standardized code we can approve, and we can take this one here and modify it in some way or make a new one entirely.

MR. L. J. SMYTH (Kansas City): I think this question is far too important for any snap judgment. The traffic situation in every large city is such that experts should give it at least a year of very thorough study before any uniform code is formulated. I would like to endorse Mr. Coffin's plan to adopt a committee to go into this question, give them all the time necessary so that they will finally be able to make recommendations that will really solve the traffic problem.

MR. R. N. HEMMING (Fort Wayne): I agree with Mr. Coffin, a committee ought to be appointed.

CAPT. JACK ROBBINS (Windsor, Canada): Speaking for Canada, I am one of the representatives and I think something should be done today, but as Mr. Smyth says, not on snap judgment. We come so close to Detroit it is going to interest us greatly, and we are going to work in co-operation with the United States laws.

MR. R. B. MORLEY (Toronto, Canada): I have talked with various members of the Toronto traffic squad and they are firmly of the opinion that traffic laws should be, that is certain fundamentals should be, uniform for the whole continent. I think it is also the feeling of the Police Department in other centers.

CHAIRMAN TALBERT: It is extremely difficult for a body of men to formulate in its entire detail, a code applicable to every town. A system

in one town will not answer for another, and yet we do know there are certain general principles of traffic that are by common consent recognized throughout the country, but they are only elemental. We can not attempt to devise a complete code at this time, that would undoubtedly entail long discussions, a great deal of work, committee meetings, and personal contact to thrash out those minor points. We are all committed to the general policy of standardization in our principal rules.

There are two things we can do today. We can appoint a resolution committee who can carefully consider Mr. Eno's letter—because their work should be recognized and the end they intend to attain should be recognized—and make it clear we are heartily in sympathy with that scheme; that we are willing to cooperate with them and work with them. We should attempt in that resolution to show how we can do that. We might at this time present certain definite, general basic rules of traffic that we would recommend be included at once in a national traffic code and that these rules be added to from time to time. As an example, we have in several States a rule that a vehicle on the right has the right of way. I don't know whether there is any national law upon that or not, in the United States. But that is the first simple elemental rule we have, drive to the right and yet it is only by common consent and by common usage that it is done. The vehicle on the right has the right of way, that is the rule practically everywhere, it is a State law in Missouri, and it may be in other States. There are two examples which are fundamental. We might add that we are willing to go on record in favor of a few fundamentals like that and to take on others from time to time.

I doubt if there is a man here who doesn't know the time it takes to get one board of aldermen to settle on a traffic law. How much more difficult would it be to formulate a law for the whole United States? It is a process of building up to it, not of days or weeks but of months and years. We could formulate certain rules which we may add to and make that the foundation upon which we build from time to time.

If we don't take any action on it, on the other hand, we can start up with these other things and build up from them. Having our policy started it will be much easier than to formulate a perfect regulation at the outset and have that adopted. I would like to have a discussion on that phase and particularly as to whether we should appoint a resolution committee to consider Mr. Eno's letter because it deserves all the courtesy that we can give.

MR. MOREY: It is a big problem for any one community to get into, and I think appointing a committee—we have never had a committee on that subject—would certainly be a good idea. Surely this body isn't ready to adopt a code, and I don't see how it can be approached in any other way than to appoint a committee of careful selection, men who will work and produce a definite report to be gone over and adopted in whole or in part and I surely will move the appointment of a committee to work on this.

CHAIRMAN TALBERT: What do you think of a resolution committee to answer his letter?

MR. MOREY: I would simply refer that to this committee who would immediately acknowledge receipt of the letter and tell Mr. Eno the matter

was referred to a committee and the results would come from it.

INSPECTOR MAY: I will withdraw my motion, and I think it will be all right for a committee to be appointed, but I really can't see the necessity of a year's wait for a report.

MR. J. H. HANSON (Rochester): I think this committee ought to take some action, say three months, or ninety days, that would be time enough.

MR. A. RYDER (New York): I agree with Inspector May, usually if you give a committee a year's time they will let nine months go by and then do it all in three months.

In this public safety education we are starting with the children. Why can't we look ahead ten or fifteen years on this thing? For instance, if you didn't have grade crossings you wouldn't have many of the problems that you are talking of today. I don't see why this same committee can't look into that question so that we can look forward to fool proof crossings at every busy section in the United States.

MR. CARL L. SMITH: I think we ought by all means appoint a committee to reply to Mr. Eno's letter. He has written us several times to get some definite suggestion from the National Safety Council and we ought to reply as soon as possible one way or the other.

It occurs to me that he mentioned sometime back in his correspondence that the revision of this code would be somewhere around January 1, that next January they are going to issue the new code with amendments and modifications and improvements that they have been receiving from all over the country. I, however, think that as far as a code is concerned, the National Safety Council is big enough and has representatives enough in States and practically all large cities, that we should prepare our own code and I think that if we appoint a committee here to take up this matter of code we should either write Mr. Eno or telegraph him before the Congress closes. In that telegram state that we have appointed a committee on the traffic situation that is going to work out a code, and then give that committee the power to work out a code along the lines we have been discussing. Don't wait until the next Congress to have them report, have them report in sixty days, or ninety days. The Executive Committee can get together perhaps in some future time and receive that report.

MR. MOREY: I think it vitally important that no confiction enter these things and a proper committee should be appointed and get in immediate touch, not only in acknowledging that letter, but in conference with that National Council of Defense, and these other bodies, the Automobile Clubs, etc., and be the medium to get a uniform code.

CHAIRMAN TALBERT: I have very distinctly in mind that we must do one of two things; either refuse any advice or suggestion from Mr. Eno, or get into it and do something. We must not come in and talk about a committee and then let it drift. If we acknowledge this letter in any way then we must follow our action, without which we would be stultifying ourselves. There is a motion made and seconded that the Chair appoint a committee to draft a reply to Mr. Eno's communication, that maybe in the form of a resolution, telegram, or whatever they think best. Those in favor say "Aye"—Contrary "No." The motion is carried.

COMMITTEE APPOINTED TO ANSWER MR. ENO'S COMMUNICATION

The Chair will appoint Mr. Carl L. Smith, Mr. H. P. Coffin, and Mr. Louis G. DeArmand to be the committee to draft that communication to Mr. Eno.

There is another matter brought up by Mr. Roemer, that is the manner in which this traffic committee shall carry out its work. He offers a suggestion that we should formulate certain definite things and then transmit them to the different communities and ask them to criticize them before we finally decide upon them. Do you think that is feasible?

MR. H. SPROEHRER (St. Louis): Before answering that specific question, my thought was that we have so much conflicting legislation on our books at the present time, if you are going to attempt to unify those laws in the various States then it is absolutely ill advised to adopt this code, because some of the States would immediately accept that endorsement and begin to found new laws on this code. The matter of appointing a committee and getting immediate action is the proper procedure.

As to the matter of submitting those opinions to the practical people, I think that is also highly advisable.

CHAIRMAN TALBERT: What is your idea, Mr. Morey? Is it feasible for the committee to formulate different rules and send them to the different communities and organizations?

MR. MOREY: I would say, to a certain extent that would be according to the amount of money, and the amount of time that can be put into it. I think if we had the money and we had the time, as to getting results from that sort of thing you would be getting opinions that would be almost invaluable.

MR. MORLEY: This matter has engaged the attention of the National Safety Council so long, I know the headquarters in Chicago will give all the necessary assistance in canvassing that this committee will want. I think it is a very important thing and as far as the expense, and time, and work, are concerned, I am sure the headquarters will help you.

MR. MOREY: I think we are agreed what the motion should be and I move you that the Chair appoint a committee, and leave it to his judgment as to how many, to consider this entire matter and get results.

(The motion was seconded.)

CHAIRMAN TALBERT: If I am empowered to appoint that committee I would take it up on the basis of the person; what the men could do and would do; their geographical location; and their ability to cooperate with other organizations on the same line. There are several organizations working on this and very much interested and we would give that very careful consideration.

MR. RYDER: The United States is engaged today, and will be engaged for the next five or ten years in building roads, mail roads all over the country. These roads are going to be permanent. I don't see why we shouldn't interest ourselves that those roads are built along the best lines for accident prevention work.

MR. ROEMER: This committee's work isn't building roads, it is conduct-

ing the traffic of those roads. I don't believe that it is within the scope of this committee to interfere with the building of roads.

CHAIRMAN TALBERT: I will say for Mr. Ryder's benefit that the matter mentioned by him was proposed in another meeting and will be given consideration. It is fairly certain that the Council will establish within the next six months, a separate division of engineering which will consider that phase of the work, e. g., the type of road that will be safest, but which would be entirely distinct from this committee's work. Road building has technical features entirely different from the regulation of traffic.

Are there any objections to the Chair appointing a committee of not less than seven members, bearing in mind what I said as to geographical location, etc.? Our Traffic Committee on the Safety First Federation consisted of twenty-one or twenty-two men. We held three or four different meetings, and we gave two or three days of discussion at each time, and I think we can have some of those men work on this. We will get the benefit of their work and ideas and also the cooperation of the American Automobile Association.

TRAFFIC COMMITTEE TO BE APPOINTED

The motion is made and seconded that the Chair appoint a committee to take up the phases of traffic as discussed.

(The motion was carried.)

CHAIRMAN TALBERT: Now shall we at the present time take up any further detailed discussion of this particular phase, or shall we leave that to the first report of that committee?

MR. STEWART: I move that the details of that traffic code be left to that committee to be reported on within ninety days, and a copy of that report be mailed to each member.

(The motion was duly seconded and carried.)

MR. MOREY: As Chairman of this Section the Chairman should put himself on that committee.

I move that Mr. Talbert be Chairman of this Committee.

(The motion was duly seconded and carried.)

CHAIRMAN TALBERT: I have been in considerable correspondence and I do know a good many men who are in the automobile business and the American Automobile Association. I am sure we can get their cooperation.

Now I want to bring up a matter Mr. Roemer and I were discussing.

MR. ROEMER: The question I would like to bring up this morning, Mr. Morey brought the first thought to mind, is the statement that manufacturers were trying to cooperate with the legislators and were to be complimented as to what they had done. The legislators were trying to get information, and in order to get legislation the manufacturers were spending money for these devices. The legislatures are willing to act if they can get the right information, but the proposition isn't submitted properly until some organization like the safety first organization goes behind the thing and approves it.

Now the one thing I have particularly in mind is a law that was just

passed in the State of California making it compulsory to put on the rear end of every closed automobile such a safety signal as would warn the man behind of your intentions. If you will look up statistics on accidents you will find an alarming percentage are rear end collisions, and these are due to faulty signals.

I would like to have this body, if it is possible, to do one of two things the same as the National Traffic Officers' Association did, on the Coast. Either to endorse such a proposition, or appoint a committee to investigate the points I have tried to bring out. That committee can report back to this section with a view of legislation and I am sure the manufacturers of any of these signal devices will aid you and the ultimate purpose will be gained and we will avert these accidents.

MR. HEMMING: I am interested in tail end signals. Some rear end signals are in the center of the car and some of them off to one side. I recall several accidents both rear end and front end, also side smashes because of lack of signal. We can greatly eliminate that class of accidents by defining a definite position for tail lights. To my mind, that should be on the left rear guard on top; red to the rear; green to the front or any combination of colors, for the reason that the approaching car has a gage line of clearance. That is very important, especially when one of the headlights is out on either car. The headlights being out is the cause of many head-on collisions or side swipes.

That is one important thing that the committee on standardization of rules should take into consideration. It is important not only in connection with automobile driving, but in every kind of traffic, especially on narrow streets where vehicles left on the curb are sometimes left out to such extent they are hit by the electric cars. If the signal were on the dash it would signify instantly what the clearance line is and accidents would be avoided.

CHAIRMAN TALBERT: Let us try to close, if we can, in the next ten or fifteen minutes.

Two or three years ago we had considerable discussion on uniform signals, or signs on the public highway. To my mind those signs undoubtedly should be uniform so that when a man is traveling he doesn't have to stop to read the sign. We are getting many national highways now, and we ought to have standardized signs. That question should be given fair study. We have three types of signals for the motorist, those on the roadside; those given by the traffic officer; and those on the car itself. Are not those three sufficient to ask for special consideration? In other words, ought they not be taken up separately from the traffic committee?

MR. MOREY: If one committee handles it you will get information from the same parties and there will be no duplication, and questionnaires, and letters, and all that.

CHAIRMAN TALBERT: We might appoint a subcommittee of the traffic committee.

MR. MOREY: I would suggest a subcommittee.

CHAIRMAN TALBERT: Mr. Coffin, what do you think of appointing a general traffic committee and dividing it into subcommittees?

MR. COFFIN: That is a very good idea, I am sure. The Chairman spoke

about standardized signals. We made a full set about five years ago which are now in the Museum in New York. This shows you the idea. As we adopted it in Portland, and I believe St. Louis has it, the green in the center denotes safety and carries the words: "Safety First". The ring outside is bright red, and on that you can print anything you wish. "Caution"—"School"—"Slow Down"—"Dangerous Corner"—"Keep to the Right"—"Steep Hill Ahead". That is mounted on a regular standard sign, or fastened to a telegraph pole. Signs where black lines are used don't show up at night.

MR. HEMMING: In the next six months we will be swamped with questions from all these committees. I suggest the committees be so mapped out, that they do not run at cross purposes.

CHAIRMAN TALBERT: My suggestion is that the Chicago office receive all this correspondence and tabulate the information. If these committees will do the investigation work the necessary clerical work will be done at the Council's office and that will simplify the committee work and get better results. These committees might formulate the questions and indicate the people to whom they should be sent, and the Chicago office will take care of it.

MR. SMITH: We beg to submit the report of the Resolutions Committee, and suggest that this telegram be sent to Mr. Eno tonight.

REPORT OF RESOLUTIONS COMMITTEE

"Mr. Wm. P. Eno,

"Your letter of September 26, 1919, was read today before a special session of the Public Safety Section of the National Safety Council, and it was unanimously agreed that the subject matter being of such vital importance to the country, your code was referred to a special committee for consideration, with instructions to report not later than January 1st, 1920.

"We thoroughly agree with you that a national traffic code should be adopted throughout the country.

"Mr. Charles M. Talbert, Director of Streets and Sewers, St. Louis, Missouri, and Chairman of Public Safety Section, National Safety Council, will advise the personnel of this committee.

"(Signed) Carl L. Smith

"Secretary Public Safety Section, National Safety Council, Chicago, Ill.

"H. A. Coffin

"Executive Secretary Public Safety Commission, Portland, Ore.

"Louis C. DeArmand

"Commissioner of Public Safety, Davenport, Iowa."

CHAIRMAN TALBERT: It has been moved and seconded this telegram be approved and forwarded to Mr. Eno tonight by night letter. Any discussion?

MR. RYDER: Any work that is done by the committee is absolutely free from Mr. Eno, is that the idea?

MR. COFFIN: This is only the committee on resolutions. We have no power to tie the committee to Mr. Eno, or any policy. We thought we would leave that to the committee.

CHAIRMAN TALBERT: I will send him a personal telegram telling him it is our purpose to cooperate with him just as fully as we possibly can. I will outline the purpose as discussed here this afternoon, stating that we thoroughly believe in a national code, we thoroughly agree with him in the necessity for it, and that this committee will expect to cooperate with him. If that is agreeable to the body, I will put this to a vote for approval. Those in favor of sending this to him signify by the usual manner. I will send them then. If there is nothing further we will adjourn until tomorrow morning.

Adjournment.

SATURDAY MORNING SESSION

THE meeting was called to order by Chairman Talbert at 9:30 A. M. CHAIRMAN TALBERT: The program this year made no provision for a business session. We have on our program this morning three papers, two of which I know can be covered in a general way in a very few minutes, but Mr. Crum's paper will probably take more time. It seems to me to be more worth while to discuss our general problems and how to carry them out, than to read those detailed statements. I suggest therefore, that the two papers be read by title, with a synopsis of what they contain, with the understanding that they will be published in full in the proceedings where they can be read by anyone interested, and that the time saved be given to a discussion of the matters of our work during the year and our program for the next convention. I would like to ask you what you think of that procedure?

(Suggestion unanimously approved.)

ESSENTIALS AND NON-ESSENTIALS, AND COST OF CONDUCTING A SAFETY WEEK CAMPAIGN

CARL L. SMITH, PUBLIC SAFETY FIELD SECRETARY,
NATIONAL SAFETY COUNCIL

In presenting this paper, I am asked to state, as briefly as possible, a few things that constitute essential things to be done in a Safety Week campaign, and their cost, as well as the things that might be done to help in the campaign and that could be classed as non-essentials. Our purpose in conducting a Safety Week campaign is obviously that we want to reach every man, woman, and child in the community and impress upon them the importance of Safety. To do this it is necessary that we have some avenue by which we can reach, without a great deal of trouble, the majority of the people in the city.

ESSENTIALS

Publicity—Our first thought, therefore, is plenty of publicity, and the services of a high-grade publicity man or woman should be secured to follow up and keep before the people the fact that there is to be a Safety Week and to secure the coöperation of every one, and have published daily all meritorious items of news. It depends entirely upon the community as to the cost of a publicity expert. He should be secured at least two months prior to the time the Safety Week is to be held. However, a fair average would be an estimate of \$400.00 for two months' work.

Schools—Another avenue that is, perhaps, more effective than any other, is the schools, and the first thing to do is to reach the parents of the children with an effective message on Safety. The method used in Rochester, St. Louis, and Cleveland is to send a letter—signed by the president of the Local Council or the president of the Chamber of Commerce—by the children to the parents, stating clearly the accident situation in the city, and asking their coöperation in the Safety Week campaign to help eliminate these accidents. On the reverse side of the letter a bulletin is compiled, giving the things that the parent should teach the child, together with a picture of a crippled child and the figures as to the number of children injured annually in the United States. At the bottom of the letter is a pledge which the parent signs, stating that the window card which accompanies the letter will be hung in a window of the home. After the card has been hung in the window and the pledge signed by the parent, the child then returns the pledge to the teacher, and the teacher gives the child a ticket which carries free admission to several rallies which will be held in the community. At these rallies Safety motion pictures are shown, with speakers on Safety; also community singing as well as special entertainment. This is essential No. 2 and is by far the most effective means of enlisting the support of the citizens that has ever been tried in any Safety Week campaign. A conservative estimate of the cost of this publicity for such cities as St. Louis and Cleveland was \$1,800.00, including distribution.

Stickers—The third essential and a preferable means of publicity and enlisting the support of citizens is through the coöperation of the automobile clubs. I say clubs because in some cities there is more than one club. In St. Louis, as well as in Cleveland, a sticker of the same design and wording as the window card in the homes was pasted on the wind shields of every automobile. This did three things:

1. It enlisted the support of the driver in the Safety Cause.
2. It educated him as to the things he could do to help eliminate accidents.
3. It advertised to the public that he was willing to drive safely, and kept before him, as a constant reminder for the week, that it was Safety Week, and that he was expected to drive safely.

The stickers for Cleveland were contributed by the Automobile Club, which took full charge of securing permission to paste them on the automobiles and arranged with the Boy Scouts for their distribution. The average cost for them was \$150.00.

In this connection, in St. Louis a letter was sent to every automobile owner, visualizing to him the number of fatalities caused by automobiles, and the sticker and the letter were sent through the mail at a great expense. As there was an average of 35,000 automobiles in St. Louis, and during the war the cost of postage was two cents per letter, it can be readily seen that using the mail was rather expensive. It was decided to eliminate this expense in Cleveland and depend upon the Boy Scouts to placard the majority of the automobiles. They distributed 40,000 stickers.

Safety Sunday. Setting aside the Sunday of Safety Week as Safety Sunday, and having the ministers and the priests in the city devote part or all of their time to a sermon on Safety, has proven to be a convincing way of arousing the church-goers' interest in the safety of the community. A large portion of the ministers are very enthusiastic and give all of their sermons to this subject, others devote a part of it, and, of course, some pass it by altogether. A booklet has always been prepared in all of our campaigns, setting forth just a few things that a minister should know to deliver properly a Safety sermon. Distribution of the book was made through the Secretary of the Church Federation, who, after securing the endorsement of the Board of Directors, sent a letter to every minister who was a member of his organization, asking him to preach on this subject Safety Sunday. The same thing can be said for the priests of the Diocese, and it has been found advantageous to have in the booklet a letter signed by the Archbishop and by the President or Secretary of the Church Federation. Accompanying the letter and the booklet on Safety Sunday, it has been found well to include another booklet, known as the Plan for Safety Week, containing a résumé of all the activities to be conducted Safety Week. The cost of the two booklets, letters, and distribution, averages \$200.00.

Cooperation of City Officials. The fifth essential which I might speak of would be the cooperation of all city officials, especially the Police Department, in holding a mass meeting of Police at which time Safety speakers would talk to them on what they could do to eliminate accidents during Safety Week, such as enforcement of the traffic rules and regulations; daily demonstrations by the Fire Department to show their interest in the Cause; and cooperation of other city officials, such as Superintendent of Streets, Judges of the Police Courts, Coroner, etc.

Cooperation of Street Car Company. I would deem getting the cooperation of the street car company in a city an essential part of the program and one which can be easily accomplished. In the two campaigns held in St. Louis and Cleveland, buttons of the same design as the window card and automobile sticker were distributed to the police and to the motormen and conductors of the street car company. Large posters of the same design as the window card were used on the front of the cars in St. Louis, and in Cleveland on the windows inside and outside and on some of the strap hangers. In Cleveland, the Cleveland Street Railway Company generously assumed all of this expense, amounting to \$350.00.

These six points that I have mentioned constitute really the founda-

tion of the campaign, and are the essential things that should be done, and must be done, in order to have in the smallest way an effective campaign, at a total cost of \$2,900.00.

NON-ESSENTIALS

As to the non-essentials, I will say that, of course, it is desirous to have as many things to interest the people as possible during the week in order to have sufficient momentum to arouse the interest of every one in the community and have them know that there is a Safety Week demonstration being held. The following are some of the attractions that contributed to the success of St. Louis' and Cleveland's Safety Weeks:

Parades. Now that the war is over, and people have had a rest from parades, these might well be included as a splendid way to draw the attention of the public. The schools (including any military organization), industrial bands and the drum corps of private concerns and organizations, can be mustered into service with little cost. In Cleveland every school held a parade in the vicinity of the school, and it proved a splendid way of interesting not only the child but also the parents as many of the mothers turned out to see their children parade.

Accident Clock. An effective way to interest citizens is to have something spectacular, such as the accident clock used in St. Louis and Cleveland, and banners to be placed on all vehicles of the city.

Circulars. Circulars on home and street safety, to be inserted in bundles by all department stores, reach many people, and 100,000 of these were distributed in Cleveland at a cost of \$210.00.

Teachers' Meeting. A mass meeting of all school teachers in the city is a splendid way of securing publicity and the proper propaganda on Safety, especially as regards school safety. Out-of-town speakers on this subject can be easily secured and this can be done at a small expense.

Complaint Cards. Complaint cards may be run in the newspapers during the week, giving the citizens a chance to report careless practices they see occurring on the streets, these complaints to be followed up by the Police Department by letter, calling the attention of the offender to an infraction of the traffic rules and regulations. In 99 cases out of 100, people will reply, apologizing and pledging their support and cooperation to make the city safe.

Safety Supplement. Sunday supplements in newspapers, as given in Cleveland by the Cleveland News-Leader, are far reaching in the interest aroused among the citizens.

Slogans on Milk Bottles. All milk companies can be enlisted to run slogans on the caps of the milk bottles, such as was done by the Telling-Belle-Vernon Company and others in Cleveland, reaching 200,000 people every day with a Safety message. This without cost.

Window Displays. Department stores will be glad to arrange for window displays providing that material for such displays is furnished them.

Slogans on Menus. Hotel and restaurant menus are splendid mediums for slogans, drawing the public's attention to Safety Week. These were successfully used this week in Cleveland at practically no cost.

Slogans on Bills. Telephone, Gas and Electric Light Companies will be glad to run the same slogan on all their monthly bills provided you interview them early in preparing your plans for Safety Week, as most of these companies have their printing done sixty to ninety days in advance. The City of Cleveland used a slogan on all letters and bills sent out.

Safety Speakers Before All Clubs, Organizations, High Schools. All clubs holding noon-day luncheons during Safety Week will be glad to have men who are of national prominence in safety work speak before their organizations. The high schools and normal schools are always glad to cooperate by having speakers talk to the students.

Demonstration of Boy Scouts. It is interesting to have the Boy Scouts give demonstrations and exhibits of First-aid Work at some central point in the city during the noon hours. The boys like to participate in this movement for they feel they are doing something worth while. These demonstrations also give good material for publicity and a great many homes are reached in this way.

Welcome Cards. The Retail Dealers' Association is glad to help in the arrangements for Safety Week in attending to such matters as arranging for the stores to exhibit Welcome Cards in their windows.

Advertising Club. The Advertising Club of St. Louis appointed an advisory committee to assist the secretary and general arrangement committee in all matters of publicity. In Cleveland the Advertising Club assumed entire charge of the out-door advertising, such as posters, bulletin boards, pennants for trolley wires and lamp posts, etc. They also prevailed on the members in the Club, who had contracted for advertisements in the newspapers during the week, to insert in the advertisement a slogan regarding Safety Week.

Motion Pictures. The Ford Motor Company of Detroit and the local motion picture people in Cleveland arranged to take motion pictures of all things that were done during the week. The local motion picture agency will distribute their films in every theatre in Cleveland following the week, showing the people the full story of Safety Week.

Slides in Theatres. Slides in theatres are effective. A week previous to Safety Week a black and white slide was run in all theatres of Cleveland, announcing the coming of Safety Week and asking the people to observe all rules of Safety. Two hundred slides were distributed in Cleveland at a cost of \$300.00. One hundred slides in three colors, of the same design as the window cards, showing how to make Cleveland safe from accidents, were run during Safety Week.

Prizes for Cartoons. In Cleveland and St. Louis prizes were offered for the five best cartoons published during Safety Week, as follows:

First prize	\$ 50.00
Second prize	30.00
Third prize	25.00
Fourth prize	20.00
Fifth prize	10.00

\$135.00

Notice was given to the cartoonists through the city editors of all newspapers. News items were published about the contest and letters were addressed to cartoonists personally inviting them to participate.

COST OF SAFETY WEEK DRIVE

The total cost of a Safety Week drive in cities the size of Cleveland and St. Louis can be safely estimated at \$3,000.00 for the necessary and essential things, and \$2,000.00 for the non-essentials, making a total cost of \$5,000.00, which does not include any entertainment when the Safety Week is a part of the plans for the holding of a National Safety Council's Annual Congress.

From the results achieved from Safety Week demonstrations we can safely assume that the National Safety Council has now a plan that will get results. In almost everything attempted, the idea has been to pledge those concerned to do their part. The result has been that we have secured coöperation, and it takes the coöperation of every man, woman, and child to have community safety.

I think we all realize that while a Safety Week demonstration does good and is far-reaching in awakening a community to the importance of Safety, it is only a start and is only intended to create the proper impetus for the establishing of a Public Safety Committee with a definite program of activities for a year's work—which will be explained to you in detail by the next speaker.

I think we are to be congratulated on the results obtained in Cleveland. As a result of the work done on public safety, we decreased the number of fatalities in Cleveland since the first of August, fifty per cent. Inspector May of this city who was present yesterday questioned that statement, so he went back to his office and on investigation found it to be true.

(Mr. Smith read Mr. Talbert's paper.)

ST. LOUIS PLAN OF PUBLIC SAFETY

C. M. TALBERT, DIRECTOR, DEPARTMENT OF STREETS AND SEWERS,
ST. LOUIS, MO.

There are three distinct and common causes of deaths in the United States today, viz., sickness, public accidents, and industrial accidents.

In the past five years splendid reduction has been made in fatal accidents in industry, due principally to the fact that the National Safety Council being an organization composed almost entirely of industrial men has focused its attention chiefly on the prevention of industrial accidents.

This demonstration has been fine and it has proved conclusively what can be done to control the human factor in industry. Managers of industries all over the country are now beginning to see that public accidents have a direct bearing on their business, just the same as industrial accidents. It is claimed by some that we cannot hope to reduce industrial accidents to the minimum that we should until something is done in the way of controlling careless habits of the employee on the street. For il-

illustration, it hardly seems good business to spend so much time and money educating an employee to be careful while he is working in industry if when he leaves the shop he forgets all that has been taught him, and on the way home is struck by a street car or automobile and fatally injured.

It matters little whether an employee is killed in the shop or on the street—it is obvious that the loss of a valuable workman to the employer is just the same. It is no consolation to the wife and children that their protector and provider was killed in a public accident, nor can industrial safety men feel that they have done their duty.

It is indeed encouraging to know that fatalities in industries the past five years have been decreased from 35,000 to 22,000; that serious injuries have been reduced from 750,000 to 500,000. It is rather discouraging to think that 80,000 people lose their lives every year in public accidents (6,000 of which are children under ten years of age), and that so many thousands of people are seriously injured that we hesitate to estimate the figure.

INDUSTRIAL SAFETY WORK SUCCESSFUL ONLY IN SPOTS

Factories all over the country have done efficient safety work but this success has been entirely individual, and in spots. Before the formation of the Central Mississippi Valley Division of the National Safety Council in St. Louis only 5 per cent of the factories in St. Louis were doing anything like efficient safety work. As a direct result of the work of this division during the past year all large manufacturing plants that are members of the National Safety Council are doing constructive work, and a great many of the smaller ones.

A liability manager for the largest insurance company in St. Louis recently stated that the safety work among his assureds had been increased 50 per cent the past year, and that this was due to the employing of a permanent secretary in the district who could give all of his time to the work, and the adopting of a permanent program with such activities as School for Safety Supervisors, when fifteen lessons on the fundamentals of safety were taught; each lecture being given by a high grade speaker. Over five hundred students were enrolled in this school with such men in attendance as managers, superintendents, safety engineers of plants, coroner and his deputies, insurance factory inspectors, and state factory inspectors. Two hundred and twenty-six of these students who had attended 75 per cent of the lectures were graduated and each received a diploma.

Other activities were monthly meetings for foremen and superintendents with an average attendance of 1,500 to 2,000; meetings for managers with an attendance from 200 to 400; motion picture shows in plants and safety instruction given to the children of the public schools.

SAFETY MUST BE PART OF COMMUNITY LIFE

This proves, does it not, that safety to be successful must be a part of

the community life, and an integral part of every man, woman, and child's life. People must come to respect safety just as they do pure milk, pure food, or pure drinking water.

We know the fundamental fact of safety work proven by the experience in industry is that only one-third of accidents can be eliminated by mechanical guards and that two-thirds must be eliminated by educational methods. What is true in industry is likewise true in public safety. Not more than one-third of the causes of fatal accidents on the streets can be taken care of by such installations as safety zones, crosswalks, proper signals, clearances, etc.

SAFETY WEEK IN ST. LOUIS

Can any definite results in public safety be shown by educational work? I think you will agree with me that this was conclusively proved by the demonstration of Safety Week in St. Louis last Fall which synchronized with our Seventh Annual Congress. Only one death occurred—a case of a drunken man falling from a wagon—notwithstanding the fact that previous records show that for several years there had been one to four deaths every day. The corresponding week in September, 1917, there were twenty-four deaths and the corresponding week in September, 1918, ten deaths occurred. Does this not prove that the human factor can be gotten hold of in a city with a population of 800,000 and that every man, woman, and child can be made to think Safety?

PERMANENT ORGANIZATION

Following the Seventh Annual Congress and the Safety Week demonstration in St. Louis steps were taken by the executive committee of the Central Mississippi Valley Division of the National Safety Council to appoint a permanent safety committee and to adopt a definite program of procedure to reduce the amount of public accidents in the city of St. Louis.

To begin, there were two fundamental questions to be considered: First: What steps should be taken to produce results; second, who were the logical men in St. Louis to do the work?

The committee decided to name a temporary chairman and they selected Mr. Arthur T. Morey whom most of you know because of his wide experience and intensive interest in safety work, and the fact that he was past president of the National Safety Council. The committee felt that by having a strong industrial man at the head of the General Public Safety Committee it would insure the permanency of the chairman, whereas if some one were named in public life, such as a director of public safety, a change in the administration might occur and the head of the committee would then be lost.

It was realized that no organization could expect to achieve the cooperation of all the citizens unless enough momentum was given the movement to arouse the public to the necessity for unanimity of action on the part of all the leading organizations of the city, so a public

meeting was held to which were invited representatives from all the leading organizations, such as the Automobile Club, Chamber of Commerce, City Club, Retail Dealers Association, Advertising Club, Team and Truck Owners' Association, Women's Clubs, representatives of the municipal government such as the mayor, coroner, chief of police and fire departments, police commissioners, director of streets and sewers, circuit attorney, prosecuting attorney, director of public safety, complaint board, health commissioner, comptroller, judges of all courts affecting traffic, superintendent of schools, etc.

PUBLIC MEN MUST BE INTERESTED

It was obvious that if we were to succeed in any plan it was necessary to interest the men who by reason of the office they held should necessarily be members of the committee. For instance, it would be rather foolish to organize a committee and not include the men whose duty it is to look after the welfare of the citizens. Imagine how ridiculous it would be to have an industrial man as the head of the statistical committee, whereas it is logical that the coroner would be the proper person by reason of the office he holds.

A personal visit was made to all of these men by some representative of the executive committee of the council and they were told of the proposed plans and sold the safety idea, just as it is necessary to sell a manager of a plant before you can expect to install any spirit of safety in the works.

PUBLIC MEN NOT FAMILIAR WITH SAFETY

To prove further the necessity for this personal contact, would it surprise you to know that the coroner of St. Louis, Dr. R. S. VHL, who is one of the most ardent safety supporters in our city, did not know previous to the holding of the Seventh Annual Congress in St. Louis last fall that such an organization as the National Safety Council existed, and what is true of the coroner of St. Louis is true of 95 per cent of all the public office holders in our large cities today.

As I said before this general meeting of public men was held, at which time the general chairman outlined the reasons why we should take some definite steps to form a public safety committee with a definite plan of action. All present were asked to submit suggestions regarding things that should be attempted and the names of the men in St. Louis who should naturally undertake the work, also what committees should be formed to correct the present careless condition.

Figures were given by the coroner's office showing the number of deaths occurring last year, their causes, etc. All newspapers were represented by reporters.

After all had gone on record as to their willingness to support the idea of a public safety committee, it was moved and seconded that a general chairman and a general secretary be elected and the general chairman be empowered to appoint a committee to select men to serve

on the various committees and to outline the tentative duties of these committees, and at the next meeting these committees appointed should form and elect a chairman and secretary of their committee and then submit to the general committee their plan of action for approval. This was done and the following is the plan as adopted:

THE PLAN

AUTOMOBILE AND LEGISLATION COMMITTEE: It was obvious that it was necessary to have a strong committee to look after the many activities that would naturally come under this heading, such as parking problems, traffic regulations, hazard of pedestrians, speeding, head lights, slowing-down at crossings, etc., and the following committees were named. Please note the official connection of the men on this committee: C. M. Talbert, superintendent of streets and sewers, chairman; J. C. Josse, superintendent Continental Portland Cement Company, secretary; F. S. Pingree, president St. Louis Automobile Club; Howard Siderer, prosecuting attorney; J. A. Bruner, secretary Lawton-Byrnes-Bruner Insurance Agency; Louis Nolte, comptroller; Lawrence W. Daniel, assistant attorney; Patrick Kelleher, general superintendent Columbia Transfer Company.

SUB-COMMITTEE ON AUTOMOBILE PARKING: H. E. Engel, secretary, Team and Truck Owners' Association; T. B. Wirtke, attorney; K. F. Niemoeller, secretary, St. Louis Retail Credit Company; A. E. Martin, Martin-Breitt Real Estate Company; Dr. W. H. Bruner.

SUB-COMMITTEE ON TRAFFIC LAWS AND REGULATIONS: Howard Siderer, prosecuting attorney; T. B. Wirtke, attorney.

SUB-COMMITTEE ON PRIORITY FOR PEDESTRIANS, WOMEN, AND VEHICLE DRIVERS: F. S. Pingree, president St. Louis Automobile Club; J. A. Bruner, secretary, Lawton-Byrnes-Bruner Insurance Agency.

RECOMMENDATIONS ADOPTED BY COMMITTEES

1. Licensing of professional chauffeurs and teamsters.
2. Regulations for pedestrians, such as adopting of city ordinance to compel pedestrians to cross the streets at the crosswalks and refrain from crossing in the middle of the block.
3. Parking laws to be revised in the congested district for the limit of thirty minutes on some streets and one hour on other streets; also, that certain streets be kept entirely free from parking and be used exclusively for heavy hauling for teams and automobile trucks.
4. Additional traffic police to be provided on busy intersections and between crossings, and to enforce traffic regulations pertaining to both pedestrians and vehicles.
5. Effort to be made to have all pedestrians at intersections follow the signal of the traffic officer and move with the traffic.
6. School to be held for licensed chauffeurs. Suggested subjects to be taught:

- a. Traffic rules
- b. Safe operations of automobile and truck.
- c. Hazards on the streets
- d. How accidents occur
- e. Dangerous curbs and corners
- f. Proper signals

Other subjects to be selected and speakers for these subjects to be secured and pamphlets provided on each subject by the headquarters staff of the National Safety Council.

VIGILANCE COMMITTEE

Were you to ask me what is the one thing most needed in every city to promote public safety, I should unhesitatingly say the enforcement of the present traffic laws. Police are handicapped in making arrests and securing prosecutions in the courts because there has been no united effort on the part of the citizens, or on the part of any organization to cooperate with the judges in securing this end. What arrests are made usually result in no conviction in the courts because of the fronting done by the friends of the arrested one.

I dare say that a great many men in this room have passed through this experience. Most everyone has some friend that will say a quiet word to the judge. When the judges were asked about this condition they said: "What is the use of convicting or fining one offender when there are hundreds doing the same thing every day who are not molested. If any united effort is made to stop men who are infracting the law, we will do our part." So a vigilance committee was formed to give special attention to this need. This committee is at present composed of one hundred and fifty prominent men.

First, five men were appointed on the committee, viz: Major Roy F. Britton, attorney, chairman; William Dover, deputy coroner, secretary; Herman Spoehrer, secretary and treasurer Union Electric Light and Power Company; C. M. Talbert, superintendent of streets and sewers; Cline Finnell, president Junior Chamber of Commerce.

The chairman selected was a man who had charge of the four hundred and sixty secret police during the war. These five men met and adopted a pledge card that every member of the committee must sign before becoming a member, as follows:

PLEDGE

As a member of the vigilance committee of the St. Louis Safety Council, I realize the importance of eliminating needless traffic accidents and promise that I will faithfully endeavor to note all instances of hazardous violation of traffic regulations coming under my observation on "Chance Taking Reports," and forward same promptly to Secretary E. G. Marsh, Complaint Board, City Hall, St. Louis, Mo.

I have read the ordinances of the City of St. Louis and the laws of

Public Safety Section

1051

Missouri relating to motor vehicles and traffic regulations and consider myself competent to report violations.

Name

Address

Telephone No.

He is then given a number and thereafter is known not as Mr. John Brown, but as number 23, 24, etc., and is supplied with a number of report cards on which he is pledged to report careless practices occurring on the streets, as the following sample complaint card:

REPORT OF CHANCE TAKING

Month.....Day.....191.....Time.....M.

Location

License No.

(X opposite violation, or write in blank space)

-Recklessly drove in front of moving car.
 -Recklessly passed car while taking on or off passengers.
 -Pulled in front of approaching car when parking.
 -Passed car to left on double track.
 -Created hazard by excessive speed.
 -Did not slow up on nearing pedestrian at crossing.
 -Did not give way to right for faster moving vehicle.
 -Passed another vehicle to right.
 -Failed to signal change of direction, slow down, stop.
 -Started from curb into traffic without giving notice.
 -Front; rear lights out.
 -Did not sound horn or slow down nearing crossing or curve with obstructed view.
 -Did not show license as required by law.
 -Driver continued on after accident.
- (Write particular not covered above)

Witness(Name)

Address

Car No.....

Signature.....

These cards when filled out are sent to the secretary of the Complaint Board who takes the matter up either personally or by letter with the person concerned. Complaint card is filed by license number of the car.

Should a second offense be reported more severe measures are taken and in case of a man being tried in court for careless practices, such as speeding, etc., the judge will look up his record at the Complaint Board and see if he has had previous complaint made against him. Imagine if you can what chance a man would have of being acquitted by a safety judge when a judge finds there are three or four complaints filed against the offender for carelessness.

Each one of these five men agreed to name five more men and be responsible for their instruction. This made a total of twenty-five men. These twenty-five after they had signed the pledge card and had a little experience named five more men, making a grand total of one hundred and fifty men.

The idea was taken up slowly until the results could be demonstrated. As stated before the names of the committee are held entirely secret; the secretary being the only one who has the file showing who these men are. It is not necessary for them to sign their name in making complaint, they simply sign the number by which they are known. You never can tell but what the friend you are driving around on Sunday afternoon in your car is one of these special police.

As an example of the public's willingness to coöperate, here is a sample of the many letters received in answer to letter sent out by the Complaint Board calling attention to the violation of traffic laws:

BROWN PLANING MILL COMPANY

Manufacturers of

SASH, DOORS, AND BLINDS

3100 Salena St.

St. Louis, Mo., March 29, 1919.

Mr. E. G. Marsh, Secretary, Complaint Board,
Municipal Courts Building,
St. Louis, Mo.

Dear Mr. Marsh:

Referring to your letter of complaint calling attention to the reckless driving of our truck driver on Grand Avenue, regret exceedingly this inexcusable offense. We have reprimanded him severely and will let him out if further complaints are received.

We certainly do not approve of these reckless tactics, and will be glad at any time to coöperate with your office to reduce these violations.

Thanking you for your kind letter, we are

Yours very truly,

(Signed) A. R. BROWN.

COMPLAINT COMMITTEE

Lewis B. Tune, superintendent of Bradstreets, chairman; E. G. Marsh, secretary of Complaint Board, secretary.

The specific duties of this committee are to follow the complaints that are received from the Vigilance Committee. We have found that em-

ployers of labor and business men are very considerate and courteous about replying to a letter calling their attention to infractions of traffic regulations. The records show that only two people out of one hundred and fifty to whom letters were sent calling attention to complaints received failed to answer the letter sent them by the Complaint Board. In cases like this the secretary of the Complaint Bureau gives the complaint special attention, and should further reports be received against such individuals the matter is called to the attention of the judges of the police court and summons are issued for their appearance in court and they are tried on the last complaint filed against them. In special cases like this it is sometimes necessary for the man filing the complaint to appear as a witness. This they are willing to do.

COURTS

C. B. Hardin, president, Central Mississippi Valley Division, N. S. C., chairman; C. L. Smith, secretary, Central Mississippi Valley Division, N. S. C., secretary; Chauncey I. Krueger, judge Court of Criminal Correction; Calvin Miller, judge of Criminal Court; George E. Mix, judge City Court No. 1; Anthony F. Ittner, judge City Court No. 2.

The purpose of this committee is to adopt a uniform method of dealing with traffic violators and to cooperate with the police and other committees. You will be interested to know that this was the first time the judges of the courts of St. Louis got together on a problem of mutual interest. With every judge a safety judge, changes of venue for the traffic violator will be a thing of the past.

STATISTICS

Dr. R. S. Vitt, coroner, chairman; W. L. Patterson, St. Louis Motor Service Company, secretary; M. W. Doyle, American Automobile Insurance Company; Barney Verheyen, assistant to chief of police.

One of the greatest helps in tackling an accident condition is to have a thorough analysis and study of causes. To understand such problems as the automobile problems and for the use of various other committees, it is necessary to have a statistical committee that could give a statistical analysis of all automobile and vehicle accidents, advising for instance: Ages of victims; ages of drivers; condition of drivers, whether intoxicated, etc.; whether drivers were owners, members of family, or employees; location of accidents; description of accidents; cost of accidents, such as property damage; personal property and personal damage; what laws, rules, or cautions were violated; adoption of proper form to report accidents; analysing causes of accidents; securing pictures of all wrecks and furnishing a statement of the accident. This to be used as propaganda matter for bulletins, etc.

POLICE

C. H. Stewart, assistant treasurer, Laclede Gas Light Company, chairman; Barney Verheyen, assistant to chief of police, secretary; C. W.

Mansur, president, Board of Police Commissioners; Wm. A. Giralдин, member, Board of Police Commissioners.

This committee is to assist the police department and help them realize that in their hands lies a large part of the solution of this automobile situation, and to procure for the police the necessary backing of public opinion and the police courts.

The following recommendations were adopted by this committee:

Safety code for patrolmen

Proper report form for accidents

School for police—suggested subjects to be taught.

1. Handling pedestrians
2. Statistics
3. Automobile and truck hazards
4. Hazards of children playing on the streets
5. Parking problems
6. Enforcement of traffic regulations
7. Proper safety equipment

SCHOOLS

Dr. John W. Withers, Superintendent of Instruction, chairman; George Platt Knox, assistant superintendent of instruction, secretary; Dr. E. George Payne, principal, Harris Teachers' College; Carl G. Rathman, Assistant Superintendent of Instruction; Henry J. Gerling, Assistant Superintendent of Instruction; W. J. S. Bryan, Assistant Superintendent of Instruction; Rev. J. P. M. Murray, Supervisor of Instruction Parochial Schools.

It is obvious this committee's work has to do with the safety education of children which involves instruction covering such items as: Roller skating in streets; bicycle riding in streets; playing ball in streets; "hitching" onto vehicles; unsafe coasting in and across streets; playing tag in streets; simple rules as to crossing streets safely; secure proper material for instruction of children.

The plan for instruction of children has been well worked out by Dr. E. George Payne, principal of the Harris Teachers' College, St. Louis. Dr. Payne has written a syllabus covering the teaching of safety to the children, and the matter of school safety will be taken up in detail at one of our general sessions.

STREET CARS.

Bruce Cameron, superintendent, United Railways Company, chairman; Homer Hodson, safety engineer, East St. Louis & Suburban Railway, secretary; George Fisher, assistant to manager, Illinois Traction System.

This committee adopted the following on which to focus their attention: Constant education of motormen and conductors; safety slogans inside and on front of cars; special lectures to motormen and conductors; backs of transfers to be utilized for safety slogans.

BULLETINS AND PUBLICITY

Carl L. Smith, secretary, Central Mississippi Valley Division, N. S. C.,

chairman; Anita Moore, publicity expert; H. J. Krusz, Ludlow-Saylor Wire Company, secretary; H. C. Davis, assistant treasurer, Wagner Electric Company.

This committee will give their attention to the following items: Publicity, such as all items of interest to newspapers, house organs and trade magazines; establishment of standard bulletin boards in all garages and gasoline stations, using public safety bulletins of the National Safety Council monthly; designing monthly bulletins regarding home accidents which are distributed into the homes by the school children; cooperation with other committees and especially Women's Committee in regard to bulletins for the home.

WOMEN'S COMMITTEE

The members of this committee should consist of the prominent members of the various Women's Clubs of the city, such as Women's Council of National Defense, Federated Clubs, etc.

The duties of this committee will consist of taking charge of the distribution of bulletins in the home each month by school children; to arrange for speakers to talk before all women's societies, parents, teachers' organizations, etc., and such other work as they see fit.

CLUBS AND ORGANIZATIONS

Dr. E. George Payne, Principal, Harris Teachers' College, Chairman.

This committee is organized solely for the purpose of supplying speakers on Industrial, Home, and Street Safety. Its duties consist of: Organizing Speakers' Bureau and training men, women, boys, and girls for speakers to hold themselves in readiness to speak as they may be assigned; to supply speakers for all clubs and organizations upon request.

PLAYGROUNDS

Nelson Cunliff, Park Commissioner, Chairman; T. P. Chapman, Chairman, Parks and Recreation Committee, Chamber of Commerce, Secretary; Martin Collins, President, Papa Club.

This committee is primarily for the purpose of establishing safety in connection with all playgrounds. Their activities are as follows: Playground safety; motion picture shows on playgrounds during summer months; utilization of streets for playgrounds.

FEW COMMITTEES DESIRABLE

The mistake has often been made in organizing a Public Safety Committee to have too many sub-committees, so that the committees become burdensome. In the outline that I have given you there is but one committee—a General Committee. All of the sub-committees are a part of the General Committee and meet when the General Committee meets at a regular monthly meeting. In this way should a member of any sub-committee desire information an opportunity is given to any member of the other

the papers in detail. That will allow us more time for questions and discussion, because every man who comes into this meeting should be allowed, and even requested to give us his ideas.

DISCUSSION

MR. ROEMER: I think that inasmuch as the time allowed for the various meetings is very short, that the plan you have suggested is the proper one, especially so since the real good out of any particular subject is gained through the discussion and questions. That was shown on several different matters yesterday. I think your plan is the best.

H. B. ADAMS (A. E. & C. R. R., Aurora, Ill.): I believe we will save a lot of valuable time in adopting your plan. Time is very valuable; when we come a thousand miles to get to one of these conventions we ought to conserve it.

MR. DEARMAND: I move that the plan as outlined by the Chairman be adopted and submitted to the Executive Committee, for approval.

Motion seconded by Mr. R. N. Hemming, Fort Wayne, Ind.

CHAIRMAN TALBERT: It is moved and seconded that this Section request of the Executive Committee that at the next annual convention it be assigned a definite room for the entire period of the Congress, with a Secretary or Assistant Secretary who will be in charge during the entire time, and that the place assigned be at some point commensurate with the work we have in charge.

(Motion unanimously adopted.)

MR. SMITH: I think the idea is a good one. I think that can be worked out very easily. I will certainly give it my attention and I will see that the details are carried out according to the plans adopted.

PROGRAM SUGGESTIONS FOR 1920

CHAIRMAN TALBERT: Before we start on the next paper I want to ask for suggestions as to the character of the program for next year. The work this year has been carried on by six committees, the Traffic, Statistical, Educational, Elevators, Publicity, and Pedestrian Hazards. Next year's program should be taken up largely with the reports of these committees and their discussions.

MR. DEARMAND: I suggest that we have a paper by some street railway man. Also it seems to me to be a good idea to have some member of a teamster's union present the teamster's side of the proposition of public safety as it relates to vehicles and pedestrians.

CLAIR BOWERS (Goodyear Tire & Rubber Co., Akron, Ohio.): I would like to recommend that we have four papers presented, one by a policeman or traffic man who is outside and sees the accidents, one by a postman, and one each by a teamster and an automobile man.

MR. MORLEY: What we want to get at is essentials. We want to find out exactly what people in the different modes of locomotion on the streets and highways think of the other fellow. We want to give their attitude to the public at large, and if we can take these four classes and can get

someone who will come and give us their ideas on the subject, we will evolve something a great deal better than if we had them tell us what they think they do is right.

CHAIRMAN TALBERT: A suggestion was made yesterday that next year we hold a joint meeting of this section and the Educational Section. Mr. Hemming, what is your opinion of that suggestion?

MR. HEMMING (Chairman, Public Utility Section, National Safety Council): I would like to see it go one better. Inasmuch as the electric railway field is so closely allied with the public safety proposition, I would like to see a joint session combining the three, public safety, transportation and public education. I think the two Sections would be deeply interested in the educational feature, and that is the thing we are all driving at. If we can get the Public Safety Section to meet with us jointly, I think we would be able to thrash out in a very short time problems the solution of which otherwise would take a period of from three to five years.

CHAIRMAN TALBERT: We will ask the Executive Committee for a joint session of the Public Safety Section, the Educational and the Electric Railways' Sections.

DR. PAYNE: It seems to me that there is a little bit of duplication there. You have an Educational committee of this Public Safety Section, and you also have an Educational Section. It seems to me that the Educational Section really belongs to the Public Safety Section as a part of its work, and therefore the program should be merely a part of this Section's program.

MR. VIRT: There are two subjects which we have discussed very little here, which I would like to see taken up at our next year's convention, and they are Vigilance Committees and the police judges' attitude with reference to traffic violations. I believe that traffic violations play a very important part in large cities' relations to public safety, and we should have a freer discussion at our convention next year as to what large cities are doing to the traffic violators, and the attitude of the police judges.

MR. TALBERT: We found that was one of the best plans we could get hold of, because the judges go back to the bench with the public attitude toward these accidents. The question now is whether we should have a paper from some judge or traffic court dealing with that point of public safety. (There were remarks of approval.)

MR. JOSSE: Mr. Chairman, for the benefit of those gentlemen who are not from St. Louis, I suggest that you outline the coöperation we have received from our two police judges since they joined our committee. When a man comes up before either of those judges, it doesn't make any difference whether he has a "fixer" or not, he gets it, that is all. Our State Headlight Law went along for 18 months without any prosecutions at all; but when these two judges got in they notified automobile drivers that they were going to start enforcing that law on a certain day, and they started too. They had six hundred violators the first day and every one of them was fined. That has a very salutary effect on a fellow. Out of some eleven thousand men who came up before these two judges in

three months' time for violations of automobile laws, only two repeaters were reported, and they won't repeat again.

MR. TALBERT: I remember Judge Mix apologized at one of our meetings because he was only 98 per cent pure, saying he had let two people off. So far as the judge is concerned, the moral support of somebody back of him is the greatest possible thing you can have in enforcing your traffic regulations.

Then I have added to the prospective papers for next year, one by some police magistrate on his view of traffic violations and hazards of that nature.

DR. S. DANA HUBBARD (Supt. Division of Industrial Hygiene, New York City): I would suggest for a paper of that nature that you select a man who is Secretary of State.

MR. SMITH: The question arises there whether the Secretary of States is really sold on the question of safety as strongly as a judge is?

MR. HUBBARD: In New York State the present law gives him the power to abrogate a license, and he is now sitting as a magistrate.

MR. SMITH: Yes, but I see he has almost taken the punch out of the law by saying that he is going to modify the power of the law, and is not going to compel automobile drivers to become licensed, except in the cases of new ones.

DR. HUBBARD: I don't think you quite understand it. His plan is this. In licensing new drivers, men who have never driven before, he is going to require a physical examination. My complaint was that there were some 35 or 40 narcotic addicts who were driving up to the clinics on trucks and getting their dope, and it was my opinion that a physical examination should be required, as both a snuffler and a needle man could be recognized. Mr. Hugo stated he would not require a physical examination of every person, nor a road test. Mr. Hugo is sitting as a committee magistrate, and any man who repeatedly violates the law is brought before him, and if it is a question of intoxication, reckless driving, incompetency, moral deficiency, etc., he immediately stops his license.

MR. TALBERT: Mr. Smith suggests that we have a paper outlining the methods followed by Vigilance Committees in the various cities. Do you think that question is worthy of a paper and discussion?

MR. SMITH: Four Vigilance Committees are working now, one in St. Louis, Pittsburgh, Kansas City and Cleveland.

LOUIS G. DEARMOND (Davenport, Ia.): What success have they had in St. Louis?

MR. VITT: I think they have had very good success. I know that on some days they send in as high as fifty and one hundred reports of violations of Ordinances. The reports are sent in to Mr. Marsh, who is Chairman of the Complaint Board, and he in turn writes them a letter calling attention to the violation which has been reported. He reports that 95 per cent of the answers to his letters are courteous and apologetic. From eleven or twelve hundred reports from the Vigilance Committee, he probably has a half dozen repeaters, which shows that some attention is being paid to the letters from the Complaint Board. To those who do not answer he writes a second letter and refers the names of the parties

to the Chief of Police, who sends for them and talks to them in rather a corrective manner. There are no fines or other methods used. It is merely a corrective plan.

CHAIRMAN TALBERT: I am going to ask our Secretary, Mr. Carl Smith, to bear this topic in mind and during the year collect all data he can from all cities having Vigilance Committees, and then present a digest of the results. We can then go on record as to whether Vigilance Committees are desirable. We will now proceed to Mr. Crum's paper.

FREDERICK S. CRUM (Prudential Insurance Co., Newark, N. J.): I will not read the report in full, but will run over it and pick out the more important points and elaborate on them a little, and then the report will be printed in full in the proceedings.

PUBLIC ACCIDENTS AND THEIR COST

FREDERICK S. CRUM, PH. D., ASSISTANT STATISTICIAN, THE PRUDENTIAL INSURANCE COMPANY OF AMERICA, NEWARK, N. J.

Accidents to persons may be conveniently divided, or classified, into three main groups—namely, INDUSTRIAL, or those arising out of industry or employment, HOME, or those occurring in and immediately about the home, and PUBLIC, or those met with in public places. This grouping is not entirely satisfactory but if it can be generally adhered to, a beginning will have been made in clearing up what is now a very chaotic condition in the statistics of personal accidents.

We are all familiar with these three types of accidents, but no one can say definitely what proportion each type forms of the grand total of personal accidents. Almost nowhere, in the various and numerous official reports of accidents, is there a sharp differentiation made of these three classes of accidents. Fairly satisfactory distinction is made in the Interstate Commerce Commission reports between accidents to employees (industrial accidents) and accidents affecting passengers and trespassers (mostly public accidents) but even here there is an overlapping. A commercial traveller, for illustration, must use trains in the pursuit of his occupation. If killed in a train accident, the death can quite logically be classified either as an industrial or a public accident. Similarly, if a driver of a truck is killed in the street as a result of collision, or other accident occurring while in the pursuit of his regular work, the death is very likely to be classified both as an industrial and as a public accident. In other words, public accidents are quite likely to include or affect a very considerable number of industrially employed persons who are in the pursuit of their vocations when the accidents occur.

One of the most laudable recent attempts to separate persons killed as a direct result of their employment from persons killed otherwise is that made by The Metropolitan Life Insurance Company.¹

¹See *Mortality Statistics of Insured Wage Earners and Their Families*, by Louis I. Dublin, Ph.D., Statistician. New York: 1919.

In this mortality experience—limited to white males, ages 15 and over, and for the period 1912-1916—out of 14,151 deaths from sixteen specified causes or forms of accidents, careful inquiry revealed the fact that only 28 per cent were definitely assignable to occupation or were of occupational origin. If weather agencies, such as lightning, excessive cold, excessive heat (insolation) and certain other forms or types of accident had been included, the percentage would have been smaller. Again, it must be remembered that this experience embraced mainly the industrially employed, or wage-earners. If the professional, commercial, and other largely non-wage earning classes had been as fully represented as in the general population, the effect would have been still further to reduce the percentage of accidental fatalities of occupational origin. In only four types of accidents in this experience traumatism in mines and quarries (91.4 per cent), traumatism by machines (80.9 per cent), crushing—other than vehicular and in mines and quarries, by machines and by falls (64.9 per cent), and electricity—lightning excepted (61.9 per cent)—were the percentages of fatalities of occupational origin in excess of fifty. On the other hand for drowning accidents the percentage of occupational origin was only 6.2 and for falls the percentage was only 6.3. For railroad accidents the percentage assignable to occupation was only 35.2. Obviously if females had been included in this experience these percentages would have been further and quite materially reduced.

If we assume that one-fourth the total accidental fatalities in the general population of ages 15 years and upward are due to occupation the estimate is probably a liberal one. Three-fourths of the deaths by accident, ages 15 and over, would then be assignable to either PUBLIC or HOME accidents. Here, however, we are left without any very definite knowledge of what percentage or proportion belongs to either class. From general knowledge and experience, however, it seems reasonably certain that fully one-half of all the fatal accidents in the United States are chargeable to public accidents. It is quite probable that the true proportion considering all ages is nearer 60 than 50 per cent, but to be conservative, this argument will be based upon the assumption that 50 per cent of all accident fatalities in the United States are of the public type.

In the registration area of the United States during the calendar year 1917, which then embraced about 73 per cent of the total population there were 65,644 accidental deaths, so reported. For the whole population and area of the continental United States the total of accidental deaths must have been close to 90,000 during 1917. On the basis of the above assumption 45,000 of these may be considered as having been of the PUBLIC type. Of this total (45,000) about three-fourths were males and one-fourth females.

Considering the age factor, we know that in the registration area during the ten years 1907-1916, 12 per cent of the decedents by accident were of ages under 5 years, 9 per cent, ages 5-14 years, 44 per cent, ages 15-44, 20 per cent, ages 45-64 and 15 per cent, ages 65 and over. The age distribution of those killed by accident are quite different for the two sexes, however, as the following table clearly shows:

AGE DISTRIBUTION OF ACCIDENTAL DEATHS

U. S. REGISTRATION AREA, 1907-1916

Ages	Total Deaths		Male Deaths		Female Deaths	
	Number	Per cent	Number	Per cent	Number	Per cent
Under 5.....	56,613	11.9	31,562	8.6	25,051	22.9
5-14	43,100	9.1	31,739	8.7	11,361	10.4
15-44	209,172	44.0	185,509	50.7	23,663	21.6
45-64	95,823	20.1	80,233	21.9	15,590	14.2
65 and over.....	70,926	14.9	37,072	10.1	33,854	30.9
All known ages.....	475,634	100.0	366,115	100.0	109,519	100.0
Unknown	2,777	.....	2,608	.....	169	.....
All ages.....	478,411	.....	368,723	.....	109,688	.....

Among females a much larger proportion of fatal accidents occur at the extremes of life, that is at ages under 5 and at 65 and upward, than is true of males and, conversely, the proportion of ages 15-44 is much smaller for females, or only 21.6 per cent as against 50.7 per cent for males.

Returning now to the fatal accidents which occurred in the United States during 1917—the total was estimated at 90,000 for the continental United States during 1917, or 1,730 per week, and the public accidents, constituting fully one-half of the total, were estimated at 45,000, or an average of 860 per week. These 45,000 deaths distributed by age and sex on the basis of the reported total accidental deaths in the registration area, 1907-1916, can be tabulated as follows:

ESTIMATED DISTRIBUTION BY AGE AND SEX, OF 45,000 FATALITIES BY PUBLIC ACCIDENTS IN THE UNITED STATES DURING 1917

Age	Total	Males	Females
Under 5	4,993	4,046	947
5-14	4,051	3,094	957
15-44	20,537	14,960	5,577
45-64	9,243	6,834	2,409
65 and over.....	6,176	5,066	1,110
Total	45,000	34,000	11,000

Assuming further that the approximate average economic loss by these deaths was on the following basis:

APPROXIMATE AVERAGE ECONOMIC VALUE PER ANNUM OF HUMAN LIFE IN THE UNITED STATES BY AGE AND SEX

Age	Males	Females
Under 5.....	\$350	\$150
5-14	600	200
15 and over.....	750	300

We arrive at the following estimate of the total economic loss involved in the 45,000 deaths by public accidents in the United States during the calendar year 1917.

Age	Total	Males	Females
Under 5.....	\$ 73,517,000	\$ 66,557,000	\$ 6,960,000
5-14	88,438,000	79,825,000	8,613,000
15-44	338,567,000	291,720,000	46,847,000
45-64	52,634,000	46,130,000	6,504,000
65 and over.....	4,133,000	3,800,000	333,000
Total'	\$557,289,000	\$488,032,000	\$69,257,000

MALES

Age	Number of Deaths	Expectation of Life to Age 72	Total Number of Years of Life Lost	Average Economic Value per Life per Annum	Total Loss
Under 5.....	4,046	47	190,162	\$350	\$ 66,557,000
5-14	3,094	43	133,042	600	79,825,000
15-44	14,960	26	388,960	750	291,720,000
45-65	6,834	9	61,506	750	46,130,000
65 and over.....	5,066	1	5,066	750	3,800,000
Total	34,000		778,736		\$488,032,000

FEMALES

Under 5.....	947	49	46,403	\$150	\$ 6,960,000
5-14	957	45	43,065	200	8,613,000
15-44	5,577	28	156,156	300	46,847,000
45-64	2,409	9	21,681	300	6,504,000
65 and over	1,110	1	1,110	300	333,000
Total	11,000		268,415		\$69,257,000

Enormous as these figures are they represent but a fraction of the economic loss involved in public accidents for they refer only to fatal accidents while accident insurance and workmen's compensation experience shows that there are approximately 125 non-fatal but more or less disabling injuries to every fatal injury. Assuming that these in the aggregate involve an economic loss three times that of the fatal accidents, we have it that these estimated 5,625,000 non-fatal injuries by public accidents during 1917 involved an aggregate economic loss of \$1,671,867,000 which added to the former total of \$557,289,000 gives a grand total of \$2,229,156,000. Even yet, however, the total economic loss has not been

¹The method of estimation. In brief, is as follows: From the life tables prepared by the United States Bureau of the Census and based upon the population of 1910 and the mortality for the three years, 1909-1911, we find the approximate normal expectation of working years of life to age 72 separately for the males and females who are estimated to have been killed in public accidents during 1917. It is assumed that age 72 years marks the period when life ceases to have an appreciable economic value. The number of deaths by age and sex multiplied by the expectation of life factor (average number of years normally lived through to age 72) gives the total number of years of life lost as the result of public accidents. These years when multiplied by the estimated net economic worth to society of these lives, as shown in the previous table, gives the aggregate net economic loss by age and sex. The table in detail is given above.

accounted for, as we have only considered the loss involved in the human wreckage to which must be added untold and unknowable losses from wreckage and destruction of property values resulting from the destruction of all kinds of material wealth such as buildings and other structures, crops, rolling stock, including vehicles of all kinds, goods, chattels, etc. Then to all this there must still be added the unmeasurable but none the less real and enormous physical and psychological loss involved in the physical pain and mental anguish of the victims, their dependents and friends.

From the foregoing statements it must be patent to every reasonable person that public accident prevention is a worth-while undertaking and that organized effort should be put forth on a nation-wide scale to abate the present criminal negligence and recklessness which is so characteristic of Americans. In no other civilized country is life held so cheap. To emphasize this point some tables have been prepared which will form an appendix to this statement. Also the toll of life in the United States in disasters and sports have been itemized for several years as a part of this paper. When these are placed before you I am sure that you will agree with me that it is high time that a more definite and resolute course of action be adopted by the National Safety Council and other official and public organizations to check these enormous and largely preventable losses of lives and property due to public accidents.

A good beginning will be to place the facts before the public in a clearer light. This cannot be done effectively until public accidents are more completely reported, more intelligently classified and more clearly differentiated from industrial and home accidents. To this end the Committee on Statistics (Public Safety Section) of this organization of which I have the honor to be Chairman is trying to develop blank forms for the better reporting and recording of public accidents. When these are perfected we may hope to get information before the public, the truth of which will be undeniable and the significance of which will be so truly startling that a much wider cooperation of government and public for the prevention of public accidents must be the sure result. Then and only then can we hope to see a reduction in public accidents similar to that which is now being effected in industrial accidents and in certain diseases such as pulmonary tuberculosis, typhoid fever, malaria and diphtheria.

APPENDIX A

DISASTERS

Some of the more important public accidents involve such loss of life that they may properly be designated as disasters. Many of the land transportation or vehicular accidents fall within this class and a large proportion of serious accidents at sea, as also many navigation accidents on rivers and other inland waters fall within this group. In the following lists drawn largely from the annual summaries of the Chicago Tribune I have included the more noteworthy disasters of all kinds within or near the United States during the period 1908-1918. Only

accidents involving a reported loss of twenty or more lives have been included in these lists.

RAILWAY DISASTERS

		Lives Lost
1908	Sept. 25, Collision, Northern Pacific R. R., Young's Point, Mont.	21
1910	March 21, Derailment, Chicago, Rock Island & Pacific, Green Mt., Iowa	50
	April 21, Collision, Ft. Wayne & Wabash Interurban R. R.	43
	Oct. 4, Collision, Interurban R. R., Staunton, Ill.	36
1911	Aug. 25, Derailment, Lehigh Valley R. R., near Manchester, N. Y.	28
1912	March 18, Locomotive Boiler Explosion, San Antonio, Tex.	32
	July 4, Collision, D. L. & W. R. R., Corning, N. Y.	41
	July 5, Collision, Ligonier Valley R. R., Wilpen, Pa.	21
1913	July 31, Collision, Ore train, Duluth, Minn.	21
	Sept. 2, Collision, N. Y., N. H. & Hartford R. R., Waterford, Conn.	21
	Oct. 19, Derailment, Mobile and Ohio R. R., State Line, Miss.	26
1914	Aug. 5, Collision, Kansas City and Southern R. R., Tipton's Ford, Mo.	40
	Aug. 15, Derailment, St. Louis & San Francisco R. R., Lebanon, Mo.	27
1915	Nov. 22, Collision, Georgia Central R. R., Columbia, Ga.	24
1916	March 29, Collision, Lake Shore R. R., Amherst, Ohio.	26
	Aug. 12, Collision, Electric Cars, Johnstown, Pa.	25
	Nov. 8, Elevated R. R. Accident, Boston, Mass.	54
1917	Feb. 27, Collision, Pennsylvania R. R., Mt. Union, Pa.	20
	Sept. 28, Collision, St. Louis and San Francisco R. R., near Kellyville, Okla.	23
	Dec. 20, Collision, Louisville & Nashville R. R., Shepherdsville, Ky.	45
1918	June 22, Collision, Michigan Central R. R., Ivanhoe, Ind.	53
	July 9, Collision, Nashville, Chattanooga & St. Louis R. R., near Nashville	89
	Nov. 1, Derailment, Rapid Transit R. R., Brooklyn, N. Y.	98

MARINE DISASTERS, U. S. AND CANADA

1909	April 5, Steamer "Oak Branch", Pacific Coast	20
	May 11, Sinking of launch "Pittsburgh"	23
	Dec. 10, Marquette & Bessemer No. 2 Ferry Boat, Lake Erie	38
1910	Oct. 1, Drowning Accident, Hudson River	47
1911	June 24, Explosion, Steamer "City of St. Joseph", Memphis, Tenn.	20
1912	April 14, Sinking of Steamship "Titanic"	1,517
	June 23, Drowning Accident, Niagara River	39
	Dec. 22, Steamer "Florence", New Foundland Coast	22
1913	Aug. 18, Steamer "State of California", Alaskan Coast	40
	Nov. 10, Steamer "Bridgeport," lost at sea	42
	Nov. 10, Steel Freighter "Regina", Lake Huron	20
	Nov. 10, Steamer "Wexon", Lake Huron	20

Public Safety Section

1067

	Nov. 10, Steamer "Charles S. Price", Lake Huron.....	28
	Nov. 10, Steamer "James Carruthers", Lake Huron.....	25
	Nov. 10, Steamer "John A. McGear", Lake Huron.....	23
	Nov. 10, Steamer "J. P. Hutchinson", Lake Huron.....	20
1914	Jan. 4, Steamer "Oklahoma" off Sandy Hook.....	27
	Jan. 29, Steamer "Monroe", Virginia Coast.....	41
	April 2, Steamer "Newfoundland", Newfoundland Coast.....	77
	April 2, Steamer "Southern Cross", Newfoundland Coast.....	173
	April 15, Steamer "Kite", Newfoundland Coast.....	65
	April 18, Barge "America", Alaskan Coast.....	50
	April 29, Steamer "Benjamin Noble", Lake Superior.....	30
	May 29, Steamer "Empress of Ireland", St. Lawrence River.....	1,027
	Sept. 19, Steamer "Frances A. Leggett", Oregon Coast.....	80
1915	April 4, Steamer "Prince Mauritz", Virginia Coast.....	49
	July 24, Steamer "Eastland", Chicago River.....	811
	Aug. 17, Steamer "Maroigne", Gulf of Mexico.....	96
	Nov. 13, Steamer "Charles A. Luch", Lake Superior.....	20
	Dec. 12, Steamer "St. Kilda", Newfoundland Coast.....	29
1918	July 4, Sinking of Steamer "Columbia", Illinois River.....	85
	? Steamer "Florizal" off Cape Race.....	92
	? U. S. Collier "Cyclops" lost at sea.....	293
	? Steamer "Princess Sophia", Alaskan Coast.....	343

FIRES AND CONFLAGRATIONS

1908	Jan. 13, Theatre, Boyertown, Pa.....	172
	March 4, School house, Collingwood, Ohio.....	178
	Oct. 16, Forest, Michigan.....	50
1909	Jan. 20, 71st Street Crib, Chicago, Ill.....	55
1910	Aug. 21, Forest, Idaho.....	80
	Oct. 9, Forest, Northern Minnesota.....	30
	Nov. 25, Factory, Newark, N. J.....	25
	Dec. 24, Stockyards, Chicago, Illinois.....	24
1911	March 25, Triangle Waist Co. Factory, N. Y. City.....	142
	Aug. 25, Theatre and panic, Canonsburg, Pa.....	87
1913	Feb. 23, Dewry Hotel, Omaha, Neb.....	20
	July 22, Binghamton, N. Y.....	32
	July 22, Jackson, Miss.....	35
	Dec. 3, Arcadia Hotel, Boston, Mass.....	28
	Dec. 24, Fire and panic, Calumet, Mich.....	72
1914	March 8, Athletic Clubhouse, St. Louis, Mo.....	30
1915	Oct. 21, St. John School, Peabody, Mass.....	21
1917	June 14, New York City.....	20
1918	April 13, Norman, Okla.....	37
	Oct. 12, Forest, Minnesota.....	1,000

EXPLOSIONS

1908	Feb. 20, Dynamite, Berkeley, Cal.....	30
	Nov. 20, Gas, Brooklyn, N. Y.....	25
1910	Oct. 1, Dynamite, Los Angeles Times Office, Los Angeles, Cal.....	21

	Dec. 27, Dynamite, El Paso, Texas.....	20
1911	Feb. 1, Dynamite, Jersey City, N. J.....	35
1913	March 7, Dynamite, Baltimore Harbor, Md.....	50
1915	Sept. 27, Gasoline, Ardmore, Okla.....	47

STORMS AND FLOODS

1908	Jan. 13, Cyclone, Mississippi.....	20
	April 24, Cyclone, Louisiana.....	108
	April 24, Cyclone, Alabama.....	31
	April 24, Cyclone, Mississippi.....	229
	May 13, Cyclone, Louisiana.....	42
	June 6, Cyclone, Nebraska.....	23
	June 20, Storm, Oklahoma.....	100
	Aug. 28, Flood, Folsom, N. Mexico.....	20
	Aug. 28, Flood, Georgia.....	60
	Aug. 28, Flood, S. Carolina.....	26
	Nov. 25, Cyclone, Northwestern Ark.....	27
1909	Feb. 5, Cyclone, Arkansas and Mississippi.....	23
	April 7, Storm in Northwest.....	58
	May 29, Cyclone, N. Dakota and Oklahoma.....	22
	May 30, Cyclone, Texas.....	32
	July 21, Hurricane, Galveston, Texas.....	38
	Oct. 15, Storm, Tennessee and Georgia.....	93
1911	April 4, Cyclone, Missouri, Kansas and Oklahoma.....	28
	Sept. 30 Flood, from burst dam, Austin, Pa.....	74
1912	April 4, Flood, Mississippi River.....	20
	April 18, Flood, Boliver Co., Mississippi.....	200
	April 21, Cyclone, Illinois and Indiana.....	75
	April 22, Cyclone, Georgia and Alabama.....	25
	April 27, Cyclone, Oklahoma.....	60
	May 9, Flood, Louisiana.....	75
	June 16, Storm in Missouri.....	26
	July 18, Cloud burst, Seven Tvaughs, Nev.....	29
	July 23, Cloud burst, Western Pennsylvania.....	65
	Sept. 2, Storm, Western Pennsylvania and W. Virginia.....	40
1913	March 14 Cyclone, Middle West and South.....	338
	March 22, Cyclone, Mississippi Valley.....	220
	March 28, Floods, Indiana and Ohio.....	736
	Dec. 4, Floods, Texas.....	500
	Dec. 4, Storm, Colorado.....	24
1914	May 3, Storms in Southwest.....	20
1915	April 23, Floods and Cyclone, Texas.....	40
	May 4, Tornado, Louisiana.....	41
	July 7, Cyclone, Middle West.....	58
	Aug. 2, Cloud burst, Erie, Pa.....	35
	Aug. 16, Hurricane, Texas Coast.....	375
	Aug. 20, Storm, St. Louis, Mo.....	20
	Sept. 29, Hurricane, Louisiana.....	500
1916	Jan. 28, San Diego, Cal.....	100
	Jan. 28, Floods, Arkansas.....	29

	June 5, Storm in Southwest.....	150
	July 6, Storm, Alabama and North Carolina.....	80
	Aug. 3, Cloudburst, Tazewell, Tenn.....	38
	Aug. 9, Cloud burst, W. Virginia.....	94
1917	Feb. 22, Cyclone, Georgia and Alabama.....	20
	March 24, Cyclone, New Albany, Indiana.....	36
	May 25, Cyclone, Andale, Kansas.....	36
	May 26, Cyclone, Illinois.....	94
	May 26, Cyclone, Kentucky.....	70
	May 27, Cyclone, Alabama.....	48
	May 27, Cyclone, Tennessee.....	34
	May 30, Cyclone, Missouri.....	79
	June 1, Oklahoma and Kansas.....	21
	June 6, Cyclone, Missouri.....	22
1918	Aug. 21, Cyclone, Tyler, Minn.....	35

MISCELLANEOUS DISASTERS

1910	Feb. 23, Snowslides, Montana.....	118
1912	June 11, Volcanic Eruption, Alaska.....	200
1913	Jan. 23, Fall of building, McKinney, Texas.....	35
	May 24, Collapse of Municipal pier, Long Beach, Cal.....	39
1916	July 24, Water tunnel accident Cleveland, Ohio.....	23
1918	June 29, Collapse of store, Sioux City, Iowa.....	41
	Nov. 9, Asphyxiation Accident, Pittsburgh, Pa.....	25

These disasters may be summarized as follows:

Years	Railway	Marine	Fire	Explosion	Storms and Floods	Miscel- laneous	Total
1908	21	.....	400	55	691	.....	1,167
1909	.....	81	55	.....	286	.....	402
1910	129	47	159	41	.....	118	494
1911	23	20	229	35	102	.....	414
1912	94	1,578	.....	.....	616	200	2,488
1913	68	218	187	50	1,818	74	2,415
1914	67	1,570	30	.....	20	.....	1,637
1915	24	1,005	21	47	1,069	.....	2,166
1916	105	.....	20	.....	491	23	639
1917	88	.....	1,037	.....	454	.....	1,579
1918	240	813	.....	.....	35	66	1,154
Total	864	5,332	2,138	223	5,562	481	14,605
(1908-1918)							

In these lists of the more important disasters, and not all are included, there were 14,605 reported deaths during the eleven-year period, or an average of 1,328 deaths per year. By kinds of disasters, storm and floods and navigation easily lead in importance. Fires, too, are shown to be responsible for many disasters, those listed causing a reported loss of 2,138 lives. Railways are a less frequent cause of disasters today than a few year ago, although 1918 was a particularly bad year.

The above lists and summary furnish striking evidence of the importance of disasters in swelling the grand total of lives lost in public accidents and they emphasize the importance of devising more efficient preventive measures. With the possible exception of deaths in storms and floods there would appear to be great possibilities for the saving of lives which now are lost by thousands in needles fires, explosions, collapse of buildings, etc., and in transportation both by land and water.

APPENDIX B

FATALITIES FROM SPORTS

Probably few of us realize or even stop to think of the toll of lives which Death takes in Sports in the United States every year. The most interesting figures on this interesting subject are to be found in the annual summaries of the Chicago Tribune. No pretense is made that these data are complete or entirely accurate, but they will serve when totaled for a number of years to attract attention to a series of public hazards many of which are preventable and all of which are indicative of American recklessness. During the eight-year period, 1911-1918, inclusive, there were no fewer than 4,143 fatalities as the direct result of sports, hunting, celebrations, etc., according to the records of the Chicago Tribune. It is not likely that this total is anywhere near large enough to express the whole truth, and it does not contain the fatalities due to ballooning and aviation, but it is significant of the accumulative results of many small numbers. By specific causes or methods of death, bicycles and motorcycles is at the head of the list with 1,769 fatalities; hunting is second with 1,105; and Fourth of July and other celebrations is third with 303 fatalities. It is interesting to note that this class of fatalities has been rapidly reduced with more rational community action in the regulation of the sale and use of fireworks, firearms, and other dangerous display and noise makers. In 1908 the Chicago Tribune reported 178 deaths due to Fourth of July celebrations, when ten years later in 1918 only 8 such deaths were noted. Here is a most significant lesson in the value of rational accident prevention work.

The danger of careless handling of firearms is clearly set forth in the data collected under the caption "Didn't know it was loaded." During the eight years, 1911-1918, no fewer than 298 fatalities were reported by the Chicago Tribune as the result of this fatal excuse of ignorance; it is a record which in disastrous results is now more important than celebrations. During the last five years, 1914-1918, this cause was responsible for 177 fatalities against 149 from celebrations.

In eight years 198 deaths have been charged against baseball and 134 against football. Even golf is charged with 7 deaths and tennis with the same number, also basketball. Coasting has cost 71 lives, roller coasting 34; roller skating 24; prize fighting 19; boxing 17; wrestling 18; horse-racing 31; and polo 6. The record of fatalities from auto racing does not seem to be complete, but it has become a real menace not only to the drivers but to the spectators as well.

Rocking the boat may be an interesting diversion, but is charged with

45 fatalities, which probably does not express more than a fraction of the truth. Scenic railways have caused 13 deaths during the period under review. In this connection it is interesting to recall the recent (August 10, 1919) disaster at a Montreal resort in which seven passengers on a scenic railway were dashed into a fire and their bodies burned beyond recognition. Merry-go-rounds have caused one fatality per year, on an average. The other specific causes of sport fatalities as listed by the Chicago Tribune are of minor importance, but for convenience the data have been tabulated in the following table by order of the relative importance of the causes specified:

Death Toll of Sports in the United States—Data Rearranged from Annual Summaries in Chicago Tribune, 1911-1918

Sport	No. of Fatalities	Sport	No. of Fatalities
Bicycles and Motorcycles.....	1,769	Scenic railway	13
Hunting	1,105	Merry-go-round	8
Fourth of July and other celebrations	303	Golf	7
Didn't know it was loaded.....	298	Tennis	7
Baseball	198	Basketball	7
Football	134	Polo	6
Coasting	71	Pole vaulting	3
Rocking the boat.....	45	Disc throwing	3
Prize fighting	35	Foot racing	2
Roller coasting	34	Hammer throwing	1
Horse racing	31	Putting the shot.....	1
Roller skating	24	Tobogganing	1
Wrestling	18	Hockey	1
Boxing	17	Trapeze	1
		Total	4,143

APPENDIX C

MORTALITY FROM ACCIDENTS IN THE REGISTRATION AREA OF THE UNITED STATES 1907-1917

(Rates per 100,000 Population)

Year	Males	Females	Total
1907	21,899,144	21,117,846	43,016,990
1908	23,876,529	22,913,384	46,789,913
1909	26,020,431	24,850,087	50,870,518
1910	27,606,526	26,237,370	53,843,896
1911	30,463,411	28,812,566	59,275,977
1912	31,128,193	29,298,946	60,427,139
1913	32,607,069	30,691,640	63,298,718
1914	33,984,486	32,004,807	65,989,293
1915	34,678,550	32,658,442	67,336,992

Eighth Safety Congress

1916	36,721,421	34,900,211	71,621,632
1917	38,453,558	36,546,442	75,000,000
1907-1911	129,866,041	123,931,253	253,797,294
1912-1916	169,119,719	159,554,049	328,673,768

ALL ACCIDENTS

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	31,816	145.3	8,474	40.1	40,290	93.7
1908	29,570	123.9	8,406	36.7	37,976	81.2
1909	31,488	121.0	9,185	37.0	40,673	80.0
1910	35,731	129.4	9,685	36.9	45,416	84.4
1911	38,335	125.8	11,786	40.9	50,121	84.6
1912	38,233	122.8	11,542	39.4	49,775	82.4
1913	41,757	128.1	12,254	40.0	54,011	85.3
1914	37,097	109.2	11,465	35.8	48,562	73.6
1915	38,667	111.5	12,739	39.0	51,406	76.3
1916	45,919	125.1	14,152	40.6	60,071	83.9
1917	49,173	127.9	16,476	45.1	65,649	87.5
1907-1911	166,940	128.5	47,536	38.4	214,476	84.5
1912-1916	201,673	119.3	62,152	39.0	263,825	80.3

POISONING BY FOOD

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	Not Separately Reported					
1908						
1909						
1910	99	0.36	58	0.22	157	0.29
1911	262	0.86	219	0.76	481	0.81
1912	285	0.92	288	0.98	573	0.95
1913	337	1.03	320	1.04	657	1.04
1914	336	0.99	305	0.95	641	0.97
1915	344	0.99	295	0.90	639	0.95
1916	393	1.07	327	0.94	720	1.01
1917	427	1.11	352	0.96	779	1.04
1907-1911						
1912-1916	2,695	1.59	1,535	0.96	3,230	0.98

OTHER ACUTE POISONING

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	Not Separately Reported					
1908						
1909						
1910	728	2.64	199	1.90	1,227	2.28
1911	789	2.59	610	2.12	1,399	2.36

Public Safety Section

1073

1912	769	2.47	579	1.98	1,348	2.23
1913	855	2.62	598	1.95	1,453	2.30
1914	832	2.45	595	1.86	1,427	2.16
1915	733	2.11	547	1.67	1,280	1.90
1916	754	2.05	531	1.52	1,285	1.79
1917	719	1.87	577	1.58	1,296	1.73
1907-1911						
1912-1916	3,943	2.33	2,850	1.79	6,793	2.07

CONFLAGRATIONS

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	Combined with Absorption of Deleterious Gases					
1908						
1909						
1910	483	1.75	262	1.00	745	1.38
1911	486	1.60	383	1.33	869	1.47
1912	554	1.78	347	1.18	901	1.49
1913	622	1.91	327	1.07	949	1.50
1914	639	1.88	283	0.88	922	1.40
1915	590	1.70	381	1.17	971	1.44
1916	641	1.75	413	1.18	1,054	1.47
1917	705	1.83	452	1.24	1,157	1.54
1907-1911						
1912-1916	3,046	1.80	1,751	1.10	4,797	1.46

TOTAL POISONING

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	989	4.52	736	3.49	1,725	4.01
1908	957	4.01	695	3.03	1,652	3.53
1909	1,006	3.87	773	3.11	1,779	3.50

TOTAL CONFLAGRATIONS AND ABSORPTION OF
DELETERIOUS GASES

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	1,125	5.14	566	2.68	1,691	3.93
1908	1,100	4.61	588	2.57	1,688	3.61
1909	1,262	4.85	575	2.31	1,837	3.61

BURNS

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	1,679	5.67	2,239	10.60	3,918	9.11

1074

Eighth Safety Congress

1908	1,540	6.45	2,148	9.37	3,688	7.88
1909	1,677	6.44	2,315	9.32	3,992	7.85
1910	1,810	6.56	2,372	9.04	4,182	7.77
1911	1,891	6.21	2,676	9.29	4,567	7.70
1912	2,072	6.66	2,767	9.44	4,839	8.01
1913	2,156	6.61	2,779	9.05	4,935	7.80
1914	2,002	5.89	2,503	7.82	4,505	6.83
1915	2,105	6.07	2,699	8.26	4,804	7.13
1916	2,579	7.02	3,147	9.02	5,726	7.99
1917	2,975	7.74	3,854	10.55	6,829	9.11
1907-1911	8,597	6.62	11,750	9.48	20,347	8.02
1912-1916	10,914	6.45	13,895	8.71	24,809	7.55

ABSORPTION OF DELETERIOUS GASES

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	} Combined with Conflagration					
1908						
1909						
1910	999	3.62	380	1.45	1,379	2.56
1911	1,472	4.83	671	2.37	2,143	3.62
1912	1,595	5.12	783	2.66	2,378	3.94
1913	1,531	4.70	740	2.41	2,271	3.59
1914	1,625	4.78	792	2.47	2,417	3.66
1915	1,516	4.37	686	2.10	2,202	3.27
1916	2,010	5.47	917	2.63	2,927	4.09
1917	2,359	6.13	1,007	2.76	3,366	4.49
1907-1911 .....	.....	.....	.....	.....	.....	.....
1912-1916	8,277	4.89	3,918	2.46	12,195	3.71

DROWNING

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	3,918	17.89	389	1.84	4,307	10.01
1908	4,262	17.85	415	1.81	4,677	10.00
1909	4,144	15.92	414	1.67	4,558	8.96
1910	4,396	15.92	422	1.61	4,818	8.95
1911	4,972	16.32	599	2.08	5,571	9.40
1912	4,760	15.29	553	1.89	5,313	8.79
1913	5,656	17.35	812	2.65	6,468	10.22
1914	4,827	14.20	511	1.60	5,338	8.09
1915	5,479	15.80	1,035	3.17	6,514	9.67
1916	5,519	15.03	666	1.91	6,185	8.64
1917	4,853	12.62	609	1.67	5,462	7.28
1907-1911	21,692	16.70	2,239	1.81	23,931	9.43
1912-1916	26,241	15.52	3,577	2.24	29,818	9.07

TRAUMATISM BY FIREARMS

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	798	3.64	99	0.47	897	2.09
1908	885	3.71	101	0.44	986	2.11
1909	840	3.23	104	0.42	944	1.86
1910	1,029	3.73	132	0.50	1,161	2.16
1911	1,166	3.83	161	0.56	1,327	2.24
1912	1,217	3.91	152	0.52	1,369	2.27
1913	1,380	4.23	192	0.63	1,572	2.48
1914	1,202	3.54	166	0.52	1,368	2.07
1915	1,301	3.75	200	0.61	1,501	2.23
1916	1,401	3.82	212	0.61	1,613	2.25
1917	1,478	3.84	252	0.69	1,730	2.31
1907-1911	4,718	3.63	597	0.48	5,315	2.09
1912-1916	6,501	3.84	922	0.58	7,423	2.26

TRAUMATISM BY CUTTING AND PIERCING INSTRUMENTS

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	Not Separately Reported					
1908						
1909						
1910	80	0.29	9	0.03	89	0.17
1911	98	0.32	24	0.08	122	0.21
1912	90	0.29	16	0.05	106	0.18
1913	79	0.24	16	0.05	95	0.15
1914	98	0.29	14	0.04	112	0.17
1915	81	0.23	8	0.02	89	0.13
1916	98	0.27	19	0.05	117	0.16
1917	129	0.34	35	0.10	164	0.22
1907-1911	-----	-----	-----	-----	-----	-----
1912-1916	446	0.25	73	0.05	519	0.16

TRAUMATISM BY FALL

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	Not Separately Reported					
1908						
1909						
1910	5,320	19.27	2,985	11.38	8,305	15.42
1911	5,603	18.39	3,302	11.46	8,905	15.02
1912	5,806	18.65	3,516	12.00	9,322	15.43
1913	6,097	18.70	3,650	11.89	9,747	15.40
1914	5,814	17.11	3,757	11.74	9,571	14.50
1915	5,909	17.04	4,070	12.46	9,979	14.82

1076

Eighth Safety Congress

1916	6,654	18.12	4,121	11.81	10,775	15.04
1917	6,538	17.00	4,550	12.45	11,088	14.78
1907-1911						
1912-1916	30,280	17.90	19,114	11.98	49,394	15.03

MINES AND QUARRIES

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	2,127	9.71	3	0.01	2,130	4.95
1908	1,915	8.02	2	0.01	1,917	4.10
1909	1,904	7.66	3	0.01	1,997	3.93
1910	2,474	8.96	10	0.04	2,484	4.61
1911	2,368	7.77	4	0.01	2,372	4.01
1912	2,128	6.83	9	0.03	2,137	3.54
1913	2,381	7.30	4	0.01	2,385	3.77
1914	2,110	6.20	3	0.01	2,113	3.20
1915	2,103	6.07	7	0.02	2,110	3.13
1916	2,223	6.06	3	0.01	2,226	3.11
1917	2,710	7.05	3	0.01	2,713	3.62
1907-1911	10,878	8.38	22	0.02	10,900	4.29
1912-1916	10,945	6.47	26	0.02	10,971	3.34

MACHINES

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	1,042	4.76	29	0.14	1,071	2.49
1908	876	3.67	25	0.11	901	1.93
1909	1,139	4.38	35	0.14	1,174	2.31
1910	1,275	4.62	24	0.09	1,299	2.41
1911	1,200	3.94	39	0.14	1,239	2.09
1912	1,351	4.34	28	0.10	1,379	2.28
1913	1,486	4.56	40	0.13	1,526	2.41
1914	1,191	3.50	39	0.12	1,230	1.86
1915	1,220	3.52	37	0.11	1,257	1.87
1916	1,584	4.31	40	0.11	1,624	2.27
1917	2,054	5.34	54	0.15	2,108	2.81
1907-1911	5,532	4.26	152	0.12	5,684	2.24
1912-1916	6,832	4.04	184	0.12	7,016	2.13

RAILROAD

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	7,239	33.06	437	2.07	7,676	17.84
1908	5,724	23.97	356	1.55	6,080	12.99
1909	6,299	24.20	360	1.45	6,659	13.09

Public Safety Section

1077

1910	7,435	26.93	442	1.68	7,877	14.63
1911	7,217	23.69	479	1.66	7,696	12.98
1912	7,676	24.66	533	1.82	8,209	13.58
1913	7,747	23.76	465	1.52	8,212	12.97
1914	6,170	18.16	443	1.38	6,613	10.02
1915	6,190	17.85	462	1.41	6,652	9.88
1916	7,509	20.45	618	1.77	8,127	11.35
1917	7,783	20.24	743	2.03	8,526	11.37
1907-1911	33,914	26.11	2,074	1.67	35,988	14.18
1912-1916	35,292	20.87	2,521	1.58	37,813	11.50

STREET CARS

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	1,568	7.16	312	1.48	1,880	4.37
1908	1,397	5.85	299	1.30	1,696	3.63
1909	1,412	5.43	311	1.25	1,723	3.39
1910	1,611	5.84	338	1.29	1,949	3.62
1911	1,570	5.15	313	1.09	1,883	3.18
1912	1,503	4.83	329	1.12	1,832	3.03
1913	1,641	5.03	357	1.16	1,998	3.16
1914	1,309	3.85	284	0.89	1,593	2.41
1915	1,251	3.61	304	0.93	1,555	2.31
1916	1,436	3.91	339	0.97	1,775	2.48
1917	1,779	4.63	480	1.31	2,259	3.01
1907-1911	7,558	5.82	1,573	1.27	9,131	3.60
1912-1916	7,140	4.22	1,613	1.01	8,753	2.66

AUTOMOBILES

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	232	1.06	62	0.29	294	0.68
1908	310	1.30	83	0.36	393	0.84
1909	473	1.82	159	0.64	632	1.24
1910	781	2.83	199	0.76	980	1.82
1911	1,026	3.37	265	0.92	1,291	2.18
1912	1,370	4.40	388	1.32	1,758	2.91
1913	1,957	6.00	531	1.73	2,488	3.93
1914	2,172	6.39	578	1.81	2,750	4.17
1915	3,120	9.00	858	2.63	3,978	5.91
1916	4,114	11.20	1,079	3.09	5,193	7.25
1917	5,193	13.50	1,484	4.06	6,677	8.90
1907-1911	2,822	2.17	768	0.62	3,590	1.41
1912-1916	12,733	7.53	3,434	2.15	16,167	4.92

OTHER VEHICLES

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	1,608	7.34	202	0.96	1,810	4.21
1908	1,675	7.02	249	1.09	1,924	4.11
1909	1,883	7.24	269	1.08	2,152	4.23
1910	1,674	6.06	266	1.01	1,940	3.60
1911	1,918	6.30	319	1.11	2,237	3.77
1912	1,941	6.24	280	0.96	2,221	3.68
1913	2,057	6.31	324	1.06	2,381	3.76
1914	1,996	5.87	316	0.99	2,312	3.50
1915	2,040	5.88	308	0.94	2,348	3.49
1916	2,025	5.51	308	0.88	2,333	3.26
1917	2,004	5.21	298	0.82	2,302	3.07
1907-1911	8,758	6.74	1,305	1.05	10,063	3.96
1912-1916	10,059	5.95	1,536	0.96	11,595	3.53

LANDSLIDE AND OTHER CRUSHING

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	Not Separately Reported					
1908						
1909						
1910	529	1.92	27	0.10	556	1.03
1911	454	1.49	11	0.04	465	0.78
1912	453	1.46	23	0.08	476	0.79
1913	536	1.64	65	0.21	601	0.95
1914	400	1.18	18	0.06	418	0.63
1915	419	1.21	26	0.08	445	0.66
1916	543	1.48	20	0.06	563	0.79
1917	472	1.23	48	0.13	520	0.69
1907-1911	.....	.....	.....	.....	.....	.....
1912-1916	2,351	1.39	152	0.10	2,503	0.76

INJURIES BY ANIMALS

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	Not Separately Reported					
1908						
1909						
1910	461	1.67	41	0.16	502	0.93
1911	486	1.60	34	0.12	520	0.88
1912	495	1.59	48	0.16	543	0.90
1913	495	1.52	45	0.15	540	0.85
1914	478	1.41	51	0.16	529	0.80
1915	527	1.52	36	0.11	563	0.84

Public Safety Section

1079

1916	537	1.46	52	0.15	589	0.82
1917	583	1.52	70	0.19	653	0.87
1907-1911 .....	.....	.....	.....	.....	.....	.....
1912-1916	2,532	1.50	232	0.15	2,764	0.84

STARVATION

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	Not Separately Reported					
1908						
1909						
1910	24	0.09	14	0.05	38	0.07
1911	61	0.20	33	0.11	94	0.16
1912	35	0.11	15	0.05	50	0.08
1913	21	0.06	13	0.04	34	0.05
1914	27	0.08	14	0.04	41	0.06
1915	29	0.08	14	0.04	43	0.06
1916	24	0.07	23	0.07	47	0.07
1917	26	0.07	12	0.03	38	0.05
1910-1911 .....	.....	.....	.....	.....	.....	.....
1912-1916	136	0.08	79	0.05	215	0.07

EXCESSIVE COLD

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	233	1.06	47	0.22	280	0.65
1908	205	0.86	22	0.10	227	0.49
1909	221	0.85	30	0.12	251	0.49
1910	219	0.79	35	0.13	254	0.47
1911	170	0.56	18	0.06	188	0.32
1912	267	0.86	49	0.17	316	0.52
1913	203	0.62	27	0.09	230	0.36
1914	293	0.86	56	0.17	349	0.53
1915	277	0.80	67	0.21	344	0.51
1916	322	0.88	49	0.14	371	0.52
1917	438	1.14	69	0.19	507	0.68
1907-1911	1,048	0.81	152	0.12	1,200	0.47
1912-1916	1,362	0.81	248	0.16	1,610	0.49

EFFECTS OF HEAT

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	389	1.78	191	0.90	580	1.35
1908	550	2.30	279	1.22	829	1.77
1909	562	2.16	254	1.02	816	1.60

1080

Eighth Safety Congress

1910	557	2.02	269	1.03	826	1.53
1911	2,101	6.90	1,064	3.69	3,165	5.34
1912	547	1.76	232	0.79	779	1.29
1913	860	2.64	366	1.19	1,226	1.94
1914	511	1.50	168	0.52	679	1.03
1915	291	0.84	116	0.36	407	0.60
1916	1,584	4.31	472	1.35	2,056	2.87
1917	1,451	3.77	512	1.40	1,963	2.62
1907-1911	4,159	3.20	2,057	1.66	6,216	2.45
1912-1916	3,793	2.24	1,354	0.85	5,147	1.57

LIGHTNING

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	107	0.49	26	0.12	133	0.31
1908	132	0.55	29	0.13	161	0.34
1909	136	0.52	14	0.06	150	0.29
1910	134	0.49	22	0.08	156	0.29
1911	198	0.65	42	0.15	240	0.40
1912	211	0.68	32	0.11	243	0.40
1913	260	0.80	57	0.19	317	0.50
1914	234	0.69	30	0.09	264	0.40
1915	190	0.55	31	0.09	221	0.33
1916	280	0.76	60	0.17	340	0.47
1917	292	0.76	67	0.18	359	0.48
1907-1911	707	0.54	133	0.11	840	0.33
1912-1916	1,175	0.69	210	0.13	1,385	0.42

ELECTRICITY

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	Not Separately Reported					
1908						
1909						
1910	464	1.68	14	0.05	478	0.89
1911	500	1.64	13	0.05	513	0.87
1912	553	1.78	14	0.05	567	0.94
1913	661	2.03	9	0.03	670	1.06
1914	533	1.57	10	0.03	543	0.82
1915	502	1.45	13	0.04	515	0.76
1916	575	1.57	11	0.03	586	0.82
1917	638	1.66	16	0.04	654	0.87
1907-1911 .....	.....	.....	.....	.....	.....	.....
1912-1916	2,824	1.67	57	0.04	2,881	0.88

FRACTURES

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	1,088	4.97	838	3.97	1,926	4.48
1908	446	1.87	288	1.26	734	1.57
1909	230	0.88	127	0.51	357	0.70
1910	376	1.36	247	0.94	623	1.16
1911	235	0.77	128	0.44	363	0.61
1912	285	0.92	180	0.61	465	0.77
1913	301	0.92	145	0.47	446	0.70
1914	227	0.67	165	0.52	392	0.59
1915	261	0.75	130	0.40	391	0.58
1916	438	1.19	198	0.57	636	0.89
1917	333	0.87	142	0.39	475	0.63
1907-1911	2,375	1.83	1,628	1.31	4,003	1.58
1912-1916	1,512	0.89	818	0.51	2,330	0.71

OTHER EXTERNAL VIOLENCE

Year	Males		Females		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1907	7,654	35.0	2,298	10.9	9,952	23.2
1908	7,596	31.8	2,827	12.3	10,423	22.3
1909	8,310	31.9	3,442	13.9	11,752	23.1
1910	2,773	10.0	618	2.4	3,391	6.3
1911	2,092	6.9	379	1.3	2,471	4.2
1912	2,270	7.3	381	1.3	2,651	4.4
1913	2,438	7.5	372	1.2	2,810	4.4
1914	2,071	6.1	364	1.1	2,435	3.7
1915	2,189	6.3	409	1.3	2,598	3.9
1916	2,676	7.3	527	1.5	3,203	4.5
1917	3,234	8.4	790	2.2	4,024	5.4
1907-1911	28,425	21.9	9,564	7.7	37,989	15.0
1912-1916	11,644	6.9	2,053	1.3	13,697	4.2

SUMMARY AND ESTIMATES OF ACCIDENT MORTALITY IN THE UNITED STATES, 1918 AND 1919

	Registration Area, U. S., 1917	1917	United States (Estimated) 1918*	1919*
Poisonings by Food.....	779	1,067	1,115	1,165
Other Poisonings	1,296	1,775	1,855	1,939
Conflagrations	1,157	1,585	1,656	1,731
Burns	6,829	9,355	9,776	10,216
Absorption of Deleterious Gases	3,366	4,611	4,619	5,036
Drownings	5,462	7,482	7,819	8,171
Traumatism by Firearms.....	1,730	2,370	2,477	2,589

Traumatism, Cutting and Piercing Instruments	164	225	235	246
Falls	11,088	15,189	15,873	16,587
Mines and Quarries	2,713	3,716	3,883	4,058
Machines	2,108	2,888	3,018	3,154
Railroad	8,526	11,679	12,205	12,754
Street Cars	2,259	3,095	3,234	3,540
Automobiles	6,677	9,147	9,559	9,989
Other Vehicles	2,302	3,153	3,295	3,443
Landslides and Other Crushing	520	712	744	778
Injuries by Animals	653	895	935	977
Starvation	38	52	54	56
Excessive Cold	507	694	725	758
Effects of Heat	1,063	2,689	2,810	2,937
Lightning	359	492	514	537
Electricity	654	896	936	978
Fractures	475	651	690	721
Other External Violence	4,024	5,512	5,760	6,019
All Accidents	65,649	89,930	93,987	98,179

*On the assumption that there has been no increase or decrease in the accident rates which prevailed in 1917.

MR. CRUM: The automobile question as regards public accidents, probably is today the most important. There are in this country over eight thousand fatalities from automobiles annually and that is a real serious problem because the number is increasing rapidly. The intensive effort in the safety work ought to more than offset the increase in the number of automobiles. That is an enormous problem, and the States are getting after it. Massachusetts is going to enact some drastic legislation.

Here is a little report on fatalities in the one borough of Manhattan. In one year there were 712 fatalities due to automobile accidents.

CHAIRMAN TALBERT: I want to extend the Section's sincere thanks for the time Mr. Crum has put on this work and the two wonderful papers he has presented.

DISCUSSION

DR. S. DANA HUBBARD (Division of Industrial Hygiene, New York City, N. Y.): I would like to say that we publish a weekly and monthly bulletin in which we give our figures carefully studied and carefully analyzed, and also comments by the various public officials. We also publish in this bulletin a scientific paper prepared by a publicist on some particular subject such as health. When you figure there are fifty thousand industrial establishments in New York, and that Manhattan is only twenty-five square miles, you can readily understand what it means. It is like dealing with contagious diseases, the greater the congestion the greater the danger of the diseases. For instance, I am told that 125,000 people pass out of the Equitable and Woolworth Buildings in a day. The subway in the city of New York with less than fifty miles of track, carries

pretty close to 3,000,000 people a day.

New York City is an island. On one side the river is a mile and a quarter wide, and our bay on the east side is about five miles wide. Last year a canoeing party crossed the river for a picnic. A storm came up and forty-six persons were drowned. This year we forbade any such canoeing in groups.

The same thing is true about motor boating. You may recall a fishing expedition off of Seebright, in which fifteen motor boats sank at one time with a loss of 116 lives. The Park Place disaster was a question of a cigarette. The Ireland Building fire had similar origin. When you have 50,000 industrial establishments it is impossible to be in those places all the time. A State Factory Department and an Industrial Commission can't be everywhere, and the result is, that where there is a large number of people the police power will not do the trick, and you have to educate the people by concentrated instruction.

FREDERICK S. CRUM: It was not my intention, Dr. Hubbard, to criticise Manhattan.

DR. S. DANA HUBBARD (New York City, N. Y.): That is all right. We need it and deserve it.

FREDERICK S. CRUM: If those figures were posted where they could be seen by everyone in New York, I think it would help some.

DR. S. DANA HUBBARD: We are glad to have those facts brought out and we want them made public. We appreciate where the negligence is, and I think to a large extent it is due to a lack of knowledge of the English language. I came here for the purpose of learning safety, with the idea of taking it back to the city of New York in a comprehensive report, in order to show the citizens of New York, who are contemplating a campaign on industrial health promotion and safety, just what is being done. We don't want to steal anybody's thunder or patent their devices, but we do want to know about the best methods of educating the people of New York to this work. We have forty-five inspectors who have just been appointed at a salary payroll of \$65,000, and we have a publicity payroll of \$20,000, making pretty close to \$100,000 we are spending a year to prevent accidents. Now if we are going to tax our tax payers for that money, we have to give them something for their money.

CHAIRMAN TALBERT: That concludes the papers to be presented this morning. I wish those who were in the Public Safety Section work last year at the St. Louis Congress would please raise their hands. (Only five hands were raised.)

Now you can see for yourselves how radically these assemblages change from year to year. On the other hand, if you will go to the industrial sections you will find men there who have been there for years. They are able to tell pretty accurately about how many of their members will be present next year, but in our work it is extremely difficult to get in touch with those on whose cooperation we can count, and upon whom we can rely for committee work. That condition is not due to any fault of the members, but to the fact that most of them are public officials, people who are interested from one cause or another outside of the industrial relation.

We are now in position to carry on actively our propaganda work. That is, the National Safety Council has financed us to the extent of employing a most excellent Field Secretary, Mr. Carl Smith, who will carry on this work during the coming year. Mr. Smith has had a good deal of experience in this work. During the next twelve months he will be at the service of this Section.

MR. SMITH: We have at Headquarters, two men who will coöperate with these committees. The committees appointed this year will be expected to continue their work through correspondence as far as possible. The Chairmen of those committees will communicate directly with this Section and with the Chicago office. The mailing of questionnaires or circulars of information, or the printing of reports, will be done by the Chicago Office. In other words, as far as possible the headquarters staff and field staff will take the detail work from these committees. We want the committees however, to outline what is to be done, and then entrust to us the work of carrying out the details.

COMMITTEES

CHAIRMAN TALBERT: I am going to ask the chairmen of committees to furnish a list of all members selected by them. It was agreed upon at our first meeting that two or three of the chairmen of this year's committees should continue through the next year. Through the assistance of the National Safety Council we are now in position to do some real work, and these men should be allowed to continue their work under these advantageous conditions. With that understanding Mr. Crum has been asked to continue on the Committee on Statistics, and I believe you will agree with me that that is a good appointment and should be continued. Mr. DeArmand has been reappointed as Chairman of the Committee on Publicity. I am asking him to select such men as he thinks will be of most service to him, but I am going to suggest that Mr. Morley would be a very valuable man on that committee.

MR. DEARMAND: I have selected the following members to work with me on the Publicity Committee:

R. B. Morley, Ontario Safety League, Toronto, Can.

W. N. Fitch, B. F. Goodrich Co., Akron, Ohio.

Clyde R. Miller, Hicox Bldg., Cleveland, Ohio.

Marshall Dana, Portland Oregon Journal.

CHAIRMAN TALBERT: Next we have the Committee on Pedestrian Hazards of which Mr. H. W. Mowery was chairman.

We have a Committee on Elevators of which Mr. Dana Webster was Chairman, but Mr. Webster suggests that someone else be appointed as Chairman for the coming year, bearing in mind that he will act as a member of the committee.

MR. WEBSTER: I would suggest the name of Mr. Geo. W. Greenleaf as Chairman of the Committee on Elevators.

CHAIRMAN TALBERT: Then we have the Committee on Education. I would like Dr. Payne to say a word on that. Last year we appointed Dr. George Platt Knox who is an associate of Dr. Payne's in St. Louis, as Chairman of that Committee. While I have the highest personal regard

for Dr. Knox, it seems to be the logical thing for Dr. Payne to take that committee for this Section. However I would like to have an expression from some of the other delegates from St. Louis.

MR. JOSSE: Dr. Knox was very unfortunate in having a rather severe accident which kept him from attending the meetings of the Executive Board for three months. I think Dr. Payne is the logical man for the committee.

DR. PAYNE: Dr. Knox is probably as much interested in public safety work as any man I know of in the country, and we don't want to lose him to that movement. I would be perfectly happy to work with him on the committee, and I would suggest if possible, that we hold that matter over until you and I and Dr. Knox can get together in St. Louis and talk it over.

CHAIRMAN TALBERT: It happens that all three of us are from St. Louis, so if the members here will permit me, I will consult with the two gentlemen after we return to St. Louis, and we will arrange for the chairmanship of that committee, bearing in mind that it will be either Dr. Knox or Dr. Payne.

MR. CRUM: I move that Mr. Talbert be authorized to talk this matter over with the two gentlemen in St. Louis, and there select the chairman for the Committee on Education.

(Motion seconded by Mr. Hodson, and unanimously adopted.)

MR. CRUM: Is there any By-Law or Rule governing the Section as to the size of committees, and what has been the practice in the past in that respect?

CHAIRMAN TALBERT: The idea has been to confine the committee to as small a size as you can and still get good results. So far as getting information is concerned, I want you to follow your own judgment. You can feel perfectly at liberty to circularize men in various towns to act as committeemen and to care for that town. You are authorized, if you desire, to ask any man in any town to act as your representative or your committeeman for that particular city, and to furnish you such information as you want.

A. W. WHITNEY (National Workmen's Compensation Service): I think the idea of allowing the various chairmen to select as large a committee as they desire, is a good one, because public safety work is a little different, in that it reaches out and strikes all cities, and you have to create the machinery for getting hold of them.

CHAIRMAN TALBERT: We still have the Traffic Committee to deal with. I made the suggestion that the Traffic Committee be sub-divided, and that one section be made to cover signs and signals. It developed that there were three different characters of signs and signals as controlling traffic, that, by the officer at his station in the highway; signs adjacent to the highways, and signs on cars. I appoint Mr. Harry P. Coffin of Portland, Ore., and who is a member of the Public Safety Commission of that State, as Chairman of the Traffic Committee. He has taken a deep interest in this matter, and has made a thorough study of it. In addition I appoint on the Traffic Committee Lieut. Lewis of Portland, Ore., who is in charge of the traffic work in Portland, and who I understand is in direct com-

munication with the entire Coast situation; also Inspector H. May of Cleveland, who has traveled rather extensively under the auspices of the Cleveland Chamber of Commerce, studying the traffic situation.

Before we adjourn I want Mr. R. B. Morley, General Manager of the Ontario Safety League, of Toronto, Canada, to say a few words to us. I am going to ask him to prepare for us as a part of next year's program, a resume of the Canadian situation.

ONTARIO SAFETY LEAGUE

MR. MORLEY: Nearly six years ago the Ontario Safety League was created, largely because of the reports received by the Ontario Railway and Municipal Board dealing with electric railway accidents throughout the Province. The original intention was that we would deal with traffic accidents only. About three months after we started our campaign in 1914, we came to the conclusion that traffic accidents were only a small portion of the work, and that we had to extend our activities into the industrial field. We have used bulletins, pictures, buttons, blotters and practically all the approved methods of publicity. That is to say, that nearly everything we have done has been done in some form or other by someone else.

Our organization is represented throughout the Province. We have an excellent Executive Committee, composed of men who take a real interest in the work. We have devoted a large portion of our time to the education of the children through various channels of publicity. We have lately created a new organization to be known as the Canadian Safety League, by which we intend to encourage the formation of Provincial Leagues in the other provinces, leagues similar to the Ontario Safety League. We are now, through the Canadian National League headquarters, in communication with five of the other provinces, and I believe at least two will line up and form provincial leagues before 1920. We expect to work out some sort of a proposition for affiliation with the National Safety Council. If there is anything at all that I can do to help things so far as any of your committees go, I will be only too glad to do it.

There is one thought I want to leave with the members of the committee, namely that as a source of funds, you cannot beat public safety work. Nearly ninety per cent of the people who have contributed to our work in Canada have done so through a succession of years, largely on account of Public Safety work. Public Safety is the big end of it and is really the tent under which all the others will ultimately come.

CHAIRMAN TALBERT: The other day I asked Mr. Hodson of E. St. Louis, Ill., to present to us a resume of the conditions under which his Boy Scout was designated to come to this convention. I want to express my appreciation to him for the help he has been, and the gentlemanliness and manliness in which he has carried out those things left for him to do. I am going to ask Carl to stand so that we can all get a look at him.

(Carl E. Wiemken, Boy Scout from E. St. Louis, Ill., stands up and is applauded.)

DR. HUBBARD: I move that the Public Safety Section of the National Safety Council thank E. St. Louis and its representative for their work.

and that we extend to E. St. Louis and their Boy Scouts the thanks of this Section for the work they have done in sending this young man, and that we thank Carl Wiemken of Troop 9, for coming here.

(Motion duly seconded and unanimously adopted.)

HOMER J. HODSON (E. St. Louis, Ill.): I have made a short report showing how this Boy Scout was selected, and this report will be put in the record.

REPORT ON SELECTION OF BOY SCOUT DELEGATES TO NATIONAL CONGRESS

Each troop in East St. Louis, Illinois, was asked to submit the name of a Scout who had successfully passed an examination in his individual Troop and had proven to be the best speaker on the value of scouting and safety. The scout chosen from each Troop then appeared before the Court of Honor (of which I am a member), which selected the best scout who could deliver the best five-minute talk on scouting and safety. The reward was a trip to the National Safety Congress, with all expenses paid.

I think that one of the greatest things which we could do for the Scout movement, with regard to its safety work, would be to suggest to all local Boy Scout Councils that they put on this same competition next year and that the reward for the winner shall be a trip to the Annual Safety Congress. It might be well, and I think it would be an ideal movement, for the National Safety Council to establish a Boy Scout Section.

You will recall that the Council was instrumental in arranging with the Boy Scouts of America to establish a Merit Badge Examination in Safety First. The questions which a Scout must answer before he is entitled to a Safety First Merit Badge are as follows:

1. State four or more dangerous conditions in the average home and indicate what steps should be taken to correct these conditions.
2. Produce satisfactory evidence that he is personally responsible for the application of at least two constructive Safety First principles in his home town.
3. Name the most serious violation of public safety principles which has come under his observation and produce satisfactory evidence that he has done all within his power to correct the same.
4. State in writing at least six of the most important regulations covering street safety to meet the conditions of the neighborhood in which he lives.
5. State in writing at least six of the most important regulations covering street safety to meet the conditions of the school he last attended.
6. Submit in writing an outline of his own plan for a school fire drill, and explain the method of properly carrying it into effect.
7. State in writing at least six violations of Safety First principles which are responsible for accidents in connection with railroads.
8. Stand a satisfactory examination, showing a knowledge of the importance of the Safety-first Movement, and the most important principles it involves, and satisfactorily demonstrate his ability to assume leadership in case of a fire, panic or other disaster.

Surely after a scout has successfully passed such an examination as that given above, he would be a great booster for the Safety-first Movement, and if it were possible to have a delegation of Boy Scouts at the next

Annual Conference, they would go home so enthusiastic for safety work that it would be a great help in getting all of the Scouts to cooperate in this valuable movement.

I have a promise that this idea of sending a Scout to the Congress will be given wide publicity by the National Headquarters of Boy Scouts of America in their weekly magazine, which reaches every Troop in the United States, numbering, I believe, about 450.

I do not believe that there is any one in this audience who is not interested in the Boy Scout movement, and especially to the part the Scout plays in the Safety-first work.

As I explained to Mr. Barclay, after his valuable paper at our session yesterday morning, I would be very glad indeed to explain this idea, which is suggested to all the Boy Scout organizations throughout the United States.

Respectfully submitted,

Homer J. Hodson.

Safety Engineer, E. St. Louis Ry. Co., E. St. Louis, Ill.

INSPECTOR MAY: There is one thought I would like to send back to the various communities represented here today. It seems to me that in many cities the aim is to move traffic quickly. Every man here should go back to his community and advocate the slogan, "Move it safely".

CHAIRMAN TALBERT: The question has been asked as to whether the Chairman of this section should appoint the sub-committees of the Traffic Committee. I believe it would be better for Mr. Coffin to appoint his own sub-committees.

LIEUT. LEWIS: I would like to get a list of the members on that committee for use at the National Traffic Officers Convention. They are going to appoint a committee for the nationalization of traffic laws themselves, and I would like to have that list with me.

CHAIRMAN TALBERT: We are not trying to assume to ourselves the right to say what these things shall be. We want to cooperate and offer this Association's machinery for doing that. You will express to them our attitude and tell them that what we want to do is to cooperate. If they will appoint a committee to work with us we will be very glad to meet them. We will ask you as a member of this traffic committee to take that up in detail and keep us fully posted in regard to the situation. Is there anything further to come before the meeting at the present time?

CARL E. WIEMKEN (Boy Scouts of America, E. St. Louis, Ill.): Mr. Crum quoted statistics showing that about seventy-five per cent of all accidents involved the male population. The Boy Scouts have a merit badge system which teaches them "Safety First", and if you gentlemen, when you go back to your respective communities, will look up the Boy Scouts and interest yourself in their organizations, I think you will be able to reduce the accidents to the male population through the Boy Scouts. I think you will find out things you never knew before if you will just put yourself in a place where you can help the Boy Scouts.

CHAIRMAN TALBERT: If there is nothing further, this meeting will stand adjourned to meet next year.

Adjournment.

Public Utilities Section

October 3 and 4, 1919

C. E. PAIGE, Chairman

Manager, Malden and Melrose Gas Light Company, Malden, Mass.

WILLS MACLACHLAN, Vice-President

Electrical Engineer, Consultant Employees' Relations, Toronto, Canada

SAMUEL H. REID, Secretary

Bureau of Safety, Chicago

FRIDAY MORNING SESSION

CHAIRMAN PAIGE: The meeting is scheduled for 9:30 and, although all the delegates have not come in yet, I think we have enough here to listen to the report of the Chairman.

REPORT OF CHAIRMAN

This section has before it possibilities that were but vaguely appreciated at the time of its inception.

More and more we are brought to realize that *business*, large business and small business, has given up Safety First as a fad, but has taken it up as a practical necessity.

It has now become so intimately related to operation, both in production and distribution, that many companies have well and carefully planned departmental organizations to work coöperatively with the other branches of the enterprise.

But the smaller companies, who are not in position to have definite organizations to work out this matter, must and are giving it attention. They may not have a corps of inspectors, or "safety staff." They must look to the National Safety Council for the highly-specialized knowledge which their particular problems require.

This section must function as a clearing house for ideas and preventive equipment, for the handling of accident prevention and for methods of dealing with accidents peculiar to public utilities.

The key-note of this convention is struck by the phrase—Employees' Relations.

Its various phases have formed the subject of many discussions here, formal and informal. Utilities are not unfamiliar with the term. Public relations have been an important feature of our operations, and it is but a step to private or better named employees' relations.

No matter what a company may believe with regard to the merits of various theories in the matter, we have one point on which we must all agree.

Accident prevention interest can not come from the top down, it must permeate the whole structure, bottom and top, and to this extent all must recognize that satisfactory work can be accomplished only by developing a relationship which acknowledges unreservedly that this effort is indeed for mutual benefit. There are many things which are closely related to this matter. They go into the methods of employment, questions of physical examination, vocational differentiation and questions of company policy with regard to protecting employees' interests.

All these things are so closely related to our work that they indeed are a part of it.

If these subjects are to be worked out as part of the program of this section we must prepare ourselves.

If this Section is to be considered a valuable asset to the National Safety Council and to the industries we represent, we must go to work.

At times like this we find no difficulty in getting up enthusiasm and making plans. Plans do not mean much if they are not executed. By all means let us have our plans, but when you have returned to your everyday occupations, and are expected to do something for the Section as an officer, or a member of a committee, or as an individual, recall the enthusiasm you now feel and make your effort count.

The various committee reports will give you information as to the status of the section, past and present.

The program is before you. Let us make the most of it, and let every man here leave with a sense of obligation to the Section, and remember his duty until we meet again.

We will now have the report of the Secretary.

SECRETARY'S REPORT

The secretary was not privileged to attend any of the meetings of the Public Utilities Section during the year and his report will therefore be brief.

According to the best information available, 25 member companies canceled their membership during the year and 13 new ones were added, resulting in a net loss of 12. The total membership at the time of this report is 224.

It is significant that most of those who cancelled are small companies, and some are isolated from the great center of population and Council activities and it is evident that they withdrew their memberships because of a feeling that they were not getting the worth of their money.

The service rendered by the National Safety Council is largely general and the need of members of the Utilities Section, particularly the small companies, is special service designed so far as possible to meet local and individual problems. In view of this fact and the obvious necessity for a close study of the problems of member companies, the following recommendations are submitted:

(1) The adoptions of a prearranged policy governing the activity of the Public Utilities Section during the coming year and strict adherence to that policy..

(2) That more meetings be held and a special study be made of the needs of the member companies.

(3) That efforts be made to make this section of the National Safety body of, by, and for its members.

(4) That special attention be given to the smaller companies, particularly those far removed from the center of activities of the National Safety Council and the local councils of the larger cities.

(5) That all helpful information gathered from time to time be promptly distributed to the members.

(6) That more attention be given to the gas, ice, and water interests, and that these interests be given a place on the programs of the Annual Congresses.

(The report was accepted and filed.)

MR. HERMANN SPOEHRER (Union Electric Light & Power Co., St. Louis): I would like to inquire why some of the larger companies have withdrawn their membership.

SECRETARY REID: In each instance, the company withdrawing stated the reasons and if the members want to take the time to go over them, I shall be glad to do so.

MR. SPOEHRER: I would like to say that I imagine resignations of some of the smaller ones are due to consolidations, but I can hardly conceive of such a large company as the Newark, N. J., Company withdrawing their membership.

MR. H. A. JOHNSON (Omaha Gas Company, Omaha, Neb.): Some of the smaller companies gave reasons, but as for the Newark Company, I have this question up with their main office and they plan to take it up again. Does that answer the question, Mr. Spoehrer?

MR. SPOEHRER: Yes, sir.

CHAIRMAN PAIGE: Mr. Rosseland of the headquarters staff is here and as his time is limited, he has asked for the privilege of speaking at this time.

MR. ROSSELAND: I want to ask for some help and suggestions. The first proposition is to urge that members be a little more free in sending in bulletin material. Send in suggestions for bulletins. I don't know whether you all appreciate it or not, but it is difficult to even attempt to cover adequately the public utilities field and when, as in the case of the Council, we are entirely dependent upon the membership for suggestions and for material you may realize how important your part is in the work. Please send us bulletin material, pictures if possible, if not, simply a clear, concise statement of what you think should be in the bulletin. If it is impracticable to send a picture, please tell us what you think the picture should contain, then possibly we can arrange through some of the other members to secure the pictures.

Then I want to ask that you consider whether you wish the Staff to work with such of your officers as you may select in the preparation of a Safe Practices pamphlet. Other sections have prepared pamphlets

during the year and if you decide that you want one, and will appoint officers to work with the Council's staff in the preparation of the pamphlet, you shall have it. I also wish to refer to the use of the Council's Information Bureau. You are probably rather tired of hearing us tell how much information we have in our files. We have a lot of it. It is in the form of reports and letters, but we feel, keenly, that the information is of no value in the files. We know from conversation with members who come into the Council Headquarters and through correspondence, that there are many subjects upon which we have information that members desire to have. What can we do to encourage the use of the Information Bureau? —

I should like very much, if your Chairman will permit, to have some discussion of the several points that I have brought up. I don't want to delay you, but I want you to feel that the Council is yours.

MR. C. E. MORRISON (Utilities Mutual Insurance Company, New York): The subject of bulletins is mentioned. I think possibly there has been a little feeling in this section that some of the information submitted to the Council has not been accepted and recognition has not been placed upon the bulletin and it has not been shown that the information came from the Public Utilities Section. We are very glad to cooperate and I know those who have no bulletins on hand are more than anxious to get such information through the Council. I don't know whether we have assumed that we have a right to more space than we probably are entitled to, but that matter ought to be cleared up so we won't be laboring under a misapprehension.

MR. ROSSELAND: The Public Utilities section has received during the past year, without exception, one special bulletin each week. Inasmuch as this section includes several industries, we have tried to divide the subjects of the bulletins so as to give at least three of them something during the year, that is, the gas plants, the electric light plants and the telephone and telegraph companies. So much for that. We are constantly at some pains to maintain the sectional bulletin service so that it will cover the specific hazards of the industry that we are trying to serve. I can't speak, of course, for the years prior to my connection with the staff of the Council but since that time, much of the material that has been sent in for sectional bulletins has been very general, and really not suitable for sectional bulletins which should cover a specific hazard peculiar to the industry. Please understand, however, that material that is not used immediately is not lost, it may not be desirable or practicable to place it in the general bulletin service immediately because of other material possibly already printed.

As to crediting the member companies that send in material, I know personally of instances where credit was not given where it should have been. That again is another illustration of human element, men working under pressure, and trying to do the best that they can. I know of two companies each of which provided twelve pictures but they asked that their names be not shown on the bulletins. Does that answer your question?

MR. MORRISON: Yes, sir.

MR. SPOEHRER: Do the suggestions come through the officers of the section or are they sent to the Council headquarters for approval?

MR. ROSSELAND: That is a question your officers must decide. It makes no difference to us unless it is something that requires immediate attention, in which case we should like to have them sent to the Council and copy sent to sectional officers. If the sectional officers are ready and willing to care for such matters as may be brought to them by correspondence, we prefer to have them do so, but remember, we are on the job to try to relieve them of as much of the detail work as we can.

MR. F. W. FISHER (Rochester Railway & Light Co., Rochester, N. Y.): I would like to urge a little better coöperation on the part of the gentlemen here and the member companies in sending in bulletins. I have been somewhat responsible for helping collect them and it is very discouraging to write a lot of letters to your friends and acquaintances and get promises and have them stop with that. If we want bulletins, we all must get into the work or see to it that somebody has the time and means and money to make a special study of it and work up new bulletins. There is plenty of material that has been used and it isn't the easiest thing in the world to re-hash it and work it up to make it look like new so I urge you to coöperate next year to do all you can.

MR. ROSSELAND: I want to second Mr. Fisher's remarks. He was chairman of the committee having the bulletins in charge. I know how discouraging it is not to get material from Bill and Jack who are good friends, upon whom you depended when you accepted the office. There is no secret about safety bulletins. I don't believe that there is a single member of this section who couldn't provide at least six bulletins and the photographs to illustrate them, each year.

CHAIRMAN PAIGE: Has anybody anything further to add to this discussion? If not, we will proceed to the regular order of business.

REPORT OF THE MEMBERSHIP COMMITTEE

There are at present a total of 210 companies in the Public Utilities Section. This includes 44 companies who are also operating electric railways and are therefore counted in the Electric Railway Section as well as in the Public Utilities Section.

According to the 1918 report of this committee there were 198 members, so it appears that there has been an increase in membership of 12 new members during the past year.

At the request of this committee a letter enclosing a folder explaining the activities of the National Safety Council was mailed to each company member of the Iowa District Gas Association by their Secretary, Mr. H. R. Sterrett, of Des Moines, Iowa. This letter was written on their stationery and heartily endorsed our organization. Only one new member was obtained by this effort, and I believe it shows that it is very difficult to obtain members through correspondence.

As this Association grows and adds Field Secretaries, I think great results could be obtained by having a representative of the National

Safety Council attend the large annual conventions of the American Gas Association and similar societies, at which time short talks could be given and membership booths established.

The Membership Committee wishes to express its appreciation of the hearty coöperation of the Headquarters of the National Safety Council.

The Membership Committee, H. A. Johnson, Chairman.

(The report was accepted and filed.)

CHAIRMAN PAIGE: The next is the Program Committee, Mr. John Bailey of Philadelphia, Chairman.

REPORT OF PROGRAM COMMITTEE

MR. JOHN BAILEY (Bell Telephone Company of Pennsylvania, Philadelphia): The Program Committee has no special report to make. Its duties, I believe, were finished when they presented the program for this meeting. When I was elected Chairman of this Committee I supposed there would be other members of the committee but I was surprised to find that the Chairman was a whole committee. I want to take this occasion to thank the Chairman of the other committees for the assistance they rendered me in preparing the program. I would like also to make the suggestion to the Section that I think it would be well in the appointment of a Program Committee if there would be other members named, selecting those members from the various utility bodies that are members of the section in order that you may be able to get good representative selections for people to present papers. It is pretty hard for a telephone man or electric light man or gas man to be conversant with the proper people and the proper subjects for all the various utilities and I think it would very materially aid my successor in selecting a program for the coming year.

CHAIRMAN PAIGE: You have heard Mr. Bailey's report and I am sure the logic of his suggestion will appeal to you.

MR. W. L. BRUCE (Westchester Lighting Co., Mt. Vernon, New York): I move you, Mr. Chairman, that the report be accepted and filed and as a suggestion, I would offer that at the next meeting of the Council next year, the Program Committee arrange to have on possibly the second day, as that will not interfere with our arrangement of program, a get-together dinner, as this seems to be the arrangement here that different sections have their meetings and informal gatherings and I think it would be a good idea to get something among ourselves at some specified evening. I offer the suggestion for the next Program Committee.

(Motion seconded and carried.)

CHAIRMAN PAIGE: The next is the Safe Practices Committee, Mr. F. W. Fisher, Rochester.

REPORT OF SAFE PRACTICES COMMITTEE

MR. F. W. FISHER: The Safe Practices Committee collected several hundred bulletins, the majority of which were sent on to the Council and most of them were used. In my remarks a few minutes ago, I covered practically all that the Committee has to report. I especially

urge that in coming here, information on what we call "stunts", "short cuts", unsafe tools or safe methods which are not standard and not on the market, information on those things be sent in. They have been particularly valuable in our own Company and I feel that they will be equally valuable in other companies. The work on preparation of special Safe Practices pamphlets has been held in abeyance pending some action of this body.

(The report was accepted and filed.)

MR. J. B. DOUGLASS Mr. Chairman, it seems to me it would be interesting to hear something of the relation between the work of our Safe Practices Committee and the work of the individual or department of the home office which has to do with safe practices. It seems to me we should get a little closer together there. Speaking entirely without reference to this Section but in the attitude of the Executive Committee of the Council, it seems to me that the Safe Practices pamphlets can be better handled by the home office. I have never known any good results to be had from a Safe Practices pamphlet put out by the Safe Practices Committee. In fact, I don't know of a safe practice committee which is putting out any pamphlets. It seems to me that the relations of our Safe Practices Committee should be more clearly defined. Of course I think that the question of whether we haven't been assuming something that we shouldn't assume is embodied there. I don't know but that the retiring chairman feels the same way.

MR. F. W. FISHER: A year or two ago I inquired of the home office what the practices of the Safe Practices Committee were and the information was given me that the work was limited almost entirely to collection of bulletin material, and I may say that is all the committee has tried to do this year.

MR. J. B. DOUGLAS: Then, Mr. Chairman, may I ask would it not be well to change the name of our Committee to Bulletin Committee as it used to be known as it seems to me that is expressive and to the point. It doesn't comprehend anything that we are not responsible for.

MR. ROSSELAND: If I may be permitted to say so, I think that would be highly advisable. The fact of the matter is that the securing and preparation of the bulletins is enough for one committee to handle as it is. In so far as the headquarters is concerned, if the membership decide that they wish one or more safe practices pamphlets and will so indicate, the staff is prepared to assign a member, one of its engineers, to work with an individual or a committee appointed by the section in the preparation of a safe practices pamphlet.

MR. F. W. FISHER: I think the record will show that we have already made recommendations to the staff for Safe Practices pamphlets. As retiring Chairman of the Safe Practices Committee, I would like to make a recommendation that we abolish that committee and substitute in its stead a Bulletin Committee, and that the former recommendation relative to preparation of Safe Practices pamphlets on our industry by the Staff be renewed. I make that as a motion.

(Motion seconded and carried.)

CHAIRMAN PAIGE: The next order of business is the appointment of the Nominating Committee. On that committee I have appointed Mr. F. W. Fisher, Chairman, Mr. John Bailey, and Mr. Charles B. Scott. This committee is to report tomorrow morning and should get together in the meantime.

CHAIRMAN PAIGE: We will now proceed with the reading of papers. The first paper is on the subject of "Preventing Accidents in Gas Plants," by Mr. J. F. Conner.

MR. J. F. CONNER: I feel that I must make an explanation in regard to the brevity with which I have treated this important subject. The fact is that had I gone into it in detail it would have consumed more time than that at my disposal for its presentation, so I have therefore taken it up in a general manner hoping that the detail part of it would come out in the discussion that would follow.

PREVENTING ACCIDENTS IN GAS PLANTS

J. F. CONNER, SAFETY SUPERVISOR, THE UNITED GAS IMPROVEMENT
COMPANY, PHILADELPHIA, PA.

In view of the fact that during the past several years all phases of the accident prevention problems have been broadly and ably discussed by men and women who, in serious interest, have given much of their time and thought to the questions involved, there appears to be left little or no opening for further amplification, and in addressing you on the subject "Preventing Accidents in Gas Plants" I fear that my remarks may not carry with them any new or constructive suggestions.

The title may lead persons unacquainted with the operation of gas plants to assume that employment in such plants is an extra hazardous occupation, fraught with unusual danger. Let me at this point make it clear that with few exceptions, the accident hazards met in gas plants do not materially differ from those found in other industries where mechanical and construction operations are the rule.

My conclusion in this respect is based on experience gained from a close acquaintance with such operations, receiving reports of accidents and investigating their causes, and from making accident hazard inspections of many gas plants.

HAZARDS PECULIAR TO THE INDUSTRY

The industry has, of course, inherent hazards. There are certain zones in gas works where in the course of operation pockets of gas may accumulate and, with the admixture of air, serious explosive hazards may form. Precautions should be taken against such conditions arising. The ventilation, and the lighting system of such zones are questions for consideration. Such places should be as well ventilated as conditions will permit. In the lighting system, approved types of keyless socket, vapor proof globe electric lamps with remote switch controls should be used, to guard against the possibility of the gaseous atmosphere being fired by an electric arc. Warning signs of size sufficient to attract attention cau-

tioning against smoking and the carrying of naked flames in such zones, should be posted in conspicuous places.

Like precautions should also be taken to guard against dust explosions in coal crusher rooms and pits where the air may be heavily charged, especially while the crushers are in operation, with minute particles of carbon which may be ignited and exploded by contact with an exposed flame. Dust explosions, while infrequent in gas plants, have been known to occur frequently in other industries with disastrous results.

It may be unnecessary to state that all warning signs should be kept in clear, legible condition if any benefit is to be derived from their posting. The writer has found, in the course of inspections, instances of lettering on painted wooden signs having become illegible from exposure to weather, and enamelled metal signs covered by accretions of smut and dust.

Emergency conditions may arise which will require working against live gas. In such instances, the workman should be protected by a suitable type of respirator. The same precaution should be taken when a workman is required to enter any gas-charged atmosphere and in every instance he should be under the clear observation of a person outside the danger zone, who should be prepared to render immediate assistance. Oil and other tanks in which gases are present should, where conditions will permit, be first purged by steam and well ventilated before entrance is made to such enclosure. Life lines can in such work be used to advantage.

Generally speaking, gas plants are usually well guarded mechanically. Occasionally, however, accidents occur on machinery due to guards being temporarily removed during repairs and failure to replace guards before putting the machines in operation again, or possibly to an exposure being considered too remote to warrant guarding.

A review of cases reported shows that the causes responsible for the greater number of accidents are due to the simple hazards found in all industrial establishments such as tripping, falling, slipping, and lifting, protruding nails, to the use of defective hand tools, ladders, scaffolds and makeshift supports that give insecure footing, and other like minor hazards, and to disregard of instructions to wear goggles when engaged in work in which the eyes are exposed to flying particles or splashing liquors.

The safeguarding of machinery and the installation of other mechanical devices for the prevention of accidents is unquestionably a necessary measure in any well-ordered plant, but in many cases the guards cannot be made absolutely fool-proof, so that in the final analysis, the greater reliance for preventing accidents must be placed on the human agency.

GREATER EFFORT MUST BE MADE TO EDUCATE WORKMEN

If we are to continue to look forward to a reduction in the accident frequency, greater efforts must be made to educate the workman to know the dangers that beset him, and others, from carelessness, thoughtlessness, and inattention on his part, and to arouse and maintain the accident prevention spirit in him.

How we shall best reach the workmen by educational propaganda is a

question of personal opinion. Reasoning with the men collectively is usually attended by good results. In obdurate cases, however, resort to individual approach brings the best results. We should not, however, be too hasty in censure of the workman for apparent indifference to safety. He possibly may be influenced by environment and be reflecting the attitude of his superiors to this important question. The problem, to my reasoning, should first be brought convincingly to the attention of the man higher up, the man directly in charge of the operation. If he meets it, as he should, in a spirit of serious interest and by precept and example sets the standard for his subordinates, lets it be known that he is keenly alive to any failure or disinterestedness on their part to shoulder their duty, the indifference, if any, of the foremen and sub-foremen will quickly vanish and those in positions of responsibility will, figuratively speaking, be standing on their toes and showing greater activity toward preventing accidents. The interest they show is bound to be reflected in the workmen and with the environment of good housekeeping, a place for everything and everything in its place, which must of necessity be part of the program, there will come a subconscious awakening of the prevention spirit in the workmen and that is the dominating factor in preventing accidents.

The company with which I am connected is one of the pioneers in the first aid and prevention field. Its activity in this regard dates back some fifteen years. The education of its employees in accident prevention has been carried on by means of safety rallies including motion pictures, shop meetings including lantern slides, a house organ under the title of "Safety News", the use of bulletins, buttons and other measures that tend to instill, attract, and maintain an interest in accident prevention and in holding down the accident occurrences.

Team work as outlined means coöperation. When the force of coöperation is behind the punch for safety, the fight for accident prevention is soon won.

MR. J. F. CONNER: It has been my experience time and time again that the safety engineer or supervising inspector in going through a plant greets the superintendent or manager and his presence is accepted more as a matter of fact, something that they have to bear with and their attitude toward safety is not such as would reflect on their workmen and I believe, as I have stated in my paper, that if we are to get the results from the safety movement, our efforts must first be directed towards the men above and bring them to a realization of what our work consists and get them to fall in line with us.

CHAIRMAN PAIGE: Mr. Conner has given us a real contribution. Before opening the discussion, I wish to announce that Mr. Scott has given me an adequate reason for not serving on the Nominating Committee and the name of Mr. H. A. Johnson of Omaha is substituted. The discussion on Mr. Conner's subject will be taken up by Mr. A. O. Mitchell.

DISCUSSION

MR. A. O. MITCHELL (Adjuster, Northern Indiana Gas and Electric Company, Hammond, Indiana): Mr. Chairman and fellow members, I

also wish to apologize for the brevity of this discussion, feeling that it was better, possibly more practical, to treat a few of the points rather than go into it in a general way.

In my discussion of Mr. Conner's paper I cannot hope to offer anything particularly original or new along the lines of accident prevention in and about gas plants, but rather to view the subject in the light of my experience, in the investigation of such accidents. These investigations with few exceptions, disclose no especially dangerous conditions, after, of course, the machinery and equipment contained therein has been protected with guards, as most of them are at this time.

The possibility of explosion brings to mind a case wherein the blast line of a water gas plant was literally blown to pieces by the ignition of gas which it contained. Investigation developed the fact that the valve from the generator was leaking and certain quantities of gas entered the blast line; when the generator was next opened the gas in the blast line was subjected to the heat of the burning coke, a terrific explosion resulting. Fortunately no one was injured, the accident taking place in the early hours of the morning when comparatively few workmen were about the premises. The remedy for blast main explosion requires that the blast valves be kept clean and in good repair and that the blast main be purged continually by a strong current of air.

ILLUMINATION AN IMPORTANT FEATURE

Illumination is an extremely important feature, not only in the plant itself, but in the yard where men are called upon to attend valves and around the coke and coal dumps where employees have regular duties at night. Good light shows up the tripping hazard if any there be due to construction or unusual maintenance about the works; it exposes the up-turned shovel, nail, fork or other tool in the passageway, thoughtlessly laid down by fellow workers.

Warning signs have a wholesome effect on accident prevention. They are handicapped somewhat in plants where a number of different nationalities are employed and where it does not seem practical to have them printed or embossed in the several languages. I have noted, however, that the foreign workman, though not being able to read our language, has learned that a sign indicates something special, usually a danger, a place not to enter, a piece of machinery or apparatus not to touch and in many instances will bring from him an inquiry as to its full meaning.

GAS PLANT ELEVATOR, A SOURCE OF ACCIDENTS

I have found the gas plant elevator an enemy of the safety inspector and a source of numerous accidents to the workmen. Many of the accidents attributed to the elevator, however, are due to the men who operate them. They persist in tying or fastening the safety gates so that they cannot function. Elevator platforms are left above or below building platform levels causing severe strains, and bumps from coke and coal buggies. Simple adjustments will usually remedy this condition. Within the past thirty days I have investigated a case wherein an elevator

chain broke inside of the stop weight, permitting the chain and weight to fall inside and on the elevator platform narrowly missing a workman who had placed a coke buggy thereon. Had this weight fallen on the workmen most likely another fatality would have been added to our gas plant records. This condition has been a difficult one to compete with. Daily inspection by the foreman is possible, but this does not always suffice—the guards and gates being tampered with as soon as the foreman's duty requires his attention elsewhere.

Disciplining employees for failure to abide by safety regulations or for tampering with guards is a matter worthy of our deepest consideration. It is a very simple matter to discharge a man, but not nearly as simple to bring another to the point of efficiency gained by experience of the man going out. Hence it would seem that our duty is to get the confidence, the respect of the trifter or meddler, to win him over to the safety side. This may require persistent effort, which perhaps may be attended by some little unpleasantness, but it is being done every day and in several instances of my own knowledge has been well worth the effort expended. These men frequently develop into our best inspectors, calling to the attention of their foreman or superintendent dangerous conditions and practices that had seemingly been overlooked. I am a firm believer in inspections made jointly by the workmen and the safety inspector. The interest the former will show is surprising, especially when he is convinced that his suggestions are being given the consideration to which they are entitled. He has in mind hazards which may not have been considered as such by the foreman or inspector and can usually tell you how Bill or Tom was cut, bumped, or bruised due to the conditions he will point out.

COMPANY OFFICIALS DISREGARD SAFETY RULES

The safety example set by a Company's officials has either an effect beneficial or detrimental upon the employee personnel. To illustrate this point, I wish to call attention to an action brought by an employee to recover for personal injury received while employed in a building where gasoline was used. Smoking was prohibited in this building; large "No Smoking" signs printed both outside and inside the building in addition to which the employees had been personally warned against smoking. Regardless of these warnings the employee caused an explosion while lighting a cigarette. In the trial of the cause he testified that it was the practice of the manager and superintendent to come into the building with a lighted cigar and that he (the employee) did not think it dangerous. In this testimony he was supported by the shop foreman and the evidence injured the Company's case to a considerable extent.

Education is of course a feature for serious consideration. The method of teaching, I believe, should differ as the conditions are different. A method that will avail in one plant may be a failure in another; hence, it falls to the lot of the individual directing the work to figure out and to observe a method that will give the best and the quickest results. Many communities offer night schools to the foreigner, which, for no other ex-

pense than the pencil and paper he uses, give him the opportunity to learn the rudiments of our American grammar, mathematics, etc. These classes invariably start out with a large attendance; the percentage completing the work or of finishing the first year, I am not in a position to state.

I would like to hear a discussion of the elevator question, one that is a serious question with me.

THE ELEVATOR QUESTION

MR. J. F. CONNER: I think there is only one answer to that question, that all elevators should be properly guarded, not only the casing of the shaft but the gate should be high enough to prevent a person leaning over the top and should extend to the floor level to prevent any material from falling into the shaft. The platform of the elevator should have fence guards, and the sides of the platform used for entrances should have gates. The top of the elevator car should have a heavy screen guard over it to prevent any material falling into the shaft from above and injuring the operator. The gates should be constructed so that they cannot be operated from the outside. They should also be arranged so that when the gate is opened, the elevator is locked at that landing. Of course the counter weights should also be guarded. The machinery overhead should have a substantial bar grating or ceiling underneath to prevent any broken parts from falling and it goes without saying that the cables should be frequently inspected. There should be adequate space left at the foot of the shaft in event of any repairs being made there to guard against the platform descending on the man at work. In fact there should be landing posts or trestles put in the bottom of the shaft if any work is being done there.

MR. A. O. MITCHELL: I wish particularly, Mr. Conner, to have you deal with the method of trifling, or prevention of trifling with the elevator gates, weights, etc.

MR. J. F. CONNER: If the ropes, chains, or cables on the elevator gates are properly housed to prevent a person from getting hold of them, that will eliminate one source of danger. If the gates are of such construction that when they are closed they are locked on the inside, that prevents any one from meddling from the outside.

CHAIRMAN PAIGE: The discussion will be closed with the announcement that those interested in elevator hazards have at their disposal Safe Practices pamphlet, No. 15.

The next paper is the "Inspection of Plants of Gas Companies," by Mr. Alvin E. Bliss.

MR. BLISS: I am in hearty accord with the previous speakers that twenty minutes is a very short time to deal with a subject so large as "Accident Prevention in Gas and Electric Companies." I have tried to touch the high spots as the previous speakers have done and after listening to those two very valuable papers, I feel, Mr. Chairman, that mine might well be dispensed with. I have dealt with mine a little more on a personal style than general.

INSPECTION OF PLANTS OF GAS COMPANIES

ALVIN E. BLISS, GENERAL SUPERINTENDENT,
CHARLES H. TENNEY AND COMPANY, BOSTON, MASS

The spirit of victory which has become so much a part of our lives since the eleventh of November last, can only be maintained by a spirit of safety and this "Spirit of Safety" must be followed by each individual in order to establish the solid foundation for the constructive element of the future.

About five years ago the companies which I represent became interested in the subjects of Inspections and Safety First and appointed me as official inspector.

At the end of my first visit to each plant I sent in this report: "Safety first is almost unknown in some of our plants so far as signs, guards, fire traps, etc. are concerned. I could not begin to relate the number of small defects which might mean tremendous loss and possibly serious accident. Belts and dangerous places should be properly guarded and signs placed conspicuously about all plants calling attention to the fact that no trespassing is allowed."

From that time on, our managers became aware of the importance of safety first and coöperated with me by explaining the merits of safety first and accident prevention to employees at each meeting of their department heads.

During the past five years the improvement has been remarkable. It is impossible for an industrial plant to be "accident-proof," but I believe that some of our companies nearly approach that mark.

There is so much to be said on my subject: "*The Inspection of Plants of Gas Companies*"—that I hardly dare get in too deeply as time will not allow it.

HAZARDS OF A GAS PLANT

A gas plant is particularly hazardous. The first item is perhaps the coal pile where some kind of accident happens almost every day. A man hauling coal in a wheelbarrow stubs his toe; gets a cinder in his eye; the coal pile slides too rapidly burying him; beyond this many companies have a high trestle or perhaps low trestle, with railroad sidings where coal passers are at work and everywhere you look is an accident hazard. Next comes the man at the retorts; under a constant and intensive heat, liable to burns of all kinds. Then we have acids, by-products, etc., of inflammable nature, not to mention asphyxiating gas. In fact, we could easily recite:

"Accidents to right of them
Accidents to left of them
Accidents all around them"

when speaking of plant employees of gas companies.

How then can you attempt to overcome the danger of accident? There is only one way—and that is by a process of education. In other words

safety first must be driven and pounded again and again into the heads of the employees.

Realizing the *human element* is the vital factor in safety first and that the human equation must be reckoned with at every turn, how should we proceed to educate the employee in regard to *his* safety?

We know that the school teacher has to go over the A B C's many hundreds of times before the pupil can begin to form words, so our foreman must keep everlastingly at the rules for Safety First. Eternal vigilance is the price of liberty and it is also the price of safety.

There is no subject with which a man is so familiar as himself, so if we could put through a systematic campaign of safety by compelling each man to put himself into accident prevention—we should go a long way toward improving conditions in an establishment or plant.

Even now, it would be interesting if each employee would take stock of himself; check up on the items of precaution which he has used since the campaign of Safety First has been in force. I believe it would be helpful information for any plant.

HINT OF SAFETY ON PAY ENVELOPES

It is the custom in one or more of our companies to have a hint of safety on the pay envelope. One that I have seen has Safety First in bold type printed on the envelope flap. Across the back of the envelope: "Did you ever stop to think—that you, yourself, are the one who should be most interested in our accident prevention work? You and your family suffer more than any one else if you are injured. **THINK FIRST—BE CAREFUL ALL THE TIME.** Let's cut out all accidents."

Another one is as follows:

If you are HURT, say so.

Report all accidents, no matter how trivial they seem.

Do not neglect small cuts.

Don't take chances.

Be Careful.

Further, we think we have obtained some results by using the safety bulletin which we try to issue each month. Many of these are actual accidents which have been photographed around the plant showing the right and wrong way of handling switches, valves, manhole covers, etc.

COPY OF SAFETY BULLETIN GIVEN EACH EMPLOYEE

A copy of the bulletin is sent to each employee with instructions to take it home. In this way, we feel that the family will become interested and by talking it over in the home, the workman is more thoroughly impressed.

This process of education is more or less unsatisfactory as many of you have proved. One of the greatest difficulties to overcome is the utter disregard of instructions. For instance: Goggles are always provided where there is danger of accident, but it is very rare that the employee uses them—his excuse being that they are a bother and he is unable to see while using them. Only a few days ago, one of our em-

ployees got a cinder in his eye. It troubled him, of course, but he thought it was too trivial to report, so kept on working. He suffered all night and the next morning went into the superintendent's office and asked him to remove it. The superintendent immediately took him in an automobile to the doctor, who, after many attempts covering a period of several hours, removed the cinder. The eye was badly inflamed which meant a great deal of pain to the employee, expense and loss of time for the company, and all this because the employee failed to obey instructions.

This clearly shows the lack of cooperation on the part of the employee by not reporting the accident. Analyzing cooperation—the first and most important thing to accomplish is the manager's interest; then the foremen; and the employees. As stated before this is often a slow process, but once the germ of Safety First is inoculated, it spreads rapidly.

Our experience has proved that another good way to get results is by the formation of a Safety Committee in each of our organizations. Right here I would call attention to the report made by a committee on accident prevention which is published in the *Proceedings of the American Gas Institute*, Vol. X, 1915. This report goes into the subject in a very exhaustive manner and is well worth the careful attention of every

RECOMMENDATIONS OF COMMITTEE ON ACCIDENT PREVENTION

manufacturing institution. It recommends the appointment of one or more employees, of whom at least one should devote a large portion of his time to the work of looking after safety details. Care should be taken in making these appointments as the men chosen should be proficient in their own work and should command the respect of their fellow workmen. Unless every man is made to see that his work is closely related to that of the other fellow, success will not follow. Each and every accident should be referred to this committee and the committee should consider all the details in connection therewith and make a report as to whether or not it was preventable, and see that conditions are remedied so that a like accident cannot occur.

It is the custom to send a copy of the report of each accident to me.

EMPLOYEES' REPORTS OF ACCIDENTS

On the back of this report is written a remedy if possible; suggestion for precaution against a similar accident; and finally, whether or not the accident was unavoidable. Some of these suggestions are very amusing, as follows:

"While about work some sand fell down the neck of one of the other employees and he, thinking it was a fellow employee who threw it, hit him over the head with his shovel.

Remedy: Employees have been warned not to get too vicious—and we do not know of any safety appliance that would have prevented this accident."

"Employee was washing the floor and he used his knee to push the

mop causing it to swell and become inflamed.

Remedy: He will be instructed to leave out the use of knee in mopping."

"Injured party was putting new pin in stoker and tried to use his finger as a drift pin. Finger was caught in the hole and slightly jammed.

Remedy: This man should not have used his finger in the manner he did and he has been cautioned and instructed not to repeat the performance."

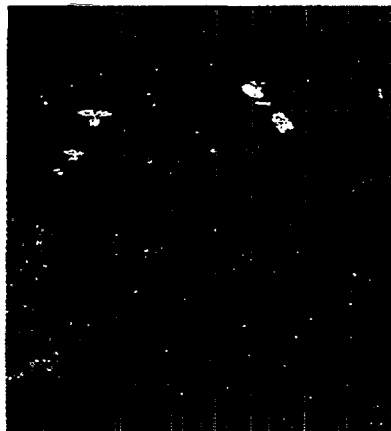
Most of the remedies are very helpful however, one of which is described as follows:

"Employee was laying 6-inch gas main and fellow employee pushed a length of pipe into place and it caught employee's forefinger on his right hand.

SAFETY BULLETIN

No. 3

June, 1919



Step ladders are furnished for work of this kind. This man, for some reason or other, preferred to take chances. Fortunately no accident resulted from this carelessness.

WHY TAKE SUCH CHANCES?

ACCIDENT PREVENTION COMMITTEE

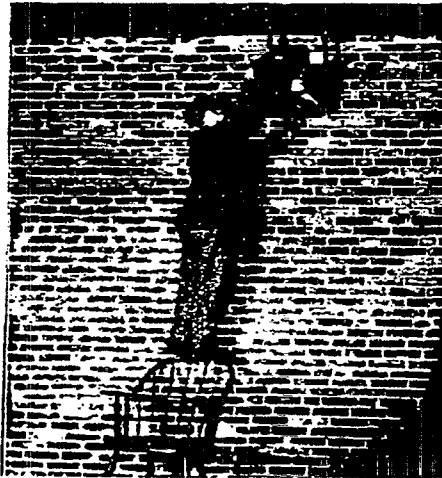
CHARLES H. TENNEY & CO.



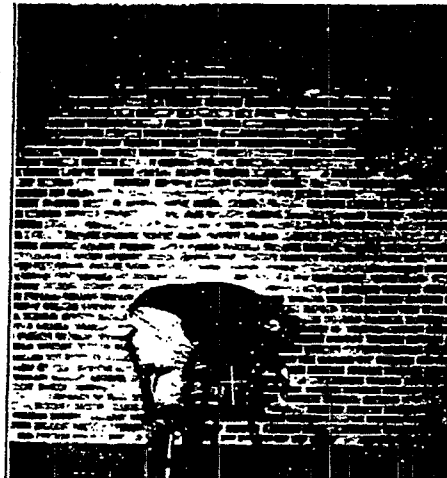
SAFETY BULLETIN

No. 7

October, 1917



This man stood up on the back of a chair placed against the wall to work on a meter—



The chair slipped out and the man was painfully injured by the fall.



If you would avoid
accidents you must

If he had used a step ladder the accident would not
have happened.

THINK SAFETY



ACCIDENT PREVENTION COMMITTEE
CHARLES H. TENNEY & CO.

Report: Cause was carelessness on the part of fellow employee together with careless handling by other man."

Employees are continually cautioned to use a perfect step-ladder, but occasionally, owing to laziness or in the hope of saving time, he will resort to any and all kinds of make-shift with the result that the accident occurs—See illustration from "Safety Bulletin," No. 7 (Reduced). Another lazy-man contrivance is shown in "Safety Bulletin," No. 3 (Reduced).

A LAZY-MAN CONTRIVANCE

Another glaring case was where a step-ladder had been utilized for some time as a means of getting into and out of a sub-basement. After attention had been called to this condition, the proper steps were provided. (See illustration on page 1108).

In one of my discussions at a convention of our companies I told them that I could write a book about the chairs, tables, ladders, benches, etc., which I had condemned in my inspection and which had been destroyed in my presence. At that time I urged each one present to condemn and destroy everything that was hazardous.

Just as a side incident, I should like to state that our medical friends are cooperating with us to the extent of inventing complete first-aid kits which are very necessary for any industrial plant if kept in a complete condition. Only recently another very valuable remedy for burns came to our attention.

HOT WAX TREATMENT

One of our employees was badly burned by receiving an electric shock on a 33,000-volt circuit. By the persistent use of the hot-wax treatment, this man is slowly recovering and my latest report is that he has been dismissed from the hospital and expects to report back to the company for very light work, the last of this month. He owes his life, however, to the fact that his fellow-employees acted promptly and intelligently, which points out the absolute necessity of always having somebody accompany a man who is working around dangerous places and back of all this, the importance of instruction regarding all kinds of first-aid work.

REQUIRES CONSTANT CARE TO PREVENT ACCIDENTS

We have proved then that it requires constant care to rid us of the menace of accidents and their followers of pain, sorrow, grief, disfigurement and despair, a combination of enemies far more insidious than those that face nations, because they lie so stealthily in wait for each individual.

I have felt obliged to be more or less personal in this paper, but I believe that these experiences, even in "testimonial form" will meet the conditions of some of our delegates.

The best slogan in the world today is—*BE A GOOD AMERICAN* and one of the best ways to be a good American is to *PREACH, TEACH, and PRACTICE "SAFETY FIRST."*

MR. J. B. DOUGLAS: Before the formal discussion of this paper takes place, I would like to make a few remarks. I have listened to Mr. Bliss'



BEFORE



AFTER

A STAIRWAY IS NOT ONLY A SAFETY MEASURE BUT IT INCREASES EFFICIENCY

paper with much interest, but there are certain points at which I am not absolutely of the same opinion. Mr. Bliss refers to a gas works as being particularly hazardous. He considers conditions around a gas works as being dangerous but I question whether many of you feel that either of those statements apply. As Chairman of the Accident Prevention Committee of the American Gas Association, I am at work on some statistics. Our committee got into action in August at which time I sent out a letter soliciting accident reports. My greatest trouble is a lack of accident reports on which to make suggestions. I have also on file in my office from a number of companies, letters stating that the first six months of 1919 did not produce an accident to report. It seems almost impossi-

ble. Now in having made an analysis of some ten thousand cases some time ago during our investigation, purely gas cases, as I recall, the percentage peculiar to the industry amounted to two or three per cent or less. In other words, the accidents we have in gas industry are pretty much the same that are met with in other industries and I have been informed that certain insurance companies which thought that accidents

ARE GAS PLANTS EXTRA HAZARDOUS?

were more or less extra hazardous, are beginning to change their viewpoint entirely. I don't know whether Mr. Fisher is in the room, but I understand he has practically no accidents in his gas works. If he isn't here, Mr. Morrison can tell you the wonderful record that the Rochester plant has. No doubt Mr. Van Doren can tell you of the small number of accidents in New York and I know many plants around the country where they go for months without any accidents. I am just stating this because I don't want those who are not familiar with gas plants to think that they are extra hazardous. Mr. Bliss has made a very helpful contribution but I don't think it should be allowed to stand without some statements on those two points. I would be interested as to whether other men from their experience, think that a gas works is extra hazardous.

CHAIRMAN PAIGE: Is Mr. Fisher in the room? Mr. Morrison, have you any thing to say?

MR. C. E. MORRISON: In a measure, Mr. Douglas is correct. There is not as great a hazard in the gas industry as a good many people are inclined to believe. I think that possibly the reason for that is that the nature of the personnel of the employees is such that it doesn't very frequently change as it does in normal industries. You have the same people year after year, particularly in the smaller plants, old trusted employees who know how to take care of themselves. One point that has not been touched upon, I think reflects the accident frequency: Is the attitude of the employer right? I don't mean the manager necessarily, but the president and perhaps the owner. I am firmly and absolutely convinced that if the employer and owner have the right attitude, the proper concept, they can instill into the employees the idea of safety which will prevent accidents. We have frequently come across very serious structural conditions which one naturally concludes would result in many accidents, and yet the record of accidents is absolutely nil. Another hazard that hasn't been touched upon is that occurring when men are digging a trench for the laying of gas mains, which I think is very important. We find very frequently that these trenches are not shored in sufficiently to protect the workmen from the dirt which may fall into the trench. The class of workmen you get there are casuals, the drifters who come in and work for a week or a month, or during the open season and then leave. To my way of thinking, much more stress should be put upon that than perhaps in the gas plant itself.

MR. V. R. HUGHES (Pacific Gas & Electric Co, San Francisco): We have about the same number of accidents in our gas department that

we have in the electric. Some of them are not quite so severe because, as you say, they don't need to fall off a pole to be injured, but the gas men will go under a house once in a while with a match or candle and blow the house to pieces. The electric man will get on a pole and short circuit something or get against a wire. Talk about your old employees, they are the hardest ones to convert that there are. The old gas men have an idea that they know how to make gas and that is all there is to it, but we have gradually got away from that and got the men to clean up a little, take up the dirt, and not sweep it into corners and under things. Our electric departments are pretty well cleaned up but our gas plants were in bad shape. There is another item which has just occurred to me, speaking of valves. I have an article in "Power", February 25, 1919, on this subject. I talked it over with Mr. Jones, Chief Engineer of the Gas Department, and he said they devote a large amount of time to the inspection of valves but very little time as to where they are going to put them, up high, in the ground, with the stem sticking out in the way, some back of a pump or back of shafting where

EXPERIENCE WITH SIGNS

they are either hard to get at or right in the way. There is also another item of signs mentioned in these papers. My experience with signs has been very poor. I went into a warehouse with the superintendent of supplies one day to put some supplies in and I asked him about the signs and he said they were no good. And yet right near us on a shaft, was a sign reading "No Smoking" and he was smoking himself. The only accident we have had, fatal accident, this year, was the case of a man crushed against a sign which read "Look Out for the Cars".

MR. G. R. RINKE (Utilities Mutual Insurance Company, New York): I haven't any statistics in my hand but I think you will find just about as many accidents in gas as in electric plants. The reason you do not have as many fatalities in gas is that there is not the electric hazard. I have been very much interested in the point raised several times about Americanization. I believe there is one point not touched on and that is that gas makers or men handling gas machines should be American-speaking people. So frequently you will find that they are Italians or other foreigners. They are naturally badly handicapped in case some unusual condition is met. Quite frequently, too, you will find that there are machines installed and in operation and the people who are operating them do not have complete instructions as to what to do or the proper procedure to go through in starting a set up. I have in mind an accident where one man was killed and two others horribly burned. The man instead of controlling the draft through the ash pit doors, endeavored to control the draft through the clinker doors; the result was gas pockets formed. There is a question as to whether they formed under the grates or in the fuel bed itself, but it was a fact that the fuel was thrown out on the men. These men had been operating the sets in that plant probably since their employment and no accident had occurred but they weren't doing it the right way. There is a little question in my mind also as to whether the manufacturers of the equipment aren't

somewhat at fault because of the fact that they do not give sufficiently definite instructions as to just what the procedure should be in operating the equipment. That question of accidents seems to show that in an organization such as you have around a gas works, you usually have more foreign-speaking people around than in an electric station. Quite a number of laborers are necessary to take care of outside work and those people seem more prone to accidents than the others. I think the electric hazard makes the electric plants really more dangerous than the gas plants.

CHAIRMAN PAIGE: The discussion on Mr. Bliss' paper will be handled by Mr. H. A. Johnson.

DISCUSSION

MR. H. A. JOHNSON (Adjuster, Omaha Gas Co., Omaha, Neb.): I have read Mr. Bliss' paper with a great deal of interest and not only has he touched on the subject of "Inspection", but referred in a general way to the prevention of accidents in the Gas Industry.

Mr. Bliss states that a gas plant is particularly hazardous, but, although one would expect that the greatest number of employee personal injuries in the Gas Industry occur at the Works or Manufacturing Department—on account of the machinery, boilers, generators, etc.,—it has been our experience that we have less accidents in this branch of the work than in others. This probably is due to the fact that the men are under a closer supervision than those men who have to work in dark basements of consumers' homes or on the street.

With very few exceptions, the hazards of the gas plant are similar to those of other industries. We have found that the best plan to reduce these hazards is by inspections at regular intervals, which work I have been doing for some time. I usually make an inspection of our plant about once every month. This inspection covers all our departments including the Commercial Office. Fire risks as well as accident hazards are noted and a report, giving location, nature of hazard—together with a recommendation to remedy it is referred to the Manager for his approval—after which the person in charge of each department is expected to take immediate action reporting back what is done in each case.

Very good results have been obtained from these inspections owing, especially, to the fact that we have the coöperation of manager and foremen, which Mr. Bliss says is the most important thing to accomplish. The foremen are especially interested in reducing these hazards because most of them are caused by poor housekeeping, and by adopting the policy of putting everything in its place immediately after completing each job, it is quite easy to eliminate several items on the report.

Owing to the responsibility placed on employers by Workmen's Compensation laws, the Company of course is quite interested in providing the necessary guards for machinery, stairways, footwalks, etc., and it is important that the Company does its duty before asking the coöperation of the employees.

I agree with Mr. Bliss that the only one way to overcome the danger of accidents is by a process of education. As Mr. Bliss says, there is no better and easier way to educate the workmen in accident hazards than through safety committees.

ORGANIZATION OF SAFETY COMMITTEES

We organized a Safety Committee in our Works last March, similar to that outlined by the Accident Prevention Committee of the American Gas Institute, and mentioned in Mr. Bliss' paper, and we have found that it pays. We also expect soon to organize them in other departments. While there hasn't been any reduction in the number of accidents over last year during the same period of time, there has been a reduction in time lost by employees on account of accidents—amounting to 25 days; and the cost of holding the Safety Committee meetings, plus compensation paid injured employees, together with medical expense, was less than that paid for accidents in the Works last year during the same period of time.

The Superintendent of Works acted as Chairman of this committee for six months and six workmen were appointed to serve on the committee with him. Each workman serves 90 days, and at the end of every 30 days two men are replaced with 2 new men and by this plan we hope soon to give every employee a chance to serve on the committee—in this way educating every person. At the expiration of his time each member is given a gold-mounted safety button which he wears with much pride.

The Committee meets every two weeks and spends about two hours time. Part of the time is spent on an inspection through the plant, after which a round-table discussion is held on working conditions in general. I have been acting as Secretary and occasionally accompany the men through the plant, and I have been surprised to find the number of important recommendations the men make. Most of the suggestions made would probably never appeal to an inspector who did not happen to see certain work being done.

This Committee does not confine its meetings to Safety, but talks about other conditions which help to reduce operating expenses so it is impossible to place a value on the work of such a committee. Each accident that occurs in the plant is discussed by the Committee and in this way considerable publicity is given on accidents, at the plant.

REPORT OF AMERICAN GAS INSTITUTE COMMITTEE

I am glad that Mr. Bliss referred to the report made in 1915 by the American Gas Institute Committee and hope that every member, if he has not already done so, will secure a copy of this report and study it. It is based on the experience of several gas companies, and covers in detail most every hazard in the Gas Industry.

In this connection I would also like to refer to some work now being done by the Accident Prevention Committee of the American Gas Association of which Mr. James B. Douglas of the United Gas Improvement

Company is Chairman. This Committee is asking for a report of all accidents in Gas Companies wherein the injured person is disabled over one shift. I think this section ought to coöperate with this Committee so that every Company can get the benefit of the other's experience.

As Mr. Bliss states, much can be said on the subject of "Gas Plant Inspections", but I should like to point out some of the things I consider most important in this kind of work. Any plant can select a man to devote a few hours each month to this work. He need not be a safety engineer nor a graduate of a technical school, but he should be a man who is not daily on the ground—as he will be more alert and notice the little things, which, left unchanged, might cause serious injuries.

INSPECTION TOUR THROUGH GAS PLANT

I recently had the pleasure of accompanying an inspector on a tour through our Gas Works, and the first place he advised going was to the top of our large gas holder, or highest point near the Works. He said he could usually tell from this point if a plant was paying much attention to safety, by the appearance of the yard, in general, and he also stated he could plainly see loose pieces of slate or other defects on roofs of buildings. I was glad to hear him say our yard was very clean, but he did notice some loose pieces of slate. We have great difficulty in preventing the last hazard owing to continued Western winds which usually find their way under the pieces of slate.

In making these inspections, I try not to be too critical, and oftentimes correct small things at time of inspection by calling the attention of the person whom I feel is responsible for the condition, and in this way I think the foremen will not be apt to consider the report too critical.

It is necessary, around a Gas Works, to have several valve pits with wooden covers, and I find it quite important frequently to inspect the cover and if it becomes cracked or rotted, recommend repairs at once. This hazard appeals to me particularly owing to the fact that while making an inspection, I stepped on a cover over a pit which was located in one corner of a holder yard, and my leg immediately went through. Fortunately, however, I was not injured. Upon close examination I found that the material had become so rotted that it was nearly like paper, but to look at it one would have thought it quite strong.

Wooden stairways, wooden passageways, or ladders exposed to the weather, should receive the most careful attention.

Some of the most common hazards around a Gas Works are oily waste on floor or work benches, clothing or other combustible material in bottom of lockers. Frequently tools are found with mushroomed heads, nails protruding from boards, and pieces of coke on runways. It is necessary to have several foot-walks around a Gas Works, and the proper guard rails should be provided, also toe-boards on sides to prevent accidents from falling objects. It is important to provide sloping tops on all lockers and small cabinets to prevent the storage of material on top of

same. Lockers may be purchased with sloping tops and it is well to so specify when ordering.

Our storeroom and distribution shop is located in a six-story building away from the plant, and there are several conditions to be watched here, such as nails protruding from boards near place where stoves and other material are uncased, and we have also had a few accidents caused by trucks running over loose nails on floor causing the head of same to become wedged in floor and injuring workmen by striking foot against point of same.

Shelves used in storing glassware and other material should have uprights to prevent material from falling; fixtures should be suspended from hooks and not nails; passageways should be kept clear.

In our storeroom we have a sprinkler system, and we have had considerable difficulty in getting our men to realize the importance of not piling material closer than 18 inches to the sprinkler heads. It is quite important to provide ample fire protection in meter repair shop such as sand pails and Tetrachloride Fire Extinguishers on account of oil fires.

DANGER FROM EXHAUST PRODUCTS OF AUTOS IN A CLOSED GARAGE

We also have our own Auto Repair Shop where we have tried to provide suitable fire protection, and I should like to mention at this time the danger of workmen being made sick by the exhaust products of autos in a closed garage, especially during the winter. Two years ago our distribution superintendent installed three or four pipe connections leading from the inside wall of the garage to the outside of the building, and in the cold weather the cars being repaired are backed up to the wall and a hose is connected from the exhaust pipe of the car to pipe in wall. This has helped us to eliminate the disagreeable and dangerous condition in the garage when the engines of two or three cars are running.

I have tried to touch only on the most common hazards of the gas industry, and hope I have covered at least a few conditions which might be new to some of the members—or at any rate renewed their importance in your minds.

Mr. A. E. BLISS: I am very glad that this matter of particular hazards of gas companies has been brought up. Our employees must report everything and I think that I am safe in saying that the serious accidents are no worse in the gas companies than in the electric, but cinders in the eye, cutting fingers, or slight accidents of that kind that do not lay the men up, are very common in the gas plants and that was what I had reference to in bringing out the large number in gas plants over electric.

CHAIRMAN PAIGE: The next paper is on "Effective Means of Focusing the Responsibility for the Prevention of Accidents upon Foremen" by Mr. J. W. Easley, Kansas City Home Telephone Company, Kansas City, Missouri.

**EFFECTIVE MEANS OF FOCUSING THE RESPONSIBILITY
FOR THE PREVENTION OF ACCIDENTS UPON FOREMEN**

J. W. EASLEY, KANSAS CITY TELEPHONE COMPANY, KANSAS CITY, MO.

A discussion of effective means of focusing the responsibility for the prevention of accidents upon foremen naturally leads to an investigation of the foreman's relative position in industry, and to the methods by which can be secured his supervision to cover prevention of accidents to the end that such supervision will be a matter of assigned routine and not optional. The problem is a constructive psychological problem; a problem to secure a realization and acceptance of responsibility.

FOREMAN THE MOST POTENT FACTOR IN ACCIDENT PREVENTION

In the organization scheme of the telephone industry the foreman, because of his functional duties is probably the most potent factor in accident prevention. To a more or less extent this is probably true in all industries, but particularly so in the telephone industry because of the necessary wide-scattering of the working units; the foreman's direction is final; his judgment conclusive; he is the controlling element relatively absolutely responsible for the efficiency of his unit and the correct performance of its duties. If properly organized the foreman and his crew are working under well-defined instructions, each operation covered by standardized specifications. To make proper progress in prevention work accident prevention must be made an integral part of the operation of the unit; safety practices and safety standards must be made part and parcel of construction specifications and construction methods—and the foreman must be brought to a realization of his responsibility in this regard—then will accident prevention receive relative consideration. Definite instructions must be issued for every operation of the crew, instructions estimated to provide for the completion of a given operation without accident, and the foreman's duties must be clearly defined to cover supervision in that direction. Output should not be a controlling factor. It should not be optional with the foreman whether a workman do this or that which may be safe or unsafe, even to hasten production. He should be specifically charged that his directions must be along the line of the fewer hazards regardless of output. As the human equation is a controlling factor in accidents, and as the mental attitude of the workman has much to do with success of prevention work, the matter of hiring and discharge should be delegated, with restrictions, to the foreman. He is in a position to judge motives and should not be hampered with workmen who are antagonistic to the safety idea. The problem of the new man on the job and his relation to accident prevention is one for the foreman's particular study. Much thought and energy have been concentrated upon improvement of method without a single new idea as to the

man on the job. The foreman should be as responsible for correct instruction of safety practices as for operating methods, and this responsibility applies particularly to the new employee. Foremen should not tolerate indifference.

Necessarily all employees should be required to inspect and test for efficiency, strength, and safety, all equipment and tools used by them. They should be instructed to do nothing contrary to their judgment with reference to their personal safety, and that when in doubt they must consult their foreman and be governed by his instructions. The foreman must be cautioned not to accept an instruction or put it into effect if in his judgment it will lead to unsafe practices. He must be encouraged to question the correctness of instructions as affecting safety. He must know that working conditions can be improved largely through his suggestions and that it is his moral obligation to make such suggestions and that such suggestions would be of benefit both to the employee and the employer. Inspection and correct instruction for use of tools and materials should be made a part of the foreman's duty. He should be made responsible for the condition of tools.

If foremen or workmen are fined, laid off or dismissed for violation of operating rules, why should they not be fined, laid off or dismissed for failure to follow safety practices if these are to be a part of the operating rules? Dismissal of employees for unsafe practices should be delegated, with restrictions, to the foreman and there should be a well-defined penalty for accidents resulting from improper supervision.

UNSAFE PRACTICES CHECKED UP TO THE FOREMAN

Safety inspectors should report failure to observe safe practices as carefully as the output inspector reports faulty output, and the same penalty should apply. Faulty output is checked up to the foreman, why not unsafe practices? In our plant we have tried the scheme of plant inspectors. They are appointed from the rank and file of the employees, to serve for a term of three months. Their reports are transmitted to our committee and are treated confidentially. The results have been very gratifying. The foremen are continually on the outlook to prevent unfavorable reports. But foremen must not be made too dependent upon inspection for improvement, as it hampers their initiative.

The economic loss resulting from an accident should be brought forcibly to the foreman's attention; the detrimental effect upon morale, the resulting confusion and tendency to uncertainty. The foreman should be required to make a detailed written report of all major accidents to members of his crew. He should be kept informed of the condition of the injured person. The foreman must know intimately the effects of the accident upon the workman and his family, really to appreciate what it means. The foreman must realize his moral obligation.

The foreman must be informed of the principles of common law as they relate to his position. He should know that an employer is bound to use ordinary care to prevent injury to an employee; that the degree of diligence varies with the character of the work and that for this reason the

degree of diligence in utilities is very high; that the employee, to recover damages must be free of continued negligence; that reasonable rules and safeguards must be formulated and adopted by the employer and that the responsibility rests upon the foreman to see that they are enforced and that any neglect on the part of the foreman in not carrying out the orders of his employer subjects the employer to full liability in case of injury to the employee, for reason of such neglect; that if the foreman is sues proper instructions and urges caution they will tend to mitigate the damages. The foreman must realize his legal obligation.

The foreman should be well-informed as to Compensation laws that may be in effect. For instance, in Missouri: he should know that compensation will not be allowed for an injury or death due to the employee's or another's willful misconduct including failure or refusal to use a safety appliance or perform a duty required by statute or failure to obey any reasonable rule adopted by the company for the safety of the employees. He should especially know that the burden of proof rests upon the employer; that it is an accepted principle in compensation that neglect on the part of a fellow workman does not prevent recovery of compensation. If a compensation law is in effect, foremen and all other persons in supervisory positions should be furnished with a copy of the law and with the notations and explanations as issued from time to time by the Commission, and they should be encouraged to discuss them at the various meetings. The foreman should be in a position to see that justice is done as relating to compensation.

The study of accidents and their causes, by the foremen, is very important. We find a very good method is to submit the circumstances and conditions leading up to an accident to each foreman for suggestions as to how the accident could have been prevented. If accidents occur the details should be given wide circulation among employees. We are employing for this work a personal letter to the employees as we question the value of the collective method—the use of the bulletin board. An effective method also of securing the coöperation of the foreman in accident prevention work is to make the discussion of accidents an important feature of the foremen's meetings. In these meetings accident prevention should be considered equally important with the discussion of other plant matters, and topics for discussion should be assigned in advance.

CHAIRMAN PAIGE: Mr. Easley has given us a new slant on this question and the discussion to be taken up by Mr. H. C. Lucas will be interesting.

DISCUSSION

MR. H. C. LUCAS (Secretary-Treasurer, Philadelphia Electric Company, Philadelphia): To those who have studied safe practices in large utility companies, the question of focusing the responsibility for prevention of accidents upon foremen has been answered in the admirable paper you have heard read.

There are two classes of foremen to be considered: The foremen properly instructed to the necessity of doing work well and as expeditiously as possible, who carries out his orders, always keeping in mind

safe practices while so doing, he is known as a safe man. To such a man fully realizing the importance of safe practices, and the responsibilities of the company as relating to his position, no accidents are chargeable. Accidents may and do happen under him, but they are few. There is the other foreman, just as intelligent, just as safe in some particulars, but who insists on the work being done expeditiously, safely if possible, if it does not interfere with getting it done quickly. This is the man we must consider. There is a lack of earnestness when he talks of safe practices to his men. He neglects frequently to call the attention of his men to safety. Labor conditions of the past few years brought new men in each gang every week. These men he neglected to instruct in safe practices.

There is another class of foreman I have not considered. He is out of the pale. Intelligent or otherwise, safe practices have no place in his composition. He simply will not consider them, and therefore should not be retained.

In considering the responsibility of the foreman—it is fair to begin with the assumption that if proper attention be given to laying out the work and if proper tools are supplied to do a given task, and instructions on safe practices given to the men, a very large portion of the proper duty of a foreman has been complied with.

Where this has been done, only a direct violation of orders, or gross carelessness on the part of the worker is likely to result in an accident. At first glance, it does not seem fair to charge the foreman with responsibility for such accidents. Nevertheless, the foreman who tolerates careless methods, who permits any deviation by the worker from the recognized and safe practices of work which have been explained to him, must in all fairness be held responsible for such carelessness and disobedience, particularly if the worker is not an entirely new employee.

Too many foremen close their eyes to chance-taking, simply because they have seen so many chances taken and gotten away with safely, that they unconsciously acquiesce in rule disobedience, rather than take the time to censure and discipline infraction of the safe though narrow way of performing the operation.

How to get the foreman to realize his responsibility for the waste and sorrow incident to accidents, is indeed no easy matter, but one that requires plain talk from the management. Such realization can only be expected after man-to-man talks with him—only after he has become an honest-to-goodness safety man himself. Like many other things, it is a matter of education, and no man should be a foreman if he cannot be brought to a realization that a job is not well done if there is any sort of accident entering into the performance of the work.

EDUCATE THE FOREMAN

Talk to the foreman; show him that the accident cost is part of the job; show him that a foreman that turns out jobs with an accident cost tag attached is a luxury that cannot always be tolerated. Show the indifferent foreman that he cannot compete with a real production man

who insists that all work that he in any manner has supervision over, must be done, not only accurately and expeditiously, but free from the stain of any accident overhead. Show the foreman the record of accidents in the plant, and how many he is responsible for in his division. Create an incentive for him to make his division 100 per cent accident free. Fail not to let him know you are interested in this record.

Every foreman if he is honestly and earnestly interested in safety will find his men the same way. It is the foreman tolerant of careless and unsafe methods who finds his men reflecting his attitude. Such a foreman must be talked to earnestly; told positively if unsafe practices continue he will be discharged. While the bulletin board is effective, the personal letter to the foreman, as Mr. Easley says, is the most effective. A weekly letter to all the foremen in his department by the head of that department calling their attention to the accidents that have happened during the week, the persons responsible, analyzing the causes, and determining if avoidable; discharging those foremen and men whose record is continuously bad; laying off for a few days those responsible for avoidable accidents, and encouraging all to strive for a clean monthly record.

One of the most effective means for focusing the responsibility for prevention of accidents upon foremen is the safety engineer. In season and out, every time they meet, he continually boosts SAFETY. His position, however, does not empower him to fine or discharge the careless foreman, but it is his duty to report to the head of that department any infractions of the rules he may observe, or that may be brought to his attention. The head of the department is the man with authority to fine or discharge, and if his attitude is strict, the observance necessarily will be.

A trained foreman is the logical instructor of every man working under him—he is the creator of dozens of safety enthusiasts where only one existed before.

All this he can obtain by tact—by friendly coöperation. The good foreman should not quarrel with nor unduly censure his men—win them the other way—make them realize that accidents are not only unnecessary, but economically wrong, that they, too, somewhere along the line have to absorb part of the cost, and that when they help to minimize or wipe out entirely such wastes in operation, they are doing real things, and are surely headed for financial advancement.

The foreman who makes excuses for accidents occurring within the division of work he supervises, rather than train his men in safe practices, *cannot be considered as a good foreman*, and therefore should not be considered as in line for further promotion.

Safety talks were all right when we started the safety campaigns. We have passed that stage. What is needed now is safe practices; safe practices enforced by reprimand, fines, lay-offs, and dismissal.

Mr. J. B. DOUGLAS: Mr. Lucas' remarks on discipline are rather new in this day when men are so scarce, and I would like to ask what peculiar plans the Philadelphia Electric Company has for making men safe

to their employment in case they are fined or laid off for a while. If we did that in the same town, they would never come back. It seems to me in this time of labor shortage it has been felt very generally that it would be rather disastrous for others to try that idea.

MR. J. W. EASLEY: I brought this proposition up just to see what you folks thought about it. This was our experience as I have outlined it, that when we fined or laid off or disciplined one employee or one foreman who failed to observe safe practices the news scattered so quickly that we weren't required to lay off many more. The result was to boost the standard of our work.

MR. H. C. LUCAS: The superintendent in one of our plants gets out weekly letters to his foremen on such points as may seem best. We are so scattered, occupying probably one hundred and twenty-eight square miles of territory, that while we work more or less out of one store there are foremen who report at the station fourteen or fifteen miles distant or other parts of the city.

MR. B. F. DAY (The Philadelphia Electric Company, Philadelphia): It seems foolhardy to let a man go in these times of difficulty in getting foremen but we have found that it is difficult to penalize foremen to the extent of letting them go if they will not size up as a safety man and we have never lost permanently any men that we have desired to retain as foremen through that fact. Probably the answer is that the service of the Philadelphia Electric Company is more desirable to foremen than many other companies. In other words, it may be to their advantage to pay the penalty rather than seek employment with the competing company. We try to use men and foremen like men should be used. Our employees are not paid entirely under compensation if they are absent on account of accident, but, in addition to state compensation, they are allowed an amount sufficient to bring their wages up to their full amount and the instances in which we have discovered malingering have been very few indeed. Personally, I believe that penalizing is a process which must be used very cautiously. We have tried to be diplomatic in the matter and so far have not incurred any permanent hatred or lack of cooperation from the foreman who has been penalized.

BENEFIT ASSOCIATIONS

MR. J. B. DOUGLAS: One feature Mr. Day omitted when speaking of the features offered by his company to employees is their beneficial association. As far as we can learn from our employees, their connection with the United Gas and Improvement Company is very satisfactory and attractive to them but you take two companies in the same city with working conditions being equal as far as they can be, if one company has a pension and beneficial system, it is natural for a man, if fined, to think the second time before he kicks out and loses what rights he may have in that system, whereas with the other employer having no such welfare plan, the employee does not give the matter the same concern. I have no doubt that the very excellent welfare that Mr. Lucas has among employees there in Philadelphia has a great deal to do in

causing employees if fined to submit to the fine and return to their work because from what my friends have told me and from what I know of other ordinary employers, I know that in this day it is almost impossible to dock a man or fine him or penalize him and expect him to come back to his job unless you have some unusual hold such as beneficial association or something unusually attractive.

MR. H. C. LUCAS: I don't believe the beneficial association is one that will pay full pay for any accidents for practically unlimited time, especially for accidents on duty. I don't think that has any bearing on this at all, neither do I think the service annuities or anything else matters to that extent. Of course, I think that with the older foremen it is different as Mr. Day and myself are placed in position where we do take care of them irrespective of beneficial association or anything else because their records of years and years entitle them to that. I think it is the man, the foreman. Any foreman that is just and strict will keep his men the same way and they will realize that when they are laid off, they are laid off for a cause and that cause was their own. I don't think there is a bit of difference between Mr. Douglas' men and the other company's men and I don't think the beneficial association makes a big difference but the average employee when you lay him off says that he'll get a job somewhere else. I think it is the foreman and when you settle it, as Mr. Easley says, focus it on that man and make him liable for it, you have struck the nail on the head.

MR. WILLS MACLACHLAN: In connection with the placing of blame for accidents, one method that we have used is to have the safety committee, as you call it, go over the accident and see who was to blame and what was the cause. If the blame is placed by fellow members, there isn't the sting to it of the blame being placed by the company, but the matter of laying off or firing for cause has been used for years by all railroad companies quite successfully, in fact the only successful system.

CHAIRMAN PAIGE: We have had some very interesting papers and very interesting discussions and in behalf of the Section, I want to thank those who have put so much effort into making this program so successful. The next session of this section will be tomorrow morning at 9:30 A. M.

The Section then adjourned.

SATURDAY MORNING SESSION

THE meeting was called to order at 9:00 o'clock A. M., Mr. Wills Maclachlan, Vice-Chairman, presiding.

VICE-CHAIRMAN MACLACHLAN: The first item on the program is the report of the Nominating Committee. As Mr. Fisher, the Chairman of this Committee, had to leave last night, I will ask some one else on the Committee to present the report.

REPORT OF NOMINATING COMMITTEE

Mr. JOHN BAILEY (Bell Telephone Company, Philadelphia, Pa.): Mr. Fisher asked me to present the report of the Nominating Committee. The following members were nominated:

Chairman: Wills Maclachlan, Electrical Engineer, Consultant Employees' Relations, Toronto, Canada.

Vice-Chairman: Charles E. Morrison, General Manager, Utilities Mutual Insurance Company, New York City.

Secretary: H. B. Harmer, Philadelphia Electric Company, Philadelphia, Pa.

We recommend that the various sub-committees be appointed by the incoming Chairman.

(These candidates were elected.)

CHAIRMAN MACLACHLAN: I appreciate very greatly the honor you have paid me in this, and possibly after I have had a little time to think it over I will try to lay before you some of the policies of the incoming administration.

The next order on the program is a paper by Mr. H. J. Burton, Consumers' Power Company, Jackson, Michigan, on "Working Safely on Live High Tension Lines."

Some of us who have known Harry Burton for the past five years appreciate what he is doing in the instruction work and the developing of the men in his Company to carry on the technical work for that Company. I think that a paper on this subject by Mr. Burton will be appreciated by all of us. Mr. Burton.

WORKING SAFELY ON LIVE HIGH TENSION LINES

H. J. BURTON, CONSUMERS' POWER COMPANY, JACKSON, MICH.

Ordinarily live, high tension conductors are dangerous to touch or approach, and they can only be handled safely by those who have been properly trained and equipped for the work. Energized electric light and power circuits should be handled carefully under all conditions, and in no circumstances is greater caution required than in the installation and repair of high tension lines and equipment.

HAZARDS NOT ONLY ELECTRICAL

Some causes of accidents are common to most industries, and the danger to the electrical worker is not only due to shocks and burns, but also to falls from towers, poles, or other elevated structures. Many conductors are placed underground, in conduits and in tunnels, and there is sometimes danger from explosive or inflammable gases. The question of asphyxiation of employees must also be taken into consideration. Coal or coke dust, or any deposit on the insulators, in the nature of a conductor, or partial conductor of electricity, increases the chances of flash-overs and danger to the worker. The weather affects operating conditions—rain, snow, wind, sleet, and lightning generally mean work for the trouble man, and quite often the most dangerous work to be done is during or imme-

diately after a storm. "As there is always a possibility of danger from lightning, induction or live conductors swinging into and energizing the lines to be worked upon, no lines should be treated as "dead" or not energized unless they are short circuited and thoroughly grounded.

EDUCATING THE PUBLIC

The use of electricity is daily becoming more general, and a network of electric wires extends over and under the streets of our cities and across the fields of our country. The number of injuries due to the public wittingly or unwittingly coming in contact with live conductors is unnecessarily high. Experience teaches us that most accidental injuries can be prevented by education. Persistent instruction to the public would tend to decrease some of these accidents.

In this paper an attempt will be made to outline some of the precautions to be observed for the safe handling of live or energized lines and equipment. It will deal more particularly with electrical hazards rather than those common to most industries.

SELECTION OF MEN FOR LINE WORK

Records show that linemen and patrolmen, that is, the men who handle distribution circuits and transmission lines, sustain a large percentage of the fatal accidents to employees of the electric light and power companies and particular attention should be given to the selection of men for this work. In dealing with the problem of safety to linemen, it should be realized that most of the accidents are due to mistakes, lack of instruction or the incompetence of employees. Such accidents can be prevented by education. Very few of the accidents are due to mechanical or physical conditions of the property.

CONSTRUCTION OF LINES

If the construction of the lines is of a temporary nature, the clearances and other physical conditions should be checked up. If it is essential that such lines be worked on while energized, it may be necessary to build special platforms and barriers before any work can be done.

Electricity is sometimes generated and distributed at from 2,300 to 7,500 volts. In other cases it is generated at from 2,300 to 7,500 volts and it is then stepped up by means of transformers to from 30,000 to 150,000 volts and transmitted long distances and then stepped down again and distributed at lower voltage. On account of the great difference in voltage between distribution lines or circuits, and transmission lines, two distinct safety problems are presented. Methods and practices that would be safe when considered in connection with distribution circuits, would be out of the question for the higher voltage transmission lines.

Live distribution circuits can be worked upon safely in good weather when the poles are dry without any intervention between the worker and the live conductors, except a good pair of rubber gloves or other comparatively thin insulating guard. When work on high tension transmission lines is to be done, long insulating rods, tongs, or similar appliances that isolate as well as insulate must be used.

TRAINED MEN ESSENTIAL

A competent crew of trained men is essential if work on live lines is to be performed safely. Too much care cannot be taken in the selection and training of the foreman who has to take immediate charge of the work and all of the men must be instructed as to the character of all lines and equipment on or near which they are to work. Employees should not be left to learn their work by the "absorption" method, they should learn by the "intentional" method, that is, it should be the duty of some competent person to instruct them. Some foremen consider their duties fulfilled when they have briefly outlined to the men under them the work to be performed, but in order to insure safety they, or some authorized instructor, must give repeated and detailed instructions. Sometimes men do not fully understand or they forget their instructions. The foreman should satisfy himself that all of his men are competent and their knowledge of line conditions and hazards should not be taken for granted.

PROTECTION FOR THE MEN

In addition to being properly qualified to perform their work employees must be equipped with suitable insulating appliances for the safe testing and handling of live equipment and lines. All insulating tools and appliances must be inspected and tested regularly and they must be properly stored or taken care of when not in use.

Rubber gloves, when not in service, should be stored in a dry and cool place where the temperature does not exceed 75 degrees F. The gloves should not be exposed to the light and each pair should be kept in a separate box. If rubber gloves have to be stored for any length of time, it is a good practice to take them out periodically and roll or crumple them with the hands. They should then be straightened out and laid away again. This practice seems to revive the rubber and lengthens the useful life of the gloves. It should be borne in mind that a perfect pair of rubber gloves can be rendered useless for work on live conductors if subjected to rough usage. They should not be worn while climbing as a splinter or a slight abrasion or puncture will destroy or lessen their insulating value and render their use a hazard instead of a protection. Special care should be exercised to avoid puncturing the gloves when making a wire splice. It is advisable to wear leather gloves over the rubber gloves to protect them.

Linemen's shields or protectors should always be used when work is to be done in tight places on distribution circuits. These shields which are of rubber, or some other insulating composition, are for placing over live conductors that are in close proximity to the lines on which the work is to be done. These protectors are guaranteed by the manufacturers to withstand all ordinary distribution circuit voltages. They are of great help to linemen and their use should be encouraged. When not in use, shields should be placed in and carried to and from the place where the work is to be done, in substantial boxes. If this is not done, they are liable to be damaged by contact with the other tools in the line-wagon.

Linemen's spurs are necessary for climbing wooden poles, and they

should always be kept in first class condition. The gaffs should be kept sharp and should be replaced when they are so short that they will not puncture into the wood far enough to hold safely. The straps and buckles should be inspected frequently for defects. Spurs should only be worn when they are actually needed for climbing. They should not be worn while traveling to or from work. Fooling and scuffling among linemen while wearing their spurs has been the cause of many accidents.

Safety belts are essential for preventing accidents to linemen, and yet quite frequently they are not used. The materials used in the manufacture of these belts should be the best obtainable and the workmanship should be of the best. They should be inspected frequently to make sure the straps, rings, snaps, rivets, and buckles are in good condition. When using a belt, care should be taken to see that the straps and buckles, are properly secured before weight is brought to bear on them.

Rubber boots and coats are now used quite extensively, by linemen, their use being especially valuable when work is to be done during or immediately after a storm where broken lines or falling wires have to be handled.

The ropes used in connection with the work on high tension transmission lines should be impregnated with paraffin and kept in a canvas bag. The insulating rods should be thoroughly treated with paraffin. A drying room or oven should be provided where the tools can be thoroughly dried and then treated. This should be done at regular intervals.

Insulating tools and appliances should be of the best obtainable and employees should be instructed that they must not use anything else as a substitute. The insulation commonly placed around the handles of pliers, screw drivers and other tools used by linemen serves to keep static away but should not be relied upon for complete protection. Rubber gloves, in fact, all insulators may lose their insulating qualities and become incapable of resisting high voltages by wear or by deterioration. If they are not inspected and tested periodically, their use may prove a hazard instead of a protection.

INSTRUCTING EMPLOYEES

First: Employees should be instructed how to avoid shocks and short circuits when working on or near live conductors. Before starting any work they should be informed by the foreman which conductors they are to handle and which to avoid. The employees should be acquainted with the fact that if they are thoroughly insulated from the ground and all other conductors, it is comparatively safe to touch a single conductor, but that contact with two conductors or one conductor and the ground is dangerous and may result in injury. The foreman should caution his men to keep all parts of their body, as well as feet and head, away from live conductors. The insulation on high tension wires cannot be relied upon as a protection against shock and this also should be explained to employees.

Second: Linemen, before climbing, should be satisfied that the pole or tower is in good condition and strong enough to bear additional weight.

Poles may be tested near the ground line for decay with a bar or screw-driver, and sounded for decay at the center of the pole by rapping with a heavy tool or block of wood. When poles or crossarms are apparently unsafe, they should be properly braced or guyed before any dependence is placed upon them for personal safety. No employee should go among any wires until he knows their condition and voltage, and knows that it is safe to do so. Leaning over and crowding through unprotected wires should be avoided.

Third: Sometimes because of leaking insulators, defective transformers or broken ground wires caused by storms, or other unusual conditions, poles or towers may be energized or "hot" and difficult or even dangerous to climb. If it is necessary to do work upon a line or circuit and conditions are such that pole cannot be mounted or climbed without danger, the circuit should be made "dead" at least until protection shields, barriers, or other safeguards are in place. Employees should be instructed not to work immediately above unprotected live lines or equipment, as a tool, rope, or branch of a tree dropped across a high tension line might result in a flash with serious consequences. The rule—"work from below"—is a good one and should be enforced whenever practicable.

Fourth: Underground electrical workers are exposed to special dangers. There is always the possibility of gas in tunnels, conduits, and manholes, and employees should be cautioned not to smoke and to keep all open or exposed flames away from manholes. They should report to their superior officers unusual evidences of gas and should not enter a manhole opening if the slightest danger is evident. The use of a plumber's torch should be avoided as far as possible.

Fifth: Numerous accidents have occurred to linemen when working on new extensions to distribution feeders, due to the fact that the extension has been connected or tapped on to the energized circuit before the new work was completed. New work should be finished and all of the crew engaged on the work notified before the "hot tap" is made.

What has been said in the foregoing applies more particularly to distribution circuits. The following will apply to transmission lines.

TRANSMISSION LINES NOW HANDLED ALIVE

A few years ago working on live, high tension transmission lines was considered foolhardy and out of the question except in rare cases and under extremely dry climatic conditions. Today, insulating rods, tongs and similar appliances have been so developed that 140,000 volt transmission lines can be handled alive with no greater hazard than accompanies the handling of 2300-volt distribution circuits with the protection afforded by rubber gloves.

By means of the improved appliances, the insulators on live, high tension lines can be tested while in position and the defective insulators weeded out and replaced with good ones.

LONG INSULATING RODS USED

Several different methods are used to test and change the insulators, the fundamental principle of them being that there is always a long

insulating rod or other appliance between the man and the live part that is to be worked upon. Various patented devices in the shape of tools are used on the ends of insulating rods for removing and replacing tie wires on pin type insulators and for removing and replacing cotter pins on suspension type insulators. Special long handled testing poles for picking out defective insulators are also on the market. In testing insulators on live lines advantage is taken of the fact that a difference of potential exists between the cap and pin of a disc insulator. A wire fork on the end of an insulating pole is used in some cases for making the test, placing the wire across the insulator between the cap and pin. If the insulator is good a static spark is obtained and the absence of spark or a weak spark shows that the insulator is defective.

The following is a brief description of one of the methods used to change defective insulators on high tension lines. The insulators are first tested and the defective ones noted, a record being kept of the pole, or tower and the position of the insulators. A crew generally consisting of six men and the foreman do the work of changing the insulators. First, long insulating rods are attached to the wire and the line secured in position and held so that it cannot swing into the poles or towers. By means of rope blocks the rods are made to force the wire upward and away from its regular position. The insulator is then disconnected from the wire after which the insulator can be removed and replaced or any necessary changes made. With proper tools it is not necessary for any of the workers to approach or place their hands or any part of their body within dangerous proximity of any live conductor. Methods of working on transmission lines with lines alive were described in the June 10 and May 10, 1916, numbers of the "Electrical World."

SPECIAL PRECAUTIONS TO BE OBSERVED IN CASE OF LINE TROUBLE

Noise and static on telephone lines, discharging lightning arresters or an unusual amount of static on or around lines and insulators indicates trouble and it may be due to defective insulators or to an "arcing" ground, on the high tension lines. Foremen should instruct their men to work with extreme caution at such times. It is generally advisable to stop the regular work of changing insulators until the cause of the trouble has been located. This precaution should always be heeded on systems with a grounded neutral.

Before any work on high tension transmission lines is undertaken, for the first time, a careful analysis should be made of the job. Each operation should be considered and men should be selected and trained for the different operations they have to perform.

It is interesting to note that linemen who have tried both methods of changing insulators would rather work on live lines with insulating rods between them and the line, than on "dead" lines without this protection. The dangers incident to the accidental energizing of lines that are supposed to be "dead" are eliminated. Emergency or rush work which always adds to the hazard is to an extent avoided and the work can generally be done in the daytime when the light is good.

Telephone, telegraph, signal, and other lines that parallel high tension

lines are always liable to be more or less energized and dangerous to handle. This fact should not be overlooked in instruction given to linemen.

TO SUM UP

The prime requisites for safe working on high tension lines are: Safe construction, a good foreman, competent workmen equipped with proper tools and insulating appliances.

VICE-CHAIRMAN MACLACHLAN: Mr. Burton, would you come up and take the Chair?

DISCUSSION

MR. MACLACHLAN: We have just heard, and I am sure you will all agree with me, a very admirable paper by a man who is thoroughly competent to give some of the best advice that could be given by anybody in the Utilities gang in the United States.

In connection with the question of educating the public to the danger of fallen wires on the street, one plan that we have carried out is to prepare a letter to school children pointing out the danger of fallen wires on the street. This is a mimeographed letter and is sent to the Superintendent of the Board of Education and distributed through their regular channels to the various school boards and teachers.

We only tried to touch the one point: The danger of fallen wires on the street. Later on possibly we will touch other points. Another way that we are drawing the attention of the public to the danger on the street is by using the standard danger emblem that was prepared some few years ago by the National Safety Council on our poles and substations. We have also prepared a slide that is to be sent to various moving-picture houses which points out that wherever you see this emblem it means danger.

NECESSITY FOR INSTRUCTION OF LINEMEN

All through Mr. Burton's paper there was one thought brought out and that was the absolute necessity of education or instruction for the linemen as to the dangers of working on live lines. That is absolutely essential and I do not think that enough attention has been paid to it in the past. We have been too prone to hire a Bill Smith because he is a lineman and then put him on high tension work and let him go. I think instruction to linemen is absolutely essential and it also applies to the work of our sub-station men.

Another danger that we are up against in working on live high-tension lines or on primary lines is the danger of the ground wire on the pole. Our men, in general, are depending upon the pole for a certain amount of insulation and they forget at times about the ground wire being there. One or two fatalities that we have looked into have been partially due to the presence of the ground wire on the pole.

I will not go into the details of the testing of rubber gloves, the testing of linemen's shields, blankets, and standardizing the belt question, because I think most of you have seen the work that has been done by

the N. E. L. A. Accident Prevention Committee in this line. They have out at the present time standard specifications for rubber gloves for work on lines of not more than 3,000 volts. They are working at the present time on the standardized belt for linemen. The preliminary standard has been in operation with linemen now for two or three months and is working out very satisfactorily.

WORKING ON LIVE TRANSMISSION LINES

The point that I wanted to touch upon more particularly was this new phase that we are getting into—the working on live transmission lines. Very few companies have had experience in this and without a word of warning I think that we will have fatalities, due to the carrying out of the work originated by the Georgia Company, as I understand.

It is quite practical and perfectly safe for the skilled, trained surgeon to carry on an operation in a perfectly equipped operating room. It is perfectly safe for a skilled, trained lineman with the use of these tools to change insulators, but it must be remembered that this does not apply to all linemen, all types of tools and all types of construction. Where you have to change an insulator above a live line, I think you are simply juggling with your life.

I think the companies should instruct their men as to the best ways of grounding the line and short circuiting, because I think we have all come to the point where we have very little confidence in the ground chain and very little confidence in our present method of grounding because a number of us have had fatalities, or near-fatalities on lines supposed to be grounded.

I think these two will have to go hand in hand for a few years:—the old method of short-circuiting the line, grounding it, tagging it at your substations at both ends, and carrying on work on a dead line, and that of changing insulators by trained crews with special appliances, and I would like to reiterate that statement on certain types of construction.

After the meeting is over, if you wish to see it, I have a report on the changing of insulators on 44,000 volt pole construction by this method with about forty photographs showing the different details. We tried it as an experiment. We do not believe it is generally applicable to our lines and we intend to carry on our present methods as the standard routine for special work.

I would like to have a general discussion on this subject because it is one of the most important that we have before us.

GENERAL DISCUSSION

MR. HERMANN SPOEHRER (Union Electric Light & Power Co., St. Louis, Mo.): Mr. Burton's paper was most complete and interesting. There are one or two questions I would like to submit.

To begin with, I notice the National Line and Safety Bureau has been getting out circulars from time to time and I took occasion to write to Chairman Paige on the subject because I noticed they showed the linemen not wearing gloves, and in another instance where he was wearing

buckskin gloves without any rubber gloves, and whether it was intended or not, it would tend, I am afraid, to encourage unsafe practices among the linemen.

We have the county division and the city division in our company. The county division made it a practice to put their gloves on after they reached the top of the pole for fear they would snag them in climbing the poles. In the city they made it a practice to put the gloves on before climbing the poles. If you climb the pole without gloves and pass the safety strap around the cross arm of the pole after you get up there, it is rather hazardous to do that without the use of gloves, for, of course, you have to have a safety belt in order to put the gloves on. I would like to know the general custom in that respect.

Mr. Burton also referred in his paper to the matter of educating the public. Notwithstanding the precaution you take and the efforts to reach the public, we still have repeated accidents. It is practical to use motion pictures in pointing out to the public the danger of handling dangling wires, and probably a newspaper advertisement should be resorted to. I would like to know what experiences other companies have to offer in that respect.

MR. F. B. VAN DOREN (Utilities Mutual Insurance Company, New York): I would like to know if Mr. MacLachlan had reference to the distribution system or high tension.

MR. MACLACHLAN: Distribution.

MR. VAN DOREN: I have come across, in my experience, another bad hazard: that is fire-alarm contact. In this instance, companies covering the fire alarm had taken the apex of the pole and run the wires down about a foot or a foot and a half from the top of the iron conduit, from the iron conduit to the fire-alarm box and from the fire-alarm box to the ground. Several men working on the distribution system have come in contact with this wire and have been seriously injured.

Another thing, Mr. Burton spoke about linemen's belts. I think every company should make an exact inspection of these belts. It has been brought to my notice lately, in three different instances, where the linemen's belts apparently were in good condition but where the snap seemed to be working very easily and I took the belts and by giving them a slight twist they would come unhooked every time. That is something that should be watched very closely.

CHILDREN AND FALLEN WIRES

MR. H. A. JOHNSON (Omaha Gas Company): I don't happen to be connected with the electric industry but this hazard of the children coming in touch with fallen wires has come to my attention several times during the past summer. In driving through our city, especially after a storm, I have seen children gathering around electric wires that have fallen and it seems to be a common thing for them to do. I have never seen a motion-picture reel on this subject. It seems to me there is a chance for some of the electric companies to get up such a reel which could be

shown, especially to the school children, and also in the motion-picture houses.

I also think that during the school season if there happens to be any severe electric storm where this hazard is to be found, that the school teachers would be glad to cooperate with the electric companies if they get in touch with them over the telephone and have them make some announcement just to call the attention of the children to this hazard.

Mr. SCOTT: The thing that is on my mind in connection with Mr. Burton's paper is this changing of insulators on transmission lines and the danger connected with it. The tendency seems to be now on the part of the operators to work on live transmission lines wherever they have an execution for continuity of service and this is going to be very popular in that connection. They don't want to kill the lines. They don't want to shut off the current so they rely upon this new method. Recently this matter was put up to our safety organization for approval or disapproval.

I must confess that I am afraid of the thing, afraid something is going to happen and yet after going over it with those who are in charge of the work and being assured that the instructions are carried out, I feel that it is probably safe. I am afraid, although this has been confined to a trained crew, that there will be a tendency to ignore that in a little while; they will say, "Well, Frank is sick; we will take John today." I want to know how many trained crews Mr. Burton has on his properties for this special purpose and if there has been a tendency towards breaking the rules and regulations that were especially provided for that work.

Mr. BURTON: We have two crews.

Mr. W. H. MULLIGAN (Hydro-Electric Power Commission of Ontario, Toronto, Canada): There is one point that I would like to bring out and that is the education of the man.

A few years ago in our Company, on a duplicate circuit, 110,000 volt lines, we undertook to change insulators with one side dead. We had trained crews and trained men, yet, in that summer, within two weeks, we had two men killed; they climbed the poles and thoughtlessly walked into the live side. We can't impress that point too much on the men.

One thing Mr. Burton said was that gloves must not be worn when climbing. Gloves must be worn when climbing. We do not allow any man to wear rubber gloves without leather covers.

Another point mentioned was the inspection of belts and spurs. In our Company we have monthly inspections of these things.

Mr. BURTON also said that gloves must not be relied on as complete protection. I would like to ask Mr. Burton why. All of our gloves are tested. They receive monthly tests. The men have to use gloves very often when standing on the ground when the poles are wet and in stormy weather. If they cannot rely on the gloves as ample protection, what else have they?

Another question is, how does he recommend keeping open flames out of manholes especially when it is necessary to tap joints?

The matter of educating the public cannot be put too strongly. Just recently at one of our safety meetings a man said a line was down the other day and Mr. So and So came up to him and said, "I noticed this wire. I knew it was a live wire and I just took my umbrella and shoved it to one side." It was an iron umbrella.

CHAIRMAN MACLACHLAN:—Is there any further discussion on this point? Mr. Niesz, have you anything to say on this?

MR. H. E. NIESZ (Commonwealth Edison Company, Chicago): I haven't any discussion to contribute, but since I have been called upon, I would like to express, on the occasion of my first convention of the National Safety Council, three things that impressed me the most: One is the large number of people in attendance; another is the caliber of the men here, who are mostly either practical or technically-trained men, and third, the wonderful enthusiasm that each and every man has for his work, and if that enthusiasm, that ability is carried along the lines of the safety organization down to the ultimate worker, we can't help but do the things that we are to do to make work safe for the men and to conserve human life.

CHAIRMAN MACLACHLAN:—I will ask Mr. Burton now to wind up the discussion on his paper.

MR. BURTON: I agree with Mr. MacLachlan regarding the working on high tension lines. It can only be done where the construction is right. Some types of construction, that is high tension lines, cannot be worked upon alive. There are also some types of construction that cannot be grounded safely and worked upon. For instance, if it is in close proximity to other circuits, it isn't safe to ground the circuit you are working upon. You are liable, if you are close enough, to get against the other line and the hazard is greater with the grounded line than with the line not grounded. It is safer in that case, if it is at all possible, to work the line alive and handle it from the end of long poles or sticks, or other insulating appliances. Sometimes it is safer to ground the wire and sometimes it is safer to work it alive. It is a question of the construction.

DEPENDENCE ON RUBBER GLOVES

Regarding putting on rubber gloves, after climbing the pole: The rubber gloves are lessened in their insulating value if they should get the slightest abrasion and if you use them for climbing you are liable to do that and such gloves are not worth much after you get up to the top of the pole. I think the circuit should be killed until the man gets to the top of the pole and then he could put on his protectors and other paraphernalia and go to work.

Regarding not placing complete dependence on rubber gloves: Rubber gloves are tested, it is true, for 10,000 volts or 20,000 volts or whatever it may be, but it isn't necessary to place complete dependence on them. For instance, if a man has a wire that is of 2,300 or 5,000 volts and he is standing on the wet ground, he should put a board on the ground. Rubber gloves may be used safely there but he should not

base complete dependence upon them. He has just one factor of safety if he puts complete dependence on the rubber gloves. He should put the board on the ground, keep away from the ground wires, use a pole wherever possible, keep away from all other conductors, then use his rubber gloves.

A man had tested rubber gloves and said, "They are good for 10,000 volts." He asked a man to stand on the ground and ground the circuit on one side and let the other side take on the voltage and then test the gloves by putting his hands on there. You know what it would do. I wouldn't do it. They may be safe while they are on the testing machine but not immediately afterward.

Regarding the education of the public. You may be interested in knowing that we had a 5,000 volt circuit on the top of a pole—about a fifty foot pole—perfectly straight, with no steps on it and we thought no one could climb up it except the lineman. An eight-year-old boy climbed to the top of this pole, thinking there was a bird's nest up there, and was killed. It seemed impossible that an eight-year-old boy could climb up there but if you had seen the boy you wouldn't wonder at it. I went to see him at the hospital; he was burned so badly that he soon died.

CREWS FOR WORKING ON HIGH-TENSION TRANSMISSION LINES

Regarding the crews for working on the high-tension transmission lines: The company I represent has two crews at the present time. We only do work under favorable conditions. We don't use substitutes when we don't have a complete crew. The beauty of this work is that it doesn't have to be done on short notice. It is not emergency work. We do not wait until the work gets that bad before we do it. As soon as we know it is in any way defective, we go ahead and change insulators.

Some time ago we were testing out a line and when we got close to the cross station we found some insulators in a very bad condition. I think nine out of ten poles were defective and the tenth was holding up the line. Now the operator had occasion to operate around this line. Due to "hot line" testing we found that place and remedied it before an accident occurred. That is one of the things to say in favor of working on "hot" lines, you can find the trouble and remedy it. The work does not have to be done, therefore, you can wait for the men on the crew. I wouldn't attempt to change an insulator on a high tension line until all my main men were there.

Regarding open flames in manholes: Open flames in manholes should not be used where there might be explosive gas. It is hard to tell sometimes whether there is gas; it is more or less of a guess method. There are some devices on the market, I believe, for testing for gas in manholes. I don't know how logical they are.

CHAIRMAN MACLACHLAN: I am sure we are very grateful to Mr. Burton for his paper. It has opened up a point that is being discussed in a

great many companies at the present time and needs to be carefully gone into.

We will now hear from Mr. Walter Wagner on the question of "Practices of Operators and Tagging of Switches, Markings, and Barriers."

TAGGING, BARRIERS, MARKINGS, AND PRACTICES OF OPERATORS

WALTER C. WAGNER,

PHILADELPHIA ELECTRIC COMPANY, PHILADELPHIA, PA.

Safety is a cogent word these days, and there is no activity in which its powerful appeal to determine the course of action is more strongly felt than in the Central Station industry.

Safety measures in stations serve not only the local station men, but this protection, with its corollary insurance of continuity of safe service, involves, directly or indirectly, the safety of the community dependent upon electricity for light, heat, and power. The use of equipment of greater capacities, the concentration of greater power demands in limited areas due to unprecedented growth of load, and increased voltages, have individually and collectively tended toward greater hazards; but, due to the introduction of safety measures, an equal or greater degree of safety has, in general, paralleled these changes.

Under the stress of the war's demands for the maximum and continuous production of electric power, safety measures were given all possible consideration, but the application and further development of proper methods and devices were necessarily somewhat restricted.

Now, confronted in this new era of peace by increasing demands for power from industrial activities, by the assimilation of untrained men in the industry, and with the difficulties of the general labor situation with its attendant great increase in turnover of employees, those who are responsible for Central Station safety today require the guidance from an active and extended discussion of the subjects of this paper. With such guidance, they will be assured of tried practices, which will make for the greatest practicable degree of safety and efficiency.

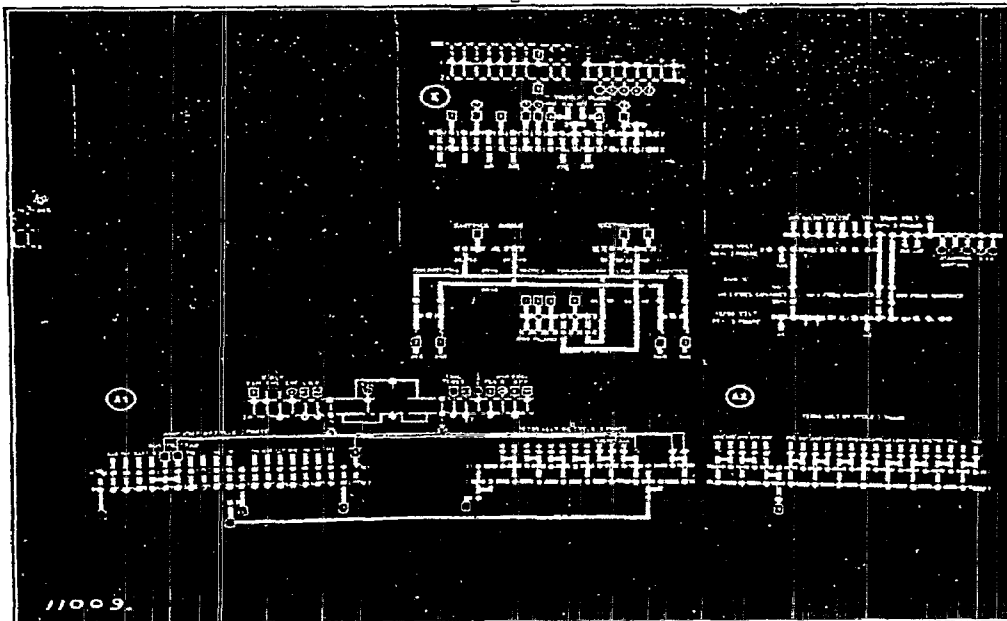
Another potent factor requiring an adequate development of these subjects at this time, is the fact that the revision of the 1916 edition of the National Electrical Safety Code is now in progress. The United States Bureau of Standards is concerned with the development of a code of minimum requirements, and while an effort should be made here, by papers and discussion, to present the very best practice and design for electrical safeguards found in the industry today, many of these elements of general progress will serve, through their incorporation in the safety code and by its distribution, better to guide those concerned with safety in central stations throughout the entire country.

An adequate presentation of all the important features is obviously not possible here, and it will, therefore, be assumed that descriptions of the more common safe practices in general use throughout central

stations need not be included. This will permit the presentation of some of the more recent safe practices in large electrical systems using high voltages of distribution. In many instances, the methods used by The Philadelphia Electric Company will be submitted as being productive of good results.

TAGGING AND OTHER BLOCKING OPERATIONS

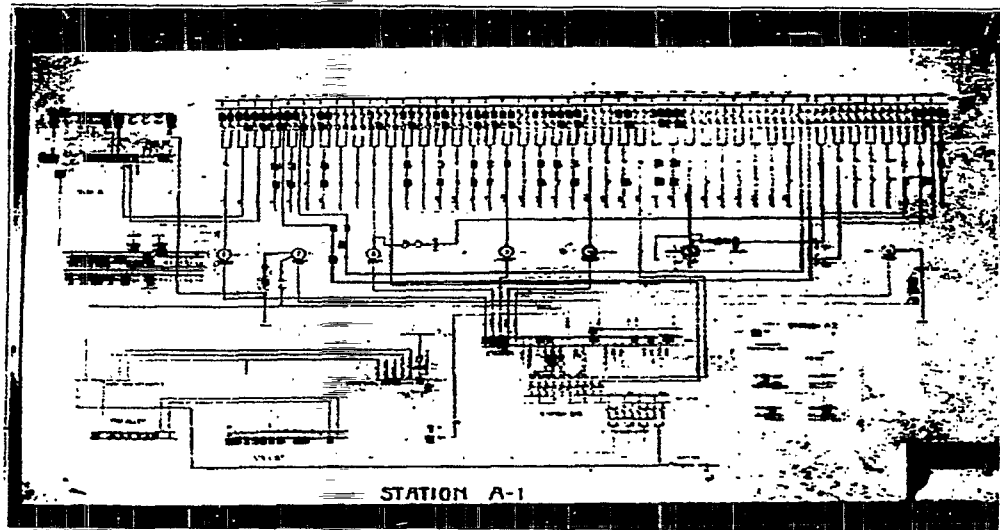
In the natural growth and development of electric power systems from



PL. 1. STATION PANELS-LOAD DISPATCHER'S BOARD

one to many stations, and with the increasing extent of conductor networks, the control by the station operator has given way to the direction of system activities by a load dispatcher. He, as the central authority responsible for the successful control of the entire system, directs the general machine and switching procedure at all stations. The extent of detail with which the load dispatcher is concerned, as compared with details delegated to the station operator, can best be shown by a comparison of their respective dispatch panels. See Plates Nos. 1 and 2. It is evident that the load dispatcher's field is limited to the major elements of control, leaving the station operator responsible for those details of switching and miscellaneous control which come within the jurisdiction of the individual stations.

On Plate No. 2 is shown a system of marking switching locations by means of colored enameled tags hung on small hooks. In stations, this is the method used to reinforce the operator's memory. The same principle is carried out on the station panels of the load dispatcher's board,



PL. 2. GENERATING STATION DISPATCH BOARD

but substituted for the enameled tags are miniature electric lamps, capped with glass bull's-eyes and controlled by jacks located on the dispatcher's desk. No illumination indicates that the switch is open: when illuminated, a green cap placed over the lamp denotes the switch is closed, and a red cap that the switch is blocked. Manually-operated metal plugs



PL. 2. LOAD DISPATCHER'S OFFICE

fitting into recesses are used for switching at the less important points.

A reproduction of the entire system, with stations and feeders in relative position, is shown in Plate No. 3. The panel lights and emergency room illumination can be supplied from a battery at the rear of the dispatch board.

Cycle of Tagging (Blocking) Operations. The circuit or apparatus upon which work must be done is examined by an authorized representative of the department which is to do this work. He reports to the load dispatcher the amount of equipment involved, the nature of the

21-35-2M-4-19

THE PHILADELPHIA ELECTRIC CO.

OPERATING DIVISION

Date 9-1-19 Time 10:50 P.M., Permit No. 893Issued by Riley to Pierce of the Opus Dept.Permission is hereby given per Thomasto repair main oil switch90% feederat Station ChesterAlso see Permit No. -Cleared by Pierce Time 4:00 P.M., Date 9-2-19Inspected by Israel Time 4:15 P.M., Date 9-2-19

FOR DETAILS OF BLOCKING SEE OTHER SIDE

PL. 4. FACE OF CARD

THE PHILADELPHIA ELECTRIC CO.

OPERATING DIVISION

Details of Blocking.....

main and cable dis.connecting switchesopenPermit closed by Jones Time 4:20 A.M., Date 9-2-19

Immediately upon completion of the work notify Operator in Charge by returning Permit, properly signed. Operator will then notify Load Dispatcher, repeating carefully Permit Number and nature of work for absolute identification.

PL. 4. REVERSE SIDE OF CARD
BLOCKING PERMIT CARD

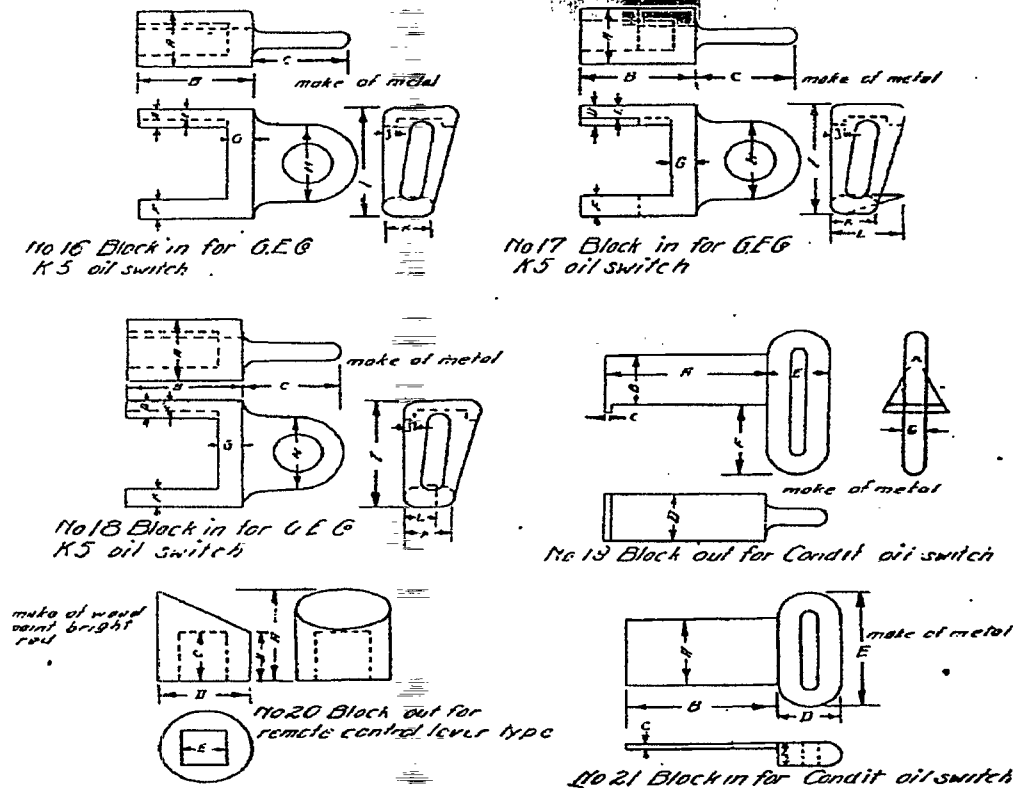


FIG. 5. MECHANICAL BLOCKS FOR BLOCKING TYPES OF HAND-OPERATED AND REMOTE CONTROL OIL SWITCHES

work, and its probable duration. With the reproduction of the system before him, the load dispatcher determines the necessary blocking procedure on the equipment to be worked upon, and enters this information on a permit card bearing a printed serial number. This card is shown on Plate No. 4. When it is time to start the work, the load dispatcher directs the operators at all stations involved to do the necessary blocking. The operator at the station where the work is to be done makes a copy in duplicate of the load dispatcher's permit, using the same serial number. This operator gives the original of the duplicate permit to his assistant. This assistant, accompanied by the man in charge of the work, blocks the necessary equipment and the permit is handed to the workman. The operator makes the corresponding changes on his circuit dispatch panel. Then, assured that all stations have properly blocked the circuit involved, and making the corresponding changes on his dispatch board, the load dispatcher directs the operator at the station

where the work is to be done to proceed with the work authorized by the permit.

Where oil switches are involved, these would be opened by the usual remote-control mechanism, having the usual pilot lamps to indicate the operation, and the control and power circuits and equipment blocked mechanically and electrically, as follows: A conspicuous and substantial mechanical block—of which No. 20 block on Plate No. 5 is an example—is placed as a guard over the control switch to prevent accidental closing. The positive and negative knife switches supplying the control circuit

Station Chester
This card issued by
order of Load Despatcher
in connection with
Permit No. 893 by
request of Pierce,
Operating Dept.

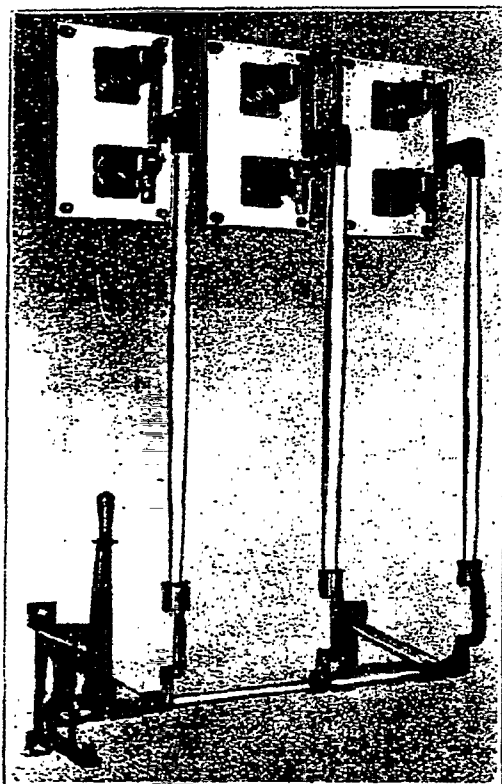
PL. 6. FACE OF TAG

DANGER

PL. 6. REVERSE SIDE OF TAG

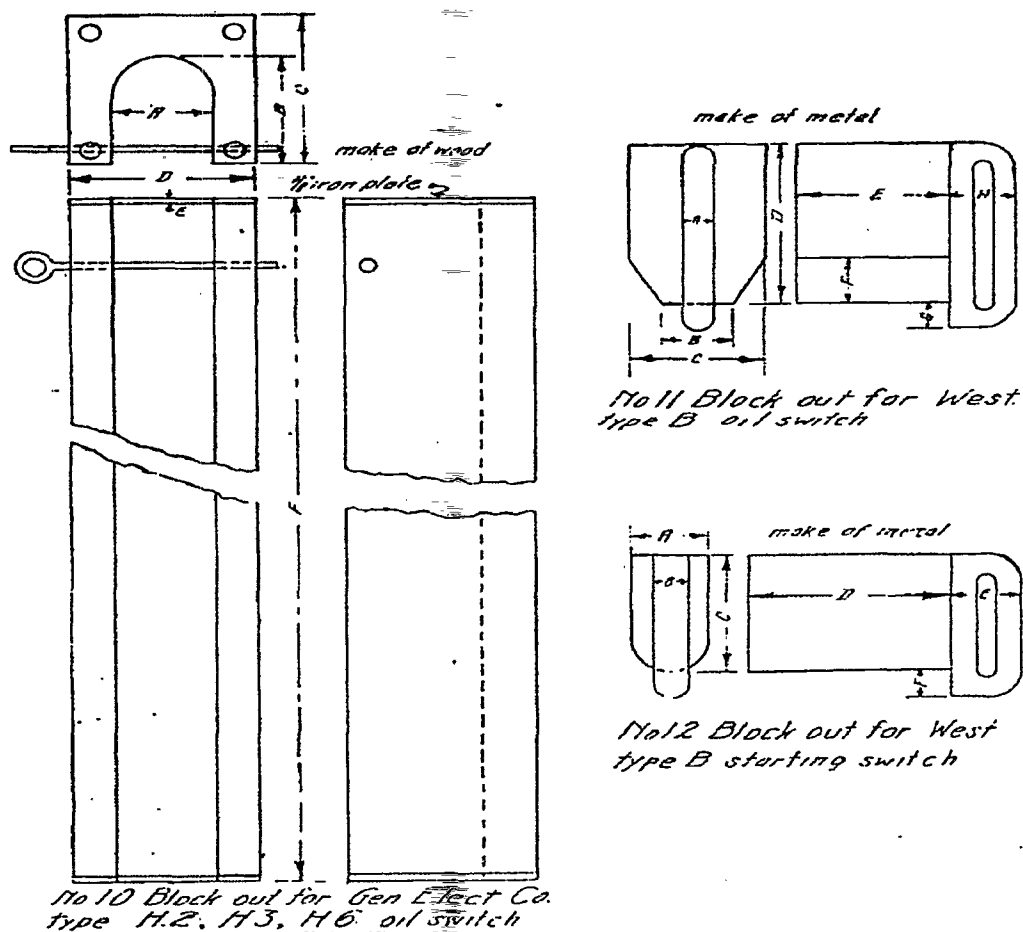
are opened and tagged with a red blocking tag by the operator's assistant. Potential transformer fuses on the voltmeter and synchronizing circuits of the apparatus are opened and tagged to prevent the energizing of the apparatus through the insertion of a plug in a voltmeter or synchronizing receptacle.

In one present station design, all station compartments are locked, and but one key will open the compartments of any circuit. The operator then supplies this key to his assistant for access to the proper switches. His assistant and the man in charge of the work then go to the necessary disconnecting switch compartments, which are plainly marked with the equipment designation and its phases, and looking through the clear wire glass panels of the compartment door, observe if the green indicating lamp is burning. This is an incandescent lamp



PL. 7. TRIPLE POLE REMOTE-CONTROL DISCONNECTING SWITCH
OPERATING MECHANISM

placed at all disconnecting switch points in a low voltage circuit positively controlled by the oil switch mechanism, and it burns only when the oil switch is in open position. It is placed at all disconnecting switch compartments where switches may control conductors connected to the oil switch. As the lamp must be burning to indicate when the discon-



PL. 8. MECHANICAL BLOCKS FOR BLOCKING VARIOUS AND REMOTE-CONTROL TYPES OF HAND-OPERATED OIL SWITCHES

necting switch may be safely pulled by a hook with an insulated handle, it is an additional precautionary measure to prevent a mistake in the operation of a disconnecting switch. With this green lamp burning, the compartments are opened, the disconnecting switches pulled, and red blocking tags (see Plate No. 6) are attached at all points where the equipment to be worked on can be made alive. Where necessary, the further precautions of grounding or short-circuiting are used, and these would also be noted on the permit. Types of remote-control mechanism that have been recently developed, open and close the disconnecting switches on all the phases of a circuit simultaneously; this absolutely prevents the accidental opening of a phase of an adjoining circuit. One of the means is shown on Plate No. 7. In the closed position, the link-

ages are on dead center, holding the blades in position, and the operating lever can be locked with the switches either open or closed.

Where work is being done on remote electrical control oil switches, the workmen are further safeguarded from accidental tripping of the mechanism by opening a small knife switch in the control circuit at the oil switch, and by the use of special mechanical blocks, such as is indicated by No. 10 Block on Plate No. 8, to prevent movement of the switch parts.

In case more than one department or outside firm is working on the apparatus, or is exposed to hazard by the possible re-energizing of this blocked apparatus, separate permits must be issued, and as many red blocking tags as there are permits issued must be placed wherever the equipment may be made alive. No tag is to be removed until all departments have signed their permits and have reported "clear," and the work and equipment are checked by the operator's assistant to make certain that everything is clear for service. The operator, upon receipt of this advice, signs the permit, then informs the load dispatcher, and restores the switch indications on his dispatch panel. Whenever he considers it necessary, the load dispatcher may require the additional approval of the district supervisor. When all departments have reported "clear," the load dispatcher orders the removal of all blocks, and after having directed the making of the necessary tests and restored the equipment to service, he then corrects the switching indications of his dispatch panels. The equipment with tags removed is then ready for service.

Special tagging of circuits and apparatus for the purpose of identification and tabulation of apparatus and cable condition data is in common use. In some instances, these are for permanent service, an example being the use of a stamped non-corrodible metal tag wired to the lead cable sheaths. Others are designed for temporary use, as, for example, the attachment of an oil tag to apparatus until its case is properly filled with oil. —

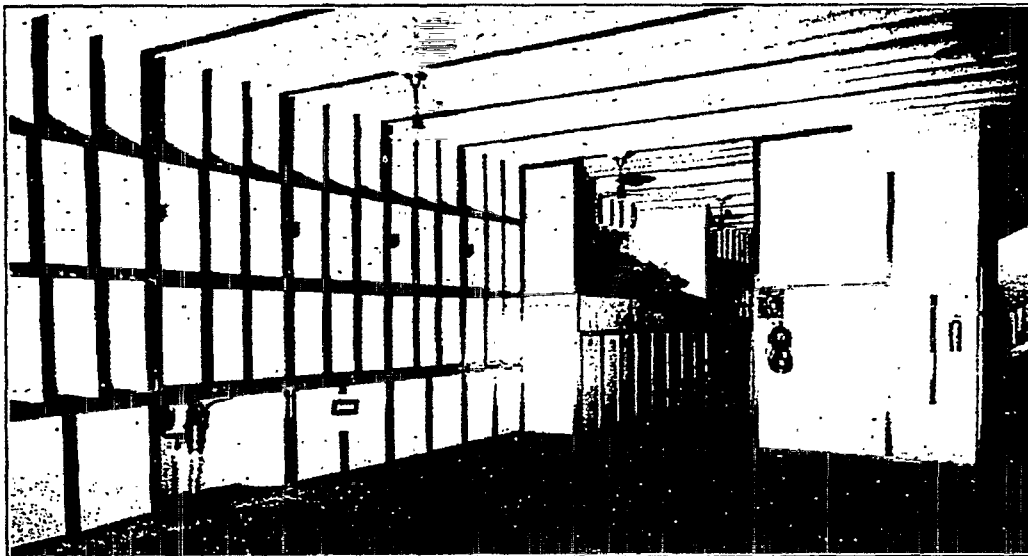
BARRIERS (INCLUDING COMPARTMENTS)

Barrier walls are designed to give separation for conducting parts at different potentials and, when provided with covering doors, form complete isolating compartments, which give protection to those in the vicinity from all arcing, shock, and mechanical hazards. Unlike warning signs, they form a physical protection against thoughtless or accidental movements. This construction is superior to insulation in that equipment so enclosed is generally supported on separate insulators or connected to a permanent ground, is easily inspected and accessible for repairs and changes, and incurs no possible shock hazard from deteriorated materials. Simplicity of arrangement of conductors and apparatus, and the less room space required, also serve to render conditions safer for station men. —

Confining this discussion to concrete construction, the following characteristics of this material may be noted. It cannot be considered in any

sense an insulator, nor is it a good conducting medium. It serves to isolate live parts, which are otherwise insulated, and to support casings and frames, which must be grounded by other means, even should the concrete be reinforced with steel.

As a rule, barriers should not support live busses or apparatus subject to stress due to electrical disturbance, and, where isolating live parts, should have a minimum of reinforcement consistent with mechanically safe construction. Doors cover the openings between the barriers, and are designed to be readily removed for access to the compartments covered. Such doors may be painted white pine frames, paneled with impregnated asbestos where they enclose conductor runs and instrument transformers; paneled with clear wire glass in front of disconnecting switches; and built of heavy wire screening where heat radiation necessitates this construction, as in front of reactance coils. Such doors



PL. 9. FEEDER AND LIGHTING. ARRESTER COMPARTMENTS

must be of small size, light weight, not easily damaged in handling, and rugged in construction. A pair of handles for detachable wall doors, and detachable hinge supports, allow ready removal. Where covering ceiling runs, the doors are permanently hinged, with latches to fasten them in place. A door having a special panel in which a spring-hinged panel is inserted is placed in front of locked current transformer and oil switch compartments, where an electrical breakdown might cause a sudden formation of gases.

The standard practice is not only to isolate circuits of different classes—such as power feeders and station-use conductors—but also to separate the individual phases, as shown in Plate No. 9. In this illustration are also shown the special barriers isolating the lighting arrester, through which cords pass which operate the charging mechanism.

MARKINGS (IDENTIFICATION)

The general identification of the character of equipment by those concerned in the maintenance and operation of electrical stations, is based on a knowledge of the nature of the construction—namely, the method of isolation, type of barrier, support, and insulation—and of the general characteristics of the apparatus connected thereto. In a system where unvarying practice in arrangement of equipment exists, as a fixed order of phases and number of compartments and apparatus, the relative positions are a further means of identification, especially when clear and adequate, yet simple, wiring diagrams showing physical arrangements of units, apparatus, and circuits are at hand, and where the more hazardous situations are, in general, made inaccessible by elevation or enclosures.

For example: The Philadelphia Electric Company establishes the same definite reference point at all stations, and all groupings of units, apparatus, circuits, and conductors have their sequence of numbering or lettering determined by this point. Special exceptions are definitely indicated.

Experience has shown that further insurance of safety is absolutely necessary, especially in large stations. To make a complete identification a certainty, markings in the forms of well-illuminated color arrangements, signs, tags, and markings of a permanent nature on surfaces of walls or equipment must be used.

The danger of placing too few or too many signs is obvious; insufficient guidance makes men uncertain, and too numerous signs tend toward possible confusion. In the latter case, for example, if signs were placed at every possible hazardous spot and its absence led a workman to conclude that the location was safe because not marked alive, the accidental removal of a sign might be a serious matter. *It is now the general practice for authorized persons having access to hazardous locations to assume that everything is alive unless marked otherwise.* Such rule, together with wisdom in distribution and in placing warning and identifying markings, makes for the greatest practicable degree of safety. The markings or symbols must be permanent, easily distinguished, legible, concise, simple, and absolutely accurate in legend; and the marking system must supply a distinguishing number or symbol for every part of the circuits and apparatus.

The key to the markings of electrical equipment in a station is given on the station dispatch board, mounted, with a single-line wiring diagram with symbols indicating the nature and designation of the lines and apparatus, and with the provisions for manipulating switch indicators. See Plate No. 2. Such indicators are changed simultaneously with operation affecting the indications.

The standardization of switchboard panels, with their markings showing control characteristics and indicating operating conditions, and also the use of mimic wiring to indicate the relative positions of circuits and apparatus, are too well known and extensively used to be described



PL. 10. BUS SWITCH COMPARTMENTS

in this paper. Special attention should, however, be directed to the requirements of simplicity in designation and maintained legibility of symbols and legends, and their good illumination with the absence of glare.

Markings, either portable or painted upon permanent surfaces of contrasting color, may be used for general identification throughout the hazardous parts of electrical stations. Entrances should have warnings—in several languages where necessary—to unauthorized persons, which

will also serve as a general guide to workmen. For those who must move about in these rooms or enclosures, markings and signs are placed to indicate the hazards which should designate the highest voltage concerned, and the electrical apparatus and circuits and phases of circuits must have their character clearly identified.

Portable signs serve well in some instances, especially where special or temporary conditions exist. For permanent construction lettering and symbols are painted, stenciled, or stamped on every accessible side of enclosures and equipment. Care should be taken to see that these markings are so placed that the removal of a part, such as a compartment door, does not result in the entire loss of identification of the equipment concerned. Plates Nos. 9 and 10 show some of these markings used in a high-tension switch-room. The broad, dark band covering the edges of wall and ceiling barriers is bright red in color on a light surface, and furnishes a division marking between the sets of three single-phase compartments of three-phase circuits. In addition to this identification of circuit divisions, special metal red tags with white letterings project from the barrier walls, which are more plainly shown in Plate No. 10. A workman standing before any set of compartments containing the three conductors of a circuit has this tag facing him on either side, with the circuit designation clearly marked thereon in contrasting colors. This permanent tag has been recommended for use by the sub-committee on accident prevention of the National Electric Light Association.

Where wire glass or wire screen doors are placed over apparatus, they serve to facilitate inspection as to condition, but their use is no excuse for laxity in maintaining the necessary identifying markings.

PRACTICES OF OPERATORS

It is not without pride that we can say that no other activity has given the matter of safe practices more study and intelligent application; and today many instances can be pointed out which make work in an electrical station, even with its more complex and higher voltage conditions, far safer than in the earlier stages of development.

This has, in a large measure, been due to increasing vigilance in the early detection of hazards arising from the use of new operating methods and equipment. Guided by the experience of the departments and the work of the laboratories, the safety engineers have produced safeguards and inaugurated methods of practice and courses of education, which have proven fully adequate to meet these new situations. So interfused is this factor of personal safety with other elements of company organization that the measure of success in the proper application of its principles is, to a large degree, determined by the success of the company's management in general. In turn, every successful effort to make safety more certain is reflected in raising the whole tone of the organization.

"Standardization" and "coöperation" are the key-words in the application of general station safety organization methods. There must be, of

course, a clear understanding of the principles involved; a familiarity with practices for efficient action, especially in times of emergency; and a realization and assimilation of the spirit of loyal coöperation with others. All this must be furthered through frequent get-together meetings for conference, study, and general social activities.

Special reference should be made at this time to the importance of Safety First courses at the stations, to secure the presence of all the station men, and teach prevention and first aid in familiar surroundings.

A fixed order of routine according to approved methods—in general, in the form of published operating rules—is essential to maintain this standardization and coöperation.

In addition to the protective practices, which have heretofore been described in this paper, the following are worthy of comment at this time:

Rubber Gloves: A study of the specifications of manufacturers and practices of operating companies, and an extensive series of tests on the various makes of rubber gloves, have enabled the accident prevention committee of the National Electric Light Association to prepare and recommend specifications for the purchase, testing, and care of rubber gloves for service on high-tension apparatus not to exceed 3,000 volts to ground.

Insulating Stools: An insulated wooden stool having extended corners to prevent stool from tilting.

Fuse Puller: A fuse puller with wooden handles, for use around high-tension apparatus, requiring the use of both hands (protected by rubber gloves) on the fibre insulators of the two handles.

Lamp Guard: A lamp guard with a wooden handle and fibre guard for the globe.

Pliers with Insulated Wood Handles: Ordinary pliers with straight oak wood handles about eight inches long, which can be placed on gas or wire-cutting pliers.

Wooden Nozzle: A wooden nozzle, made of oak, with a guard, for use in cleaning around electrical apparatus.

Safety Rod: A wooden rod with an attachment at one end to engage the handle of a D. C. railway feeder switch, keeping the operator at a distance, and preventing hazard from poor operation of the feeder circuit breaker.

Permanent Ground for Station Bus: This feature of station bus design dispenses with the unsafe practice of trailing grounding cables throughout rooms, and eliminates the use of all temporary ground connections. Permanently-mounted disconnecting switches in compartments, with grounded blades, are arranged to ground positively any station bus. A test for possible potential on a bus supposed to be disconnected from sources of energy is provided as follows: A double-throw knife switch, carrying a small-capacity expulsion fuse in the grounded blade, is thrown down to a clip which places it in series with a test lamp in a lighting circuit. The burning of the lamp indicates fuse integrity. The blade is then swung up to the clip connected with the station bus, which

enforce the rule that was to be put into effect on that particular job, or did it in such an off-hand way that the fellow didn't know that it was an order but thought it was a suggestion.

I think if we get to work on these three things we can boost up the work we are trying to do. Those of you who followed this paper closely will agree with me that it was a presentation of a perfect system of guarding against those dangers which may be guarded by tagging and marking and practices in the ideal central station.

I can't conceive of saying anything that would add to the admirable arrangement presented here. It would be impossible for me to do so. I doubt if the highly-trained technical men could suggest anything to improve the points brought out but all the time I was thinking of this paper, following it, I was thinking of the large central station in the large city, then my mind would go to the little plant away down in the country that wouldn't know what this was if they read it, wouldn't know what a plant was like this if they would see it and I am thinking about their getting the thought that is expressed in this paper and applying it in these stations that are not able to put in this sort of construction and follow these ideas and when I get through that is one point I would like for Mr. Wagner to touch on and help me out on as to how the problem that is unsolved here may be answered for these small companies.

LOCKS EQUIPMENT AND HOLDS FOREMAN RESPONSIBLE FOR ENERGIZING THE CIRCUIT

Now you always think the company you are connected with has it on the other fellow just a little bit and I am thinking now of the Commonwealth Edison Company. Mr. Wagner's plans for killing the circuits would appear to be ideal, and could not be improved upon, but the Commonwealth Edison Company has gone just one step farther than the thoughts presented in this paper. In addition to all the things that have been pointed out here with reference to killing circuits, the Edison Company provides a padlock and locks the equipment. The key to this lock is carried by the foreman of the men who are doing the work, or who are at work on these lines, and the lead dispatcher who attends to energizing the lines here couldn't energize the lines until the foreman who has the key comes back and unlocks the block that controls the switch, so that the responsibility for energizing the circuit, instead of being left with the operator or the dispatcher, is placed upon the foreman, the man who is in charge of the men doing the work. In the case of more than one crew doing work, two locks are provided and two keys are provided for the separate foremen. I don't know whether that would be practical in all instances or not but it is one of the things that this Company has adopted.

The Edison Company also is trying out a leather coat for the operator to prevent injury from flashes. This coat is made without sleeves and has a hood that comes up over the head and the operator wears that coat to prevent being injured by flashes. Perhaps it wouldn't appeal to you

so much but it goes to show how far you can go in getting absolute protection, making assurance doubly assured. I think that spirit in an organization to do that sort of thing is a mighty good spirit to have, even though some of the things that are done seem to be going a little bit too far

CHAIRMAN MACLACHLAN: I would like to hear a full discussion on this paper. It is a paper that applies very closely home. Mr. Scott has pointed out the question of the smaller company; the application of these ideal conditions that are in the larger company to the smaller. Mr. Rinke, can you let us have any information on this?

GENERAL DISCUSSION

MR. G. R. RINKE (Utilities Mutual Insurance Co., New York): It is rather a difficult point to cover the smaller company as the smaller operators are very badly handicapped and they haven't had the opportunity to get in touch with the larger proposition.

So far as protecting the plant is concerned, there is an awful lot to be done. It is surprising to see how fully guarded they are when you get around to them. There are a few ways you can reach those people. Quite a few of them, it is true, read technical magazines of some sort, but they seem to lack the incentive to go ahead and do the things that they realize are well worth while doing.

MR. W. L. BRUCE (Westchester Lighting Company, Mt. Vernon, New York): I would like to hear whether or not some of the men here have had any accidents in connection with employees coming in contact with the metal guards. When I talk to my engineers about it they laugh at me. I am satisfied to be a clown if it stops any one from getting hurt. Why they make guards out of metal I don't know. Just as an illustration: When I went up to Sing-Sing Prison in our district about fifteen years ago there were guards in uniform with muskets and rifles and here about two years ago when I went up there I didn't see any guards. They kept those prisoners in check with a league called the Mutual Welfare League. You wouldn't think you were in a prison. Now I believe there ought to be some other method of guarding sub-station apparatus.

MR. MULLIGAN: I will state that in one company with which I am familiar they formerly had iron-clad doors in front of their buses. I am not aware whether or not they had an accident, but due to the possibilities of an accident these doors were replaced with asbestos board doors.

In one of our stations we have had a number of near-accidents to men who went to examine the oil rings in the barriers and at the same time a flash-over occurred. I have spoken to several men who have missed these flash-overs by a second. I am wondering what protection Mr. Wagner has in the examination of oil rings.

CHAIRMAN MACLACHLAN: I have asked Mr. Wagner to make a note of these points. Mr. Davis, have you something to add to this?

MR. DAVIS: At the sub-stations we lock the switches, as Mr. Scott stated, and the key is carried by the foreman in charge of the work. One other point was brought out in Mr. Wagner's paper with reference to the foreman turning the work off to the leading operator in the station, as I understood his paper. The foreman does not turn the work off to the operator but the operator, after he has reported that the work is completed, checks over the work that has been done to make sure that it is O. K., then the foreman goes to the booth and calls up the load dispatcher and turns the work over to him, seeing that everything he had to do is complete. Immediately after that the load dispatcher checks up with the operator to verify that the work has been completed and is O. K. and put in service. The same way when the foreman starts on the job, the permission is given him through the load dispatcher to start on the work after the dispatcher has checked with the operator in the station to make sure everything had been properly attended to. The foreman goes around and watches every movement that is made by the operator to make sure that everything is O. K. so that when he goes to the load dispatchers and gets the orders to proceed with the work he is absolutely sure that there is no chance of the line being made alive before he starts to do the work.

In grounding the more modern sub-stations after pulling the disconnect from the live side of the bus, we have it fixed so that we can insert that disconnect in the ground bus and then after that has been done we close the oil ring to the ground and the oil switch is closed and the foreman carries the key to that lock.

OIL RINGS

MR. SPOEHRER: I want to say a word in regard to oil rings. During March, of 1919, I had a letter from Mr. Paige and I sent him some photographs showing how it is practiced in St. Louis and those photographs were for bulletin purposes. The photograph to which I refer shows a small mirror at an angle of forty-five degrees over the opening which permits the man to see whether the oil ring is turned without the necessity of placing his head in a dangerous position over this opening or the machine in operation.

MR. F. N. LEONARD (Public Service Company of Northern Illinois): There isn't much that I can add to what has already been said except one point in connection with reaching the small properties. Now none of our small stations are isolated from our system of transmission lines but we have that class of men whom you call service man whose duties are to operate the sub-station, read the meter, control the high tension lines, and do all the general work in his small community. Our method of reaching him and giving him the information to carry on these various combinations is through our safety meetings. We do pay particular attention to that class of men. We give them all the detailed information we can by discussing the different phases of this work at our meetings.

MR. BURTON: Regarding the question of oil rings: The man knows when the cars are near the station and he can watch his opportunity to

look at the rings which would prevent his getting in such a position that he would be in line with the flashes.

Regarding metal guards: I happen to know to what guards the gentleman refers because I was present at the meeting the other day when he brought it up, and I would suggest that the ammeter be more carefully guarded; it should be grounded to make it safer. If the metal guard was so close that the man couldn't go in between, it ought to be placed farther away. The metal guards are better to use because wooden guards would add to fire risks and if it is asbestos it would have to be reinforced with something else. If it is anything else but metal it is liable to be injured and soaked with the rain.

Regarding the difference between the smaller stations and the larger ones. If the smaller station didn't have the apparatus they couldn't guard the same way as the larger stations. It seems to me it would be easier to guard the small station than the big one. The small stations are not guarded as well as the larger ones because they think the power is less. We are coming to a point where we have to take more pains in guarding them.

CHAIRMAN MACLACHLAN: I will ask Mr. Wagner to close the discussion and answer those points that have come up.

MR. WAGNER: I believe I am in the happy situation of having most of the questions answered.

Regarding the little fellow: I was a little fellow for about twelve years myself. I really think, if I were a little fellow today, I would guard the small station not directly connected with a larger station in any way. I would keep in touch with all the developments regardless of how ideal they may be so far as concerning their own equipment because the experiences that have been brought out in the National Safety Council meetings are nationalized in character; no item is over-estimated. I do not think that too much emphasis can be placed upon the fact that the little company should keep in touch with the larger things that are happening as indicated in this Council.

With respect to the Commonwealth Edison Company, I believe that particular improvement regarding locks is very good. One company goes up one way and another, another and possibly a complete investigation of the intricacies would show the same percentage of safety for both companies. I won't be satisfied until I know more about that particular locking plan.

With respect to oil ring examinations, that has been answered the way I would answer it.

With respect to substation guards: Where the screens were so close that umbrellas could be poked through we moved them back so this condition would not be so hazardous.

With respect to the plan of checking up the work: We place the direct responsibility upon the station operator, the foreman of the job being directly responsible for him in practically all instances.

CHAIRMAN MACLACHLAN: I am sure we are all glad that we had Mr.

Wagner here. We hope that in the future he will give us further papers and come and enter into the discussions.

The Nominating Committee dodged their full duty and I think they have taken some of the ideas out of the army and learned how to "pass the buck" along. I got the incoming Vice-Chairman and the incoming Secretary together and discussed with them the Chairman of the various committees that are to be appointed. I wish the appointment to come right from the Secretary. In suggesting to you these names, we have had in mind the fact that we have electricity, gas, and telephone, and also that the Chairmen of these committees should be appointed from various sections of the country.

With those remarks I suggest to you, for Chairman of the Membership Committee, Mr. H. E. Niesz, of the Commonwealth Edison Company; Chairman of the Program Committee, Mr. Hermann Spoehrer, of the Union Electric Light & Power Co., St. Louis; and for the Safe Practices Committee we suggest that we will communicate with the headquarters of the A. T. & T. Company and ask them to suggest a man from their engineering department to fill that position.

If this meets with your approval, I would like to hear a motion from the floor appointing these men to fill the office of Chairmen of the various Committees.

MR. C. HOWARD STEWART (Laclede Gas Light Co., St. Louis): I move you that the gentlemen mentioned be placed in nomination for the positions that you have mentioned.

(The motion was seconded and carried.)

CHAIRMAN MACLACHLAN: I declare these gentlemen elected as Chairmen of the various Committees and I would ask the gentlemen who are present to wait for a few minutes after this meeting so that we can hold a preliminary Committee meeting.

We are now going to have the pleasure of hearing from Mr. Webber, of Chicago, on that most important point, "Spasmodic Safety Efforts and the Harmful Results." We have all had them and I am sure Mr. Webber can give us a great deal of information.

SPASMODIC SAFETY EFFORTS AND THE HARMFUL RESULTS

H. M. WEBBER, SUPERINTENDENT, DEPARTMENT OF CLAIMS, CHICAGO
TELEPHONE COMPANY, CHICAGO

To the experienced safety man this subject is practically answered at the start. On the very face of it, the real, honest-to-goodness safety man knows that no possible good can come from occasional efforts to bring before the employees or the public the value of accident prevention.

Whether the safety work is of the public or industrial type, the need of forceful, intensive, persistent, and systematic efforts is necessary and should be of the "hammer and tongs" variety. No one can or ever will make a success of accident-prevention work who does not continually follow it up.

To my mind there is nothing more harmful to the general safety movement than spasmodic efforts, and this is one of the primary reasons why so many companies entering into the safety work make a failure of it.

To make a start today with a blare of trumpets and possibly continue for a few weeks or a month and then forget the work for the next six months, is a decided waste of effort and a source of danger to the great safety movement. In every line of endeavor the success of the movement is conditioned by the degrees of effort that are obtained. Thus it is that the unsatisfactory results or lack of results which follow spasmodic efforts may end in the dropping of the effort on the part of the employer and will have a tendency to discourage others who may be contemplating entering into this work. We all know that properly conducted safety work in a plant means the saving of both lives and limbs, and this is true not only in our industrial plants but in public safety work as well. It means the possible prevention of an accident or death, not only to strangers to us but possibly to the members of our families.

With so much at stake in the maiming of thousands of people each year, as well as numerous deaths caused through accidents, and with the knowledge we have, that by persistent efforts in properly presenting to the employees, their families, and the public the value of the safety movement, it can be plainly seen that it must be constructive, not destructive. Spasmodic safety efforts are destructive and will tear down all of the beautiful plans you may have prepared before the movement was started.

Does any one believe that the National Safety Council, with all of its wonderful and glorious success in the safety work, would have been any where near as effective today had the officers and management made only occasional efforts to interest the employers, employees, and the public in this work? "The proof of the pudding is in the eating" and the results attained by the National Safety Council have been secured only by hard and persistent efforts on the part of the entire and most efficient management. In other words, the National Safety Council did not go to sleep on the job. They knew that the subject was a live one and accordingly went out to make the best of it. It was their persistency and belief in the value of the work in hand that helped toward the final brilliant success which they are now receiving; and only by such efforts will the safety movement be a success.

SUCCESS MAY BE TURNED INTO FAILURE UNLESS PROPERLY FOLLOWED UP

Would the railroads and other public utility companies, the steel industries and our large manufacturing plants that have made such wonderful strides in accident-prevention work have been able to make such a showing in the reduction of the number of accidents in their industries if they had not kept the work alive by constantly keeping the movement before the employees in such a manner as to keep them interested? No one man can make a success of the safety or accident-prevention work without the cooperation of every man, woman and child in the industry in which he is engaged, and this must include the officials and the entire supervisory force. When he has secured this cooperation and all thoroughly believe that safety is a real live issue and that lives and limbs can be saved by

following out its dictates, and that the continued success of the movement depends upon each individual's efforts, then and then only will the safety work in any industry become a success; yet, this success may be turned into a failure very quickly if it is not properly followed up.

Consider for a moment what would have been the results if only occasional efforts had been made on the part of the Allies to stop the great German army in its progress during the period of the war. Does any one believe for an instant that the final success gained by the Allies could possibly have been gained in any other way than by dogged persistency and determined efforts to make their entire campaign a success?

If after a brilliant start we then rest on our oars, hoping what we have done will bring forth results, we might just as well have not started, and the harmful results of such spasmodic efforts will unquestionably be shown in the lack of interest which the employees take when we again try to put the matter before them. You can't just say to employees or the public that the safety movement is a good thing; that you thoroughly believe in it and you want them also to believe in it. You have got to show them that there is something behind the movement. You must let them know that you are not alone interested in it from the Company's standpoint, but that you know it is for their own individual good and for the good of their families.

One of the fundamental principles of the safety movement is education. It is much more simple to teach a child than an adult, for the child's mind is always in a receptive mood and is constantly seeking information. "Train up a child in the way he should go" is an old and true saying. And in teaching safety, we must train the men the way we want them to go. It is hard, however, to teach an old dog new tricks, and so it is with the presentation of safety work to the workmen. You must put it before them in such a manner as to impress them, not only with the seriousness of the subject but in such a way that they will realize that they will be the gainers by accepting it. Show them that it is not from the standpoint of saving money for the organization which you represent that you urge them to prevent accidents, but that it is for the general interest of the individual and his fellow employees. Teach each man to be a real safety man. Show him how he can assist himself and his fellow workmen by preventing accidents, and that your interest in the work is wholly in his behalf; but that in order to make a real success you must have his individual help. Every employee has a vital interest in his fellow employee whether he knows it or not, and it is only through education that he can be brought to see the real assistance that he personally can render in the prevention of accidents.

SPASMODIC SAFETY EFFORTS PREJUDICE EMPLOYEES

Spasmodic safety efforts will result in the lack of appreciation of the importance of safety ideals in the plant where such spasmodic efforts are made, and cause the employees to feel that this is only one of the numerous fly-by-night fads which are constantly cropping up from time to time, so that when the real safety campaign is finally put under way, the safety man will find that he is up against a much harder job than would have

been the case had the movement been started originally in the proper manner. It will be necessary for him to convince the men that the movement is one for their good, and he will be compelled to put forth greater efforts to put it across and overcome the serious prejudice which the men will have by that time taken to the entire question.

When once the employees have become prejudiced against a movement of this kind, it will be necessary for the safety man to use a much greater amount of tact and diplomacy. He will have to start a propaganda in the plant in favor of the idea before he will be able to secure their confidence.

I believe that where one company in a group has made only superficial efforts to interest employees in safety work, especially if that company has a large number of employees, the prejudice that will enter the minds of the employees of that plant will in time permeate the minds of employees of other plants in the immediate vicinity and cause great harm to the entire safety work in these plants. We all know that the greatest influence in making a shop or job safe is careful work, and hence it is that accident-prevention work is a constant battle against habits. All of us are constantly and persistently fighting bad habits that are easily formed and difficult to break. On the contrary, we are constantly trying to teach good habits that are hard to form and easy to break. However, the habit of being careful is not self-sustaining. When you start your automobile the engine roars and sputters, and every evidence of the vast amount of energy being expended is given, and yet, once the engine is started it gets under way and quiets down; but there must be a constant supply of power, and fuel, and a level head if the automobile is to be kept going. In conducting accident-prevention work a similar condition exists. In instilling habits of safety work there must be a constant supply of power and fuel in the form of inspiration, supervision, and direction. If the supply of fuel is interrupted, the accident-prevention work is bound to slow down, and may even stop, and much energy will be wasted in getting it started again.

SAFETY MOVEMENT ONE OF CONSTANT ADVERTISING

Success in safety work is comparable somewhat to the success which some of the large concerns of this country have made through the efforts in advertising, and the success in their line was not made by the placing of an ad today and again in six months, but by constant and persistent advertising. Think for a moment of the best-selling merchandise that you know of. Some of the following, no doubt, come to your mind: Heinze's 57 Varieties, Ivory Soap, Waterman's Fountain Pens, Wrigley's Gum, Cream of Wheat, etc. These names occur to you at once because of the steady and persistent manner in which the advertising was placed. You may also be able to recall articles that were extensively advertised for a short period, which are no longer on the market, and you probably can recall these names only with an effort. The purpose of advertising, then, from a sale standpoint, is to impress the name so firmly and so fixedly in the minds of the public that the name will become synonymous for that particular class of articles; so that when a purchase is contemplated the name will instantly leap in the mind of the prospective purchaser.

People readily forget, however, and if advertising is not kept up the advertiser soon loses the advantage gained, and we no longer think of this particular article but simply ask for those articles as a class. The safety movement is one of constant advertising; the more the better.

During the great world war strenuous efforts were made not only by the National Safety Council but by all of the various industries throughout the country and more especially in the shipyards and munition works, to impress upon the employees the necessity for safety in order to preserve the man power of the country and thus assist in preventing the slowing up of production.

Today, with our men returning to their various vocations after spending many months in preparation for and in actual warfare, we should not relax in any way in the education of the workmen along safety and accident prevention lines. On the contrary, we should use, if possible, greater efforts to prevent loss of life and limb, for production is needed now as much as during the war to help in the reduction of the high cost of living and thus assist in overcoming the general unrest among the working classes.

In starting the safety movement in the company I represent, we began in a small way and have kept it constantly before the minds of the employees. It was started some seven or eight years ago by first presenting the idea to our supervisory force at one of our Monday luncheons, having for the speaker a man who had been interested in the work for some time. From that time to the present we have never omitted a single day to do something to keep it alive and to keep the employees interested. Our company publishes each month a magazine devoted to the employees, which is mailed to their homes, and from the time we started the Safety Campaign there has not been a month that data of some kind pertaining to the safety work has not been published under the heading of "Safety and Accident Prevention." The articles are not limited to Accident Prevention, but also touch on subjects pertaining to the general health of the employees and their families. Our pay days are twice each month and the checks are mailed to the employees at their homes. On the first pay day a bulletin on Accident Prevention or Health accompanies the pay check, and on the last pay day the check is accompanied by a small calendar blotter on which appear short, snappy, up-to-date Accident-prevention or Health slogans. These calendars are never sent out in the same general form, but changed to attract attention, and we are advised that the employees and their families have come to watch for them so as to see what new thought or suggestion they contain. We have, of course, held the usual meetings on Accident Prevention, First Aid, Welfare, etc. These we call only occasionally, not frequently enough to tire the employees, but simply to keep up their interest.

Having had charge of the accident work for my company for the past twenty years, I have had occasion to study the question from all its angles and to appreciate most fully what the safety movement means and what it would have meant to the numerous employees and their families years ago, in the saving of life and limb, and how much needless suffering might

have been prevented had we then had the present-day efficiency in the safety work.

From the experience in my own field of endeavor, I know that the continuous, persistent efforts we have made to keep the employees interested and advised on questions of safety have paid, and paid big, and that the results accomplished could not have been secured had we made only half-hearted or spasmodic efforts.

CHAIRMAN MACLACHLAN: This is the type of paper that we all need at practically all times. I would like to hear what Mr. Lucas has to say in connection with the danger and bad features of spasmodic efforts.

- DISCUSSION

MR. LUCAS: If you slow down your campaigns you will find that your accidents will immediately start to crawl up. You have got to keep going all the time, month after month and year after year. I do feel, as I said yesterday, that we have had an awful lot of safety talks. I do not mean to let up on safety talks. I mean to continue the safety bulletin and the safety meetings of all kinds.

You can talk to some men until doomsday and it would produce no effect on them, but take it out of their pay and you will see them wake up immediately.

MR. V. R. HUGHES (Pacific Gas & Electric Co., San Francisco): I do not believe in antagonism and when you are fighting and lay him off you antagonize him. When I find a man a little lax on the movement I talk to him, and I have gotten a good deal of work out of such men, who were indifferent to start with. Some of our best men today are the ones who were indifferent on the start.

CHAIRMAN MACLACHLAN: Due to the fact that I had in my hand the second edition of the program instead of the final, I have inadvertently made an error and I will now call on Mr. Buchaca to carry on the discussion on this subject.

One thing, I would like to ask those who discuss in the future to stick to the subject under consideration and after we have taken that up we will revert to the subject that was under discussion yesterday, which is extremely important.

MR. E. J. BUCHACA (District Engineer, New York Telephone Company, Syracuse, New York): Leading the discussion I presume means starting the discussion, and perhaps the best way to start something is to disagree as much as possible with the other fellow, and also call attention to points upon which there may be difference of opinion.

Mr. Webber has cited a number of cases to show that best results come from hard and persistent efforts. He refers to the endeavors of the National Safety Council of public utility companies, the steel industry, manufacturing plants and to the doggedness of the Allies that won the war. Certainly we must agree with him in this.

He says that the unsatisfactory result, or lack of result, which follows spasmodic safety effort, may end in the dropping of the campaign on the part of the employer and the discouragement of those who have been

promoting the safety work. This is indeed true, for it seems to be human nature to start something new with enthusiasm, gradually lose interest, and finally drop the matter altogether, unless there is a will behind the movement to keep it going without regard to obstacles. However, even the will to do safety work opposed by great pressure from other sources may result in spasmodic rather than continuous effort, leaving the question still open whether such effort is better than none at all. There was a great deal of such pressure during the war, and many managers who would have liked to have kept up the safety work found it impossible to do more than put on an occasional campaign. Don't you think they accomplished some good?

The influence on the employee is mentioned as a harmful result. It is stated that as a result of spasmodic effort he will show lack of interest the next time that the matter is put before him; that he will not appreciate it but will consider it one of the numerous fly-by-night fads which are constantly cropping up, and that this feeling will spread to other plants in the immediate vicinity and cause great harm to the entire safety work in these plants. I can hardly agree with this, for I have found that if when the safety work is revived, it is dressed up in new clothes and approached from a different angle with a good selling campaign to present it, employees grasp the idea as enthusiastically as they did the first time, and often show a new and stronger interest. They welcome it as an old and helpful friend who works in their behalf.

Now we come to the subject of education and training, and here is where I hope to make my stand in favor of the proposition that the net result of spasmodic safety effort may be good, that it is better than nothing at all.

Surely we agree with Mr. Webber in his statement concerning the value of training both the child and the adult in the value of safety, and in its ways.

May I develop this thought a little further from the psychological viewpoint?

If a manufacturer, for instance, puts on one advertising campaign and does nothing further, he is soon forgotten, but nevertheless he has made a few sales as a direct result and has made an impression upon the minds of all those who have come in contact with his campaign which cannot be entirely eradicated by time, and should he put on another at some little time afterwards the old impression will be revived and the purchaser will feel conscious of having heard of the thing before, which in advertising is an advantage, giving the article a certain standing. If he continues these occasional campaigns he will make a deeper and deeper impression and his goods will become more and more familiar. There is a mathematical relationship between spasmodic and continuous. If the periods between the spasmodic efforts were shortened and shortened, these efforts would tend to become continuous and the results would multiply until we got the well known results of Heinz's 57, Ivory Soap, etc., as mentioned by Mr. Webber.

TRAINING EMPLOYEES TO RECOGNIZE RISKS SUBCONSCIOUSLY

In much the same way as with advertising, the purpose of the safety movement is to make such an impression on the mind of the employee that when an unsafe act is contemplated the safety idea will instantly leap into his mind and cause him to do the safe thing. Putting this same thought into other words, accident prevention training is not so much for the purpose of "educating" workmen or keeping employees from being careless, or even of arousing enthusiasm, as it is for training them to recognize risks subconsciously and without hesitation to decide on the safe way and proceed in that manner. This sort of training is particularly necessary in public service work where men work singly or in small groups without close supervision, often at some distance from city or village, and where the chances of accident through carelessness and lack of foresight are great. It is a branch of education just as advertising and schooling are, and for the best results has for its object the training of the subconscious mind.

This is particularly necessary if accidents are to be prevented, since more than 80 per cent of all accidents according to statistics are due to risk-taking, which the employee may or may not be conscious of, and less than 20 per cent are due to structural or mechanical defects, risks of employment, acts of God, or physical deficiency. The employee's own mind, conscious and subconscious, must be his chief guardian against accident and injury.

If the initial safety campaign were well staged, it "sold" safety to the employees at that time and made an impression. It is reasonable then to believe that some accidents at least, with their pain and sorrow, were avoided as the direct result of that first campaign. In view of what has been said about advertising and safety work and the similarity of the objects to be accomplished, is it not clear that each succeeding safety effort, even though infrequent, tends to revive the impression made by the initial campaign and deepen it and stir the employee's self-interest in avoiding accident, at least for a short time afterward? Surely some accidents will be avoided as the direct result of each campaign and some from the lasting impressions carried by many of the employees. Can the possible harmful results that might come from spasmodic effort outweigh this saving of life and limb?

FOR SAFETY EFFORT WHETHER OCCASIONAL OR CONTINUOUS.

In conclusion, I would like to say that while I may seem to disagree with Mr. Webber on some points, I agree with him heartily in this, that continuous, persistent effort saves life and limb, pain and sorrow, out of all proportion with the effort expended, dividends that cannot be estimated in terms of dollars and cents. However, I am for safety effort whether occasional or continuous, and wish to leave it with you to decide whether there isn't some net good resulting from even spasmodic efforts.

CHAIRMAN MACLACHLAN: Is there any further discussion on this paper? I would like to hear some one speak who hasn't spoken this morning.

MR. M. C. GOODSPEED (General Electric Company, Erie, Pa.): I just have one item to add. The gentleman who just spoke covered these points very fully. Although I agree that spasmodic efforts never can give us the results that continuous efforts will give and that continuous efforts are by all means to be desired, still I am fully convinced that the spasmodic efforts must give us some beneficial results. The man who is in charge of the spasmodic efforts, because they are spasmodic, may tend to become discouraged. You may think you have harmful results because he becomes discouraged, but you will find that while one man may have been discouraged, hundreds of others may have been encouraged for the time being. I will increase that to thousands that may have been encouraged, as shown by the safety rally here in the city of Cleveland this week. It is a spasmodic effort for safety for one week. We don't expect it to be extended for the entire year but you are getting results in the city of Cleveland from the spasmodic effort and you expect to get further results when the city of Cleveland and its Safety Council go ahead with the work, on probably different basis perhaps, and present that work to the city and utilize the results and enthusiasm of this spasmodic effort to obtain definite permanent results in the increase of safety in the city.

MR. BURTON: I think this question of spasmodic effort depends upon the question of labor turnover in the labor industry. For instance, you may come back next week or next month and find you have an entirely different set of men.

MR. A. O. MITCHELL (Northern Indiana Gas & Electric Co., Hammond, Ind.): The question of spasmodic effort brings to my mind a peculiar situation in which I work, arranging safety committees, going to the property and calling all the foremen together from every department and outlining the plan which we are to follow, telling them what we intend to do, then during that day, having those men select two men from their department to complete the committee from that department, and then having a meeting the next day of all the committeemen. I think in this particular case they numbered 26 out of 150 employees. We had meetings every week and I went every day during that week with the different foremen, half-day or quarter-day with each one, making a complete inspection of the division over which they had control, inspecting all of the line wagons, the gas wagons, the push carts and all the tools and appliances that they contained. We wound these meetings up with a general safety rally to which the women and children were invited and a great many, in fact a larger percentage than we expected, responded, and giving some little entertainment and luncheon for that night. During that time we took the opportunity of telling the women what we were intending to do and urging them to use their influence in the work.

I left and was gone about two months before getting back. When I came back I asked the man who was made President of this safety organization how they were getting along and he said, "We are doing pretty well, we haven't had any meeting since you left though." It was vacation time. I said, "When do you expect to have a meeting?" He

said. "We are going to take it up now, right away." This was the first of September.

I got around some of those foremen and found they were practicing safety although they were not having any meetings. That was a spasmodic effort that I know had no harmful results, and I know the work will be taken up again this fall and they will get into it during the winter and have their meetings.

We completed an organization in another section employing about 250 men some two years ago. It started out, not with a cry of a horn or any big spill or noise but now they have a very complete organization. During their first six months, as I recall it, their efforts were very spasmodic. They had no regular plan to follow but now they have gotten on a solid foundation and the work that they have done there has been worth the time and effort, not only in the prevention of accidents, the saving of money and the conservation of funds but it has brought the men closer together: it has made them sort of a family, and I find that, in that particular place, the labor turnover has been cut down to a very fine point. In fact, there are men there who have been there now for two years and previous to that time they worked possibly two weeks or a month, thinking that nothing was being done for them and nobody seemed to care anything about them. That has been changed and it started out spasmodically.

I have been with this Company for about nine years and I know of no harmful results that have come from a spasmodic safety movement.

CHAIRMAN MACLACHLAN: Is there any one else who wishes to talk on this?

MR. T. D. RAMSEY (Kansas City Gas Co.): The thought just occurred to me: What is the reason for the spasmodic effort? I was just wondering if it is in the man who starts the campaign. He may have the idea that it is absolutely necessary for him to do all the talking and all the leading. My idea in starting a campaign or in starting a movement would be to get the others interested and get them to do the work. I think that should be the manner in which the leader should lead;—get the other men to do the talking and the acting and let the leader assist them and counsel with them.

CHAIRMAN MACLACHLAN: Mr. Rosseland is here and wishes to speak to you for a few minutes.

MR. F. M. ROSSELAND: First, I want to refer to the discussion of Mr. Webber's paper. It suggested to me that there is a considerable difference in the various definitions of "spasmodic efforts." When I first heard Mr. Webber's paper I had in mind the spasmodic effort which opened up with a blare of trumpets, and then stopped, not the work such as Mr. Mitchell described, which is the usual work, the usual method of conducting safety work in a large company. I think you will agree with me in that.

As a matter of fact, the large companies seldom have a safety man out on the job who sees each man and talks to him, they have a safety meeting about once a month and the safety engineer or the safety inspector

gets around and leads the meeting and talks to the men. I wouldn't call that spasmodic safety work. I think we should consider the other angle as spasmodic safety work, that is where it starts up and dies down absolutely.

I have had it thrown up to me time and again in starting out work of that kind, "Oh, yes, they started some of that work two years ago. I didn't hear anything more about it at all." At any rate, it is a decided handicap in getting the interest of those men. In some instances, I never did succeed. We had some men who absolutely required discipline.

REGARDING PRINTING CONGRESS PAPERS IN ADVANCE

Turning to the subject of printing Annual Congress papers in advance—for some time there has been a demand for this, so that the papers might be placed on the registration desk and elsewhere for members to get and read. The objection to that is, as has been made by some of the sectional officers, the fear that the members will get the papers, look them over, put them in their pockets, and then not attend the sessions.

On the other hand, there is a decided advantage that the people who attend the sessions may get the papers, read them over, and come prepared to discuss them more intelligently than they could otherwise.

The National Safety Council is anxious to give the maximum service. We are not anxious to print the papers, however, unless you want them as it entails quite a bit of expense that could be diverted to some other good work for the Section. I should like to know what you think about it.

MR. SCOTT: I move you that it is the sentiment of this meeting that the papers be distributed in advance.

(After discussion, the motion was carried.)

CHAIRMAN MACLACHLAN: I will now give Mr. Webber the floor to wind up the discussion on his paper.

MR. WEBBER: I don't believe that there is much more that can be said. It seems to me that spasmodic efforts speak for themselves. I have no doubt that there have been cases such as some of the gentlemen spoke of where they have started a movement on safety and the result of that particular movement did sink in and that it did carry along with those who were interested and impressed them for the time being. Mr. Rosseland covered that point, however, that it must not stop permanently, that it must not stop for six months even.

I don't believe that, unless you do persistently keep after this question of safety and the accident prevention and keep it before the individual workman, you can possibly get the results that are desired.

MR. SCOTT: I move you that it is the sense of this Section that we recommend to the Program Committee that at the next Annual Congress we have a paper presented in this section on the subject of "Fixing the responsibility of penalizing the foreman and superintendent who are responsible for accidents."

The motion was seconded and carried.

MR. MULLIGAN: I would like to suggest that copies of the proceedings

of this Section be distributed among some of our superintendents. We are not interested in a whole bound volume.

CHAIRMAN MACLACHLAN:—It is the sense of this Section that the Section's proceedings be bound separately that they may be available to the members of this Section.

(The motion was seconded and carried.)

CHAIRMAN MACLACHLAN:—Now it is just seventeen minutes to one. Is it your wish that we go on with the discussion of various matters, or should we adjourn within a few minutes, or do you wish to carry on this afternoon?

MR. MORRISON: I move that we adjourn.

(The motion was seconded by Mr. Lucas.)

CHAIRMAN MACLACHLAN:—I want to thank you for the honor of being elected Chairman of the Section.

During the year to come, I hope, with the assistance of you all and with the assistance of those you have elected with me, to present possibly some other phases of the work as they apply to the Public Utility Company.

The work of the Utility Company in regard to pensions, benefits, employees' representation and other such schemes is entirely different from the work of a company having thousands of employees in one spot, and I think that we could, with profit to ourselves and to our employees, go into this question from the standpoint of public utility.

MR. ROSSELAND: I wonder if I might just add a word about the printing of the proceedings of the sectional meetings. It will be done and sent to the membership at cost. We don't like to go to the expense of printing a lot of unused copies and I would request that you who want them write in and tell us so that we may have some idea of how many to prepare.

CHAIRMAN MACLACHLAN:—It has been moved and seconded that we adjourn and I now declare the sectional meeting for this Congress adjourned.

23

11

11

11

11

11

11

11

11

11

11

11

11

11

11

11

11

Rubber Section

October 4, 1919

MINUTES

THE meeting was called to order at 9:30 a. m. to consider the advisability of forming a Rubber Section. Mr. E. H. Fitzgerald of the Federal Rubber Company acted as Chairman pro tem. The advisability of forming this section was discussed by Mr. W. N. Fitch of the B. F. Goodrich Company, R. N. Watson of the Goodyear Tire and Rubber Company, S. M. Shott of the Morgan and Wright Company, Dr. Horan of the Hood Rubber Company, and Mr. Rosseland of the National Safety Council. All spoke in favor of the section, and a motion that a Rubber Section be formed was offered, seconded, and carried by an unanimous vote.

The Nominating Committee consisted of W. N. Fitch, Dr. Horan, and Harold T. Martin. This committee nominated S. M. Shott, Chairman, E. H. Fitzgerald, Vice-Chairman and R. N. Watson, Secretary. Report of the Nominating Committee was accepted and motion was made and seconded that the nominees be elected unanimously.

The following men were in attendance at the meeting: E. H. Fitzgerald, The Federal Rubber Company, Cudahy, Wis.; Harold Martin, T. J. Dwyer, H. T. Greene, and E. Forand, the Fiske Rubber Company, Chicopee Falls, Mass.; P. B. Martens, T. S. Petty, C. G. Dimcombe, A. L. Weyand, E. S. Hoener, N. A. Shepard and M. F. Letzel, the Firestone Tire and Rubber Company, Akron, Ohio; R. N. Watson, and P. A. Belden, The Goodyear Tire and Rubber Company; W. N. Fitch, W. L. Schneider, J. C. Howard, E. P. Raiford, A. C. Mack, W. G. Oberholser, E. K. Davis, G. A. Knofler, and R. B. Howe, The B. F. Goodrich Rubber Company; H. G. Pushee, The General Tire and Rubber Company, Akron, Ohio; A. L. Rose, The Kelly Springfield Tire and Rubber Company, Akron, Ohio; S. M. Shott, the Morgan and Wright Rubber Company, Detroit, Mich.; R. W. Fogerty, U. S. Rubber Company, Mech. Goods Div. Cleveland, Ohio; A. C. Peterjohn, The U. S. Rubber Company, Mech. Goods Div., Cleveland, Ohio; W. H. Larkin, Jr., J. W. Towsen, Lycoming Rubber Company, Mech. Goods Div., Passaic, N. J.; R. L. Gould, The U. S. Rubber Company System; M. Klein, The Federal Rubber Company, Cudahy, Wis.; C. F. Horan, The Hood Rubber Company, Watertown, Mass.; Mr. Rosseland, National Safety Council, Chicago.

Mr. Rosseland of the National Safety Council was requested to inform

the Section of the committees to be appointed, their duties, and method of operation. He suggested the formation of the following committees: Program, Bulletin, Membership, and Standardization.

No papers having been prepared for reading in the section, a general round-table discussion was held on the subjects on the program.

The first subject discussed was that of washers, crackers, and mills. Mr. S. M. Shott of the Morgan and Wright Company stated that their men were not allowed to start rubber through the washers or crackers with their hands but that small wooden paddles were used to push the rubber into the rolls. Also the blocks of rubber are cut into a wedge shape to further facilitate starting.

Mr. Fitch of the B. F. Goodrich Company stated that all of their mills have been placed high and holes were cut in the floor in front of those already installed in order to bring the top of the rolls nearly as high as a man's shoulders.

Mr. R. N. Watson of the Goodyear Company reported that bars had been mounted across the front of the washers in a bearing which allows them to revolve, the rubber being run over these bars while washing, and the men are instructed to keep back of the bar.

Mr. Horan of the Hood Rubber Company reported that individual clutches are used on all washers and crackers and that the inspectors have each man try out this safety each day and that the men are trained in the proper operation of the safety. Foot treadles just under the edge of the pan have worked out very satisfactorily and are the only means of stopping the mill in case a man gets both hands caught. Mr. Horan also stated that automatic reversing devices were used on a great many of their mills and work out much better than the dynamic brake.

Mr. Snyder of the B. F. Goodrich Company stated that a special screw is being designed by the Farrell Machine and Foundry Company, for opening mill rolls.

Mr. Hoener of the Firestone Tire and Rubber Company stated that their company was using a signal from the motor pit before starting up a mill line and that an answering ring was received for each mill before the line was started.

Mr. Belden of the Goodyear stated that switch boards are mounted over the motor pits with a platform at least six feet from the floor, giving a clear view of the line and assuring the electrician starting the line that no men are near the mills.

Mr. Shott of the Morgan and Wright Company brought out the point that reports of mill line safety tests did not only report that the line stopped O. K. but also showed the distance traveled by the rolls before stopping. He further stated that these reports should go to the Master Mechanic and Safety Department signed by the mill room electrician and inspector.

It was further suggested that a "Safe Practices" pamphlet be published on the subject of washers, crackers, and mills.

The next subject discussed was calenders.

Mr. Petty of the Firestone stated that on all calenders having an opening center and lower rolls, special gears had been provided and rolls had been lowered so that the opening was at least $2\frac{3}{4}$ inches, this opening being wide enough to clear the hand in case it came near the opening of the rolls. The calenders at the Firestone are also equipped with electrical clutch and brake.

Mr. Shott of the Morgan and Wright Company reported that they are using successfully a triangular-shaped casting at the opening between the rolls, $\frac{3}{4}$ -inch clearance being provided between the casting and the rolls. This prevents a man getting near the opening in the rolls and the only danger is in getting the tips of the fingers squeezed between the castings and the rolls.

On fabric calenders the casting is split and a one-inch slot provided for the fabric to pass through.

Mr. Watson of the Goodyear reported the use of a 1-inch bar across the calenders in front of the opening in the rolls, this bar being connected with the bell crank on each end to trip the switch which operates the dynamic brake on the calender so that as soon as a man's hand strikes the bar the calender is stopped. The point was also brought out that many calender accidents were caused by slipping and that the floor when surfaced with carborundum was not slippery and provided an effective means of eliminating this hazard.

The next subject was the handling of material.

Mr. Rose of the Kelly Springfield Tire and Rubber Company inquired if there were any automatic systems of opening molds after curing. Mr. Hoener of the Firestone reported that it was done with some degree of success on a conveyor system with a hydraulic opening device but that the operation was too slow and they had gone back to a special opening bar with increased leverage.

Mr. Shott of the Morgan and Wright advised that molds and cores were not being rolled in their factory, but that a special track was provided for hauling same.

The proposition of getting men to use respirators in the handling of compounds or on dusty jobs was brought up and it was the general consensus that the men would not wear them and that some other means should be provided to remove dust.

Mr. Fitzgerald of the Federal Rubber Company reported that milk was being furnished men in the compound and mill rooms twice per day.

Several companies reported that their mills were hooded and that a strong suction was used on them so that there was no danger of injuries from compounds.

Poisonous hazards in the rubber industry was next brought up.

Mr. Martin of the Fiske Rubber Company called attention to the hazards connected with the use of benzole reporting one fatality among the women engaged on this work. Some women are more susceptible than others.

Dr. Horan of the Hood Rubber Company brought out the point that

the accelerator Eurotropine causes a rash on the hands, arms, face, and neck—blondes being more susceptible than others. This rash can be eliminated by neutralizing the sweat with borax and this has been done in the Hood Rubber company by the application of 20 per cent gum arabic solution saturated with borax to the hands and arms. This forms a shellac-like coating and prevents the chemical from attacking the skin.

The meeting then adjourned.

A special meeting of the officers of the Rubber Section was held at 2:00 p. m. October 4, 1919, for the purpose of appointing committees as follows:

Bulletin Committee: W. N. Fitch, The B. F. Goodrich Company, Chairman; P. B. Martens, The Firestone Rubber Company; H. G. Pushee, The General Tire and Rubber Company.

Program Committee: H. Martin, The Fiske Rubber Company, Chairman; H. E. Gilson, U. S. Rubber Company, General Laboratories, 11th Ave. and 58th St., New York, N. Y.; Dr. Quinby, The Hood Rubber Company.

Membership Committee: E. H. Fitzgerald, The Federal Rubber Company, Chairman; A. L. Rose, The Kelly-Springfield Rubber Company; Frank Scott, The Hamlin Company, 21 Cedar St., N. Y.

Steam Railroad Section

October 2-4, 1919

R. C. RICHARDS, Chairman

Chairman, Central Safety Committee, Chicago and North Western Railroad, Chicago, Ill.

JOHN T. BRODERICK, Vice-Chairman

Supervisor of Special Bureaus, Baltimore and Ohio Railroad,
— Baltimore, Md.

F. WHITEMORE, Secretary

Superintendent, Safety Department, Nashville, Chattanooga and St. Louis Railroad, Nashville, Tenn.

IN ATTENDANCE AT SECTIONAL MEETINGS

Alabama & Vicksburg—

D. H. Beatty, Superintendent of Safety, Southern R. R., Washington,
D. C.

Atchison, Topeka & Santa Fe—

Bert Bertram, Safety Agent, Arkansas City, Kan.

R. E. Blok, Safety Agent, Amarillo, Tex.

Isaiah Hale, Safety Agent, Topeka, Kan.

C. A. Judd, Safety Agent, La Junta, Colorado.

Geo. Moore, Safety Agent, Kansas City, Kan.

Asheboro and Southern—

D. H. Beatty.

Atlanta & West Point—

J. A. Barnette, Supervisor of Safety, Atlanta, Ga.

Atlanta & Yodkin—

D. H. Beatty.

Atlanta, Birmingham and Atlantic—

J. A. Barnette, Supervisor of Safety, Atlanta, Ga.

Atlantic Coast Line—

John R. Adams, Supervisor of Safety, Wilmington, N. C.

J. V. Miller, Supervisor of Safety, Wilmington, N. C.

Robert Scott, Superintendent of Insurance and Safety, Wilmington,
N. C.

Augusta Southern Railroad—

W. O. Wall, General Safety Agent, Augusta, Ga.

Baltimore & Ohio Railroad—

John T. Broderick, Superintendent, Safety and Welfare Dept., Baltimore, Md.

W. J. Head, Safety Agent, Northwest District, Cleveland.

Wm. D. Lenderking, Safety Agent, Baltimore, Md.

W. A. Mitchell, Safety Agent, Grafton, W. Va.

J. C. Morgan, Safety Agent, Baltimore, Md.

T. J. Reagan, Safety Agent, Southwest District, Cincinnati, Ohio.

E. R. Scoville, Supervisor of Safety, Baltimore, Md.

Bangor and Aroostook—

M. F. Dunn, General Safety Agent, Portland, Me.

Big Four—

T. R. McCampbell, Safety Agent, 719 Majestic Bldg., Indianapolis, Ind.

Bingham and Garfield—

C. H. Wilson, Safety Engineer, Garfield, Utah.

Blue Ridge—

D. H. Beatty.

Boston and Maine—

A. A. Stebbins, Assistant to General Secretary, Safety Department.

Buffalo, Rochester & Pittsburgh—

John S. Rockwell, General Agent, 155 Main St., W. Rochester, N. Y.

Carolina & North Western—

D. H. Beatty.

J. W. Chamberlain, Safety Supervisor, Knoxville, Tenn.

Carolina, Clinchfield & Ohio—

J. W. Chamberlain, Safety Supervisor, Knoxville, Tenn.

Charleston & Western Carolina—

J. A. Barnette, Supervisor of Safety, Atlanta, Ga.

Chicago & Eastern Illinois; Chicago, Terre Haute & Southwestern; Evansville & Indianapolis—

J. F. Lord, Supervisor of Safety and Fire Prevention, Evansville, Ind.

John O'Brien, Switchman (C. & E. I.), 227 Lincoln Ave., Dolton, Ill.

Walter D. Smith (C. & E. I.), Supt. Shops, Danville, Ill.

Chicago & North Western—

Geo. R. Campbell, Train Dispatcher, Eagle Grove, Ia.

Wm. H. Copp, Machinist, S. Kaukauna, Wis.

Fred Curtis, Conductor, Huron, S. Dakota.

S. M. Galaty, Safety Inspector, 226 W. Jackson Blvd., Chicago, Ill.

John W. Herrington, Telegraph Foreman, Baraboo, Wis.

H. C. Lenter, Switchman, Chicago, Ill.

C. F. Mabie, Freight Conductor, Chicago, Ill.

H. Nelson, Brakeman, Chicago, Ill.

J. A. Peabody, Signal Engineer, Chicago, Ill.

M. A. Schuster, Air Foreman, 285 24th Ave., Milwaukee, Wis.

James Sullivan, Safety Inspector, 4423 Washington Blvd., Chicago, Ill.

Chicago & Western Indiana —

V. R. Walling, Principal Assistant Engineer, Chicago, Ill.

Chicago, Burlington & Quincy—

E. M. Switzer, Superintendent of Safety, Chicago, Ill.

Chicago, Cleveland, Cincinnati & St. Louis.

B. G. Chamberlain, Safety Agent, 719 Majestic Bldg., Indianapolis, Ind.

E. B. Goodart, Safety Agent, Mattoon, Ill.

C. H. Lentz, Safety Agent, Bellefontaine, Ohio.

A. L. Mason, Conductor, 2362 Adams St., Indianapolis, Ind.

Wm. Van Gorder, Safety Agent, Springfield, Ohio.

Chicago Great Western—

L. C. Espersen, Claim Agent, Clarion, Ia.

O. P. Larson, Chairman Oelwein Shop Committee, Oelwein, Ia.

G. O. Perkins, Superintendent, Telegraph and Signals, Chicago, Ill.

Chicago, Indianapolis & Louisville; Chicago, Indianapolis & Western—

J. H. Holloway, General Safety Supervisor, LaFayette, Ind.

Chicago Junction—

T. F. Barry, Safety Supervisor, 837 Exchange Ave., Chicago, Ill.

Chicago, Rock Island & Pacific—

W. L. Bradley, Supervisor, Safety and Fire Prevention, El Reno, Okla.

W. P. McGuire, Supervisor, Safety and Fire Prevention, Des Moines, Ia.

L. F. Shedd, General Supervisor, Safety and Fire Prevention, Chicago, Ill.

Wendell H. Stillwell, Supervisor, Safety and Fire Prevention, Des Moines, Ia.

Floyd P. Wilson, Supervisor, Safety and Fire Prevention, El Reno, Oklahoma.

Chicago, St. Paul, Minneapolis & Omaha—

F. F. Reed, Inspector Safety Bureau, St. Paul, Minn.

F. F. Whaley, General Mail and Baggage Agent, St. Paul, Minn.

Geo. L. Wright, Superintendent, Safety Bureau, St. Paul, Minn.

Delaware & Hudson—

R. C. Helwig, Safety Agent, Albany, N. Y.

J. E. Long, Superintendent of Safety, Albany, N. Y.

H. G. Stevens, Safety Agent, Albany, N. Y.

A. V. Rohweder, Supervisor of Safety, Duluth, Minn.

Duluth & Iron Range—

W. N. Henry, Engineer, Two Harbors, Minn.

F. W. Hiller, Conductor, Two Harbors, Minn.

B. R. Moore, Superintendent, Motive Power, Two Harbors, Minn.

Duluth, Missabe & Northern—

W. A. Clark, General Car Foreman, Proctor, Minn.

M. J. Dixon, Locomotive Engineer, Proctor, Minn.

A. V. Rohweder, Supervisor of Safety, Duluth, Minn.

D. C. Sullivan, Conductor, Duluth, Minn.

Elgin, Joliet & Eastern and Chicago, Milwaukee & Gary—

O. F. Gnadinger, Supervisor of Safety, Elgin, Ill.

El Paso & Southwestern—

L. H. Trimble, Superintendent of Safety, El Paso, Tex.

Florida East Coast—

William W. Scott, Safety Agent, St. Augustine, Fla.

Great Northern Railroad et al.—

C. L. La Fountaine, General Safety Supervisor, Room 705 Railroad Bldg., St. Paul, Minn.

Georgia Railroad—

J. A. Barnette, Supervisor of Safety, Atlanta, Ga.

Great Northern Railroad—

Geo. F. Buehler, Machine Foreman, St. Paul, Minn.

Gulf and Ship Island et al.—

W. P. Withers, in Charge of Safety, Hattiesburg, Miss.

Gulf Coast Lines and Gulf, Colorado and Santa Fe Lines—

J. G. Fitzhugh, Superintendent of Safety, Galveston, Tex.

Gulf, Mobile and Northern and Meridian and Memphis—

J. O. Gaither, Supervisor of Safety, Laurel, Miss.

Hawkinsville & Florida Southern—

D. H. Beatty.

Illinois Central—

S. S. Morris, Chairman, General Safety Committee, Chicago, Ill.

Indiana Harbor Belt—

E. G. Steineck, Examiner and Safety Agent, Gibson, Ind.

Kansas City Southern—

D. B. Daley, Superintendent of Safety, Kansas City, Mo.

Lake Erie & Eastern—

William J. Foster, Conductor, Youngstown, Ohio.

Long Island—

T. P. Brennan, Safety Agent, New York City.

Lehigh Valley et al.—

A. E. O'Dea, Supervisor of Safety, Bethlehem, Pa.

Louisville & Nashville, and Louisville, Henderson and St. Louis—

R. L. Pilling, Supervisor of Safety, Louisville, Ky.

J. P. Hamilton, Chief Clerk, Supervisor of Safety, Louisville, Ky.

Clifton Lock, Louisville, Ky.

T. B. Lockart, Safety Agent, Louisville, Ky.

Minneapolis & St. Louis—

O. F. Johnson, Safety Supervisor, Minneapolis, Minn.

Minneapolis, St. Paul & Sault Ste. Marie, et al.—

L. P. Green, Superintendent of Safety, Minneapolis, Minn.

Missouri, Kansas & Texas, et al.—

J. W. Butz, District Superintendent, Smithville, Tex.

C. F. Colby, Safety Agent, Dallas, Tex.

J. L. Walsh, Superintendent of Safety, Katy Bldg., Dallas, Texas.

Missouri Pacific et al.—

M. McKernan, Superintendent of Safety, Room 2160 Railway Exchange Bldg., St. Louis, Mo.

Mobile & Ohio—

Vester J. Thompson, Supervisor of Safety, Mobile, Ala.

Monongahela—

V. D. Pringle, Train Master, Brownsville, Pa.

New York Central Lines—

W. L. Boslooper, Safety Agent, Detroit, Mich.

A. R. Cooper, Safety Agent, 611 Thayer St., Toledo, Ohio.

F. L. Diehl, Shop Safety Agent, 320 Aspenwold Avenue, Elkhart, Ind.

Marcus A. Dow, General Safety Agent, New York City.

H. W. Ferrel, General Foreman, McKees Rocks, Pa.

C. B. Floyd, Assistant to General Safety Agent, New York City.

D. J. Hackett, Division Superintendent, Jackson, Mich.

C. W. Hammond, Division Safety Agent, 831 E. 156th St., Cleveland, Ohio.

A. C. Hartley, Supervising Safety Agent, Detroit, Mich.

J. W. Johnston, Safety Agent, Chicago, Ill.

R. E. Laidlow, Superintendent, Terminals, Detroit, Mich.

E. M. Mann, Chief Safety Agent, 814 Columbia Blvd., Cleveland, Ohio.

F. P. McGirr, Shop Safety Agent, Buffalo, N. Y.

F. P. Neesley.

G. E. Parks, Mechanical Engineer, Detroit, Mich.

F. E. Pfeifer, Superintendent, Chicago, Ill.

W. E. Pusey, Safety Agent, Columbus, Ohio.

H. M. Ready, Jr., Safety Agent, 905 E. So. Union St. Bay City, Mich.

W. H. Siufe, Division Superintendent, Bay City, Mich.

M. H. Scheib, Buffalo, N. Y.

E. P. Spangler, Safety Agent, Jackson, Mich.

J. P. Tinley, Division Safety Agent, 525 Lake St., Ashtabula, Ohio.

E. R. Webb, Division, St. Thomas, Ont.

Nashville, Chattanooga & St. Louis—

F. Whittemore, Superintendent of Safety, Nashville, Tenn.

New York, New Haven & Hartford—

Frank A. Barrows, Inspector of Transportation, New Haven, Conn.

J. A. Clancy, Safety Inspector, Boston, Mass.

F. W. Mitchell, Supervisor of Safety and Examinations, New Haven, Conn.

E. G. Wride, Chief Clerk, Department of Safety, New Haven, Conn.

New York, Ontario & Western—

N. L. Satchell, Safety Agent, Middletown, N. Y.

Norfolk Southern et al.—

J. B. Robinson, Supervisor of Safety, Norfolk, Va.

Northern Pacific—

Fred M. Metcalfe, Superintendent of Safety, St. Paul, Minn.

E. W. Griffin, Safety Representative, Duluth, Minn.

Oregon Short Line: Los Angeles & Salt Lake—

C. T. Bailey, Safety Agent, Salt Lake City, Utah.

J. C. Clark, Assistant to General Manager, Salt Lake City, Utah.

D. K. Rawlings, Safety Agent, 625 West 1st North Street, Salt Lake City, Utah.

Pennsylvania Lines—

T. H. Carrow, Supervisor of Safety, Philadelphia, Pa.

E. S. Chapin, Jr., Safety Inspector, Insurance and Safety Department, Philadelphia, Pa.

T. E. Crosson, General Yard Master, Buffalo, N. Y.

A. L. Cunningham, Division Safety Agent, Pittsburgh, Pa.

W. H. Fassett, Vice-Chairman, Safety Comm., Philadelphia, Pa.

J. J. Henry, Safety Agent.

H. E. Meginness, Safety Agent, Indianapolis, Ind.

E. G. Otto, Altoona, Pa.

H. B. Reynolds, Superintendent, Safety Bureau, Pittsburgh, Pa.

J. H. Stadelman, Assistant Engineer, Wilmington, Del.

J. W. Warwick, Special Clerk, New York, N. Y.

H. C. West, Safety Agent.

E. J. Wilson, Safety Agent, New Castle, Pa.

Pittsburgh, Cincinnati, Chicago & St. Louis—

W. Conner, Division Safety Agent, Pittsburgh, Pa.

Pittsburgh & Lake Erie et al.—

F. H. Babcock, General Safety Agent, Pittsburgh, Pa.

W. A. Dean, Signal Supervisor, Pittsburgh, Pa.

A. G. Dunlop, Ticket Agent, Monessen, Pa.

J. W. Holsinger, Assistant Yardmaster, Aliquippa, Pa.

Pittsburgh & West Virginia—

R. M. Mall, Principal Assistant Engineer, Pittsburgh, Pa.

Reading System—

S. B. Zartman, Superintendent, Safety and Labor, Philadelphia, Pa.

Richmond, Fredericksburg & Potomac—

D. P. Browder, Safety Supervisor, Richmond, Va.

St. Louis & San Francisco—

G. L. Ball, Superintendent of Safety, St. Louis, Mo.

C. H. Baltzell, Division Superintendent, Fort Smith, Ark.

Southern Railroad Lines et al.—

J. W. Chamberlain, Safety Supervisor, Knoxville, Tenn.

Southern Pacific Lines—

R. M. Glover, Division Superintendent, Lafayette, La.

H. M. Mayo, Superintendent of Safety, Houston, Tex.

Southern Railway and Associated Lines—

D. H. Beatty, Washington, D. C.

C. R. Staples, Safety Supervisor, Lexington, Ky.

Terminal Railroad Association of St. Louis—

H. E. Watkins, Supt. of Safety, St. Louis, Mo.

Toronto, Hamilton & Buffalo—

W. J. Orr, Safety and First Aid Officer, Hamilton, Ont.

Union Pacific—

Chas. Finlayson, General Car Inspector, Omaha, Neb.

P. Groome, General Safety Agent, Omaha, Neb.

H. H. Hawes, Engine Foreman, Council Bluffs, Ia.
F. C. Hunter, Assistant Safety Agent, Omaha, Neb.
C. W. Moats, Safety Inspector, Omaha, Neb.
David More, Assistant Safety Agent, Omaha, Neb.
F. B. Olds, Brakeman, Oxford Hotel, Denver, Colo.
C. E. Olson, Locomotive Fireman, Rawlins, Wyo.
W. L. Richards, Locomotive Engineer, 217 W. 5th St., North Platte, Neb.
J. W. Taylor, Conductor, Kansas City, Mo.

Wabash Railroad—

D. J. Bailey, Chief Clerk, Superintendent of Safety, St. Louis, Mo.
J. A. McNally, Safety Inspector, Room 1423 Railway Exchange Bldg., St. Louis, Mo.
F. Meyers, Superintendent of Safety, St. Louis, Mo.
V. M. Packwood, Safety Inspector, St. Louis, Mo.

Washington Terminal—

J. O. Tatton, Chief Clerk to Superintendent, Washington, D. C.

Wheeling and Lake Erie—

J. T. Briggs, Supervisor of Safety, Canton, Ohio.

United States Railroad Administration—

J. M. Hoy, Safety Agent, Potomac District, Hagerstown, Md.
M. McGovern, Statistician Secretary, Safety Section, Washington, D. C.

Regional Supervisors of Safety—

H. A. Adams, 1205 Burlington Bldg., Chicago, Ill.
C. M. Anderson
H. J. Bell, Chicago, Ill.
C. W. Gregg
R. S. Jarnagin, Eastern Region, 3623 Grand Central Terminal, New York City.
A. Kirkendall, Allegheny Region.
F. A. Wightman, South West Region, 2002 Railway Exchange Bldg., St. Louis, Mo.

Asst. Chief Inspector of Locomotives—

J. M. Hall, Interstate Commerce Commission, Washington, D. C.

Chief Inspector of Locomotives—

A. G. Pack, Interstate Commerce Commission, Washington, D. C.

THURSDAY MORNING SESSION

THE meeting was called to order by Mr. R. C. Richards, Chairman, at 9:45 A. M.

CHAIRMAN RICHARDS: The eighth annual session of the Steam Railroad Section of the National Safety Council will come to order.

(The roll was called by roads, alphabetically.)

CHAIRMAN RICHARDS: The next order of business is the report of the Chairman of the Section. It goes without saying that the Chairman feels highly complimented that the Section should have turned out such a fine attendance at this Congress. I believe that we have the largest representation of any Section at the Congress. It certainly speaks well for you men, who are interested in safety work, that you are all ready and willing to leave your jobs and come here to get what inspiration and assistance you can and to give what inspiration and assistance you can to others who are engaged in the same line of work that you are engaged in, that is, in conserving that priceless thing, that one thing which we hold most dear—life. If we can just carry on during the next year as we have during the past year, and I am very sure that we will, with the assistance and enthusiasm and active coöperation of the Manager of the Safety Section of the United States Railroad Administration, who has done so much to assist us in adding to the membership of this Section, nobody knows how large a representation we will have at our next Congress and how much good we will be able to do in the meantime.

There is one thing that I want to say to the members of this Section as I said to you when you were kind enough to elect me your presiding officer at the last meeting. The Section is yours. It doesn't belong to the Chairman; it doesn't belong to the Secretary; it doesn't belong to the members of the Executive Committee. Whether or not the Section is going to be a success depends upon you just as much as it does upon them. Last year, too many of you left everything for "George" to do. I am very sorry to say that I got very few suggestions and no advice, and nobody stood in more need of advice than did I from the members of the Section as to what we ought to do. I hope that the presiding officer next year, will get more active assistance and coöperation from you all.

You may be interested in knowing that a year ago, we had 103 railroad members of the Section with 171,700 miles. This year, we have 127 railroad members with a mileage of 206,222. The increase in mileage and the increase in number of roads represented in this Section, of course, is largely due to the active assistance of Mr. Duffy and the Regional Supervisors of Safety. I am sure that we all appreciate very much what they have done to help us.

The Chairmen of the various Committees of the Section will be called upon for reports of the activities of their committees. During the progress of this meeting, we are to have some very interesting papers from some very distinguished gentlemen, some of whom are members of this Section, some of whom are outsiders. We owe it to these men and we owe it to ourselves to show some appreciation of the fact that they have been willing to give their time and thought to the matters that are before us.

I don't think I have anything important to say to you except that I hope that now we have gotten started, we will continue to have a very interesting Congress.

The next business on the program will be the report of the Secretary, Mr. Whittemore.

REPORT OF THE SECRETARY

SECRETARY WHITTEMORE: There is nothing of particular interest that your Secretary has to report at this meeting. The usual duties of the office have been fulfilled. The News Letter has been issued with regularity, and other routine matters have been attended to in the usual form.

CHAIRMAN RICHARDS: I want to say for the benefit of the members of the Section who are not acquainted with the work, that Mr. Whittemore has been one of the hardest working, most industrious, most enthusiastic men connected with the Executive Committee, and he has done more work than all the rest of us put together. I am sure that if you men knew how much work he has done and how much he has been called upon to do and how little assistance he has had from you fellows to do it, you would appreciate more than you do what he has accomplished.

The next report will be from the Accident Causes and Remedies Committee. Mr. Carrow is the Chairman of the Committee.

REPORT OF ACCIDENT CAUSES AND REMEDIES COMMITTEE

T. H. CARROW, CHAIRMAN, SUPERVISOR OF SAFETY, PENNSYLVANIA
RAILROAD, EASTERN LINES

J. T. BRODERICK, SUPERINTENDENT OF SAFETY AND WELFARE BUREAU,
BALTIMORE AND OHIO RAILROAD

L. G. BENTLEY, GENERAL SAFETY AGENT, CHESAPEAKE AND OHIO RAILROAD

The pamphlet published by the Interstate Commerce Commission entitled "Rules Governing Monthly Reports of Railway Accidents, 1918 Revision, Effective October 1, 1918", contains a set of causes which will be used in the future by the Interstate Commerce Commission for classifying train accidents and train service accidents, the causes having been developed for the Commission by a Committee representing the American Railway Association.

At the first meeting of the Accident Causes and Remedies Committee it was decided to call upon the statistician of the Interstate Commerce Commission with a view of obtaining a statement showing the accidents which occurred during a given period, classified in accordance with the revised causes. The Committee accordingly called upon Mr. M. O. Lorenz, Statistician of the Interstate Commerce Commission, who agreed to furnish a statement covering the month of January, 1919, which is attached and will be embodied in the printed report of your Committee.

The American Railway Association Committee in developing the causes above referred to made careful study of the accident statistics used by the large railroads in the United States and foreign countries and while experience will probably suggest certain alterations and addi-

Code No.	Cause.	Number of train accidents.	Damages to Railway property.	Total non-trespassers Killed. Injured.
1400	TRAIN FLAGGING:			
1401	Total failure to flag.....	11	7,270	16
1402	Failure to flag promptly.....	1	150	---
1403	Failure to go back a sufficient distance	7	14,140	2
1404	Torpedoes, failure to use or to place properly	3	2,520	3
1405	Fusees, failure to use or to place properly	1	640	---
1406	Failure to carry flagman's equipment	---	---	---
1407	Other improper flagging.....	4	5,340	10
1408	Total disregard of flag.....	4	6,980	---
1409	Failure to be on lookout or to regard flag in time	1	570	---
1410	Torpedoes, failure to regard.....	---	---	---
1411	Fusees, failure to regard.....	---	---	---
1412	Other failures to regard flagging..	---	---	---
1400	Not reported	---	---	---
	Total	32	37,610	31
1500	AIR BRAKES:			
1501	Insufficient air pressure, failure of engineman to observe	2	4,730	---
1502	Improperly releasing air brakes.....	1	160	---
1503	Emergency application, unjustifiable	6	2,910	2
1504	Other improper handling by engineman	1	410	---
1505	Failure to test.....	1	200	---
1506	Application from train other than from locomotive, unjustifiable....	1	230	---
1507	Retaining valves, failure to set sufficient number	---	---	---
1508	Failure to have proper percentage in service	4	17,590	4
1509	Other improper handling.....	2	3,550	---
1500	Not reported	---	---	---
	Total	18	29,780	6
1600	HAND BRAKES:			
1601	Failure to control by.....	55	14,500	10
1602	Failure to secure by.....	20	13,670	4
1603	Failure properly to test.....	---	---	---
1604	Other negligence	---	---	---
1600	Not reported	---	---	---
	Total	75	28,170	14
1700	SWITCHES:			
1701	Switch set in wrong position.....	28	18,900	9
1702	Switch thrown under locomotive or cars	14	5,670	---
1703	Wrong switch thrown.....	6	4,100	---
1704	Failure to latch or secure lever....	3	770	---

Steam Railroad Section

1183

Code No.	Cause.	Number of train accidents.	Damages to Railway property.	Total non-trespassers Killed.	Injured.
1705	Failure to see that switch points fit up properly.....	1	170	---	---
1706	Switch thrown before car cleared derail	---	---	---	---
1707	Switches run through.....	6	1,560	---	---
1708	Derail-running off	11	9,670	2	3
1709	Other negligence in connection with the operation of switches from interlocking tower.....	6	9,500	---	---
1710	Other negligence in connection with the operation of switches by hand	6	2,560	---	---
1700	Not reported	---	---	---	---
	Total	81	52,900	2	12
1800	OTHER FORMS OF NEGLIGENCE OF EMPLOYEES:				
1801	Excessive speed or failure to run with proper caution in yard limits	45	35,350	1	14
1802	Other excessive speed in violation of permanent orders.....	9	9,580	1	12
1803	Excessive speed in violation of temporary orders	3	6,130	1	1
1804	Opposing trains, failure to identify	---	---	---	---
1805	Signals for following section, im- proper display or absence of, or failure of locomotive crew to notify opposing trains.....	---	---	---	---
1806	Signals for following section, fail- ure to observe	---	---	---	---
1807	Markers, improper display or ab- sence of	1	260	---	---
1808	Headlight extinguished	1	900	---	---
1809	Headlight, failure to conceal ac- cording to rule	---	---	---	---
1810	Superior trains, failure to clear.....	---	---	---	---
1811	Meeting point, overrunning.....	2	7,160	1	---
1812	Meeting or passing point, failure to clear switch or other tracks..	---	---	---	---
1813	Otherwise fouling switches.....	29	14,600	---	20
1814	Occupying main track without authority	3	1,860	---	3
1815	Asleep on duty	2	5,940	1	---
1816	Schedule, running ahead of.....	---	---	---	---
1817	Failure of maintenance or other employees to put out slow flag or otherwise to protect when obstructing track	1	440	---	---
1818	Disregard of slow flag or other protection placed by maintenance or other employees	---	---	---	---
1819	Failure of crossing flagman or gateman properly to protect highway traffic	---	---	---	---
1820	Car doors not closed or secured....	---	---	---	---

Code No.	Cause.	Number of train accidents.	Damages to Railway property.	Total non-trespassers Killed, Injured.
1821	Joint failure to protect and disregard of caution or other signal	13	11,290	3 8
1822	Joint failure to protect and failure to run with caution in yard limits	5	5,650	2 19
1823	Low water in locomotive boiler.	8	14,290	3 11
1824	Failure of engineman to whistle or give other warning according to rules	---	---	---
1825	Failure of conductor properly to supervise movement	26	21,950	---
1826	Absence of man in front of leading car being pushed.	5	1,370	---
1827	Improper handling of cars or locomotives in switching or coupling	17	7,940	---
1828	Cars or locomotives on adjoining track not clearing, failure to observe	4	620	---
1829	Cutting off cars without rider to control	3	1,860	---
1830	Failure of rider to get on cars to control	2	860	---
1831	Cutting off cars at excessive speed	3	610	---
1832	Cars stalling, failure to bleed air	---	---	---
1833	Folling cars	2	430	---
1834	Turntable, failure to latch or secure	1	330	---
1835	Running of locomotive by unauthorized employee	3	840	---
1836	Cars off track ends (not otherwise classified)	4	1,000	---
1837	Assigning cars to yard track occupied by other cars.	9	4,380	---
1838	Coupling not properly made.	2	880	---
1839	Locomotives left with lever not on center	---	---	---
1840	Negligence of station, maintenance, or other employees in leaving baggage trucks, hand cars, or other obstructions too close to track	---	---	---
1841	Other negligence of employees.	79	55,810	5 85
1800	Not reported	---	---	---
	Total	282	212,330	18 187
	Total negligence of employees	557	471,770	59 460

2000 DEFECTS IN EQUIPMENT:

2100 LOCOMOTIVE BOILERS AND APPURTENANCES:

2101	Arch tubes	2	10	1 1
2102	Ash-pan blowers	---	---	---
2103	Blow-off cocks	---	---	---
2104	Boiler checks	---	---	---
2105	Flues	5	20	---

Steam Railroad Section

1185

Code No.	Cause.	Number of train accidents.	Damages to Railway property.	Total non-trespassers Killed. Injured.
2106	Injectors and connections (not including injector steam pipes)....	---	---	---
2107	Injector steam pipes	1	---	2
2108	Lubricators and connections.....	---	---	---
2109	Lubricator glasses	---	---	---
2110	Patch bolts	---	---	---
2111	Plugs (arch tube and washout).....	---	---	---
2112	Plugs in fire-box sheets.....	---	---	---
2113	Rivets	---	---	---
2114	Stay bolts or studs, including crown and cross stays.....	---	---	---
2115	Steam piping, blowers, and steam valves, including superheater tubes and safety valves.....	1	10	1
2116	Water glasses and fittings	2	800	3
2117	Miscellaneous	1	1,030	---
2106	Not reported	---	---	---
	Total	12	1,870	13
2200	OTHER PARTS AND APPURTENANCES OFF LOCOMOTIVES AND TENDERS:			
2201	Air reservoirs or pumps.....	---	---	---
2202	Crank pins, Collars, etc.....	4	5,190	2
2203	Cross heads and guides.....	3	690	1
2204	Cylinder heads and steam chests.....	---	---	---
2205	Headlights and appurtenances.....	---	---	---
2206	Piston and piston rods.....	2	650	---
2207	Rods, main and side.....	21	6,290	1
2208	Valve gear, eccentrics, and rods	2	650	---
2209	Other machinery on locomotives and tenders	3	390	2
2210	Pilots, loose or defective.....	---	---	---
2211	Trucks, light weight on.....	---	---	---
2212	Drivers, excessive lateral motion	---	---	---
2213	Miscellaneous	5	2,230	1
2200	Not reported	---	---	---
	Total	40	16,900	7
2300	TRUCKS:			
2301	Arch bar, bent or broken.....	73	83,930	1
2302	Bolster, broken	6	2,330	---
2303	Truck frame, broken, bent, or twisted	50	88,620	---
2304	Center pin, broken or bent.....	---	---	---
2305	Center plates, broken or bent.....	3	3,570	---
2306	Center plates, dry or rusty.....	---	---	---
2307	Column, broken	1	530	---
2308	Column bolt or nut, broken or missing	2	6,120	---
2309	Spring plank, bent or broken.....	2	540	---
2310	Journal box bolt, broken.....	6	11,000	---
2311	Journal box bolt, missing.....	5	7,070	---
2312	Journal boxes, excessive lateral motion	---	---	---

Code No.	Cause.	Number of train accidents.	Damages to Railway property.	Total non-trespassers Killed, Injured.
2313	New trucks, untried.....	---	---	---
2314	Side bearing clearance, excessive	4	1,620	---
2315	Side bearing clearance, insufficient	3	1,900	---
2316	Side bearings, broken or missing....	14	9,340	7
2317	Side bearings, short.....	---	---	---
2318	Side bearings, other defects of....	8	6,760	---
2319	Spring hanger, broken.....	1	270	---
2320	Spring hanger bolt, broken.....	---	---	---
2321	Springs, weak or broken.....	1	340	---
2322	Swing motion hanger, broken.....	---	---	---
2323	Swing motion hanger, roller bar broken	---	---	---
2324	Tie bar, broken	4	11,720	---
2325	Transom, broken	---	---	---
2326	Trucks, light weight on.....	---	---	---
2327	Other defects in trucks.....	43	25,190	1
2300	Not reported	---	---	---
	Total	226	260,850	9
2400	WHEELS AND AXLES:			
2401	Cast-iron wheels, broken, overheating	2	1,140	---
2402	Cast-iron wheels, broken, other causes	10	41,290	---
2403	Cast-steel wheels, broken, overheating	---	---	---
2404	Cast-steel wheels, broken, other causes	---	---	---
2405	Forged-steel wheels, broken, overheating	---	---	---
2406	Forged-steel wheels, broken, other causes	---	---	---
2407	Other wheels, broken, overheating	---	---	---
2408	Other wheels, broken, other causes	---	---	---
2409	Wheels, flanges worn.....	5	380	2
2410	Wheels, flanges broken, cracked, etc.	46	37,570	4
2411	Wheels, tires loose	7	4,390	---
2412	Wheels, tires broken or cracked....	5	1,260	---
2413	Wheels, flat	---	---	---
2414	Wheels, loose	10	22,620	---
2415	Wheels, out of gage.....	1	1,310	---
2416	Wheels, improperly counterbalanced	---	---	---
2417	Other defects in wheels.....	4	3,840	---
2418	Axle, bent	---	---	---
2419	Axle, broken	17	5,520	---
2420	Journal, fractured or broken, due to defects	23	19,330	3
2421	Journal, broken, due to overheating	29	23,490	---
2422	Journal, broken, due to other causes	12	8,740	---
2423	Other defects in axles.....	1	1,300	---
2400	Not reported	64	63,880	1
	Total	236	236,560	10

Code No.	Cause.	Number of train accidents.	Damages to Railway property.	Total non-trespassers Killed. Injured.
2500	POWER BRAKES AND APPURTENANCES EXCEPT AIR RESERVOIRS AND PUMPS ON LOCOMOTIVES:			
2501	Angle cocks, broken or otherwise defective	2	670	---
2502	Hose blowing off, defective threads, etc.	3	1,630	1 2
2503	Hose breaking or bursting.....	15	6,700	---
2504	Hose coupling, broken or otherwise defective	---	---	---
2505	Train line (brake-pipe), broken or otherwise defective	3	2,380	---
2506	Triple valves, lazy, dirty, or otherwise defective	1	180	---
2507	Unequal breaking power.....	---	---	---
2508	Other defects in power brakes....	4	3,270	---
2500	Not reported	---	---	---
	Total	28	14,920	1 3
2600	HAND BRAKES, BRAKE RIGGING, AND APPURTENANCES:			
2601	Brake beam, broken, disconnected, displaced, etc.	37	51,040	---
2602	Brake chains or bolts, breaking or giving way.....	1	380	---
2603	Brake chains, kinking, twisting, overlapping, or too long.....	2	360	---
2604	Brake hanger, broken or disconnected	23	10,900	---
2605	Brake rod, broken, defective, or disconnected	3	12,000	1
2606	Brake shaft, broken or defective....	---	---	---
2607	Brake shoe, worn, broken, or missing	2	2,070	---
2608	Brake wheel, loose or defective....	---	---	---
2609	Pawl or ratchet, failure of or defect in	3	870	---
2610	Miscellaneous	16	7,040	2
2600	Not reported	---	---	---
	Total	87	84,660	3
2700	COUPLERS:			
2701	Head rod, key of, missing.....	1	800	---
2702	Knuckle, broken	7	2,760	2
2703	Knuckle, worn	2	770	---
2704	Knuckle lock, broken or defective	7	1,920	2
2705	Knuckle pin, broken	2	670	---
2706	Coupler too high	---	---	---
2707	Coupler too low.....	8	3,200	---
2708	Head, broken	---	---	---
2709	Coupler shank, broken.....	4	1,750	---
2710	Other defects in couplers.....	26	15,040	2
2700	Not reported	---	---	---
	Total	57	26,910	6

Code No.	Cause.	Number of train accidents.	Damages to Railway property.	Total non-trespassers Killed. Injured.
2800	DRAFT RIGGING:			
2801	Draft timbers spreading or breaking	7	2,640	....
2802	Coupler yoke, broken.....	4	1,540	....
2803	End sills, poor condition.....	....	....	....
2804	Coupler yoke rivets or bolts, broken	6	4,080	....
2805	Draft bolts, broken.....	....	....	....
2806	Other defective draft rigging.....	37	21,340	 11
2800	Not reported .....	....	....	....
	Total	54	29,600	 11
2900	CAR BODIES AND OTHER PARTS OF EQUIPMENT:			
2901	Cars, end sills of, weak, broken, or otherwise defective	1	320	....
2902	Cars, ratchets, etc., on drop doors defective .....	....	....	....
2903	Cars, weak or defective, not otherwise classified	52	25,060	....
2904	Car doors	3	880	 1
2905	Car roofs .....	....	....	....
2906	Other defects in car bodies.....	10	5,100	....
2907	Miscellaneous	2	630	....
2900	Not reported .....	....	....	....
	Total	68	31,990	 1
	Total defects in equipment.....	808	703,450	3 63
3000	DEFECTS IN OR IMPROPER MAINTENANCE OF WAY AND STRUCTURES:			
3100	BRIDGES, TRETTLES, CULVERTS AND TUNNELS:			
3101	Bridges, structural defect or failure	1	5,650	 2
3102	Bridges, improper or insufficient maintenance .....	....	....	....
3103	Bridges, capacity insufficient for weight of current traffic.....	....	....	....
3104	Trestles, structural defect or failure .....	....	....	....
3105	Trestles, improper or insufficient maintenance .....	....	....	....
3106	Trestles, capacity insufficient for weight of current traffic.....	....	....	....
3107	Culverts, structural defect or failure .....	....	....	....
3108	Culverts, improper or insufficient maintenance .....	....	....	....
3109	Culverts, capacity insufficient for weight of current traffic.....	....	....	....
3110	Tunnels, structural defect or failure .....	....	....	....

Steam Railroad Section

1189

Code No.	Cause.	Number of train acci- dents.	Damages to Railway property.	Total non-trespassers Killed.	Injured.
3111	Tunnels, improper or insufficient maintenance	---	---	---	---
3112	Other defects in or failure of bridges, trestles, culverts, and tunnels	---	---	---	---
3100	Not reported	---	---	---	---
	Total	1	5,650	---	2
3200	TIES AND TIE PLATES:				
3201	Ties, broken	---	---	---	---
3202	Ties, decayed	12	3,320	---	2
3203	Ties, soft, poor quality of timber..	1	320	---	---
3204	Ties, insufficient number	---	---	---	---
3205	Ties, insufficient size	---	---	---	---
3206	Tie plates, broken or otherwise defective	---	---	---	---
3207	Other defects in ties and the plates	1	290	---	---
3200	Not reported	---	---	---	---
	Total	14	3,930	---	2
3300	RAILS AND JOINTS:				
3301	Broken rail	77	80,070	2	36
3302	Flow of metal	1	230	---	---
3303	Crushed head	---	---	---	---
3304	Split head	---	---	---	---
3305	Split web	---	---	---	---
3306	Broken base	---	---	---	---
3307	Other forms of rail failures, not due to wear	4	1,000	---	---
3308	Rails, spreading because improperly spiked or braced	---	---	---	---
3309	Rails, spreading because joints loosely or improperly bolted	1	6,840	---	13
3310	Rails, spreading, other causes	29	12,340	---	1
3311	Rails, giving way because of worn condition	2	930	---	---
3312	Rail joints, angle bars broken or otherwise defective	5	1,260	---	---
3313	Rail joints, failure at, due to insulation for signal apparatus	---	---	---	---
3314	Rail joints, loosely or improperly bolted (except No. 3309)	1	150	---	---
3315	Rail joints, absence of angle bars	---	---	---	---
3316	Rail joints, improperly compromised	1	320	---	---
3317	Compromise joints, angle bars broken or other joint failure	---	---	---	---
3318	Other defects in rail joints	2	290	1	---
3200	Not reported	---	---	---	---
	Total	123	103,430	3	50
3400	FROGS AND SWITCHES:				
3401	Frogs, bolts of, broken or missing	2	1,770	---	---
3402	Frogs, guard rail defective	1	150	---	---
3103	Frogs, guard rail fastenings defective	1	390	---	---

Code No.	Cause.	Number of train accidents.	Damages to Railway property.	Total non-trespassers Killed. Injured.
3401	Frogs, spring defective.....	---	---	---
3405	Frogs, spring bolts loose or defective.....	2	910	---
3406	Frogs, wing rails broken.....	---	---	---
3407	Frogs, point broken.....	2	430	---
3408	Other defects in frogs.....	2	520	---
3409	Switch-detector bar, broken or defective.....	---	---	---
3410	Switch, lost motion.....	1	380	---
3411	Switch lug, broken.....	2	630	---
3412	Switch point, bent or sprung.....	6	3,250	---
3413	Switch point, broken.....	---	---	---
3414	Switch point, worn.....	7	1,760	---
3415	Switch stand, broken or defective.....	4	2,370	1
3416	Switch, throw rod broken.....	3	600	---
3417	Switch, throw rod disconnected.....	2	590	1
3418	Switch indicator, defective.....	---	---	---
3419	Keeper or latch, broken, defective or missing.....	1	1,240	2
3420	Electric or interlocking parts or appurtenances defective or out of order, causing false indication, imperfect connection, or other fault.....	1	1,640	---
3421	Other defects in or improper maintenance of switches.....	21	9,210	6
3400	Not reported.....	---	---	---
	Total.....	58	25,840	10
3500	OTHER TRACK PARTS OR APPURTENANCES:			
3501	Break.....	---	---	---
3502	Misfit.....	---	---	---
3503	Improperly fastened.....	---	---	---
3504	Miscellaneous.....	---	---	---
3500	Not reported.....	---	---	---
	Total.....	---	---	---
3600	INTERLOCKING AND BLOCK SIGNAL SYSTEM:			
3601	Signal displaying false "clear" for caution.....	---	---	---
3602	Signal displaying false "clear" for stop.....	---	---	---
3603	Signal displaying false "caution" for stop.....	---	---	---
3604	Other improper indications of.....	---	---	---
3605	Improper location of signal.....	---	---	---
3606	Other defects in, or improper maintenance of, signal system.....	---	---	---
3600	Not reported.....	---	---	---
	Total.....	---	---	---
3700	MISCELLANEOUS:			
3701	Guard rail, improperly placed.....	---	---	---

Steam Railroad Section

1191

Code No.	Cause.	Number of train accidents.	Damages to Railway property.	Total non-trespassers Killed.	Injured.
3702	Guard rail, improperly secured.....	---	-----	---	---
3703	Insufficient superelevation of track.....	---	-----	---	---
3704	Excessive superelevation of track.....	---	-----	---	---
3705	Uneven superelevation of track.....	5	1,660	---	---
3706	Improper alinement of track.....	6	1,220	---	---
3707	Improper surface of track.....	72	37,760	---	6
3708	Low joints.....	12	6,590	---	2
3709	Track setting, new fill.....	7	5,970	---	4
3710	Insufficient ballast.....	---	-----	---	---
3711	Gage, improper.....	2	680	---	---
3712	Drainage, imperfect.....	1	1,200	---	---
3713	Turntable latch, defective.....	---	-----	---	---
3714	Excessive curvature.....	3	1,030	---	---
3715	Other defects in or improper maintenance of way and structures not classified.....	4	1,580	---	---
3700	Not reported.....	---	-----	---	---
	Total.....	112	57,690	---	12
	Total defects in or improper maintenance of way and structures.....	308	196,540	3	76
4000	MISCELLANEOUS CAUSES:				
4100	IMPROPER LOADING:				
4101	Unequal distribution of load.....	6	1,900	---	1
4102	Car overloaded.....	4	3,670	---	---
4103	Load shifting.....	17	33,140	---	---
4104	Load falling on track.....	3	6,500	---	---
4105	Other improper loading of car.....	5	2,120	---	---
4100	Not reported.....	---	-----	---	---
	Total.....	35	47,330	---	---
4200	NEGLIGENCE OF NON-EMPLOYEES:				
4201	Failure to control cars on sidings.....	---	-----	---	---
4202	Failure to secure cars on sidings.....	---	-----	---	---
4203	Other negligence of non-employees.....	2	640	---	---
4200	Not reported.....	---	-----	---	---
	Total.....	2	640	---	---
4300	MALICIOUS ACTS OR OTHER MISBEHAVIOR OF NON-EMPLOYEES:				
4301	Obstructions placed on tracks.....	1	880	---	---
4302	Switches tampered with.....	4	2,390	---	---
4303	Signals tampered with.....	1	190	---	1
4304	Brakes tampered with.....	1	240	---	---
4305	Tracks tampered with.....	1	8,000	1	2
4306	Incendiarism.....	---	-----	---	---
4307	Other malicious acts or misbehavior of non-employees.....	1	1,200	---	---
4300	Not reported.....	---	-----	---	---
	Total.....	9	12,900	1	3

Code No.	Cause.	Number of train acci- dents.	Damages to Railway property.	Total non-trespassers Killed. Injured.
4400	OTHER ASCERTAINED CAUSES:			
4401	Bridges, trestles, or culverts dam- aged or washed out by rain or floods, etc.	2	6,690	— 1
4402	Ballast or roadbed damaged or washed out by rain or floods, etc.	2	530	— —
4403	Accidental fires, equipment dam- aged by	7	3,820	— 1
4404	Bridges, trestles, or culverts dam- aged or destroyed by accidental fires	—	—	— —
4405	Animals on track	2	1,590	— —
4406	Switch or frog, obstacles in	7	5,090	— 1
4407	Landslides, boulders, etc.	16	29,660	— 9
4408	Snow and ice on tracks	9	7,420	1 6
4409	Obstructions caused by other train accidents	6	7,230	1 3
4410	Car roofs or doors on track	—	—	— —
4411	Automobiles struck by train	3	6,470	— —
4412	Motorcycle struck by train	—	—	— —
4413	Bicycle struck by train	—	—	— —
4414	Trolley car struck by train	—	—	— —
4415	Other vehicle struck by train	—	—	— —
4416	Automobile ran into side of train	—	—	— —
4417	Motorcycle ran into side of train	—	—	— —
4418	Bicycle ran into side of train	—	—	— —
4419	Trolley car ran into side of train	1	210	— —
4420	Other vehicle ran into side of train	—	—	— —
4421	Other grade crossing accidents	—	—	— —
4422	Other obstructions not specified	10	4,610	— 4
4423	Worn flags and worn switch point, combination	2	580	— —
4424	Improper side bearing clearance and irregular surface of tracks combination	2	800	— —
4425	Improper side bearing clearance and improper superelevation of tracks, combination	1	740	— —
4426	Improper loading of cars and ir- regularities in track, combina- tion	9	5,510	— —
4427	Shifting cars on or off floats	1	370	— —
4428	Dragging ballast with tie	—	—	— —
4429	Other ascertained causes	72	67,390	2 21
4400	Not reported	—	—	— —
	Total	152	148,710	4 46
4500	UNASCERTAINED CAUSES:			
4501	Probable negligence of employees	1	1,210	— 1
4502	Probable defects in or failures of equipment	2	2,230	— —
4503	Probable defects in or improper maintenance of way and struc- tures	2	500	— 1

Steam Railroad Section

1193

Code No.	Cause.	Number of train acci-dents.	Damage to Railway property.	Total non-trespassers Killed. Injured.
4504	Employee having knowledge fatal-ly injured, no other witness.....	---	-----	---
4505	Employee having knowledge leav-ing service before investigation	---	-----	---
4506	Wreck fully investigated, but cause undetermined	44	31,870	1 36
4507	Wreck not investigated.....	---	-----	---
4508	Insufficient information	4	1,200	---
4500	Not reported	---	-----	---
	Total	53	37,010	1 39
	Total Miscellaneous Causes.....	251	246,590	6 89
	Grand Total, Train Accidents..	1,924	1,618,350	71 688

Analysis of train accidents and train-service accidents, showing the classes of trains involved, and resulting casualties and damage to railway property for the month of January, 1919, as reported to the Interstate Commerce Commission.

Code No.	Class of train	Number of acci-dents.	Damages to Railway property.	Total non-trespassers Killed. Injured.
COLLISIONS:				
1	Freight	110	\$58,360	1 10
2	Passenger	9	3,850	---
3	Mixed	---	-----	---
4	Special	---	-----	---
5	Work	7	2,690	3 7
6	Yard (Switching)	175	70,080	---
7	Not included above (single train) ..	6	3,620	---
8	Two or more freights.....	80	127,140	3 33
9	Two or more passengers.....	10	49,380	36 187
10	Freight and passenger	26	46,490	5 76
L	Other combination	86	48,030	5 55
T	Not included above (more than one train)	---	-----	---
	Total	509	409,640	53 447
DERAILMENTS:				
1	Freight	995	957,620	8 76
2	Passenger	78	111,940	1 91
3	Mixed	20	12,130	---
4	Special	---	-----	---
5	Work	5	1,760	---
6	Yard (switching)	115	36,170	2 10
7	Other	10	3,950	1 2
	Total	1,223	1,123,570	12 191
LOCOMOTIVE BOILER ACCIDENTS:				
1	Freight	16	15,130	5 22
2	Passenger	3	10	---
3	Mixed	---	-----	---
4	Special	---	-----	---

Code No.	Class of train	Number of accidents.	Damages to Railway property.	Total non-trespassers Killed.	Injured.
5	Work	---	---	---	---
6	Yard (switching)	1	---	---	---
7	Other	---	---	---	---
	Total	20	15,140	5	26

OTHER LOCOMOTIVE ACCIDENTS:

1	Freight	36	19,770	---	6
2	Passenger	14	5,390	---	2
3	Mixed	---	---	---	---
4	Special	---	---	---	---
5	Work	---	---	---	---
6	Yard (switching)	2	170	---	1
7	Other	1	250	---	---
	Total	53	16,580	---	9

MISCELLANEOUS TRAIN ACCIDENTS:

1	Freight	95	44,990	1	11
2	Passenger	10	4,600	---	4
3	Mixed	1	230	---	---
4	Special	---	---	---	---
5	Work	1	640	---	---
6	Yard (switching)	12	2,960	---	---
7	Other	---	---	---	---
	Total	119	53,420	1	15
	Total train accidents	1,924	1,618,350	71	688

TRAIN-SERVICE ACCIDENTS:

1	Freight	1,624	---	62	1,620
2	Passenger	784	---	160	698
3	Mixed	28	---	1	31
4	Special	---	---	---	---
5	Work	70	---	11	74
6	Yard (switching)	1,136	---	69	1,119
7	Other	23	---	9	14
	Total	3,865	---	302	2,556
	Grand total	5,589	1,618,350	374	4,244

TRAIN SERVICE ACCIDENTS

STATEMENT SHOWING THE NUMBER OF CASUALTIES BY DETAILED CAUSES RESULTING FROM TRAIN SERVICE ACCIDENTS ON CLASS I RAILROADS AS REPORTED TO THE INTERSTATE COMMERCE COMMISSION FOR THE MONTH OF JANUARY, 1919.

Code No.	Causes	Total Casualties Killed.	Total Employees On Duty Injured.
COUPLING OR UNCOUPLING LOCOMOTIVES OR CARS:			
6101	Adjusting coupler, unexpected movement of cars due to slack	11	11
6102	Adjusting coupler, unexpected movement of cars due to mistake or misunderstanding in giving or observing hand signal	---	---

Steam Railroad Section

1195

No. Code	Causes	Total Casualties		Total Employees On Duty	
		Killed	Injur.	Killed	Injur.
6103	Adjusting coupler, unexpected movement of cars due to other causes.....	1	14	1	14
6104	Adjusting coupler, when moving cars were nearing each other.....	1	21	1	21
6105	Adjusting coupler on moving car, lost footing.....	1	2	1	2
6106	Adjusting coupler with foot, cars moving, not otherwise classified.....	---	6	---	6
6107	Adjusting coupler with foot, cars not moving, not otherwise classified.....	---	1	---	1
6108	Adjusting coupler, part of coupler fell striking person.....	---	7	---	7
6109	Coupling or uncoupling with chains or other emergency appliance.....	1	3	1	3
6110	Uncoupling without using lever, lever operative.....	---	1	---	1
6111	Uncoupling without using lever, lever inoperative.....	---	5	---	5
6112	Uncoupling lever, manipulation of.....	---	23	---	23
6113	Uncoupling, lost footing.....	2	19	2	19
6114	Uncoupling, falling from cars.....	---	5	---	5
6115	Foot caught in frog, switch or guard rail.....	1	1	1	1
6116	Miscellaneous.....	2	30	2	30
	Total.....	9	149	9	149

COUPLING OR UNCOUPLING AIR HOSE (OR TURNING ANGLE COCKS IN CONNECTION THEREWITH) STEAM HOSE AND SAFETY CHAINS:

6201	Air or steam hose, angle cocks or safety chains, cars moved while manipulating.....	1	13	1	13
6202	Air or steam hose, angle cocks or safety chains, going between moving cars to manipulate.....	---	1	---	1
6203	Air hose, uncoupling, struck by hose because of sudden release of air.....	---	9	---	9
6204	Steam hose, burned by hot water or steam from.....	---	4	---	4
6205	Miscellaneous.....	---	8	---	8
	Total.....	1	35	1	35

WHILE OPERATING LOCOMOTIVES:

6301	Shaking grates or dumping ash pans, lever slipping off.....	---	31	---	31
6302	Shaking grates or dumping ash pans, slipping or falling.....	---	6	---	6
6303	Shaking grates or dumping ash pans, coming in contact with hot parts of locomotives, tools, or coals.....	---	3	---	3
6304	Shaking grates or dumping ash pans, not otherwise classified.....	---	40	---	40
6305	Shoveling coal, slipping or falling.....	---	18	---	18
6306	Shoveling coal, coming in contact with hot parts of locomotive, tools, or coals.....	---	1	---	1
6307	Shoveling coal, struck hands or body against other parts of locomotives, or other objects.....	---	7	---	7
6308	Shoveling coal, not otherwise classified.....	---	28	---	28
6309	Using fire hook, scraper, poker or pick, slipping or falling.....	---	5	---	5
6310	Using fire hook, scraper, poker or pick, coming in contact with hot parts of locomotives, tools or coals.....	---	2	---	2

Code No.	Causes	Total Casualties		Total Employees On Duty	
		Killed	Injur.	Killed	Injur.
6311	Using fire hook, scraper, poker or pick, struck hands or body against parts of locomotives, or other objects	---	33	---	33
6312	Using fire hook, scraper, poker or pick, not otherwise classified	---	9	---	9
6313	Fire hook, scraper, poker, or pick improperly placed when not in use	---	10	---	10
6314	Water plug, operating, lost balance, fell or slipped	---	38	---	38
6315	Water plug, operating, locomotive moved unexpectedly	---	1	---	1
6316	Water plug, operating, not otherwise classified	---	36	---	36
6317	Water scoop, operating	---	4	---	4
6318	Coaling engines	---	34	---	34
6319	Wrenches, slipping on nut, etc.	---	1	---	1
6320	Reverse lever, operating	---	36	---	36
6321	Blaze from fire box	---	15	---	15
6322	Squirt hose becoming disconnected or bursting	---	4	---	4
6323	Squirt hose, valve left open or careless handling	---	---	---	---
6324	Steam, hot oil, hot water, or other hot substance or objects (except Nos. 6303, 6306 and 6310)	---	10	---	10
6325	Tank manhole, falling into, cover left off or open	---	5	---	5
6326	Coal rolling over coal board or off top of pile	---	21	---	21
6327	Slipping or falling on locomotive or tender, not otherwise classified	---	95	---	95
6328	Miscellaneous	1	146	1	146
	Total	1	639	1	639

WHILE OPERATING HAND BRAKES:

6401	Brake chains or bolts breaking or giving way	1	2	1	2
6402	Brake chains kinking, twisting, overlapping or too long	---	2	---	2
6403	Brake shaft, broken or defective	---	1	---	1
6404	Brake wheel, loose or defective	---	1	---	1
6405	Pawl or ratchet, defect in or failure of	---	1	---	1
6406	Defective hand brakes not included above	---	4	---	4
6407	Pawl slipping or accidentally knocked out of ratchet, no defects	---	11	---	11
6408	Brake club, slipping in wheel	---	9	---	9
6409	Brake club, struck by, because wheel flew around	---	5	---	5
6410	Brake club, standard, breaking	1	5	1	5
6411	Brake club, not standard, breaking	---	2	---	2
6412	Slipping or falling because of ice or snow on cars or locomotives	---	6	---	6
6413	Losing hold, slipping, or falling, not otherwise classified	4	72	4	72
6414	Using or holding hand brakes, against air	---	---	---	---
6415	Caught between running boards	---	---	---	---
6416	Miscellaneous	1	36	1	36
	Total	7	157	7	157

WHILE OPERATING SWITCHES:

6501	Switch lever flying up	---	17	---	17
6502	Switch lever or ball falling on or catching hand or foot	---	39	---	39

Steam Railroad Section

1197

Code No.	Causes	Total Casualties		Total Employees On Duty	
		Killed	Injur.	Killed	Injur.
6503	Slipping or falling on ice or snow or tracks or elsewhere	---	6	---	6
6504	Tripping, slipping, or falling; not otherwise classified	---	9	---	9
6505	Caught between locomotive or car and switch lever or stand	---	1	---	1
6506	Struck by locomotives or cars	1	6	1	6
6507	Miscellaneous	---	28	---	28
	Total	1	106	1	106

COMING IN CONTACT, WHILE ON OR GETTING ON OR OFF MOVING CARS OR LOCOMOTIVES, WITH ANY FIXED STRUCTURE ABOVE OR AT SIDE OF TRACK:

6601	Bridges, overhead	2	7	3	7
6602	Bridges, side members	1	3	---	3
6603	Buildings or gates, not otherwise provided for	1	6	1	5
6604	Coal chutes, aprons, docks, elevators, etc., used for company fuel	---	1	---	1
6605	Enginehouse or roundhouse walls, doors, or doorways	---	1	---	1
6605	Fences, track, cattle-guard, etc.	---	5	---	5
6607	Mall cranes (normal or in position for mail delivery)	---	1	---	1
6608	Overhang at station or other building	---	---	---	---
6609	Platforms	---	4	---	4
6610	Poles (telegraph, telephone, electric light, signal, etc.)	---	7	---	7
6611	Scale housings	---	2	---	2
6612	Signal arms or other parts or appurtenances of signal, etc.	---	1	---	1
6613	Snowshed, roofs	---	---	---	---
6614	Snowshed, walls	---	---	---	---
6615	Stock chutes or pens	---	1	---	1
6616	Switch stands, lamps, targets, dwarf signals, etc.	1	19	1	19
6617	Tunnels, overhead walls	1	1	1	1
6618	Tunnels, side walls	---	---	---	---
6619	Warning guards or ticklers	---	---	---	---
6620	Water and fuel-oil standpipes and spouts	---	6	---	6
6621	Wires or pipes, overhead	---	6	---	6
6622	Other fixed structures	---	2	---	2
	Total	7	73	6	72

GETTING ON OR OFF LOCOMOTIVES OR CARS:

6701	Handhold or grab iron, missing or losing hold of.	1	23	1	29
6702	Handhold or grab iron, defective	---	11	---	11
6703	Step, stirrup, or footboard, missing footing or slipping on (except Nos. 6712 to 6718 and 6726)	1	50	---	48
6704	Step, stirrup, or foothold, defective	---	3	---	3
6705	Ladder, missing footing or slipping on or losing hold or rung	---	11	---	11
6706	Ladder, defective	---	---	---	---
6707	Striking hands, arms, feet, legs, head or body against cars or locomotives	---	17	---	17
6708	Stepping or tripping on coal, boards, stone rubbish, or other loose or refuse material, or in holes	1	133	---	130

Code No.	Causes	Total Casualties		Total Employees On Duty	
		Killed	Injur.	Killed	Injur.
6709	Stepping or tripping on ties, rails, ballast, etc. (part of track)	---	29	---	28
6710	Slipping on ice or snow on ground	1	23	1	22
6711	Slipping on ice or snow on locomotives or freight cars	---	24	---	24
6712	Slipped or fell on or off coach steps, heel of shoe catching	---	2	---	---
6713	Slipped or fell on or off coach steps, foot catching in clothing	---	---	---	---
6714	Slipped or fell on or off coach steps, ice or snow on step	---	3	---	1
6715	Slipped or fell on or off coach, defective step	---	---	---	---
6716	Slipped or fell on or off coach steps, train starting	---	7	---	---
6717	Slipped or fell on or off coach steps, locomotive coupling to train	---	1	---	---
6718	Slipped or fell on or off coach steps, not other- wise classified	3	15	---	2
6719	Slipped or fell on passenger-station platform, ice or snow on platform	---	5	---	5
6720	Slipped or fell on passenger-station platform, de- fective platform	---	---	---	---
6721	Slipped or fell on passenger-station platform, not otherwise classified	1	6	1	1
6722	Falling, slipping, tripping, or ankle turned or sprained, not otherwise classified	3	195	4	140
6723	Missing footing on porter's footstool, misplaced	---	---	---	---
6724	Missing footing on porter's footstool, not misplaced	---	5	---	---
6725	Struck by locomotives or cars	1	12	1	12
6726	Getting on front end of approaching locomotive	1	1	1	1
6727	Coming in contact with trucks (baggage, express, mail, etc.)	---	---	---	---
6728	Coming in contact with or tripping over baggage, express matter, etc.	---	---	---	---
6729	Jumping from locomotive or car in anticipation of a train accident	---	71	---	70
6730	Miscellaneous	4	25	---	23
	Total	22	683	9	570

MISCELLANEOUS NOT ELSEWHERE

CLASSIFIED:

6901	Handling baggage, mail, or express	1	23	---	22
6902	Handling freight or material	1	83	1	77
6903	Turntable, ash or inspection pits, falling into	---	16	---	16
6904	Falling off through bridges, trestles, or culverts not equipped with handrails or footwalks	1	5	1	5
6905	Falling off or through bridges, trestles, or culverts equipped with handrails or footwalks	---	1	---	1
6906	Cars coming together, failure to apply hand brakes in time	---	16	---	14
6907	Sudden stopping, starting, lurch, or jerk of loco- motive, car, or train (no negligence or defect)	2	236	2	165
6908	Sudden application of brakes, improper handling of air	---	2	---	3
6909	Sudden application of brakes, air hose bursting, parting or otherwise defective	---	27	---	26
6910	Sudden application of brakes, defective air-brake equipment	---	5	---	4

Steam Railroad Section

1199

Code No.	Causes	Total Casualties		Total Employees On Duty	
		Killed	Injur.	Killed	Injur.
6911	Sudden application of brakes, failure to keep proper look-out	---	13	---	11
6912	Cars or locomotives on adjacent track not into clear, struck by, while riding on locomotive or car	1	4	1	4
6913	Cars or locomotives on adjacent track into clear, struck by, while riding on locomotive or car	---	20	---	19
6914	Fire hook or other tools extending over side of locomotive or tender, struck by, while riding on locomotives cars or trains	---	3	---	3
6915	Loose or swinging freight-car doors, struck by, while riding on locomotives, cars, or trains	---	---	---	---
6916	Other projections on trains, struck by, while riding on locomotives, cars or trains	---	6	---	6
6917	Car doors falling off	---	9	---	9
6918	Stepping from one car to another, slipping or falling	1	30	1	30
6919	Crossing over between cars	2	7	2	6
6920	Stepping or tripping on coal, boards, stone, rubbish, or other loose or refuse material, or in holes	---	49	---	43
6921	Stepping or tripping on ties, rails, ballast, etc. (part of track)	---	28	---	27
6922	Falling or tripping over material, lumber, ties, rails, etc.	---	10	---	9
6923	Falling or tripping over air or steam line, switch rods, or levers, signal wires, third rail, etc.	---	9	---	9
6924	Slipping or falling on platforms, stairways, steps, etc.	---	5	---	3
6925	Slipping on ice or snow on cars or locomotives	---	16	---	15
6926	Slipping on ice or snow on tracks or elsewhere	---	37	---	37
6927	Slipping, tripping or falling on top of box or in open cars, not otherwise classified	---	21	---	20
6928	Baggage in coach aisle, tripping over	---	3	---	---
6929	Slipping or falling in coach aisles, not otherwise classified	---	20	---	2
6930	Closing or opening trap doors on cars	---	5	---	5
6931	Closing or opening sliding baggage car doors	---	5	---	2
6932	Closing or opening sliding box-car doors	---	17	---	15
6933	Unexpected closing of car doors, no defects	---	41	---	14
6934	Unexpected closing of car doors, defective keeper or other defects	---	1	---	1
6935	Struck by coach trap doors operated by trainmen	---	2	---	2
6936	Struck by coach trap doors operated by passengers	---	---	---	---
6937	Struck by defective coach trap doors accidentally opening or closing	---	1	---	1
6938	Adjusting car windows, defects	---	---	---	---
6939	Adjusting car windows, no defects	---	2	---	1
6940	Coal, coke, or other material falling from cars or tender	---	22	---	21
6941	Splinters or nails	---	13	---	13
6942	Poling cars	---	8	---	6
6943	Roping cars	---	1	---	1
6944	End gate of car falling on person caught between gate and post	---	---	---	---
6945	Load shifting	---	17	---	15
6946	Cars or locomotives coming against cars placed for loading or unloading	---	12	---	5

Code No.	Causes	Total Casualties		Total Employees On Duty	
		Killed	Injur.	Killed	Injur.
6947	Cars or engines coming against cars being re- paired, unprotected by signal.....	---	2	---	2
6948	Cars or locomotives coming against cars being re- paired, unprotected by signal.....	1	8	1	8
6949	Coming in contact with electric current from third rail	---	---	---	---
6950	Coming in contact with electric current from catenary construction	---	---	---	---
6951	Coming in contact with electric current from other sources	---	2	---	2
6952	Caught between locomotives or cars while stand- ing or walking between parallel tracks.....	---	4	---	4
6953	Caught between locomotives or cars and fixed structures except while riding on or getting on or off locomotives or cars	2	5	2	5
6954	Spark, cinder, dust, etc., in eye.....	---	63	---	63
6955	Ice cars	---	1	---	1
6956	Stones or other objects "picked up" by train.....	---	3	---	3
6957	Trains striking tools or similar objects on or at side of tracks.....	---	4	---	4
6958	Hand cars, struck by locomotives or cars, when no damage to railway property results.....	3	9	37	6
6959	Baggage, parcels, etc., falling from racks in cars	---	---	---	---
6960	Standing, walking, or running alongside trains, cars or locomotives	---	33	---	28
6961	Falling from locomotives or cars, not otherwise classified	11	66	9	56
6962	Struck by locomotives or cars at private crossings	4	4	---	---
6963	Struck by locomotives or cars, not otherwise classified	105	133	91	101
6964	Miscellaneous	5	226	5	296
	Total	140	1,431	119	1,195
	Grade crossing accidents	244	585	---	3
	Grand Total	432	3,858	153	2,926

Code No.	TRESPASSERS CAUSE	TOTAL	
		Number of Accidents	Number of persons Killed Injured
STRUCK BY TRAIN:			
1	Pedestrians	80	46 35
2	Automobiles	128	62 169
3	Motorcycles		
4	Bicycles	3	1 2
5	Trolleycars	7	
6	Other vehicles	49	15 42
	Total	267	124 267
RAN INTO SIDE OF TRAIN:			
7	Automobiles	18	3 26
8	Motorcycles	1	

Steam Railroad Section

1201

Code No.	TRESPASSERS CAUSE	TOTAL Number of persons		
		Number of Accidents	Killed	Injured
9	Bicycles	1	---	1
10	Trolley cars	3	---	4
11	Other vehicles	1	---	1
Total		24	3	33
12	OTHER GRADE CROSSING ACCIDENTS	4	2	2
13	INSUFFICIENT INFORMATION	---	---	---
Total		295	129	302

		TOTAL		
Code No.	NON-TRESPASSERS CAUSE	Number	Number of	
		of Accidents	persons Killed	Injured
STRUCK BY TRAIN:				
1	Pedestrians	60	36	25
2	Automobiles	125	60	166
3	Motorcycles	.....	.....	.....
4	Bicycles	3	1	2
5	Trolley cars	7	.....	19
6	Other vehicles	48	15	41
Total		243	112	253
RAN INTO SIDE OF TRAIN:				
7	Automobiles	17	3	25
8	Motorcycles	.....	.....	.....
9	Bicycles	1	.....	1
10	Trolley cars	2	.....	3
11	Other vehicles	1	.....	1
Total		21	3	30
12	OTHER GRADE CROSSING ACCIDENTS	.....	.....	.....
13	INSUFFICIENT INFORMATION	.....	.....	.....
Total		264	115	283
Grand Total		559	244	585

MR. CARROW: Now I shall endeavor, as quickly as I can, to explain the system of statistics previously referred to. The main division in the statistics is between train accidents and train service accidents. There are a number of headings under which are shown certain details. Train accidents have involved the use of train orders, but so far as I know, there has never been any separation as between specific misuse of train orders. I have often wondered if, in the last fifty years, let us say, there had been an accumulation of information of this character, our system of train dispatching, our system of rules, would not have been more rapidly developed.

Under train orders, for example, I will mention one or two details in order that you may carry in your mind the scheme of the thing.

1. Error in transmission of copying, telegraph.
2. Error in transmission of copying, telephone.

One might inquire as to what the difference is. The difference is just this: Many railroads in the United States operate by the telegraph system. Others operate by the telephone system. Suppose it would come up for consideration to install a telephone system in train operation on one of your lines. The first question that would arise would be whether or not it would be safe. In two years after we have established these causes, you can go to the Interstate Commerce Commission and ascertain specifically whether operation by telephone is as safe as it is by telegraph or vice versa.

Speaking for our own road, we have telephones in use almost exclusively. I recall very distinctly, in the early stages of the game, there was very much uncertainty as to whether or not it would be safe.

The next cause under that heading might properly be: Meeting point, overrunning. We all know about the disastrous accidents that have occurred as the result of overrunning meeting points. Here we have accidents not summarized but in specific detail. A year from today when these statistics are classified, we will be able to put our finger on specific causes of accidents. In other words, we have endeavored to take it out of the realm of uncertainty and put it into the realm of science.

The next classification is fixed signals. There are as many systems of signals in the United States as there are characters and types of men here today. As to which is the best system, nobody seems to know. Yet there are certain fundamental principles which are accepted as being satisfactory and safe. I will read the first detail under that. While there are a number, I can't go into very much detail, but I will mention enough to give you the scheme of the thing. The first cause is: Clear signal displayed for occupied block. You men who are familiar with the train operation all know what that means. We all know what it would mean if we should see in the United States, for example, an epidemic of accidents from clear signal displayed for occupied block. Would it not suggest that we take steps on our respective railroads to put in motion some scheme to correct the trouble?

The proverb that impressed me strongest, perhaps, in my young life was "knowledge is power," but most knowledge is so generalized that it is not susceptible of application. It has been my opinion, ever since we undertook to work in this safety field, that our knowledge was too general.

The next general heading to which attention is called is Air Brakes. All of us know the danger of improper application of air brakes. We know about the danger that arises from improper maintenance of brakes. We know about the danger that arises from insufficient air pressure. We know all about the dangers that are related to the air, but we do not know about it specifically. Our boys who were formerly with the Interstate Commerce Commission are more familiar with that than we are, but wouldn't it be a fine thing if we knew exactly what the record had been in the United States for the last ten years?

I can tell you frankly that I have developed for specific purposes at the cost of much time and effort much information that these statistics would provide without any effort.

Those of you who are familiar with that subject know that car inspection at loading points is one of the most indefinite things on the railroad. Put your Safety Committees on that particular thing, and you will find out that some stations have inspection very carefully done; you will find that at others it is not so good. If we can develop statistics, over a series of years, of accidents that are attributable to faulty inspection, then we will have the knowledge that will lead us to understand what to do in connection with the loading of cars.

Then under miscellaneous we have malicious acts or other misbehavior of outsiders, and other ascertained causes which are quite numerous and which you can all get from the Interstate Commerce Commission's classification.

What I have said thus far relates entirely to Train Accidents. I want to direct your attention just a few more moments to Train Service Accidents, the ones with which the Safety Committees are probably more frequently bothered, but not by any means the most important.

We have eight classifications under what we call Train Service Accidents. The first heading is Coupling and Uncoupling Cars. Under this heading we have fifteen causes arranged to the best of the ability of the Committee and giving every detail which will enable the safety committee men and the safety agents to lecture or talk on the subject.

For example, there were nine killed and 149 injured during the first month of the year, which would make 108 killed and about 1,800 injured during the year. Of that number, some were due to:

1. Adjusting coupler, unexpected movement of cars due to slack.
2. Adjusting coupler, unexpected movement of cars due to other causes.

The next would be operating locomotives, under which heading there are a considerable number of accidents.

You have been sympathetic in listening to me. All I want to say is this: We do want to put safety on a practical basis. We want to make everything that we do just as reasonable, just as scientific, just as businesslike, as we can. We want to refrain, as far as possible, from unnecessary work. We want to educate also ourselves, our committees, the superintendents, and everybody else.

I recommend particularly that young men who are taken into the service be first instructed to study and master the causes of accidents. In that way, I fully believe that in the course of a few years we will arrive nearer to a satisfactory solution of the safety work than in any other way.

CHAIRMAN RICHARDS: I am sure we have all been very interested in Mr. Carrow's address. He said something about knowledge being power. Somebody said, a great many years ago, that we get knowledge from other people's experience and from books but that we get wisdom from our own experience, and wisdom is what we want.

Possibly, if this information, which has been set forth so intelligently

by Mr. Carrow, can be disseminated among all the members of this Section and the other sections of this great Council, we will all have a chance to get not only knowledge but wisdom.

The next report that we have is from the Program Committee, of which Mr. Clark is the Chairman.

REPORT OF PROGRAM COMMITTEE

MR. J. C. CLARK (Oregon Short Line): I don't believe that the Program Committee has any particular report to make. We tried to pick out subjects for discussion at this meeting that would be comprehensive and would catch the vital points in connection with safety work. We thought that you would come here to get a certain amount of information and inspiration and also to impart a certain amount of information and inspiration to others. We picked the subjects that we thought would cover the field most thoroughly, but to get the full benefit of your attendance here and to make this meeting thoroughly interesting, it is necessary for every one of you to speak your mind with regard to each subject when it comes up for discussion. In the discussion of the various subjects and in the benefit received by exchanging ideas is to be found the chief benefit of this meeting.

I hope the program will speak for itself.

CHAIRMAN RICHARDS: I am sure that this Section appreciates the work that has been done by the Chairman of the Program Committee. We gave him one of the hardest jobs we had because we knew he was one of the best workers in the organization, and he certainly has turned out a fine program which you will come to realize as it proceeds.

The next report we would like to hear is that from the Publicity Committee. Mr. Dow.

REPORT OF PUBLICITY COMMITTEE

MR. MARCUS A. DOW (New York Central R. R.): I think that the bulletins that have been distributed during the past year ought to serve as a report of this Committee. However, for your information, I will state that this Committee has held three meetings since it was appointed a year ago, and material has been prepared and submitted to the Council for seventy-five separate bulletins. Five of those were bulletins that have previously been issued which were reissued during the year. Seventy of them were new bulletins.

Your Chairman has employed the services of a professional photographer, and we have taken over 200 specially-posed photographs for the purpose of illustrating bulletins, so that every bulletin that has gone out during the past year has been illustrated with from one to three illustrations.

The Council now has on hand material for enough bulletins, furnished by this Committee, to carry them through, issuing one bulletin a week, until the end of March next year.

CHAIRMAN RICHARDS: I do not think that any of you gentlemen realize the amount of splendid work that has been done by the Publicity Com-

mittee and the amount of time and thought that has been given to the matter. I am very sure that if this Section will be a little more generous in furnishing suggestions and photographs and ideas to the Publicity Committee, the service that will be performed by that Committee will be as useful and beneficial to the Section as that of the present Committee.

I want to say again in this connection that if you have some specific accident that you want to illustrate or call attention to, something that may be new or unusual, and will furnish that information to the Chairman of the Publicity Committee, he may be able to illustrate it in a way which will be very beneficial to all the members.

The next report will be from our old friend Blakemore who served so many years valiantly as the Chairman of the Membership Committee.

REPORT OF MEMBERSHIP COMMITTEE

The Committee as formed this year consisted, in addition to myself, of the following gentlemen:

G. L. Ball, Superintendent Safety, St. Louis & San Francisco

D. H. Beatty, Superintendent Safety, Southern Railroad

C. L. LaFontaine, General Supervisor of Safety, Great Northern

L. F. Shedd, General Supervisor of Safety, Chicago, Rock Island & Pacific to whom I now wish to express my grateful appreciation for the coöperation they have given.

During previous years, by the most strenuous effort, we had raised the membership of the Railroad Section from its initial roll of 27 members to 63, then to 87, then to 103 and this year, as the United States Railroad Administration had given its approval to affiliation with the Section, I anticipated no difficulty in bringing into the fold all those other lines yet outside, but I was surprised to find still a certain indifference to our appeals; many of the lines approached being reluctant to join because of the increase in dues, which had been made absolutely necessary by reason of the higher cost of labor and supplies, so that withal the membership campaign did not resolve itself into the sinecure which I thought it would probably be. However, results have been produced of which we are very proud, the following lines having been brought into the ranks:

Arizona Eastern Railroad Company,

Atchison, Topeka and Santa Fe Railroad,

Belt Railroad of Chicago,

Boston and Maine Railroad,

Brooklyn Eastern District Terminal,

Central Vermont Railroad,

Charleston & Western Carolina Railroad,

Chicago and Alton and C. E. and St. L. Railroads,

Chicago and Western Indiana Railroad,

Duluth, South Shore & Atlantic Ry. and Mineral Range Railroad,

Duluth, Winnipeg and Pacific Railway,

Fort Worth and Rio Grande Railway,

Georgia, Southern and Florida Railroad,

Grand Rapids and Indiana Railway,

Grand Trunk Lines in New England,
 Green Bay and Western Railroad,
 Gulf, Colorado and Santa Fe Lines
 Gulf, Mobile and Northern Railroad,
 Kansas City Terminal Railroad,
 Louisville, Henderson and St. Louis Railway,
 Louisville and Nashville Railroad,
 Macon, Dublin and Savannah Railroad,
 Maine Central Railroad,
 Minneapolis, St. Paul and Sault Ste. Marie Railroad
 Norfolk Southern Railroad,
 Northern Pacific Railroad,
 Northwestern Pacific Railroad,
 Pennsylvania Railroad (Western Lines),
 Pittsburgh and West Virginia Railroad,
 Sioux City Terminal Railroad,
 Southern Railroad Lines,
 Terminal Railroad Association of St. Louis,
 Toledo, Peoria and Western Railroad,
 Toledo Terminal Railroad,
 Ulster and Delaware Railroad,
 Union Terminal Railroad Co.,
 Virginian Railroad,
 Waterloo, Cedar Falls and Northern Railroad,
 Wheeling and Lake Erie Railroad,
 Wichita Valley Railway,

a total of forty new members.

At the close of last year's work 103 railroads appeared upon our roster, but during this year 14 of them withdrew, reducing the number to 89 as the actual basis for calculating the beginning of the year's work. Today there are 129 members, an increase of 40, or 45 per cent. One year ago the memberships represented about 171,000 track miles. Today they represent nearly 216,000 track miles, an increase in mileage of more than 26 per cent.

One of the most important factors contributing to the success of this campaign was the assistance given us by the Regional Supervisors of Safety, not in urging that memberships be taken, but in helping us to fairly present our cause, and I take this occasion to make record of my sincere appreciation.

Now just a word about the future: It takes a bolder man than I am to forecast the railroad situation for next year, but I think we may safely assume that there will be changes, both in sentiment and in practice, and amid these new aspects may come dangers to this organization which has been so carefully built up. I, therefore, strongly urge that during the coming year each one of you give to your Membership Committee your utmost support. When your membership expires, hasten strongly to recommend its immediate renewal, and lose no opportunity to use your personal influence further to build up the Section, for thus,

and thus only, can we feel assured that your organization will come safely through what promises to be the most trying year of its existence. Remember that it is *your* organization and that upon *you* largely depends the continuance of the association which all of us have found so pleasant and profitable.

C. H. BLAKEMORE,

Chairman Membership Committee.

MR. D. P. BROWDER (Richmond, Fredericksburg and Potomac Railway): The administration, as I understand it, has authorized the railroad companies to take membership in the National Safety Council, but it affects us in this way: The authority they have given is limited to miles; a railroad of 100 miles can have but one membership. We have a very prosperous little railroad. In fact, we have three that I represent, and the total mileage is 116 miles. I think if Mr. Duffy or somebody could get a new way of allotting memberships based on earnings rather than on miles, it would help us considerably. We require more than one membership to get bulletins.

CHAIRMAN RICHARDS: Every member of this Section knows that regardless of any membership or any number of memberships they may have in the Council, they can purchase all the bulletins they desire at cost price.

MR. BROWDER: As I understand the rules of the Council you have to take membership to get bulletins.

CHAIRMAN RICHARDS: That is a matter that might be brought up at the round table discussion, Friday afternoon or Saturday, when everybody will have an opportunity to thrash out these questions.

You have heard the reports of the Committees. They were received in an informal way. There was no motion made that they be adopted and placed on file. That is in order now.

(On motion the reports were adopted.)

CHAIRMAN RICHARDS: The first paper that we have this morning is that by Mr. Duffy, Manager of the Safety Section of the United States Railroad Administration. Last night, we were told by Mr. Lee that he had known Mr. Duffy for twenty-five years, that during that time he had grown very fond of him and had great respect and admiration for his ability and for his manly qualities. The members of this Railroad Section came to that conclusion very much quicker than did Mr. Lee, because we have only known him about two years but we found that out about the first time we met him. I know you will all be very glad to hear from Mr. Duffy.

AIMS AND PURPOSES OF THE SAFETY SECTION OF THE UNITED STATES RAILROAD ADMINISTRATION

A. F. DUFFY, MANAGER, SAFETY SECTION, UNITED STATES RAILROAD ADMINISTRATION, WASHINGTON, D. C.

We are living in the greatest period of the world's history. The war, which as an armed combat, ceased slightly less than a year ago, has

changed many of the important fundamentals upon which this country was built. The entire industrial structure was altered to meet war conditions, and now must be again changed to meet situations resulting from the victorious peace accomplished largely through the indomitable will to win of our Army and Navy. We owe a real duty to those men who returned and to all people who in even a small measure contributed to this achievement, but we are everlastingly obligated to those men and to those women who did not come back from foreign service and to their families and dependents. The war taught the people of this nation as nothing else could have done that the most precious thing in the world from a humanitarian standpoint, and the most valuable economically, is human life—this greatest of all assets of individuals and of the country itself. I take as a matter of course the fact that our duty as safety men and women in the national developments is clear cut and without equivocation or reservation. I subscribe firmly to the belief that Safety is more than the conservation of life and limb, that it will do more than any single agency of which we now have knowledge to create industrial conditions and practices and principles which will render the employment of the man who works not only safe, but satisfactory and economically just from every standpoint.

Safety is basic in any business where physical hazard is involved, for if you will look about you, I venture you will perceive that the best railroad is the safest railroad and the most efficiently and satisfactorily operated from the standpoint of the people, the Government, the owners of the property and last but very important, the men who work on that railroad and who have it in their hands to make it a successful organization or a mediocre enterprise. No right-thinking student of current national events can fail to discern these indisputable facts.

I can best respond to the subject assigned for my address "Aims and Purposes of the Safety Section of the United States Railroad Administration," therefore, by stating with all the force and honesty of purpose and sincerity in my command that these facts as I have stated them by way of prefacing my remarks will be so intensely and indelibly impressed on the minds of railroad men and women that the transportation industry will be so humanized, and that our work will be conducted with so much intelligently applied energy, that we shall reach the high attainment which the Director General of Railroads had in view when the Safety Section of the Division of Operation was created, whereby avoidable casualties in railroad employment will be mere history.

And, my friends, this is not the mere theory of an idealist. I have been a practical railroad man during all of my working life, and I predict, without qualification, that when once the railroad men of this country thoroughly understand what we are endeavoring to do, why it is necessary, and what are the possibilities of this work—and they are rapidly reaching that understanding because of the activities of the Safety Section and the admirable assistance afforded by you Safety officers and employees—they will take hold of this subject in such a manner as to accomplish results which will startle the railroad fraternity.

The President of the United States has called a conference of representative citizens of the country, to be held in the National Capital on October 6. It is significant that this Safety Congress should be held just preceding that important gathering, because Safety is definitely related to every phase of industrialism. And perhaps out of this Congress in Cleveland and the Conference at Washington, there will come an awakening on the part of the public generally to the need for constructive, systematic, well ordered Safety in every branch of industry and in every aspect of life. Safety on railroads has been advanced many years by virtue of the recognition which has been given it by the United States Railroad Administration, and I believe that contrary to the opinion that some of you perhaps hold that this work has but a temporary existence, its permanency is already assured; it has demonstrated its capabilities and is now at the crucial time when a realization of its fullest possibilities is all but at hand. Safety today is a real, live, good-business, energetic force for good on every railroad under Federal control, and any officer or employee who does not believe in it, who does not think it is sincere, who does not give it every support and coöperation which might reasonably be expected, is so outstanding an exception that he had better be careful that some one does not find him out!

REDUCTION OF ACCIDENTS DURING PERIOD OF SIX MONTHS

So that you may understand some of the accomplishments which are now a matter of official record, I desire to call your attention to the fact that during the six months ended June 30, 1919, as compared to the same period of 1918, there was a reduction of 656 deaths and 18,554 injuries to railroad employees on Federally controlled roads; that for the same period there was a reduction of 435 deaths and 1,745 injuries to passengers, highway travellers, and trespassers; that during this period of six months a total of 95,365 conditions and 38,015 practices reported by Safety Committeemen and other employees of the railroads have been corrected and disposed of. And that each railroad under Federal control has now an officer or employee devoting the necessary time to this work with a total additional force of about 150 field assistants whose sole duty it is to supervise, instruct, and educate railroad officers and employees to understand that there is a safe way to do all work and that it must be done in that way. It will be of interest to you likewise to know that on railroads under Federal control there are today approximately 2,000 committees with a total membership of 32,282 officers and employees, devoting their best thought and effort to Safety. When I say that I am proud of that record I have in mind that each of you men should also feel gratified with these accomplishments to the extent that you have done your work efficiently and well.

I give it as my unbiased opinion that railroads—like many other industrial organizations—have not, up to a comparatively recent time, given due consideration to the human factor in industry by recognizing the fact that men and women are infinitely more important than machines, structures, or appliances of any description. When we contrast the de-

gree of care which is exercised in the purpose, use, and maintenance of locomotives with the employment, service, and training of the average employee of the average railroad we are disappointed to learn the inequality which exists as between the machine, which can be replaced with money, and the life, which is absolutely irreplaceable, and which, when once gone, can never be brought back.

Some of us are disposed to be altogether too conservative and reactionary in the activities we employ in conducting this work, and sometimes we are apt to under estimate the value which comes from the financial expenditure required to carry it on. I do not subscribe to the theory that within intelligent and reasonable limitations it is possible to become overzealous or to overdo in a matter of this kind. We must, from the very nature of the work, consistently and continuously develop new plans and methods for creating and sustaining the interest of railroad employees, and of all persons subject, directly or indirectly, to the hazard of railroad operation. It is just as good business, if we must for the moment regard the matter from a monetary standpoint, to expend money for Safety activities as it is to make investments for approved devices which will conserve fuel, increase car loading, improve efficiency, or reduce maintenance cost. It is a great deal more important, and, as a rule, will pay materially larger returns.

In deliberating these matters, however, I urge you not to lose sight of the fact that the aim and purpose of the work of the Safety Section is not to save money, but always has been and always will be to conserve human life and limb. If any saving of money is made by reason of a reduction in casualties,—and we all know that a properly managed Safety Department does save money,—surely that result is not subject to criticism, for in order to save money we must first avoid the casualties themselves.

RECOGNITION OF HUMAN ELEMENT, THE MOST IMPORTANT FACTOR IN RAILROAD SERVICE

The recognition of the human element, then, is the most important factor in railroad service, and its training and education in Safety is the foundation upon which are built the aims and purposes of the Safety Section. And, since the whole scheme of things revolves around the Safety Committee organizations it is to this phase of our work that the greatest attention must be given. There is no more honorable position today on a railroad than that of Safety Committeeman. His is a real service to mankind, and he can be proud of that service, if he is doing all that may reasonably be expected of him. If he is not measuring up to his responsibilities—and they are very real responsibilities, too—it is probably because he has not been properly instructed and trained in his work. Our Safety Committee meetings must be so regulated that the members thereof will be not merely interested in their work, but enthusiastic about it. To this end it is essential that Safety officers or their assistants attend committee meetings frequently in order to insure

their proper functioning and to sustain the interest which is so necessary on the part of Safety Committeemen.

If I were the General Manager of a railroad I would regard the meeting of a general or central safety committee as the most fruitful opportunity, with a minimum expenditure of time and effort, to improve the regularity and efficiency of operation. So it should be with the Superintendents, Master Mechanics, and other line officers in respect to the monthly Safety Committee meetings which they have with officers and employees. If the Chairman demonstrates real interest in the subject by regular attendance at the meetings the members generally are very apt to become imbued with the importance and possibilities of the work. Upon the Chairman depends very largely the success of the meeting, and we would do well to devote a large amount of time and energy to strengthening this feature of our organization.

A fact which will not admit of debate, and which is of prime importance in the relation of Safety to railroad operation, is that when experienced men are taken out of the service because of casualties the employment of new or inexperienced men in their stead not infrequently causes additional casualties to occur, because of the lack of familiarity with the work in hand; and always such a situation decreases efficiency and output, and otherwise costs money and causes hardships. This fact emphasizes too the real necessity for constructive thought and action in relation to the Safety education and training of the new man in the service, and of the employee who is promoted or changed from his customary occupation to one with which he may not be familiar.

PUBLICITY A VALUABLE AID IN ACCIDENT PREVENTION

Another of the aims and purposes of the Safety Section is to secure liberal publicity. Not of individuals or of the Safety Section or of railroads, but of the work we are doing and the necessity for it; of the altogether too large number of railroad men who are killed and injured every year in the business of operating the railroads of this country; of the appalling number of people who are killed and injured each year while wrongfully trespassing on railroad premises, and of the alarmingly increasing number of people who meet death and injury while passing over highway crossings. Publicity is a wonderful thing. It furthered the sale of billions of dollars of securities for the Government during the war, it conserved food, clothing, and fuel for the people associated with us in the war, and performed many other services. It will be of wonderful help in accident prevention if it is judiciously used, not only with employees but with the entire community served by the railroads.

Concretely, this publicity in the case of employees should be in the form of bulletins, posters, pamphlets, casualty statements, and such other data and information as may be deemed advisable. We must never lose sight of the fact that Safety is fundamentally a work of the employees who do the physical tasks incident to railroad operation. They are almost entirely responsible for the accomplishments heretofore

made in this great movement and will be the strength and power for good which will come in the future.

The railroad men of America have responded nobly to the activities of the Safety Section of the United States Railroad Administration. But if we expect them to continue in their interest and enthusiasm it will not suffice simply to beseech them to stop deaths and injuries. It will be necessary to keep them constantly informed as to the number of casualties which occur, what causes them, and what may be done to prevent a repetition of similar casualties. The data, so far as is practicable, should be prepared in some competitive form so that rivalry will be created between the various units of the railroad.

In the case of trespassing and highway-crossing accidents, it has seemed to me for some time that we have not applied ourselves to this vital question with deserved attention. We are too prone to take for granted that nothing can be done to check these evils. Consistent publicity, posters, and the medium of public and parochial schools, automobile clubs, and commercial associations, village, city, county, and state officials represent available avenues of approach in this matter.

I should be ungrateful indeed if I did not on such an occasion make at least brief reference to the National Safety Council. That organization, under whose auspices this great Congress is being held, has coöperated in every conceivable manner with the Safety Section of the United States Railroad Administration. They are doing a splendid work, have accomplished commendable attainments, have contributed very appreciably to the cause of Safety as a national matter. As the officer charged with the responsibility of accident prevention by the United States Railroad Administration, I thank them for this coöperation, and assure the Council of an earnest desire for a continuance of our cordial relations. It is indeed a pleasure thus to express publicly the appreciation we have for the Council.

The Steam Railroad Section of the National Safety Council for the past year has been in the hands of our good friend, that great Safety pioneer, Ralph C. Richards. You know better than I can tell you what it has meant to your Section to have him in charge of its affairs. We all love and admire and respect him, because, in advance of the thought of that time, he conceived the plan of railroad safety. He saw a vision and he has realized an ambition to do service to his fellowmen, which doubtless means a very great deal to him, as it does to all of us.

HIRAM W. BELNAP

At your last Congress in St. Louis, this body heard an inspiring address delivered by Hiram W. Belnap, the then Manager of the Safety Section, who died in Washington a year ago this month. I do not need to tell you about this wonderful character,—for he was a friend to every one who knew him,—except to say that he, too, had a vision—a God given vision of the possibilities of organized Safety. He told you men about that vision at St. Louis; he told you of his hopes and ambitions and of

his determination to make railroading a safer occupation. He told you what he would do and how he would sustain you in your work.

Hiram Belnap was a man of his word, and because I believed in him and what he said and did, I took up this great task when he was called by the Great Father, and with God's help and the help of you men and of every man in railroad service in this country, I have realized a stupendously large portion of the vision which I, likewise, have had in this matter.

SAFETY ENDORSED BY CONVENTIONS OF RAILROAD BROTHERHOODS

It is but natural that certain developments during the past year should stand out preëminently as auguring well for the future of Safety. One of these developments is the truly remarkable interest which has been manifested in Safety by railroad men, as evidenced by the endorsements of the work of the Safety Section in the national conventions of the Brotherhood of Locomotive Firemen and Enginemen; Brotherhood of Railroad Trainmen; Switchmen's Union of North America; Order of Railway Conductors; Order of Railroad Telegraphers; Order of Railroad Station Agents; Brotherhood of Railway Clerks, Freight Handlers, and Station and Express Employees; Brotherhood of Maintenance of Way Employees; with a total membership of 1,182,000 railroad men and women. I think it would be altogether fitting and proper if these resolutions were inscribed on bronze tablets as a perpetual memorial to the work that one of the departments of the United States Railroad Administration has done for an immense body of the finest workmen of the world. The spirit and intent of these resolutions have been observed almost universally by the local lodges of these organizations the country over. I regard likewise as a good omen the fine, intelligent publicity which is being afforded this work by the periodicals of these organizations, the railway employees' magazines, trade journals, and the public press generally.

Another development of significance is the universal approval of the Safety Committee organization and the entire plan for conducting this work as promulgated by the Safety Section. It is encouraging thus to observe as we go along that we are on the right track, and because we are right we are bound to achieve the goal of all Safety men, whereby the lives and limbs of men, women, and children will be saved from railroad casualties, so far as it is humanly possible so to do.

NATIONAL RAILROAD ACCIDENT-PREVENTION DRIVE

I cannot refrain at this time from a brief mention of the National Railroad Accident-Prevention Drive, which takes place on all railroads under Federal control for the period of October 18-31. This is beyond question the most stupendous undertaking of its kind in the history of railroading in this or any other country. We are now afforded an opportunity to demonstrate better than it could be done in any other manner the capabilities of this work. Great things have been done in campaigns of this kind heretofore held in several of the regions, and every one from

the Director General of Railroads to the most humble railroad employee will be watching the record of the October Drive. Most of you have already formulated a program and are actively engaged in this matter now, so that I will not attempt a lengthy statement concerning it. My most cherished desire at the moment is that you men will go away from this Congress with a determination that you will not merely reduce accidents during this Drive, but that you will abolish them, and that when October 18 arrives every railroad man in this country will be steeled to the point of determination to win.

The President of the American Federation of Labor, who is remarkably qualified to voice sentiment of world importance, recently said: "Let us of America face these new labors, then, in the spirit of individualistic mutuality—in the spirit of real democracy." It strikes me that we people, especially those of us who are devoting our time and energy to Safety—and most of us would, if need be, give our very lives to the cause—can well afford to pause and reflect on the wisdom of these few words. The successful culmination of the unsettled state of affairs in this country as they exist today depends largely upon the application of such principles as these, and we Safety men will do well constantly to keep them in mind and to practice and preach them.

SERVICE, TODAY ALMOST A CREED

These, Gentlemen, are days of service, not service to oneself, but service to our families, to our fellow workers, to the community in which we live, and to the greatest of all nations. It has been said that a life without service is a life without hope or happiness. Service today is almost a creed. The war has made it so. And the new industrial era which has come as a fitting climax to the war has intensified that creed. The teaching that we have had in this direction is the greatest inspiration that I get from this wonderful work of Safety—that I am performing a real service to mankind. So it would be with you and with every officer and employee of the properties with which you are associated. More especially should it apply to the Safety Committee members. The idea of service must predominate our every thought and action to the end, which is wholly possible of attainment, that we will demonstrate to all the people that we are men among men, each man being safe himself and having proper regard for the safety of other men.

Thus we will truly make railroading the safest occupation in the world. It can be done. You are the men to do it, and I have an abiding faith in the fact that the railroad men of America are equal to the task.

CHAIRMAN RICHARDS: You have heard this very interesting and illuminating paper by Mr. Duffy. Is there any discussion which anybody would like to make in this connection?

Before we proceed, however, there are two things that the Chair forgot to mention when we were going through our formal arrangements. You will notice that one order of business to come before the meeting was the appointment of a Nominating Committee. It has been customary, I think, since the inception of this Section, to have a Nominating Committee

appointed by the Chair for the purpose of recommending to the Section the officers for the ensuing year.

At a meeting of the Executive Committee held yesterday, it was decided to recommend the abolishment of that practice, and to recommend that nominations for officers for the ensuing year should not be made by a Committee appointed by the Chair or anybody else but should be made on the floor and that everybody should have a chance to speak their minds and nominate their candidates.

With the consent of the Section, the Chair will dispense with the appointing of a Nominating Committee if he hears a motion to that effect.

MR. A. V. ROHWEDER (D. M. & N.): Mr. Chairman, I move that we dispense with the appointment of a Nominating Committee.

(The motion was duly seconded and carried.)

MR. ISAAH HALE (A. T. & S. F. R. R.): Harking back to Mr. Duffy's able paper, I recall the statement that to have real joy one must share it and that happiness is born a twin. It seems to me that we fellows here might, as individuals, see to it that Mr. Duffy's happy enthusiasm or his enthusiastic happiness might find its twin of enthusiastic happiness in all of us.

CHAIRMAN RICHARDS: As Mr. Duffy mentioned in his paper, since the last meeting of this Section we have lost a very enthusiastic and important member of the Section, Mr. Hiram W. Belnap. The Chair has taken the liberty of appointing a Committee, of which Mr. Meyers is Chairman, to present to the Section a resolution in relation to Mr. Belnap.

MR. FRED MEYERS (Wabash R. R.): Mr. Chairman and Fellow-members of the Railroad Section of the National Safety Council: We have prepared a set of resolutions, as our Chairman has stated, which we should like to have acted upon here.

In presenting the resolutions of respect to our departed friend, fellow citizen and co-worker, Mr. Hiram W. Belnap, as chairman of the committee appointed to draft same, I feel the time very opportune to make a few remarks outlining briefly some of our friend's deeds.

Brother Belnap was born in Nakomia, Ill., June 21, 1867. His father was an operator and agent for over thirty years on the Indianapolis and St. Louis Railroad, now the St. Louis Division of the Big Four. He learned telegraphy under his father and assisted in the telegraph and station work for about two years. Later he accepted a position as passenger brakeman and remained in that service about six months when he entered freight service as a freight brakeman. He served in that capacity for a little over two years, being promoted to a freight conductor in 1893. From 1893 to 1903 he was employed on the St. Louis Division of the Big Four in that capacity. Resigning his position there August 1, 1903, he entered the service of the Interstate Commerce Commission as an Inspector of Safety Appliance. On July 1, 1911, he was made Chief Inspector of Safety Appliance and later Chief of the Bureau of Safety, Interstate Commerce Commission. On February 19, 1918, he became Manager, Safety Section, Division of Operation, United States Railroad Administration, which position he held at the time of his death, October 12, 1918.

Brother Belnap was a very active member of the Order of Railroad Telegraphers and the Brotherhood of Railroad Trainmen. He assisted the organization and officers of the Order of Telegraphers in many ways while occupying an official position in Washington. As a member of the Brotherhood of Railroad Trainmen from July 10, 1892, he participated actively in all its affairs, having served on the Board of Trustees, also a Vice-Grand Master. —

It was while serving the Interstate Commerce Commission that he rendered railroad men untold service. His utterances on his specialty of safety work were inspiring and clear. He sounded the true note, not merely for ideal safety, but pointed out in practical lines the rules of conduct essential for the conservation of life, and the promotion of safety on railroads. —

Being a natural leader of men, his untimely death robbed us of a strong and able guide and after years of service in behalf of mankind. God called him home at the very moment his biggest life work was to bear fruit—the organization of safety work on all Government railroads.

The corner stone of Safety First has been laid and to him we owe some fitting memorial. We can in a small measure acknowledge this service by placing upon the records of this organization our resolutions of respect.

"He lived and everybody loved him;
He loved and was never alone.
His associates were loved by him,
And God loved him and took him home."

RESOLUTIONS

Adopted By

NATIONAL SAFETY COUNCIL

(Steam Railroad Section)

At Annual Congress Held at Cleveland, Ohio, October 1-4, 1919

WHEREAS, The Great Arbiter of the destinies of men, on the twelfth day of October, Nineteen Hundred and Eighteen, summoned to his last, long rest, our friend, fellow citizen, and co-worker in Safety,

MR. HIRAM W. BELNAP

Manager, Safety Section, United States Railroad Administration, and a man prominent in the great humanitarian movement among railroad men in particular, therefore, be it

RESOLVED, That, in his death, our country lost one of its most upright, progressive, and valued citizens, the railroad fraternities, and the Safety Organizations of the United States, one of their most successful, valued, and constructive associates; and be it further

RESOLVED, That the deep sympathy, respect, and friendship of the Officers and Members of the National Safety Council, Steam Railroad Section, through a copy of these resolutions, be transmitted to his family,

and a copy spread upon the minutes of this Council in session, as a tribute to our departed friend.

(Signed) R. C. Richards

Chairman, Steam Railroad Section

F. Whitemore

Secretary, Steam Railroad Section

L. G. Bently

M. A. Dow

Fred Meyers

Chairman, Resolution Committee

Arthur V. Rohweder

Peter Groome

John T. Broderick

Thomas H. Carrow

Fred M. Metcalfe

Committee

I move the adoption of these resolutions, Mr. Chairman.

MR. ROBERT SCOTT (Atlantic Coast Line Railroad): In seconding this motion, I would like to say that this Committee has not in the least been extravagant in the language that they have applied to our deceased friend, Mr. Belnap.

MR. H. A. ADAMS (Regional Supervisor of Safety): I would ask that in passing this action the audience arise and stand in silence for one minute.

(The motion to adopt the resolutions was carried by a rising vote.)

CHAIRMAN RICHARDS: These resolutions will be shown on our minutes and a copy will be sent to the family of our deceased friend.

The next paper on our program is by our friend Marcus Dow, on "Value and Necessity of Safety Agents".

THE VALUE AND NECESSITY OF SAFETY AGENTS

MARCUS A. DOW, GENERAL SAFETY AGENT, NEW YORK CENTRAL LINES

Safety work, ever since this life-saving and conserving idea was first conceived, has been in a continual process of development and improvement, and I think that we can safely say has now passed from the experimental stage into the stage of scientific development along the lines of proven effectiveness. Wherever safety work has been inaugurated on a railroad or in an industrial plant, the first important step has been to place the responsibility for the development of the work upon the shoulders of some one person. Often-times this responsibility has been placed upon the shoulders of men who were also charged with other duties of such importance as to require the major part of their time, thought, and energy. Sometimes the responsibility for safety work fell upon the shoulders of men who were competent to carry the double burden, but in any event the idea of requiring one officer to devote his entire time to safety work was not taken into consideration, because of the fact that in its first stages safety work had not developed into a work of sufficient volume

required to show the number of employees he has interviewed on the subject of unsafe practices in each department or class of employment, the number of meetings of employees he has addressed—such as safety committee meetings, noonday gatherings of shopmen and others, or meetings of any character. Much of the material he uses in such interviews or personal talks to the men is furnished him from the headquarters of the Safety Bureau or in the monthly staff meeting which he attends, and the information which he imparts direct to the men by word of mouth includes the number of men killed or injured by indulging in certain specified practices and a recitation of the principal causes of injury which he illustrates by the use of illustrated National Safety Council bulletins which he carries with him. Each safety agent in this manner talks to or cautions in a definite and specific way an average of 350 or 400 employees monthly. These safety interviews are held in cabooses, yards, switch shanties, tool houses, and similar places where one or more men can be reached and the time secured for the few moments necessary for the interview.

REQUIRED TO ATTEND COMMITTEES

In addition to the foregoing duties of both inspector and teacher, the safety agent is required to attend each division, shop, and sub-safety committee meeting held in his territory for the purpose of taking part in the meeting, injecting life into it, and encouraging the members to put forth their best efforts in making the safety work effective.

While these safety agents on the New York Central Lines report to the General Safety Agent and are members of the Safety Bureau, they work in close cooperation with the division superintendent—with whose approval they were originally appointed, conferring with that official frequently and either receiving or offering suggestions for a better promotion of the work.

SAFETY WORK LARGELY PSYCHOLOGICAL

I have briefly outlined the character of the work of the safety agents on a railroad system which has found the safety agent to be a valuable and necessary part of the safety organization, for the purpose of showing to you that a man of divided responsibility cannot undertake such detailed work. Safety work is largely psychological. Its function is so to interest each individual employee that he will give personal thought to the work while engaged in his regular occupation, and so thoroughly to impress him with the benefits to be derived by his cooperative effort, by his careful attention, and by his approval that a lessening of the chances of his getting injured or causing an accident will be the logical result. To produce this attitude or frame of mind in the average employee requires *personal* contact and individual mouth-to-mouth solicitation by some one who not only has the time to do it, but who also knows his subject, who thoroughly believes in it and who has the enthusiasm and forcefulness to make his work effective.

VALUE OF WORK DEPENDS ON SAFETY AGENT HIMSELF

If I may be permitted, I should like to have the privilege of briefly discussing, on my own account, a certain feature of this paper. I believe that the necessity of a safety agent and the value of a safety agent will be proven and will depend very largely upon the character of the work which the safety agent himself will perform.

First of all, the safety agent must realize how greatly important his work is and what a privilege it is for him to have the opportunity to serve his fellow-men and his country by helping to prevent accidents. If you should ever, at any time, my friends, have happened to stand on the bank of a river and you should have seen another human being struggling in the water and at once all of the instincts of bravery and of chivalry that lie in the human heart scourged you to action and before you knew it you had your coat off and you were in the water, and after a desperate struggle you succeeded in bringing an unconscious form to the shore, which you laid on the bank and saw revive and breathe and live again, you would have thanked God that you were there and had the enviable privilege of saving that life. You could not but have a wonderful feeling of justifiable pride that you had done something worth while, that you had answered the call of humanity and that when the real test came you had measured up to the full requirements of a real man.

A life saved is a life saved. It makes no difference whether a drowning man is pulled out of the water just in time to save his life or whether, in a less spectacular way, he is dragged from beneath the wheels of a locomotive just in time to save him. The result is the same, and, if I may be permitted to say so, it is because the safety men of the railroads of this country, during the past year, under government control, have responded to the call that so many lives have been saved. Every reduction that has been made in an accident record means that lives have been saved, just as truly as if they were snatched from a watery grave within a few minutes before life would have become extinct. All of you men who did respond to the call, who did respond to humanity's call, who did help to decrease accidents on the American railroads during the past year, had a share in the saving of the lives that were saved, and you are entitled to the same credit and the same feeling of justifiable pride as the man who plunges into the water to save a drowning comrade.

Don't you see, then, my friends, that service as a safety man means something more than merely following certain defined rules and regulations? Don't you see that it means something more than simply drawing your salary as a safety agent?

A SERVICE OF THE HEART

In other words, can't you see, my friends, that when you are given the privilege of serving this country and your railroad as a railroad safety agent that you are given the same great privilege as the man on the river bank who heard the cry for help? Can't you see that safety work is a service of the heart, a service which calls for that spontaneous, ever-

ready, never-let-go, determined effort that you irresistibly put into the saving of a life which you know would be lost without your best efforts?

What a wonderful privilege it is, and how proud we all ought to feel that we have been given the opportunity to share in the credit and in the glory of the achievements in the accident prevention campaign that is to be made because of our effort in this work.

As I have said, so much depends upon the kind of work that is performed by the safety agent as to whether he is necessary and valuable in this work. We must all strive to become leaders in the safety movement. It has been said, at least you often hear it said, that the great majority of accidents to railroad and industrial employees are of a character caused by the fault of the injured person or the carelessness of that person. That is not altogether true; at least accidents caused by carelessness are not necessarily the fault of the injured person. The fault may have been with the man who hired him because he did not point out to him the unsafe things that he must not do, and did not teach him how to do his work safely. It may have been the fault of the other men who worked around him and who are careless and whose habits he followed because he wasn't immune to his careless, chance-taking environment.

It seems to me that a better statement and a more truthful one is that the great majority of accidents to railroad and industrial employees are of a character which can only be prevented when all of the employees and all of the officials get together and cooperate in the task of creating an atmosphere of safety, an atmosphere of carefulness. Here is where the work of the safety agent is of the utmost importance. Ever since the time when history first records the deeds of men, human beings have been known to follow a leader, and good leadership has been the secret of the health and prosperity and success of communities the world over from time immemorial. Likewise has poor leadership left in its wake untold misery, hardship and suffering.

You safety men who give real, honest-to-God heart service in this safety work will be the right kind of leaders in safety work and you will do more than anything else that I know of to help to create this atmosphere of safety, this atmosphere of carefulness. This, then, I believe is the character of the work of the safety agent which makes him indispensable, that makes him necessary to the safety movement.

"THE COMMAND IS FORWARD!"

Safety work, my friends, is essentially a progressive work. It is a work which denies the possibility of failure or retreat. In the great battle of the Argonne Forest, in the recent World War, a young American captain was shot down by a machine-gun bullet and mortally wounded. Two of his enlisted men picked him up tenderly and carried him to the rear. They laid him on the ground, and his first lieutenant, stooping over him with a pencil and paper, took down his last words. Lifting his head painfully, he looked at the first lieutenant and, pointing a shaking finger

to the front, he said, "Lieutenant, the command is forward! Lieutenant, the command is forward!"

Men of America I say to you that the command today is forward. Railroad safety men, the command is forward, forward for country, forward for loyalty, forward for justice, for humanity, for safety. Let you and I who are privileged to act as leaders in the great railroad safety army of America take heed and remember that the command is forward.

CHAIRMAN RICHARDS: Gentlemen, after the inspiring address which we have just heard, Mr. Dow's paper is open for discussion.

DISCUSSION

MR. JOHN S. ROCKWELL (Buffalo, Rochester and Pittsburgh): I have listened with wonderful interest to this splendid paper of Mr. Dow's, and I agree with him perfectly so far as the large roads are concerned. On the New York Central, on the Pennsylvania, on the Santa Fe, and the other big roads, a safety man should be employed who devotes his entire time to the supervision of the work. Safety agents should be employed to devote their entire time to the work. But how about the little roads with 400 or 500 miles? We can't have a man devoting his entire time to the superintendence of the work unless we are satisfied to have a cheap man, and it is thought best by many of the little roads to let some other official, some man who has other duties, act as the superintendent of the safety work. So far as our assistants, our safety agents, are concerned, we think it is better to use men who have work to do in other capacities. On my own little road, I have four men who act in the capacity of safety agents a part of the time. They attend safety meetings; they go about the road talking with different people. Two of those men are district claim agents and they know every man on their entire division. Three of them, rather, are district claim agents. One of them is a traveling store keeper who goes about to every shop periodically, almost weekly, examining the materials in stock, and incidentally he is working every minute for safety. There isn't a man or an employee in all the shops on our system who hasn't been talked to by him on safety.

I think Mr. Duffy will bear me out that the little roads are accomplishing as great a reduction in the number of personal injuries and deaths as the larger ones.

It seems to me that Mr. Dow should have given us some instruction or opinion as to what should be done on the little roads.

MR. FRED M. METCALFE (Northern Pacific R. R.): A feature that struck me very forcibly in Mr. Dow's remarks was the statement that the employees injured are not always injured by their own carelessness. Primarily, yes; secondarily, no. That was emphasized very recently by an inspection trip I made. I found two very bad conditions. The engineering department men were doing some work. They had unloaded a lot of scrap from a flat car right in the pathway of a switch where men were working at night. I saw this pile of barrel hoops and twisted wire and stuff of that sort, and I asked the assistant car foreman who had charge

of those tracks how long that stuff had been there. He said, "I don't know, maybe a couple of days." I said, "Have you seen it before?" He replied, "Yes." I said, "Was it too heavy for you to lift?" He said, "No, but I didn't put it there."

Then I got the yard master. I said, "Have you been around lately?"

"Yes."

"Have you seen this stuff here?"

He said that it hadn't been there the night before. I said, "Do you know that for a fact?" He said, "No."

Then I got the foreman of the bridge and building crew and I said, "Do you know anything about that stuff there?" He said, "Yes, some section men had this flat car out and filled this place up. When we got the car in we had to get rid of it so we dumped it off there." I said, "You are the foreman of this crew of twenty-five men and you let those men drop this stuff there and walk away?" He replied, "Yes." I said, "Don't you see anything wrong about that?"

"Oh, of course, it shouldn't be there."

"Why don't you have it moved?"

When I asked that he called two fellows and said, "Mike, Bill, come over here and take that stuff and throw it away." I said, "Wait a minute. Don't you want to tell those men something?"

"What is there to tell them?"

"Aren't you going to tell them why you asked them to remove that?"

"Why is that necessary? They do as I tell them."

Mike and Bill came over, and I said, "Wait a minute, boys, before you move that. Do you know why Mr. Bell, your foreman, has asked you to move that?"

"No not particularly."

"Why are you going to move it?"

"Because Mr. Bell told us to."

Then I talked to those fellows and showed them why it was that that stuff should be moved.

"I went down to another place where they were loading some 8 x 12 timbers and there they had placed a couple of long skids leading from the end of the ties up to the pile of lumber. They had left those two skids there. I got in touch with the man in charge of the work and I talked to him and the foreman in the same way. He did not explain to those fellows, when he asked them to move those skids, why they should be moved. I am just stating that to illustrate the lack of education on the part of our own foremen in safety work.

How can foremen be good safety men when they don't know enough to tell their laborers why they request them to remove obstructions from the path of work? I thought Mr. Dow's remarks in that connection were very good in illustrating that particular thing.

Easily 50 per cent of the accidents that we charge to carelessness are due to nothing more nor less than lack of supervision on the part of our supervising officers and foremen. Our field men that we put on beginning September 15 were put on solely and wholly to educate the supervising

ing officers and foremen and also to get in personal touch with the men and let them know what is being done.

Mr. C. R. STAPLES (Southern Railway): I would like to ask Mr. Dow what percentage of his monthly personal injuries is caused by bad conditions. Just approximately, what percentage is caused by faulty methods?

PERCENTAGE OF ACCIDENTS CAUSED BY FAULTY METHODS

Mr. Dow: I can answer that in this way: One year's record on our railroad indicates that 9.65 per cent of the injuries to employees were due to defective conditions. We will have to assume that the balance was due to other things.

Mr. STAPLES: I made my confession of faith in the safety movement in 1910 and was received by Brother Richards, and in my line I have been talking safety from that day to this. I have spent a world of time in the elimination of bad conditions. The perusal of the personal injury reports from 1910 up to the present time show me that 90 per cent of my personal injuries have been caused by bad practices, faulty methods, or thoughtlessness. I give that to the new members because I hope it will save them an untold amount of trouble.

Mr. T. P. BRENNAN (Long Island R. R.): One of the gentlemen, a moment ago, spoke of the small roads adopting the use of the store keeper, the freight claim agent and men in various other activities in safety work. You could achieve some things along that line, Mr. Chairman, but a man who has a divided responsibility or an accumulation of duties that pertain three-fourths to something else and one-fourth to safety, is just going to accomplish about one-fourth of what he has to do. In the first place, the man who gives his time to two or three other things is not going to be capable of being a safety agent. I speak as the representative of a small road of some 500 odd miles, conducting the densest passenger service in the United States on any steam road.

There are not enough hours in twenty-four for me to do that safety work. I may not be able to do the work that some of you younger fellows can, but I contend that it cannot be done and done efficiently. It isn't consistent with our organization. We are organized as a safety institution and not as a claim agent or store keeper organization. I contend that it is up to every small road to insist, and it is up to this organization as a safety section to insist, that the small roads assign one man who is solely and exclusively there for one purpose, to learn safety and to carry it on and not have it confined to courtesy and efficiency and a half dozen other different things, and coming in at the tail end. I think it is a thing of which all our small lines should think. The great, big fellows swallow the little ones up once in a while, but while we are small lines, let us stand by our guns.

In Long Island we are trying to make that sort of fight. I believe in one man giving his time to the work and not to a half dozen different occupations.

Mr. FRED W. MITCHELL (New York, New Haven & Hartford). I would

like to ask Mr. Brennan if he hasn't any inspectors or any other employees who give their whole time to safety work.

MR. BRENNAN: I regret to say that we have not.

MR. T. H. CARROW (Pennsylvania R. R.): I think you ought to mention how many employees you have, Mr. Brennan.

MR. BRENNAN: We have only about 8,000 employees.

MR. J. H. STADELMAN (Southern Division, Pennsylvania R. R.): I am connected with the safety work on the Southern Division, and we have committees on each one of our four divisions aggregating a total of about 100 men, and we are trying to impress particularly upon those committees that each one of the men wants to get after all the men on his division as far as he can to get them interested in the safety work. We have a total of 20,000 men on the Southern Division, and we want to get the majority of the 20,000 in the work.

EFFECT OF SAFETY AGENT ON SAFETY COMMITTEE

MR. A. V. ROHWEDER (D. M. & N.): We have two lines with about 1,300 miles of track, and I have thought a while about this safety agent proposition in that connection. We handle a tremendous ore business, and I have often wondered whether it was advisable to put on safety agents. I have always been afraid of the fact that if we put on safety agents, especially on the smaller lines where it is possible for the men in charge of the safety work to get around at frequent intervals, that we are going to destroy the safety committee idea. For example, if you put on a safety inspector at your principal points on the line and you put the job up to him to make corrections and inspections and correct practices and conditions, the safety committee men are going to feel, it seems to me, that part of their job has been taken away. On the smaller lines, I think it would be a good idea for the men in charge of safety to try to drill into the men on your safety committees that responsibility of carrying out, as members of the Committee, the duties that they are to perform. For example, on the New York Central, I have found that that has worked out very successfully. In 1916, the D. M. & N., for example, ran about seventeen accidents per one hundred men employed, and in the first eight months of this year it ran 3.32 per cent, so I believe that our program speaks fairly well for itself.

MR. DOW: As to Mr. Rohweder's suggestion about destroying the work of the safety committee, I will say this: After the division safety agents were appointed on the New York Central Lines, the efficiency of our safety committees increased to an almost unbelievable extent. On some of the committees, the number of unsafe conditions and practices reported monthly are practically doubled because of the inspiration that was given to those committee members through the attendance and the personal contact of the safety agent.

I do not agree with any suggestion that a safety agent will have any effect other than to increase the efficiency of the safety committee organization.

As to the contention that they are not needed on small roads, of course,

I can't speak for the small roads inasmuch as we have about 150,000 employees, but I will say that our safety organization of safety agents furnishes one safety agent for approximately each 6,000 men. I think that takes care of the suggestion that they are not needed in small units.

MR. E. S. CHAPIN, JR. (Pennsylvania R. R.): I have had some experience along the same lines as indicated by Mr. Dow in addressing safety committee meetings where recommendations were made in perfectly good faith by the members of the committee, which were, to a certain extent, impractical, or they might have originated at some other time and place and been met by certain measures which were found successful. In that way, knowing those points, I was able to advise the members of the safety committee so that they could intelligently draft their recommendations, possibly remove the impractical ones from the report, and point the way in which the other ones should be corrected, without their taking the time to worry about how to do it.

I feel that is a field where the safety agent, in whatever guise he may appear, can help and strengthen the hands of the safety committee members.

MR. BRENNAN: I will add to my previous remarks in regard to the appointment of a safety agent that I took the figures of our little road and I found that prior to the appointment of a safety agent, we had five suggestions on conditions, on practices and signs that we reduced three to one by going among our committees and bringing before them the importance of those things.

I might say, for the further elucidation of the question that Mr. Mitchell asked, that while we have no men exclusively as inspectors, we assign members of the several committees to those duties, and they feel it is an honor to be so assigned to assist in making inspections.

MR. JOHN T. BRODERICK (Baltimore & Ohio): I might say, for the benefit of the members of the Council present, that on the Baltimore & Ohio system, for a number of years, we conducted our safety work without the assistance of safety agents. We got along, it is true, and made good progress. About fourteen months ago, to intensify our work and to try to accomplish more than we had in previous years, we adopted the idea of the appointment of safety agents, and today we have six and we have had them for fourteen months. I am glad to say that those men have more than proven their worth. We feel that it has stimulated the work of our safety committee men. It has proven very valuable in many ways. Those men are all practical railroad men of experience, and the great good that we are getting from their services I can hardly measure in dollars and cents, and I think the same idea applies equally as well to the small roads as to the larger roads. Were I the representative of a small road, I certainly would press the idea of having at least one safety agent.

MR. H. M. ADAMS (Regional Supervisor of Safety): I have listened with a great deal of interest to the paper by Mr. Dow, and the discussion thereupon relative to the proper installation of committee organization has been very interesting. I know of no point that is of greater interest in getting the results that we are setting out to attain than the proper or-

ganization as to the sufficient number of safety agents, let the road be large or small.

I have in mind one large trunk line in the Central Western region that for several years, with 14,000 miles of track and some 50,000 employees, was handled by one man. Today, that gentleman has five efficient men from the ranks with him, and he is getting wonderful results. That is true with all of the large trunk lines with the exception of one in the Central Western region. That particular line has, I believe, four or five field agents, but the sphere in which those field agents work and the duties that have been outlined to them, carrying out other duties that are not in accord with the safety movement duties, I might say, to be specific, requires them to act as secretaries of the various committees, take care of all the clerical work and thereby relieve the various committees of their duties, taking away their initiative. That is the kind of field work, in my opinion, that will work as having a negative effect on the safety work.

The field agent in the name and meaning in which he is appointed to supervise, to attend and direct, is one of the most valuable assets that this safety section can create.

Mr. E. G. STEINER (Indiana Harbor Belt R. R.): I think we are classed as one of the smallest railroads, but I feel that it is one of the biggest little railroads that I ever saw. I think that the average small railroad makes a mistake if it does not appoint enough help to look after its men, just the same as they do on the trunk lines. We have only about 100 miles of road, and while I only have about 2,600 or 2,700 employees on that line, I have been able to make but three full inspections of the property since last February, and it is utterly impossible to think of handling more than 2,500 men or employees and do it properly where you have all the departments to look after.

Of course, we have a good many steel plants there, and they create a good deal of trouble for us. There are lots of other industries there, too, but where I get the most good from contact with the men on the outside is when I can be out on the road, riding with the crews. Those of you who have been in train or engine service will know that those men won't put their names to conditions. They want to tell it to you, and you have got to be out there to get it. That is where I get it, and so when possible we get to them with the personal touch and work on the conditions as they present themselves, taking that which is seemingly most important. I might have a line of work laid out for one day; something might come up at the extreme end of the line; I would drop the whole work and go there and have it corrected.

I think that the small railroad should have one or more men just the same as the larger ones, because it only requires one good, fair-sized accident to pay his salary for a year and he can't attend to other duties and pay proper attention to safety work. I do the examining of the train rules on our line, and it gives me an opportunity to talk safety in every examination, and that is why I welcome it.

It is only this intensive action and contact, day and night, being out with these men in all sorts of weather, that brings the results that we

want. If I don't get out with them late at night, I can see them early in the morning, and it is at times like that I find out what is going on on the railroad.

Mr. Dow: As a further evidence of what the management of the New York Central Lines thinks of the safety agent, let me say that in connection with the forthcoming national railroad accident prevention drive, I have had assigned me special men for the purpose of interviewing every employee on the railroad and soliciting his cooperation in this drive. There are to be five and six and ten on every division, and we will have 400 safety agents during the month of October.

Mr. E. M. SWITZER (Chicago, Burlington & Quincy R. R.): Mr. Chairman, this matter of safety agents is a very important subject. We have always had safety agents ever since we started safety work, and I don't see how we could get on without them on such a big railroad. We have about 10,000 miles of track. I can't be every place at once, and those men are my eyes to see with, my voice to speak with, but I think that some one ought to point out the danger from an overdevelopment of the safety agent idea. Most railroads are divisionally operated. The unit of operation is the division, and the man at the head of the division is the division superintendent, and we hold him responsible for what goes on in this division. The other divisional officers take their orders from him. If we put a man on his division who doesn't report to him but reports to us, who makes an attempt to do some of the work that ought to be done by that division superintendent, we will find that the division superintendent is very willing to surrender that part of his work to this man because he has a great deal of other work that is very pressing.

I don't believe that we ought to require the safety agent to attend every committee meeting. I don't think that we ought to require him to do any of the secretary's work, or that we ought to require him to be responsible for the success of that committee work at all. That is the responsibility of the chairman of that committee, who is the division superintendent or the master mechanic or the superintendent of terminals, as the case may be.

I repeat that I think there is danger in the overdevelopment of this idea that we may detract from the responsibilities of those men and lessen the efficiency of the safety work.

Mr. HARRY J. BELL (Regional Supervisor of Safety): I don't know exactly the trend of discussion this morning, but Mr. Switzer has so thoroughly expressed my own ideas that I want to subscribe to what he has said and to say, in addition, that we have been talking for years about the superintendents and the master mechanics being responsible for accident prevention, but we have had the accidents just the same. We have to have the safety agents, it seems to me, to follow up the work, to drive home to the superintendent and the other operating and mechanical department officers the fact that they have a real problem in front of them in this work.

The safety agent ought to make it his job to impress the officers with his added responsibility.

It is up to the safety agent to make it clear that his responsibility instead of being lessened by the employment of these men is made greater.

I have attended a good many safety committee meetings where the committeemen, to say nothing of the rank and file employees who had not had an opportunity to serve on a committee, were absolutely ignorant as to what the safety committee plan involved, what they were supposed to do as committeemen and how to do it, what their authority and what their responsibility consisted of.

It seems to me that any railroad, no matter how small, would improve its results materially by the employment of safety engineers or agents, or at least by the arrangement being made in such manner as to give the safety work on a railroad the proper supervision. It seems to me that in a smaller way it is just as necessary to have safety agents as to have train masters. We have train masters to see to it that the train operations are what they should be, that cars are moved, that engines are dispatched properly and promptly, and for the same reason I believe we need safety agents and plenty of them, but, at the same time, bearing in mind Mr. Switzer's warning not to over organize. I think there is little danger, however, of over-organization.

It seems to me that when you gentlemen present this information for consideration before your officers that one of the things that will confront you is the expense involved in such an arrangement and that we ought to be fortified with statistics to prove the possibilities of an increased saving from a financial standpoint by the employment of these men.

I have in mind a railroad in a Western country that had a material increase in its accidents in July, and it was figured that from the standpoint of the train department expense involved in that increase, basing the statement on the fact that the average cost of disposing of a case during 1918 was \$260, the railroad lost over \$21,000 during that one month because the safety work didn't properly function. Whether it was due to the lack of employment of safety agents or not, nobody can very well say. When a large railroad, in six months' time, can save in its train department expense almost \$150,000 on that one line (we all know what it costs to employ a safety agent and get a good one), it seems to me there can be no question about the increased efficiency and results that will be obtained by the employment of safety agents from the great and foremost humanitarian standpoint, to say nothing about the hard, brass-tack proposition that an operating officer might present in connection with the saving in dollars.

MR. JOHN S. ROCKWELL (Buffalo, Rochester & Pittsburgh): I realize that I have been pretty fairly shot to pieces, but I still believe that in my own case I am doing better work than I would if I had hired or should hire a safety agent. We operate 580 miles of road. We have about 7,000 employees. According to the talk here, 7,000 employees would be just about enough for the employment of one safety agent. Three of these young men who act for me as inspectors and safety agents were educated and trained in a school for safety supervisors which is run by our very pro-

gressive Chamber of Commerce in Rochester. They went through that course and got their diplomas, so they are regularly certified safety supervisors, and they go over the road and attend the meetings of the safety committees almost all the time. I attend a good many of them myself. It is my belief, notwithstanding all that has been said here, that I am getting better results from the use of these men who give a portion of their time to the work than I would if I had a single safety agent.

Our safety committees are very active and enthusiastic. We have eighteen committees on our little road, and they are very active and are turning in great numbers of safety reports, great numbers of conditions, though now they are unable to find any more unsafe conditions to speak of and they are turning in unsafe practices.

I realize, as I said before, that you have shot me all to pieces, but I still think that I am doing my work right. We have had a reduction every month. This year we have had a reduction of practically 50 per cent over 1918. I think that is going some.

MR. BRENNAN: I admire a man who stands by his guns even if he knows he is wrong.

MR. H. M. MAYO (Southern Pacific Lines): It is my opinion that the value of the safety agent, as well as the value of the superintendent of safety, depends entirely upon his influence with the employees. The selection of a man as safety agent or safety superintendent who cannot secure the cooperation and sympathy of the employees is a waste of time, energy and money.

Another thing which I call to mind: Recently, on a thirty-day drive in the Southwestern region, one railroad, a small one with four or five hundred miles of track and possibly 1,000 employees, on which safety work had never been done, saw its men pick up the spirit of the occasion and come through without an accident reportable to the Interstate Commerce Commission in those thirty days.

I can call to mind another railroad of some 4,500 miles of track which had no safety agents whatever, yet they made a reduction of nearly 56 per cent in the May drive. On the other hand, a railroad in the Southwestern region that has been well organized, well maintained and has its safety agents, made a reduction of over 70 per cent in the thirty days of the drive. I think, therefore, that you will find by viewing the situation from all of its angles conditions vary, but I still believe, as attested by Mr. Staples and Mr. Dow, that as 90 per cent of the injuries are directly attributable to the fault of the sins of omission and commission on the part of the employees, the conditions will nearly always take care of themselves.

I find, in my limited experience of about eighteen months, that the men are quick to report hazardous conditions, but they very seldom report on their cards or orally at the meetings a condition that approximates an error of practice. However, we have other means of getting at that, and through the men themselves, who, instead of recording as the result of their activities during the month the upturning of evils represented by hazardous conditions are reporting from 95 to 99 per cent errors of prac-

tice on the part of their associates. In that way, we are securing the benefit of the constructive development that is reaching out into every corner of the entire structure, building up a spirit of caution and a spirit of coöperation that we could not get in any other way.

You must have the men with you, and the appointment of any safety agent who cannot secure the coöperation of the men is going to be detrimental rather than helpful, but I believe with Mr. Dow and some of these other gentlemen that a proper supervision is only possible through the employment of outside safety agents or inspectors, and that there is no disposition on the part of the safety committees to delegate any of their authority or activity to the safety agent who really pursues a policy of suggestion to the men themselves.

In the Southwestern region, we have made it a most successful thing and have made a most excellent record; yet that record is divided among roads that have safety agents and roads that have none.

MR. P. GROOME (Union Pacific R. R.): I want to ask the gentleman from the B. R. & P. what other line of duties he follows besides being a safety agent.

CHAIRMAN RICHARDS: He has the same duties that I have.

MR. ROCKWELL: Two of my men are district claim agents, and it is only necessary to point to this gentleman standing here, our Chairman, for everybody to realize and acknowledge that no better safety man ever happened than he, who is a claim agent as well.

MR. GROOME: We will all agree on that as far as our Chairman is concerned, but in our Central Western region, I have in mind two railroads that have heads of safety departments with divided responsibilities. Their responsibilities are so great that neither one of those railroads is represented at this meeting so far as I know, and I have had a chance to observe the work on those lines and know that is true. I have travelled over their lines and attended some of their safety meetings, and I am frank to say that if I were at the head of that road I would want to have a man in supervision of the safety work who would have nothing to do but attend to that.

MR. ISAIAH HALE (A. T. & S. F. R. R.): Harking back to my friend's statement that he has an acting safety agent who is also a claim agent; this thought comes to me: When we launched our work on the Santa Fe in the safety line, that work was an adjunct of the general claim department. My experience was such that I would regard it most unfortunate for any condition to identify the safety movement too closely with the general claim department.

I grant you there is a notable exception in the case of the North Western and Mr. Richards. He has carried the work on the North Western to success simply because he is Ralph Richards, and you would find it very difficult to convince me that Mr. Richards' successor will find it easy to carry on the safety work with that same degree of success and smoothness in working conditions. I am very much opposed to that as a general arrangement.

Mr. Duffy spoke a moment ago of the absence of any comparison be-

tween the importance of safety work and the various conservations that are going on on our railroads. He mentioned fuel supervision. The road is a small one that has not now a fuel supervisor. If the conservation of fuel is important enough to demand the attention of one man's time, or more, then I ask you why is not that greater question of safety also entitled to that same attention?

CHAIRMAN RICHARDS: The Chair has felt great diffidence in saying anything on this question, because, as I stated in the opening of this meeting, I am here to be seen and not heard, but there has been so much said in favor of the division safety agents and the absolute necessity of having safety agents that I am almost obliged to say a little something on the other side.

My friend, Mr. Hale, just said that if it is necessary to have fuel inspectors it is necessary to have safety inspectors. It seems to me that the difference is so clear and plain that everybody can recognize it. We have no fuel committees to look out for dangerous conditions and dangerous practices and things that need remedying. We have safety committees on all railroads for that very purpose. It has always been my idea, although I am not so fixed in it that I cannot be changed, as Mr. Rohweder has well expressed, that there is the danger of lessening the interest of the members of the safety committees and the duties which they are supposed to perform by appointing field inspectors to look after the work.

The North Western Railroad, as you know, has about 8,500 miles of track and about 55,000 or 60,000 employees. We have only two safety inspectors, and our results so far have been at least satisfactory in the ratio of reduction of accidents.

I feel very deeply all that has been said here today in favor of safety inspectors, and I may go home with a different notion, but I think it is only fair to men representing railroads here today that have no inspectors and those where one man is in charge of the safety work who has other duties to perform, to say that I have always had plenty of time to perform the duties of the head of the safety department, as has Mr. Rockwell, because we have always taken time, and we always will take time. We think it is the most important part of our duty—the saving of lives of men who are doing the work on the railroads. Our friend Bell mentions the fact that some great railroad in the West that has a flock of safety inspectors has reduced its personal injury accounts \$125,000 or \$130,000 during the last six months. We have not a flock of safety inspectors, but we have a larger reduction than that in the personal injury account during that same period.

I don't know which is the right way to do the work, and it might be well for this Section to put itself on record as to what it thinks should be done in the way of safety supervision and the management of the safety department, or it might be well for this Section to refer that matter to a committee in order that they might give it careful thought and investigation and report at our next session. It seems to me that this very interesting discussion ought to result in something more than talk. Of course, I don't think that we ought to ever try to measure the success

of the safety organization by the reduction in the personal injury accounts, because the personal injury accounts for the first six months of this year probably cover many cases of last year, and you may have some one accident that, deplorable as it is, might wipe out any great saving that you would make in your personal injury account, which would be absolutely unavoidable. Perhaps there is nothing that any safety committee or any safety supervisor or any safety inspector could do to prevent such an accident that might cost you a half million dollars and increase your personal injury account that much instead of showing a decrease, so I don't think it is fair to measure the success of any safety work on any railroad or in any industry by the personal injury account. We want to measure it in lives and limbs saved and in the saving of lost time and not in the saving of dollars and cents, because that is the last thing that we want to think about.

I was impelled, gentlemen, to make these few suggestions because the discussion had been, seemingly, so one-sided, and my side was only heard from once or twice. If it is the sense of this meeting that we ought to take some real action in this matter, the Chair would be glad to entertain any motion that you desire to make.

MR. HALE: I recall the remark that the most becoming thing to a fool is a shut mouth. It is a bold man who takes exceptions publicly to a statement made by Mr. Richards, but I can't help but fail to subscribe to his statement that while we have safety committees we have no fuel committees. I don't believe that is true, because in view of the propaganda which has been spread during the last year along that particular line in the way of literature and school lectures and moving pictures and one thousand and one different activities, it would seem to me that every engine man today on every railroad is a member of the committee on fuel conservation just as much as the member of the safety committee has enlisted his services under the banner of greater safety, and, therefore, the appointment of a safety agent comes as naturally as the appointment of a fuel supervisor.

MR. J. H. STADELMAN (Pennsylvania R. R.): As a rule, the committees consist of members from the Maintenance of Way Department, such as track foremen, some of the train men in various departments, assistant trainmasters, division engineers, superintendents, master mechanics, assistant master mechanics, and they represent virtually the best talent on the division, and their ramifications are much broader than the number who comprise the committees.

MR. SWITZER: Mr. Chairman, you have expressed the opinion that this Section ought to take some action and make some motion on this important question. I don't think it is going to result in nothing but talk, as you seem to think, because we are all going home with more ideas on this question than we had before, but I don't think that we ought to make any motion with a view to recommending what ought to be done because railroads are not all organized alike.

I spoke before about the divisional organization under which most of us are operating. All railroads are not perfectly organized on the divisional plan. Some have an administrative organization, if I may call it

that, which means that the general officers attend to a great many details which, under the divisional plan of organization, are attended to by the local office, and I can't see how we can make any hard and fast rule about what we ought to do with this question of safety inspectors. What is good for one railroad is not necessarily good for another railroad with relation to this question.

MR. RUFUS S. JARNAGIN (Regional Supervisor of Safety): It is with some timidity that I attempt to add anything to this enlightening discussion. In fairness to John Rockwell on the B. R. & P., I do feel it my duty to tell you just a few things. I have been over the B. R. & P. and have met hundreds of their employees. Of the 7,000 men he has, I think it is safe to say that 6,000 of them know him personally. I think that same thing is true, or proportionately true, on the North Western Railroad in Mr. Richards' case. It is my humble opinion that the safety movement on the North Western and on the B. R. & P. is a monument to the personality of Ralph Richards, and John Rockwell.

No man who knows me can help but know how close to my heart is this question of safety agents. For three years, I rode over some 5,000 miles of track on four or five different railroads on the New York Central Lines west of Buffalo, attending safety committee meetings. In those days, I am frank to say that while we were making small reduction in accidents I would attend committee meetings of twenty-five, thirty, and thirty-five men, and half of them would attend a committee meeting with nothing to report. It was an example of the fact that we were spread out too thin, that we didn't have an opportunity to educate the members of safety committees through our Safety Bureau as to their duties. That necessitated attention on such properties as we have in the East, and resulted in the appointment of local safety agents. These men are known personally to the employees and they reach, within the course of two or three or four months, every employee on the division.

I shall not attempt to burden you with my own opinion further in regard to this condition but merely to recite to you a few facts which I am sure the officers on the individual lines will bear me out in stating.

In the New York Central Lines, safety agents were appointed at different times. In each instance, in the beginning at least, their duties were restricted to the territory covered by one division superintendent. In some cases, it was later extended to two and three divisions, one main line and perhaps one or two of the branch line divisions.

Mr. Dow will bear out this statement that after the appointment of a division safety agent on any single division of that road over a period of some three years, during which time they were being appointed, there was actually a decrease in accidents on that division of at least 25 per cent, and in every case where no safety agent has been appointed there was an increase.

It has been my good fortune, during the past year or year and a half, to talk to every Federal general manager of any railroad north of the Ohio and Potomac rivers, and in talking with them, I have asked them, during the course of our conversation, almost without exception, "What do you

think would happen, Mr. Federal manager, if you could be relieved of all your duties for a single month, even a single week, and go over the road and talk the principles of accident prevention and safety first to as many employees as it would be possible for you to reach?" Almost without exception, although I am frank to say that all these men—big men they are whom I have met—have been extremely modest, they said, "I know the results would be startling."

My next query was, "If you can't do that, and we all know you can't, couldn't we come nearer to accomplishing those results by having your representatives appeal directly to the men?" I think the results in the Eastern region through the appointment of safety agents amply justified that statement. I might go a little further and speak of something else. Mr. Broderick has told you what resulted when he put six men on the H. & O. I am frank to say that I have never met a bigger railroad man than R. E. McCarthy, General Manager of the Pennsylvania Lines. There was absolutely nothing that the safety section of the Railroad Administration wanted that we didn't receive at my first interview with Mr. McCarthy, which resulted in the appointment of an extremely high-class man, Hugh Reynolds, Superintendent of the Safety Bureau, and eight safety agents. Mr. Reynolds will bear out this statement. I believe, that almost the day those men were appointed—all high-grade men, train masters, divisional engineers, assistant train masters—their accidents began to decrease from 35 to 50 and 60 per cent. I believe that statement holds true today, and no man in this room will contend that even before we had safety agents there was a better operated, a more safely operated, railroad than the Pennsylvania Lines West.

The thought I want to bring to you today is that perhaps of all the railroads in the United States there are two single exceptions where we do not need or require, if you please, safety agents, and those are the North Western and the B. R. & P., and that is because only one thing is responsible—the personality of Mr. Richards and Mr. Rockwell.

MR. FRED W. MITCHELL (New York, New Haven & Hartford): You mentioned that the nomination of officers would come from the floor. Tomorrow's program mentions that order of business but it does not specify any time. In order that there will be no misunderstanding, I move you that a specific time be appointed for the nominations and elections. I suggest twelve o'clock, if that is agreeable with the Chair.

(The motion to make a special order of business at twelve o'clock of the nominations and elections of officers for the ensuing year was duly seconded and carried.)

MR. L. F. SHEDD (C. R. I. & P. R. R.): I believe I am right in saying that I voice the sentiments of every soul in this meeting when I say that the paper which Mr. Duffy read to us this morning on this great and important subject is a Duffy masterpiece. In that paper, we heard reiterated by Mr. Duffy those high aims and noble purposes that we heard his predecessor, the late Hiram W. Belnap, state. We heard Mr. Duffy reiterate them at the St. Louis convention, where we realized something of Mr. Duffy's great ability.

In connection with that paper, I believe it is fitting that we in some

way acknowledge better than we have the great inspiration that has come to us and the splendid principles inculcated therein, those principles that will lead to the culmination and the formation, if you please, to the climax, of those plans so well laid by his predecessor and so earnestly desired to be carried out by him. I have particular reference to his conclusion, Gentlemen, where he expressed the great work for us to do. But there is even something greater—his vast personal confidence in us to do it.

I suggest that we now stand in proper recognition of our appreciation of the paper, its sentiments, and the interest of its author?

(The Section gave Mr. Duffy a rising vote of appreciation.)

MR. DUFFY: Mr. Chairman and Gentlemen: You have been magnanimous in your kindness towards me. You have demonstrated by your applause and by your generous thanks that you gave me and by the feast that you gave me last night your appreciation, and I want to say to you that I accept it in no personal spirit other than that we have met here in the safety cause in which we are so intensely interested.

CHAIRMAN RICHARDS: We will now have the last paper on the program. Mr. Doolittle, Supervisor of Safety, Colorado Southern Railroad, was to have presented a paper on "Coöperation of Officers and Employees in Safety Work on Railroads." At the last minute, we got word that he couldn't be here and that he had not prepared his paper. We picked out the man we thought was the best in the Section to fill his place. He is our good friend Fred Meyers. Like a good soldier he agreed to do it.

COÖPERATION OF OFFICERS AND EMPLOYEES IN SAFETY WORK ON RAILROADS

FRED MEYERS, SUPERINTENDENT OF SAFETY, WARASH RAILROAD

It is needless for me to emphasize the necessity for harmonious co-operation between officers and employees of a railroad. We each appreciate and recognize that the principle is the foundation of our safety efforts and achievements. Man alone amounts to very little, it is only when he acts in coöperation with his fellowman that his efforts count for the most.

Experience has demonstrated beyond question of doubt, that the greatest measure of success is brought about where employer or his representative (the officers) and employees meet on common grounds of fellowship, each doing his utmost to further the cause for the benefit of all; each one a part in unity, purpose, responsibility, and service.

The sentiments of Labor (the employee) are today demanding a larger share of recognition and a voice in the administration of business affairs and a share in the profits. I am satisfied the great United States Government wants to see the true interest of employees advanced with justice and equity. The trend toward friendly coöperation between employer and employee has been most marked, particularly since the war

B

threw all classes into intimate association for a common cause, community of interest developed by conflict—A real democracy.

The farsighted wisdom and sagacity of our lamented and beloved manager and Chief of Safety Section, United States Railroad Administration, Mr. Belnap and his democratic, able, and experienced associates and advisors recognized these principles. In U. S. R. R. A. Circular No. 3, uniform methods of organizing and conducting safety work, the employees representing 65 per cent of the personnel, thereby giving them a larger voice in administering the affairs of safety work as well as the larger share in its profits and success.

His excellent address before this Congress at St. Louis last year on "What the United States Railroad Administration Expects of the Officers and Employees" was a clearly defined and intelligent exposition of the duties and responsibilities of every employee from the highest officer to the humblest employee, of the methods and the purposes of this organization which says in effect "get together." I wish he were alive today that he might share in the praise and gratitude of thousands of railroad employees for the blessings and happiness brought about by the education and cooperation of both officer and employee in the prevention of accidents.

The best part of it all was the "punch" he put in it and which his successor has developed so effectively since, when he said to all officers in executive positions that they shall give safety work their active cooperation; that they shall regard it as of the same importance as other branches of railroad work; and that they shall take an intensive interest in it and do everything they consistently can to make it successful. Again when he said that officers and employees shall cooperate to the maximum, and that proper effort shall be made to get all to realize that in safety committee meetings officers and employees meet on a common level, all being members of the committee, and each having an important duty to perform in the prevention of avoidable accidents.

That cooperation has accomplished much is proven by the following figures taken from the Wabash Railroad which I represent. For the first eight months of 1919 84 per cent of all recommendations and suggestions relative to unsafe conditions and unsafe practices have been corrected. Twelve per cent are under investigation or work not completed, or being held up awaiting material and only 4 per cent of the 4,487 suggestions deemed impractical. The result is a reduction of 24 less employees killed and 212 less injured. For all cases 37 less killed and 271 less injured.

These and many other convincing figures could be quoted indicating the remarkable results achieved under our plan and methods of organization of intensified, educational, cooperative efforts.

In passing I am not unmindful of the persistent stimulating effect and guidance of our worthy chief and leader, Mr. A. F. Duffy, and his capable family of efficient, energetic, experienced supervisors who have never found the trail too long, nor the train too late to cooperate with officers and employees in giving the best they had in enthusiasm, loyalty, interest and service. The record of the United States Railroad Administration

will ever stand as a tribute to their guidance and leadership to a cause that is worthy the desires of all mankind. I am, as I well know you are, proud of their acquaintance, association, and friendship.

CHAIRMAN RICHARDS: The opening discussion of this paper will be by Mr. Anderson. As I understand it, Mr. Anderson is the originator of the No Accident Week plan.

DISCUSSION

MR. C. M. ANDERSON (Regional Supervisor of Safety): It seems like Mr. Richards picked me just as soon as I got here. I have just completed a month's trip through the Southern region in the interest of the coming drive, and have made from eight to ten speeches a day, and in that thirty-day period of talking to something like 35,000 men. I thought I had had my share and that I would get to the Council and have a little recreation, in other words, that I could sit back in the rear of the room and have no fear of being called upon.

I want to digress just a moment and give you my experience when I first started on an individual line some four or five years ago. My enthusiasm covered me up. Fundamentally, I went at the work in the wrong way. I am very glad to confess it. I started with the employee. I attended one of the meetings of the National Safety Council five years ago in Detroit, I believe, and I left that meeting with the thought that all I had to do was to go up and down the line, preach safety, possibly have a few parades, wear a few buttons, and the work would be absolutely 100 per cent perfect. Do you know, it took me six months to find out that I was wrong. I started out on my railroad with the employees. I overlooked the superintendents, the master mechanics, the train masters, and many other local supervising officers, and while I was overlooking them, they were looking over me.

I would meet a train master and he would say, "How is the safety movement today?" He would shake hands with me and ask how things were going. In reply, I would say, using an expression we use in the South, "Everything's pretty." He would say, "Safety is a fine thing. It's coming." Then he would wink at the roundhouse foreman when I happened to turn my back. It took me six months to find out that I was wrong and that where I should have started was among the supervising officers before I even attempted to get out on the line and endeavor to get the firing line men with me.

If you can get 100 per cent cooperation between the heads of departments and those whom they supervise, you have an easy job in the way of making a success, which means you will prevent accidents to a great degree.

I want to read to you a very short paragraph from the minutes of a meeting that was held in my office on August 25 at which there were some thirty representatives of the Southern region lines and at which we had the pleasure of having with us our manager, Mr. Duffy. We also had at that meeting a gentleman who gave me a great deal of assistance on the railroad from which I came, Mr. John Kimbro, general chairman

of the B. R. T. We called upon Mr. Kimbro for a little talk, and he made a splendid one. I was very much reminded of his remarks when I first got up here. He said that he was very short on oratory but he was long on facts.

The following is the paragraph that I want to read to you which seems to strike home strong.

"Safety is one of the most important things in the railroad service, and it is different from any other branch of the service. I will tell you why this is: You can put a man in the operating department, and he gets the backing of the management, or you can put him on the road and he gets the backing of the employees, but the man in the safety department does not, at first, get the backing of either the employees or the management until he has made his own record. He has to show that he is saving lives, limbs, and property before he can either interest the management or the employees, but I want to say to you that there is not a man in the railroad service who is higher in my regard than the man in the safety department who is in the work heart and soul, and there is no man who looks smaller to me than the man who is doing safety work just to get by."

The only impression that I want to leave with you and particularly with those who are young in the safety work, is, do not make the mistake and think that the whole proposition rests with those on the firing line. Start right and get the supervising officers educated up to the point where they feel and know that safety work is above all other things, taking into consideration, of course, general operation. After you have done that, you will find that it is a very easy matter to get the man on the firing line to follow.

You remember the old saying, "So is the head, such is the body," and I think it applies very forcibly in safety work.

CHAIRMAN RICHARDS: If there is no further discussion of this subject the session will stand adjourned.

Adjournment.

FRIDAY MORNING SESSION

THE meeting was called to order at 9:40 A. M., Mr. R. C. Richards, Chairman, presiding.

CHAIRMAN RICHARDS: Gentlemen of the Steam Railroad Section, will you please come to order so we can proceed with our program.

MR. H. E. WATKINS (Superintendent of Safety, Terminal Railroad Association of St. Louis): I would like to move that this Section request Mr. Hines to have enough copies of Mr. Duffy's address, delivered yesterday, printed to put one in the hands of each employee on all railroads under Federal control.

(The motion was seconded and carried.)

CHAIRMAN RICHARDS: The first matter that we have on the program

this morning, gentlemen, is the paper on "Organized Labor's Interest in Safety Work," by Mr. W. G. Lee.

ORGANIZED LABOR'S INTEREST IN SAFETY WORK

W. G. LEE, PRESIDENT, BROTHERHOOD OF RAILWAY TRAINMEN,
CLEVELAND, OHIO

Those who know me must have been surprised at the program stating that I was to read a paper. I haven't been in the habit of doing that. In fact, I don't think I could read it so that it would be intelligently understood, and I have been in the habit for a good many years of just talking. That is one of the principal ways I have of earning my salary.

What I may say to you as representative of the various railroads under Government control, and I hope of those roads not under Government control as well, will be said to you from the heart and sincerely, and in the hope that it may be the means of aiding some one to save the life or limb of some associate employee.

I have always known something of the value of safety first. No class of employees, in my opinion, should recognize the value of safety first more than transportation employees. In fact, employees of the transportation companies of this country, whether it be the most humble employee or whether it be the general manager or the president, should recognize its necessity because the terrible slaughter of life and limb that is bound to occur is certainly worthy of the closest scrutiny and the greatest care all of us can give to it.

The organization I represent has a membership of something in excess of 190,000 men at this time. The death and disability list occurring annually is perhaps surprising to the most of you. While I am as much interested in the furtherance of any plan or any legislation that will stop, as far as possible, this slaughter of life and limb as any man in the service, it requires the personal effort of every man engaged in the occupation in order to make it a success. The officers of railroads nor the officers of your safety-first departments cannot make it a success without the cooperation of those they claim to represent, and I have endeavored in every honorable way to encourage those for whom I speak to assist in the safety-first movement at all times.

SAFETY ORDERS NOT TAKEN SERIOUSLY

For a great many years safety first was spoken of. You would see an occasional article in some magazine. You would find an occasional article from general managers or the president of a railroad in substance to the effect that he did not expect brakemen or switchmen to go in between the cars. They must not do it; they must know the equipment is safe before they undertake to make a coupling; they must know that the hand holds on the ladder are in good order before they attempt to climb onto a car. Those were the orders issued by the principal operating officers of some of these big trunk lines, but the subordinate officials under them.

principally yard masters or train masters, men who came in close touch with that class of employees, did not take those orders seriously. They seemingly did not believe that the president or general manager of that railroad really meant what was accredited to him, and so Mr. Brakeman or Mr. Switchman was constantly speeded up and he only knew one thing and that was that regardless of the weather, regardless of day or night service, regardless of the condition of that equipment, when a cut came down over the hump and he didn't get it, he knew he would be hit with the time check. He had no time to inspect the equipment. He had no time to see that everything was as the president of that railroad said it should be before he attempted to handle that car.

AUTOMATIC-COUPLER AND AIR-BRAKE LAWS SECURED

Operating officers generally wanted the safety-first movement if it didn't cost any money, but they hesitated to have certain things that looked to safety put into effect if it cost money. So with all respect to your Chairman, who, I think was first in that movement on the railroad from the operating standpoint, the Brotherhood of Railroad Trainmen claims the credit for the real first safety-first movement in this country and that is not egotism when I say it because the records will prove that thirty odd years ago this organization spent its money and kept the men at Washington to secure the automatic-coupler law and the air-brake law that are in effect in this country now. We were opposed to the finish by interests supposedly being supported by railroad companies. For ten long years we fought that battle and finally succeeded in getting those laws enacted and some of you baldheads and gray heads who have been in the service with me for forty years will remember something of the work required in order to have those safety-first laws enacted. One representative of a big trunk line in this country publicly declared, as the record will show, that he would not equip a freight car or a freight engine on his railroad (if it was possible, by law, to defeat it) with the automatic coupler and air brake. That road is equipped today, and I am confident that those in charge of that property could not be persuaded, under any circumstances, to go back to the old condition. There are many reasons for it and you will excuse the seeming egotism in my saying that the Brotherhood of Railroad Brakemen and Brotherhood of Railroad Trainmen were the first, to my knowledge, and I want to see records produced to the contrary, who spent their money and attempted to do what we think was a safety-first movement.

My experience as an officer of the Brotherhood, now in the twenty-fifth year, is that we were compelled to enact State and Federal legislation in order to secure some of the now recognized safety appliances, safety conditions that are on all of these railroads.

It took a great deal of time and money to do it because it was cheaper in the old days to pay for life and limb than it was to equip the property with the best recognized safety appliances of that time. I am proud of the fact that that day has passed.

Somewhere in your program I noticed a question something like this that is to be considered at your round-table talk as I understand it: Is it advisable that the safety committees' recommendations should be carried out or that the committees should have authority to cause their recommendations to be enforced?

Now, to me, that seems to be the only legitimate solution of the safety-first question. If you are going to have safety committees of good men, of select men, on these railroads, who express and make recommendations as to what should be done to save life and limb, then it is absurd to me because it is not safety first if money is to be considered.

I have always believed and shall continue to believe that any business should furnish the revenue properly to operate that business and it is not a question of money, but it is a question of how can we save a life, how can we save the limbs of these employees and of the travelling public, and when it is determined that if a certain thing is done, even though it costs a few thousand dollars to do it, your committee should have the absolute authority at least to have that put into effect or to know who is responsible for continuing the slaughter.

I was scheduled to talk to you from 9:30 to 10:30, according to my understanding of the program; but a safety-first movement came along in the form of Sheppard, President of the Order of Railway Conductors. He dropped into my office accidentally, not knowing of this meeting, but on other business. I said to him, "You are it. You will go along with me and I will cut my time in two with you and you can impose on those people half of the time I am supposed to abuse them." So my good friends, I want merely to say to you that the Brotherhood of Railroad Trainmen is for safety first all the time. In this gathering I find a number of members of my organization from various parts of the country. They know that they have been told through the official publication, through the official circular, and verbally by myself and other officers to encourage and assist in the safety-first movement wherever possible, and in that way try to stop, as far as they can, this slaughter of life and limb in the service.

We know that as long as these railroads operate, we know that as long as these trains run twenty-four hours in every day and night, boring holes through the darkness as they do, regardless of the weather, regardless of who is in charge of that switch or that tower, we know accidents are bound to happen, we know men will be killed and crippled. At the same time we must recognize that the careless fellow who gets out and lets them hit, has no more scruples than that careless fellow, who, as a brakeman told me, when he didn't go in and give the slogan to slow down, let them hit and broke a couple of cars, and said, "To hell with them; I don't own them." That is the spirit that makes a safety-first organization and committee necessary.

There are men in the service, in all classes of employment, with railroads, who should not be permitted to have a job with the railroad. If they work, they should not be permitted to hold a position as responsible as the brakeman's position even, or any other of the more humble classes of employees, because every one of those units have direct connection with

the main wheel of the machine and the slightest bobble or mistake may cause many deaths or much injury.

My good friends, I am proud of the opportunity to come before you a few minutes and, in the name of the organization I represent, assure you that I will continue, as long as I am with the organization officially, to do all in my power to encourage our membership to help the safety-first movement for their own sake, if not that of others.

Before closing I want to extend an invitation to all of you who may have the desire to come up to the twelfth floor of the American Trust Building if you have a few moments. You will find the International offices of the Brotherhood on the entire floor.

We are fortunate today in having Brother Stone as he expected to sneak in at the door and hear what I had to say and then roast me afterwards.

I am going to surrender the floor so that Mr. Sheppard or Mr. Stone can say a word to you.

CHAIRMAN RICHARDS: I am sure, Mr. Lee, that the members of this Section appreciate very much your taking the time to come over here and make your very interesting address. We appreciate your drafting Mr. Sheppard to come in to occupy part of your time. I take great pleasure in introducing Mr. Sheppard, President of the Order of Railway Conductors.

MR. N. E. SHEPPARD: First of all, I desire to express my appreciation of the honor and pleasure of being permitted to be here on this occasion and to say a few words to the safety section and to those who are so much interested in what to me is very essential for the welfare of men and the proper operation of railroads. I did not expect to have this pleasure because when I was first notified of the meeting, my other engagements were of such a character that I thought it would be impossible to be here. I am very much interested in the work that is now being done on the railroads by men interested in this safety movement, for various reasons. First, it is humanitarian, doing a world of good for man, the most important factor in all creation. Next, it is materially assisting the railroads in their ability to handle the vast amount of traffic that is committed to their care. Third, it enables the railroad brotherhoods to maintain insurance or mutual benefit departments at a much less cost than they could otherwise be operated.

If there were the same number of accidents and as many casualties in this day as there were twenty-five years ago, the rates of these various brotherhoods would be very much higher. They are so little at the present time that they are the wonder of the insurance world. Men in old line life insurance will not believe at first and cannot understand why these brotherhoods are able to have the rates they do. It is the work of men like yourselves in cooperation with others who are interested in their own welfare who have brought about a much better condition on the roads. Therefore, as a representative of the Order of Railway Conductors, I take pleasure on this occasion of expressing to you the best wishes of that body of men for your continued efforts and additional successes in this worthy work in which you are engaged.

Were it not for the constant admonition and constant supervision that men like yourselves give to these problems, many men would unconsciously get into more dangers than they do. Our sense of caution as energetic railroad men lies dormant. Usually we are more concerned in getting results than we are of considering the consequences, and when this safety idea was first promulgated, it was somewhat of a joke, as I think you will all agree with me. Men in the brotherhood looked upon it askance and they were fearful that it was done for advertising purposes only, and there was a time when the dollar was greater than the idea, but I think the time has come when it can safely be said that the principle involved now is being maintained regardless of cost. The railroads, I think, without exception, are doing their very best to make it possible that you can get the utmost results through your safety section and they are not counting the cost as they formerly did, so much so that I know on some of the railroads men will be disciplined if they disobey some of these safety rules. I remember when some men were disciplined how they complained to the organization but they received no support or encouragement from the organization. They were told, "It is for your good and you get in line and support the idea."

It is said of railroad men that weaklings die and cowards resign. I think that is largely true. I didn't resign: I got another job (laughter), but were it not for that very faculty, these railroads could not be operated today. Were it not for the willingness to sacrifice life and limb or take the chance, these railroads could not handle the traffic that is given them today to handle.

I remember when I applied for a position as a brakeman the train-master said to me, "Are you not afraid of getting killed?" I said, "Yes, but I didn't come here to get killed."

That is the spirit of the average railroad man. More than that, it is the inherent quality of Americans in any occupation as exemplified in the recent war. When the Americans got started over in France they never waited for the safety section; they kept going, just as they do in railroads. Therefore, I hope that you will not relax your efforts; that you will get encouragement from all sides and support in every direction.

Without taking any more of your time, I wish to say in conclusion that I thank you for the efforts you are making in behalf of the conductors whom I have the honor of representing. As an officer of that organization I will do my utmost to assist in every possible manner and may this humanitarian work continue as long as railroads are needed and may men grow up to call you blessed.

CHAIRMAN RICHARDS: I am sure we all appreciate very much what Mr. Sheppard has said about endorsing the safety first movement and doing all he can to push it along and make it even more successful than it has been in the past. Assistance coming from such quarters as those we are hearing from this morning is very gratifying to all of us and I know will do us much good.

I think, Gentlemen, we are peculiarly fortunate in having with us this morning a man whom everybody knows, whom everybody recognizes as one of the labor leaders of the country, and I have taken the liberty of

drafting him to say just a few words to you and I hope he will bring a message that will be convincing to us all. I take great pleasure in introducing Mr. Stone. ==

MR. STONE: I only came to hear my friend, Mr. Lee, talk. As usual, he quit when he got half-way through and left the time for the rest of us. Some one has said that if you listen to any great orchestra and listen to one particular instrument, you will always hear a discord. Composers of music say that is necessary in order to blend into a harmonious whole. ==

I am interested in the safety-first movement as any other man should be who is interested in conserving the lives and limbs of the railroad men of this country. We want to do everything we possibly can to uphold the hands of the men who are doing that work, and yet you know, and I know, when we call things by their right names, that a whole lot of this safety-first movement has been a joke from start to finish and it has been the catch phrase for advertising purposes instead of a real safety first movement to save the lives of men. There is no way to get around it.

Safety first doesn't mean anything to me if you have it printed on every box car and caboose and every roundhouse and every street crossing if, at the same time, you are sending power out in rotten conditions to help cripple our men.

On one particular road (I am not going to name it although it has been very prominent in the safety-first campaign) I am sure if you would wake up one of those officials in the middle of the night the first thing he would say is, "safety first." Yet on that particular road, I recall that one of our crack engineers, a man who stood without a peer in his profession, a man who was handling one of the limited trains of this country, and yet, who gave his life because a hand-hold on the side of his cab gave way when he leaned out to look at the hot tender truck and dumped him in the middle of a track in front of a fast passenger train, and yet that hand-hold had been reported time and time again by men who ran the engine. We paid \$4,500 insurance and that man sacrificed his life for the sake of a two-inch screw to hold that rail on the cab. The work on that was done like lots of it—with a pencil. They O. K.'d it and the work wasn't done. You are never going to get the results with your safety-first committee until you have power to force your recommendation and then, and not until then, will you get the results we hope for and anticipate. ==

PUT THE MAN FIRST AND NOT THE DOLLAR FIRST

Gentlemen, the time has got to come some time in this railroad world when the man counts for more than the dollar and you have to put the man first and not the dollar first. I take the position that no money, no outlay that you can make, is too much if you can save the life or limb of just one employee. There is not a single law on the statute books, State or Federal, safeguarding the men, or laws for the improvement of the service that haven't been put there by the combined force of these railroad organizations and against the combined power of capital to de-

feat them, and unfortunately assisted by a few of our friends, who are members of our own organization.

I recall when the air-brake law was put into effect. I don't go back as far as Brother Lee. I was plowing corn when he was doing these things, but I remember when it went on the books, and I know the effort of our own members to defeat it. It has been one long struggle to put these safety laws on the statute books and we all know just as well as we know we are living that under the so-called Federal operation (it wasn't Federal operation you know; the Federal Government simply paid the bill) the safety laws have been lost sight of in many cases. We have a number of operating officers throughout the country who are honestly and conscientiously trying to carry out and enforce the safety laws. Unfortunately we have another group of officers who don't intend to carry them out and the only way to make them be good is to have them come into court and say good morning. When you do that, that is the only thing they pay any attention to and as long as they don't have to do it, they don't intend to comply with safety laws. Our violations of safety laws are increasing right along at the present time. Our violations of the hours of service law are increasing on some particular roads. Why? Because they are not being enforced as they were under private control.

There is one group of men you can try moral suasion on and get results. There is another group of men you have to use a club on if you get anywhere, and you men can make all the recommendations you please with your safety committees on some of these roads, but you cannot get results because you do not have the power to enforce your recommendations. There is no use to print "Safety First" on a locomotive and then send her out leaking steam so badly that the man can't see where he is going. There is no use to do this or that or the other and talk safety first and have your committees and know that you are sending out men with power every day on that particular road that isn't fit for service and isn't fit for men to work with and isn't safe. I believe some one asked Mr. Duffy, "What would they do in a case of that kind?" I think Mr. Duffy replied that if the road foreman O. K.'d it that relieved him.

It may relieve the road foreman but it doesn't relieve the poor fellow who took her and probably never got back with his life.

We are with you first, last, and all the time in enforcing these laws and making safety first a real safety first as it was intended to be in the beginning.

In conclusion I want to extend to you an invitation, the same as Brother Lee. The Brotherhood of Locomotive Engineers has a building over here that we are proud of. Come over and see how a labor organization is really handled in the Headquarters.

CHAIRMAN RICHARDS: Gentlemen, all of the time that was assigned to Mr. Lee wasn't used. I think he has a few statistics that, I believe, would interest this audience and I am going to ask him to occupy the rest of the time and give us the benefit of that information.

MR. LEE: I think each of us who are connected with the transportation

organizations should use our every effort in cooperating with your organization after the roads are returned to private control. In my opinion, it will be more necessary to have a perfect organization then than it really is now, because now Mr. Tyler, Mr. Hines, and those gentlemen who really have the final O. K. to place on these things (I know how they feel in reference to safety first) have encouraged and permitted and ordered the expenditure of a great deal of money while the roads were under Government control, and I doubt whether the same degree of success could be looked for on some of the lines if under private control. Therefore, I think we should use our every effort to try to build up a machine known as your safety-first movement that will be continued successfully when the roads are returned, as they certainly will be before very long.

It may be of interest to those here to know that the men I speak for generally are the younger employees in the transportation department operating the trains and we may consistently look for a majority of the casualties to come to that younger class of employees because of their inexperience, yet the records of my organization do not bear that out. It is not, generally speaking, the young fellow who has only been in the service a few months or a few years, but it is the old timer, as we call him, who steps in the way of a train or goes in between them without looking, or accidentally gets killed or injured in some way in the performance of his duties. I hope you will impress upon those men, particularly, the fact that as they grow older they should become more careful.

ACCIDENT COSTS TO BROTHERHOOD OF RAILROAD TRAINMEN

In the Brotherhood of Railroad Trainmen it may be interesting to you to know that during the year 1917 we paid for 627 accidental deaths in service a total of \$954,400. During the same year we paid for 408 total and permanent disabilities from accidental causes an amount of \$627,200.

During the year 1918, we paid for accidental deaths in service of 691 men a total of \$1,051,600. In the same year we paid for 368 total and permanent disability accidents an amount of \$556,000.

In 1919, up to September 18, we paid for 487 accidental deaths in service amounting to \$875,600, accidental and total permanent disabilities during the same period of 255, amounting to \$425,800.

That is not showing very much of a decrease, but when you take into consideration the war conditions, the traffic congestion, and the many things in transportation that the men had to contend with during that time, I think that this year, 1919, is going to show a percentage reduction over either 1917 or 1918.

It may be interesting to you to know that the one organization, and the other three insurance departments along the same lines, (and perhaps their deaths and disability expenditures have been as great proportionately) which I represent paid for 1,295 deaths; in 1918, 1,458; that for the three years mentioned, 1917, 1918 and until September 18 of this year, 91 of those deaths were caused by collision, 146 coupling cars, 250 falling from train, 150 knocked off cars, 23 getting on or off train, 451 run over

switching, 211 wrecked, a total of 1,322 deaths during those three years traceable to those causes just mentioned.

In the disability payment of claims during the same time: Collision, 10; coupling and uncoupling, 97; falling from train, 104; knocked off train, 82; getting on and off train, 52; run over switching, 394; wrecks, 27. In other words, 766 men have been paid for who were totally and forever disabled from performing the duties of a trainman.

Of the accidental deaths and disabilities only, mentioned here, you will notice that 451 deaths were caused by running over while switching, and 304 disabilities while switching; so that indicates that more chances are taken by these men switching cars than in almost any other occupation pertaining to the movement of trains. I know how those things are done. You old fellows who have been in the service know that we used to pride ourselves on seeing how fast they were going and still be permitted to go in between them and pull the pin. It is a wonder that many of us, who put in the years that we have, are here today.

You may be interested in knowing that during two months, January and February of this year, the organization that I represent paid in excess of one and one-half millions of dollars for members of its organization dying from the result of the Spanish influenza.

I am proud of the fact that our fellows who drew from two dollars a day and up saw far enough in advance to permit the accumulation of a little fund out of which these death and disability claims could be paid, out of which an emergency such as that could be taken care of without an extra assessment on the organization. It is a fact that every one should be proud of and it proves again, to my entire satisfaction, that organized labor should be more interested in the safety first movement than unorganized men could possibly be, because they must put up the money to take care of these death and disability claims to which I have referred.

During the terrible influenza epidemic that swept this country, the record of my office shows that thirty-four years was the maximum age of the hundreds of men who were swept out of existence on account of the "flu." It seemed to have taken the younger element, and so the Brotherhood of Railroad Trainmen and the Brotherhood of Firemen and Enginemen were hit the hardest, of course.

In addition to that came the war, or it was going on at the same time, and let me say this in closing: No class of working men in this country is entitled to more credit for loyalty than the employees of these railroads in this country who gave their services to the war. You hear all about loyalty to the flag and to the colors, and I have seen in years gone by, published statements coming from supposedly eminent gentlemen who said that organized labor, in their opinion, would not be true to the colors, would not be true to their country if this country got into trouble, and were opposed practically to the Government. I am proud that never again can the statement be made with any accuracy to that effect, because on November 1, of last year, eleven days before the armistice was signed, the organization I have the honor to represent had 15,166

members in the army and navy of this and other countries. A majority of the railroad men who went into the service volunteered to go.

On the twenty-fifth and twenty-sixth of September last year, Messrs. Sheppard, Stone, Shay, and myself, were called to Washington and met with the representatives of the War Department because we were asked to assist in getting together another unit of 65,000 experienced railroad men of all classes for use in France by June 1, 1919. We read, or heard read, General Pershing's requisition from France, asking for 65,000 more experienced railroad men because it required a unit of that number of experienced railroad men for each fighting unit of 1,000,000 men in the service. We had in France at that time a unit of 65,000 experienced railroad men, and they wanted another unit because on the first of June they expected to have two units of a million men each fighting, to say nothing of the thousands and hundreds of thousands of men necessary behind them to take care of the issue. I mention that merely to convince you, as it did me, that even General Pershing and the War Department did not know, on September 25 and 26, 1918, nor did they have any idea, in my opinion, that the whole thing was going to be exploded and the war be over on the eleventh day of November. That shows what good guessers they were, and on the ground, too.

In closing I want to thank every man who gave service to his country, whether he worships under the Union Jack in Canada or under the Stars and Stripes in this country. He gave his all. We, who stayed at home, contributed our mite to the fund to pay the dues and assessments and insurance of every one of those men until they were honorably discharged from service.

On the first day of September there were something over 3,000 members of our organization still in army service and we are paying the premium on their insurance until they are honorably discharged.

We, who stayed at home and are gray-haired and couldn't go for various reasons, contributed our mite to take care of the insurance of those men, and it is creditable, I think, and I did not hear a complaint from our membership. I did receive numerous communications saying, "If it costs us who stay at home \$5,000 a month apiece to take care of the insurance of those men who went away and are giving their all, we will willingly pay it."

That is the spirit of loyalty and, still, some gentlemen in the past have said, "Labor organizations will not be true to the colors." You can form your own opinion, and I am not saying that with the slightest discredit to those who do not belong. I have no criticism to make.

These four transportation organizations are not closed shop organizations. They have never asked for closed shops. They have always tried to make their organizations so good that the majority, at least, of the men of their class would see the necessity of affiliating themselves with it rather than a compulsory feature connected with it. These four Brotherhoods have been often criticized by other so-called labor organizations because of our methods. Now, Gentlemen, we make mistakes: we have men who have imaginary grievances; we have our little fights with subor-

dinate officials and sometimes with the National Conference Committee representing all the roads, but it hasn't been very bitter.

CHAIRMAN RICHARDS: I am sure we have all been very much interested and very glad to hear from Mr. Lee, Mr. Sheppard, and Mr. Stone, and I want to say to these gentlemen that we thank them very much for coming here. We want them to bear in mind, however, that the safety movement didn't just happen; it isn't something that just befell. It is something that takes time to make perfect. It took them many years to get these laws that they have talked about, which we all know, now, are good laws, on the statutes. It took them many years to educate people to the necessity of having such laws and that education must come before we can get laws.

I do not believe that there has been any movement started in the annals of our history that has spread so fast as the safety movement in this country. If we will all only have a little patience, the accomplishments that will stand to the credit of the safety movement during the next ten years will be surprising to all of us. I am sure that with their assistance and the enthusiastic cooperation of the men who are in this room and the men who are to follow you during the succeeding years of our organization, we are going to surprise the world in the reduction of preventable accidents.

The next matter on the program is a question that I know we all will be very much interested in.—"Safety Suggestions—How They Should Be Treated and Disposed Of", by Mr. Carrow. We will be glad to hear from Mr. Carrow now.

SAFETY COMMITTEE SUGGESTIONS AND RECOMMENDATIONS: HOW THEY SHOULD BE TREATED AND DISPOSED OF

THOMAS H. CARROW, SUPERVISOR OF SAFETY, PENNSYLVANIA RAILROAD,
EASTERN LINES

The membership of the Steam Railroad Section of the National Safety Council is composed of representatives of nearly all railroads in the United States and since the subject under discussion will be treated in a general way and from the standpoint of all roads, a reading of the following statistics, which indicate the size of the railroads of the entire country, the volume of business handled, the number of train accidents, fatalities and injuries and not only the possibilities of safety work, but the necessity for making safety work efficient, will be helpful:

Property value of the railroads.....	\$ 21,000,000,000
Number of miles of track	400,000
Gross revenue (1918)	4,913,319,604
Number of freight tons carried 1 mile (1917).....	294,040,446,000
Number of passengers carried 1 mile (1917).....	39,739,682,000

Number of railroad employees	2,000,000
Number of different occupations	300
Number of derailments, collisions, and other train accidents (1917)	19,435
Cost of derailments, collisions, and other train accidents (1917)	\$ 15,181,810
Number of passengers, employees, trespassers and others killed on the railroad (1917)	19,087
Number injured (1917)	194,805
Payments on account of injuries to persons including employees, yearly (estimated)	\$ 30,000,000

In the very nature of things railroad work is hazardous and since the beginning of train operation safety has been of necessity a fundamental consideration, the formulation and application of safety rules and regulations and the introduction of mechanical safety devices having been an important feature in the progress and development of the business. It was not until recent years, however, that safety committees, composed of officers and employees from all classes of service, were instituted as a means of enlisting the coöperation of all persons engaged in railroad service in a concerted effort to prevent accidents, and on account of the scope of the safety committee work and the short time the committees have been operating, the field for developing a better understanding of the subject abounds with possibilities.

The May report of the Safety Section Railroad Administration shows a total of 2,051 Safety Committees on the roads under Federal control, consisting of 10,471 "Officer Members" and 21,592 "Employee Members", or a total membership of 32,063. This provides one committeeman for every 62 employees engaged in the railroad business.

Upwards of 300,000 suggestions and recommendations covering dangerous conditions and dangerous practices are being made and recorded yearly by these Safety Committees and fully 80 per cent of all recommendations thus made are being complied with. But an examination of reports shows a marked difference in results accomplished with respect to the number of recommendations made, the character of the recommendations, the manner in which they are stated and the time elapsing between date initiated and the date complied with.

A single illustration will make this observation clear. A Division Committee report for January showed a total of 55 recommendations, all but two having been complied with. The report of another committee contained 23 recommendations, only two of which had been complied with. The inefficiency of the committee last referred to is typical of many others and is primarily due to ignorance of safety work or indifference, which can be eliminated only by the adoption of suitable methods for teaching the details of the subject. For this purpose the following tentative outline of the physical characteristics of the railroad, the items covered by recommendations, the corrective measures necessary to comply with recommendations, the purpose of recommendations, the departments respon-

sible or involved and a separation of recommendations, as between conditions and practices, is made in the order mentioned.

CLASSIFICATION OF THE PHYSICAL CHARACTERISTICS OF THE RAILROADS AND RULES AND REGULATIONS

The first step necessary to develop a definite understanding of safety work is to get clear in the mind the various divisions of railroad property and the rules and regulations governing operations, which are shown as follows:

1. Tracks and appurtenances.
2. Buildings, bridges, tunnels, poles, etc.
3. Machines, tools, implements, and equipment
4. Engines, cars, and trains
5. Fire apparatus
6. Signs
7. Illumination
8. Rules, regulations, laws, methods, and practices (various depts.)
9. Miscellaneous

The next step in the process is to develop a general knowledge of the specific parts of the railroad that may be related to safety under the above divisions. The following classification, which is based on an analysis of eighteen hundred and thirty-six (1836) recommendations, is presented for this purpose.

Tracks and Appurtenances

Code No.	Detail of Recommendations	Number of Recommendations Made	Code No.	Detail of Recommendations	Number of Recommendations Made
1001	Air line and appurtenances in yards.....	4	1252	Fence—N. O. S.....	1
1050	Ballast—track	3	1253	Frogs	2
1051	Bells—alarm	7	1300	Guard rails	3
1101	Crossings, Grade—Public	10	1301	Guard rails—blocking	3
1102	Crossings, Grade—Private	1	1302	Gradient of track.....	2
1104	Crossings, Grade—Gates operated by hand.....	1	1605	Manholes or other openings	6
1106	Circuit breakers.....	4	1700	Obstructions—Ballast	3
1107	Curvature of tracks.....	2	1701	Obstructions—Car repair parts	2
1108	Crossovers	1	1702	Obstructions—Ties	9
1110	Cribbing	1	1703	Obstructions—Rails	4
1150	Depressions, holes or hills in tracks.....	28	1704	Obstructions—Lumber ..	13
1153	Derail	36	1705	Obstructions—Rubbish and refuse material....	59
1156	Drainage	10	1706	Obstructions—o t h e r Company material.....	54
1157	Ditches	4	1707	Obstructions—Coal on private sidings.....	10
1159	Driveways	2	1708	Obstructions—O t h e r stock material on private sidings.....	15
1200	Embankment	3			
1250	Fence—Inter track.....	3			
1251	Fence—To prevent walking on track.....	1			

Code No.	Detail of Recommendations	Number of Recommendations Made	Code No.	Detail of Recommendations	Number of Recommendations Made
1799	Obstructions—Rubbish and refuse on private sidings	23	2306	Coal chute	8
1750	Paving	5	2307	Chutes—N. O. S.....	1
1751	Planking or stringers.....	10	2308	Columns	1
1752	Pits—Inspection	6	2309	Cribbing	1
1753	Pits—Ash	3	2350	Doors	30
1760	Pits—N. O. S.....	7	2351	Doors to open outward..	4
1761	Post—Marker	3	2353	Docks or piers.....	1
1850	Rails	3	2400	Elevators	6
1851	Rail clamps	1	2450	Floors	41
1852	Rail joints	2	2452	Flues	1
1901	Switch levers	10	2454	Fences—(Other than on track)	14
1902	Switch stands	7	2455	Footwalks on bridges or trestles	13
1903	Switch lights	6	2500	Gates	12
1904	Switch locks	4	2501	Girders	3
1905	Switch latches	1	2550	Heating facilities.....	2
1907	Switches—N. O. S.....	16	2551	Hydrants	1
1910	Stop-blocks—(Bumping)	36	2652	Inclines	1
1912	Sidings—Industrial	3	2750	Lockers	2
1914	Sanding of rails by en- ginemen	1	2751	Lamps—Station	2
1915	Splices	3	2800	Manholes or other open- ings (other than on track)	1
1955	Ties—Defective	1	2801	Mail cranes	3
1956	Ties—N. O. S.....	5	2802	Materials—Unsuitable....	1
1958	Track too high or too low at station plat- forms	3	2900	Obstructions	4
1959	Track too high or too low at other places	9	2952	Planking or stringers....	7
1960	Track skates	2	2953	Poles	17
1961	Tracks—N. O. S.....	22	2954	Posts	4
2100	Walks or pathways.....	23	2955	Pipe—Steam	9
2105	Washouts	1	2957	Pipe—Water (cold).....	2
2199	Miscellaneous	1	2958	Pipe—Water (hot).....	5
	Total	528 (29%)	2959	Pipe—Drain	3
			2960	Pipes—Air	3
			2962	Pipes—N. O. S.....	39
			2964	Painting Bridges—Short Clearance	2
			2965	Platforms	45
			3050	Roof—Building	12
			3053	Railing—Stairway	9
			3054	Railing—Platform	7
			3055	Railing—Bridges, Cul- verts	20
			3056	Railing—Netting to be applied	2
			3057	Railing—Turntables	3
			3060	Railing—N. O. S.....	17
			3061	Runways	10
			3062	Radiators	1
			3063	Racks	1
			3100	Stairways or Steps.....	44
			3102	Screens—Window	1
			3103	Screens—N. O. S.....	1
			3104	Stoves	2
			3105	Stove-pipe	2
			3107	Signal wires	6
			3110	Signals—Manual	2

Code No.	Detail of Recommendations	Number of Recommendations Made	Code No.	Detail of Recommendations	Number of Recommendations Made
3111	Signals—N. O. S.	10	3657	First-aid kits in buildings and elsewhere	1
3112	Signal—Lights	6	3660	Flags—Blue	8
3113	Sewers	6	3678	Fuses in electric circuits	1
3114	Sheds	4	3679	Furnace	3
3115	Signal wire boxes	2	3680	Flasks	1
3116	Spouting	3	3681	Flywheel	1
3117	Signal bridges	2	3682	Fixtures	1
3150	Toilets and lavatories	15	3701	Gangplanks	1
3152	Turntables	3	3707	Goggles	6
3153	Trees and shrubbery	5	3721	Guard rails	3
3154	Tunnels	2	3722	Grinder	5
3155	Toeboards	1	3750	Hammers	4
3156	Traps—Steam	4	3752	Hand tools	3
3250	Ventilation	2	3759	Holst—Air	3
3300	Walls—Buildings	1	3763	Holst—Electric	2
3302	Windows	4	3765	Holst—Geared	1
3303	Water plugs	8	3770	Holst—N. O. S.	4
3305	Wharf—Coal	6	3850	Jack handles	2
3306	Wires—Telephone	2	3851	Jacks	1
3308	Wires—Ground transmission	5	3856	Jars—Battery	3
3309	Wires—N. O. S.	11	3950	Ladder—Stationary	20
3310	Wires—High tension	2	3955	Ladder—Portable	5
3312	Walls—Repairing	4	3960	Lathes	4
3313	Water tubes	2	3968	Lights—Red	1
3399	Miscellaneous	9	3969	Lamps or lanterns	1
Total		648(35%)	4004	Motors (Electric)	5
Machines, Tools, Implements and Equipment			4005	Machines—N. O. S.	8
3400	Air compressors	3	4100	Oil cans	1
3403	Air hammer	1	4105	Oily waste	2
3450	Belts	18	4106	Oil	2
3451	Belts—Safety—Window cleaners'	1	4154	Planer—Metal	5
3456	Blow-off valve discharge pipe	6	4156	Planer—Wood	1
3466	Borer—Wood	1	4252	Refuse box	1
3467	Bushing	1	4253	Rubber Mat	1
3468	Bells	3	4254	Rollers—Wooden	1
3511	Counterbalance weights	2	4255	Rings	1
3515	Crane—Walkways	1	4300	Saw—Band	5
3517	Cranes—Magnet	1	4302	Saw—Rip	4
3520	Cranes—N. O. S.	15	4310	Shafting	1
3527	Coal Tipple	1	4313	Shaper—Metal	1
3528	Cupolas	1	4315	Shears and punches	2
3529	Cotter pins	1	4318	Slotter	1
3550	Derrick (see hoist)	4	4319	Steam hammer	1
3555	Drill Press	7	4322	Switch—Electric knife	1
3556	Drinking fountains	3	4323	Stretcher	2
3557	Drop pit tables	1	4353	Toe boards	3
3600	Emery wheels	7	4355	Transfer plates	5
3650	Fan	3	4356	Trucks	9
3656	First-aid kits on engines and cars	2	4357	Turntable	1
			4358	Telephones	7
			4359	Transfer tables	1
			4360	Tractor	1
			4361	Tool Buggies	1
			4426	Shower baths	1
			4453	Ventilators	1
			4454	Vise	1

Code No.	Detail of Recommendations	Number of Recommendations Made
4503	Wrenches	1
4504	Welding machines — Electric	1
4505	Wash basins	2
4506	Whistles—Emergency	1
4599	Miscellaneous	8

Total 258 (14%)

Engines, Cars and Trains

4600	Air brakes	2
4602	Apron—Engine	1
4603	Ash pans	1
4626	Bell cords	2
4627	Blower pipe	2
4650	Car doors	2
4652	Car roofs	1
4655	Car improperly loaded —other than coal	1
4656	Car improperly loaded —coal	3
4658	Couplers	2
4659	Cabin doors	5
4660	Pullman cars	4
4661	Chains—safety	2
4662	Curtains	2
4728	Footboard	1
4729	Foreign cars—inspection of	1
4778	Hospital cars	1
4800	Improperly placed at sid- ings—cars	3
4850	Knuckles	1
4876	Lights on rear of en- gine or cars	3
4877	Head lights on rear of engines	1
4950	Overflow pipes (locomo- tives)	4
4975	Poling cuts	3
5050	Side stakes—removal of	1
5052	Stirrups	1
5054	Springs on engines	1
5055	Switches (electrical) on locomotives	1
5056	Squirt hose—careless handling	1
5057	Squirt hose—defective	6
5077	Trap doors	2
5079	Tubes—superheater	1
5151	Water gauge—slacked on locomotives	1
5152	Wreck trains	1
5299	Miscellaneous	4

Total 62 (4%)

Fire Apparatus

Code No.	Detail of Recommendations	Number of Recommendations Made
5310	Chemical fire engines....	3
5320	Extinguishers	8
5328	Fire ladders	1
5329	Fire pails	7
5335	Hose	3
5337	Hose truck	1
5360	Metal-lined boxes	1
5390	Sand pails	1
5392	Stoves—Coal	1
5410	Water casks	4
5499	Miscellaneous	2

Total 32 (2%)

Signs

5515	Danger or caution	4
5521	Exit	3
5530	Grade crossing	1
5551	Keep light and fire away	1
5557	Look-out for locomotives	1
5585	Repainting signs	2
5590	Short clearance	3
5591	Smoking	3
5592	Speed Restrictions	2
5595	Trespass	1
5611	Whistle board	2

Total 23 (1%)

Illumination

5710	Lights on coal wharf....	1
5740	Lights at inspection pits	1
5755	Lights along pathways	1
5756	Lights in buildings	22
5758	Lights on bridges	2
5759	Lights on platforms	8
5760	Lights in yards	28
5761	Lights in tunnels	2
5762	Lights on piers and docks	1
5763	Lights for work pits	3
5764	Lights on stairways	7
5765	Locomotive head lights	3
5775	Oil lights	4
5785	Switch lights	1
5786	Search lights on wreck trains	1
5788	Miscellaneous	—

Total 85 (5%)

Miscellaneous

7050	Hand lamps in lockers....	1
7250	Liquid soap	2
7251	Letters to employees on safety	2
7250	Newsboys on trains	1
7250	Refuse	1

1257

No.	Detail of Recommendations	Number of Recommendations Made	No.	Detail of Recommendations	Number of Recommendations Made
7600	Safety buttons	1	8601	Members of safety committees to make inspections prior to meetings	1
7601	Scrap iron	2			
7602	Smoke raiser	1	8650	New men to be placed in gang known as safety gang	2
7650	Torpedoes and fuses	1	8750	Persons unauthorized allowed in ticket offices	1
7750	Vehicles—N. O. S.	2	8850	Rivets—cutting from cars	1
7751	Ventilation of passenger cars	1	8852	Riding on steps of cars or locomotives	7
7800	Water for locomotives....	1	8900	Squirt hose — improper use of	2
7801	White-washing	1	8901	Smoking in cars marked inflammable, etc.	3
7802	Water for drinking.....	1	8902	Spitting in or around buildings or cars	1
7803	Watchman — miscellaneous	1	8903	Sand on slippery floors..	1
7999	Miscellaneous	6	8950	Toilets or pans on passenger cars—failure to lock or place	1
	Total	25 (1%)	8951	Trespassing	36
			8952	Train operation—N. O. S.	17
			8953	Trackmen clearing track for approaching trains	4
			8955	Throwing material from engines or cars.....	6
			8956	Trains—getting on or off at other than regular station stop—passengers	3
			8957	Trains—Getting on or off at other than regular stop—employees ...	5
			8958	Trains—Getting on or off improperly	9
			8959	Trains—porters, messengers, and food vendors getting on or off ..	1
			8960	Track—employees sitting on	1
			8961	Trestles or horse used under cars	1
			9050	Violation of shifting rules	7
			9100	Whistle to be blown—warning to employees ..	5
			9102	Whistle—misuse of	2
			9299	Miscellaneous	17
				Total	174 (9%)
				Grand total	1836

CORRECTIVE MEASURES NECESSARY TO COMPLY WITH RECOMMENDATIONS

After observations of dangerous conditions or practices have been made, the next step in the procedure is to apply corrective measures, 15 classifications being made under this general heading, and the original total of 1,836 recommendations being used as the basis for calculating the percentages, as follows:

	Number of Recommendations
Installation of Guards	140 (8 per cent)
Under this heading are included all recommendations covering apparatus on the track, in buildings or around machines, used primarily for personal protection. As the safety work has progressed, such recommendations have gradually diminished. But there are yet many places on the railroads where guards are necessary, but have not been installed.	
Application of Minor Parts	43 (2 per cent)
Under this heading are included all recommendations that involve the application of small parts which are comparatively inexpensive, such as nuts, bolts, lights, counterweights, etc.	
Other Extensions, Additions, New Construction, Etc.	373 (20 per cent)
Under this heading appear all recommendations covering new work and particularly recommendations that cost considerable money, such, for example, as the installation of derails, stop-blocks, foot bridges, buildings, stairways, etc.	
Change of Design or Kind	71 (4 per cent)
Under this heading are included all recommendations covering change in the design of equipment or parts of equipment or the substitution of one kind for another. Some of the items involved are derails, lids for man-holes or openings, stop-blocks, doors, machines, tools, etc.	
Change in Arrangement	69 (4 per cent)
Under this heading are included recommendations such as change in layout of track, or switches, lights, signals, doors, etc.	
Increased Clearance	147 (8 per cent)
Under this heading are included all recommendations for increasing the distance between tracks and structures alongside the track.	

Steam Railroad Section

1259

Change in Location (Except to Increase Clearance)

Number of Recommendations
57 (3 per cent)

Under this heading are included all recommendations covering change in location of tracks or appurtenances, buildings, machines, etc.

Removal

166 (9 per cent)

Under this heading are included all recommendations for the removal of obstructions on the track, objects that obstruct the vision or anything else that interferes with operation or renders the work unsafe.

Repairs, Adjustments, Replacements, Etc.

442 (24 per cent)

Under this heading are included all recommendations that cover the general deterioration, wear and tear of railroad property.

Providing Tools, Implements and Equipment

49 (3 per cent)

Under this heading are included all recommendations for any sort of tools and equipment that may be necessary in making the operation more safe or efficient.

Rules, Regulations, Laws, Methods, and Practices— Observance of

221 (12 per cent)

Recommendations under this heading include all reference to the enforcement of rules, regulations, laws, methods and practices now in effect.

Rules, Regulations, Laws, Methods, and Practices— Introduction of

42 (2 per cent)

Under this heading are included all recommendations for new rules, regulations, laws, methods and practices.

Providing Additional Help

7 (1 per cent)

Under this heading are included recommendations for Crossing Watchmen, Police Officers or any other assistance.

Dissemination of Information

3 (0 per cent)

Under this heading are included all recommendations for disseminating information, such as letters to employees on safety or correspondence with Superintendents of Schools, local authorities, etc.

MiscellaneousNumber of Recommendations
6 (0 per cent)

Under this heading are included all recommendations not shown above.

Total1,836 (100 per cent)

PURPOSE OF SAFETY COMMITTEE RECOMMENDATIONS

In order to pass intelligently on Safety Committee recommendations it is necessary to define the purpose to be served by complying with them. This is an important feature of safety work and while the duties of a Safety Committee relate primarily to safety there is no restriction placed on helpful suggestions whether for safety or not, although a line must at times be drawn as to what should be considered as within the scope of committee work. The following classification is made in this connection, the original total of 1,836 recommendations being used as the basis for calculating the percentages:

Safety OnlyNumber of Recommendations
1,068 (58 per cent)

A very large percentage of all recommendations are made primarily and exclusively for safety, such, for example, as the erection of a foot bridge, the installation of a derail, the adoption of a safety rule, etc. In other words, if it were not for Safety, action in connection with such recommendations would not be necessary.

Safety, But Regular Operating Requirement

634 (35 per cent)

Under this heading are classified all items that relate to safety but which should ordinarily be attended to in the same manner as any other feature of the railroad business, that is, by the departments involved. For example the cleaning of a yard, the repair to a platform, the installation of a mechanical guard, etc., are duties that rest upon department heads and should be attended to, as a rule, before the Safety Committees have an opportunity to observe such conditions.

Other Than Safety

21 (1 per cent)

Recommendations that appear under this heading are those that in no way relate to safety, such, for example, as measures for the protection of property, the damage to which creates no hazard but merely entails expense or measure for convenience or general efficiency.

Fire Protection

Number of Recommendations
63 (3 per cent)

Under this heading appear recommendations relating to the protection of property from fire.

Sanitation, Health, and Welfare

50 (3 per cent)

Under this classification appear all recommendations for the removal of conditions inimical to health and for the adoption of methods calculated to improve the welfare of employees, such, for example, as rest rooms, drinking fountains, removal of filth, etc.

Total1,836 (100 per cent)

DEPARTMENTS RESPONSIBLE OR INVOLVED

The following classification is made with a view of directing attention to the department and finally to the individual in each department that may be responsible, if any responsibility exists, for the presence of dangerous conditions or practices, the original total of 1,836 recommendations being used as the base for calculating the percentages:

General Management—Transportation Department

Number of Recommendations
..... (0 per cent)

Under this heading are included all recommendations relating to the movement of trains and train rules, that require action of the General Management.

General Management—Maintenance of Way Department

..... (0 per cent)

Under this heading are included all recommendations relating to the track, signal system, bridges, tunnels, etc., that require action of the General Management, such as change in standards or the adoption of general rules and requirements.

General Management—Motive Power Department

12 (1 per cent)

Under this heading are included all recommendations relating to engines, cars or machinery and require action of the General Management, such as change in standards, upkeep of equipment and the formulation of general rules and requirements.

Division Engineer

823 (45 per cent)

Under this heading are included recommendations relating to the Maintenance of Way Department on the Division and, for the most part, relate to new construction and repairs.

Train Master	Number of Recommendations 113 (6 per cent)
Under this heading are included recommendations relating to the conduct of conductors and brakemen and to the introduction and enforcement of rules and safety regulations.	
Master Mechanic	600 (33 per cent)
Under this heading are included recommendations relating to the construction and maintenance of engines, cars and machinery, and the enforcement of rules and regulations relating thereto.	
Road Foreman of Engines	21 (1 per cent)
Under this heading are included all recommendations involving the performance of enginemen and firemen, particularly the enforcement of rules and regulations relating to the handling of locomotives.	
Division Operator	27 (1 per cent)
Under this heading are included all recommendations involving telegraph and telephone employees and the condition of the telegraph and telephone lines.	
Supervising Agent	130 (7 per cent)
Under this heading are included all recommendations relating to safety at stations, such, for example, as the condition of platforms, manner of handling and stowing freight, etc.	
Police Department	43 (2 per cent)
Under this heading are included all recommendations involving the enforcement of laws, the protection of property, breaking up trespassing, etc.	
Floating Equipment	8 (1 per cent)
Under this heading are included all recommendations involving boats of all kinds.	
Joint or Indeterminate	59 (3 per cent)
There are some recommendations that cannot be classified by departments. These should be placed in the general classification, Joint or Indeterminate.	
Total	1,836 (100 per cent)

CONDITIONS AND PRACTICES

Seventy-five per cent of all recommendations cover dangerous conditions and 25 per cent cover dangerous practices, while less than 10 per cent of all fatalities and injuries are attributable to dangerous or defective conditions, indicating that great progress has been made in providing physical safeguards and surrounding railroad operation with measures to protect life, limb, and property. And while there should be no diminution in effort to improve physical conditions, the exercise of greater precaution on the part of individuals is the source from which most results may be expected.

SUMMARY

In the foregoing there has been presented a general outline of the salient features of Safety Committee work. Attention has been directed to the general parts into which the railroad may be divided: the items covered by Safety Committee recommendations, under each part: the measures necessary to comply with them; the Departments responsible for the presence of dangerous conditions and practices and lastly a separation has been made between conditions and practices.

Within these general classifications there must be developed the details necessary to place safety work in the realm of a specific science and as we progress along this line, we shall better understand how to treat and dispose of Safety Committee suggestions and recommendations, a feature of railroad business that is sure to increase in importance as the years roll by.

CHAIRMAN RICHARDS: We shall be very glad to hear from Mr. Hale. I think he is on the program to discuss this paper.

DISCUSSION

Mr. ISAIAH HALE (Safety Superintendent A. T. & S. F. R. R., Topeka): I suppose I might get up and say that the first thing that should be done with a recommendation made to a committee is to determine the merit in it and if found meritorious to put in motion the machinery that would correct it. One trouble with those recommendations is that they are allowed to hang fire too long and another is that when a local committee, for instance, passes that recommendation to a division or a higher committee, although the action may be taken with reasonable promptness, the advice that the action has been taken is very often not conveyed at all or, if it is conveyed, it is relayed in getting back to the committee and the man from whom the recommendation came.

Mr. Carrow tells you that 75 per cent of their recommendations have had to do with conditions. I want to congratulate him. I am nothing, if not honest, when I tell you that I do not believe that our recommendations on the Santa Fe will run in just that proportion, but I think a large number of them have to do with conditions.

I do not mince matters nor use ambiguous phraseology in telling our committees that so long as we come into those meetings and confine our-

selves to talking only about defective conditions, we are not entitled to walk out and kid ourselves into thinking that we have really accomplished very much because what we have accomplished is of a negative or, at least, a questionable value.

The management of the Santa Fe has been most liberal. We did not have as much preparatory work to do when we started our safety work nearly eight years ago as was the case on some railroads, but I really know of no meritorious recommendation that has been made that, if it was possible, has not been favorably acted upon. The management is still willing, as Mr. Carrow's management is, to do everything humanly possible to safeguard conditions, but on the other hand, we must change the ratio between the recommendations that have to do with practices and those that have to do with conditions. We all agree that at least 90 per cent of our personal injuries to employees come from some irregular practice.

We are not entitled to come into our committees, even on Mr. Carrow's basis, and spend 5 per cent of our time talking about the other 10 per cent of our causes.

I believe, along that particular line, that if we don't get the men to appreciate that ratio between the avoidable and the unavoidable injuries that are due to practices, and to talk about them, not only in committees but out among ourselves, we shall fail in the accomplishment of our chief objective.

I am very frank in saying that, so far as the Santa Fe is concerned, we are constantly striving toward that end. Just what the result will be, we cannot prophesy, but the future looks mighty bright because just at the present time we are making a very enviable showing, and it has simply been due to the fact that the men are waking up to that pungent fact to which I have just referred, that if we are to make real headway in our safety movement, we must get the individual man, of course keeping the physical condition of the property as nearly perfect as money and time will permit it to be kept.

CHAIRMAN RICHARDS: Is there any one else here who has the temerity to discuss this paper?

STANDARD SET OF RULES

MR. FRANK A. WIGHTMAN (Regional Supervisor, St. Louis, Mo.): I notice that Mr. Carrow touches on rules. We have found with some eighty corporations in one region, consolidated into nine groups of railroads working under the standard book of rules, so-called, that no two books quote the same language for the most important safety rules under which the men operate.

Rule 22, our flagging rule, Rule 210, our thirty-one train order rule, Rule 26, having to do with the repairs of cars and rip tracks. There is a misunderstanding in our groups where different roads are operating under the same management and I am advised, after receiving a large number of transportation and maintenance books of rules from other regions, that the same conditions exist there, and I do not think that the Railroad Administration could be of more assistance, in any one thing, to

the safety section than if they would get out a standard book of rules for the maintenance and operation of steam railroads under Federal control, and I move you that this Railroad Section recommend to the Railroad Administration such action as would meet with their approval.

(The motion was seconded.)

CHAIRMAN RICHARDS: It has been moved and seconded that this section recommend to the United States Railroad Administration the publication and distribution of a standard set of rules. Is there any discussion?

Question.

All in favor signify by saying aye, contrary no.

The noes have it. Motion lost.

ELECTION OF OFFICERS

CHAIRMAN RICHARDS: We are to have a special order of business at 12:00 o'clock. It is now 11:55. We won't have time to hear any further papers, but before we enter on that special order of business there ought to be some general understanding about the question of nomination of officers of this Section for the ensuing year and the rights of the men present to vote.

The Constitution and By-laws of the Section I will read to you because it practically leaves it to us as to how we shall take the vote in electing our officers.

"Section No. 5. Nominations of officers shall be made by a Nominating Committee—"

We decided yesterday that we wouldn't have a Nominating Committee, that we would have the officers nominated from the floor.

"—of three appointed by the Chairman of the Section, which Committee shall report at the Annual Meeting its recommendation of officers, which report shall be followed at the meeting by the election of officers for the ensuing year.

"Other nominations for officers may also be made by any members at this meeting."

You will notice that in this Section of the By-laws there is nothing said as to how we shall vote for the officers, whether we shall vote by roads, each road being entitled to the number of votes that it has memberships in the Council, or whether we shall vote as individual representatives of the Section.

It has always, I think, been customary heretofore, for every man who was attendant upon the convention, whose road belongs to the National Safety Council, to have a right to vote for the officers for the ensuing year; so unless there is some objection on the part of the members of the Section to the following of that custom which has always been in vogue, the Chair will rule that everybody here who is connected with a railroad, which is a member of the National Safety Council, will have a right to one vote for officers and that no one who is not present will have a right to vote by proxy or otherwise. If that isn't satisfactory, the Chair will be glad to entertain any motion that you desire to make

as to the manner in which this election shall proceed. Each man shall have one vote.

I want to announce that I am not a candidate for re-election and couldn't accept the office if it was tendered me.

Is there any objection to the plan as outlined by the Chairman of taking the vote?

MR. C. R. STAPLES (Safety Supervisor, Southern Railway): I move that plan be adopted.

(The motion was seconded and carried.)

CHAIRMAN RICHARDS: We will proceed to the election of officers for the ensuing year, and we shall be glad to hear from any gentleman who desires to place in nomination any man for Chairman of the Section for the ensuing year.

MR. JOHN S. ROCKWELL (Buffalo, Rochester & Pittsburgh Railroad): Mr. Chairman, I have the great pleasure of presenting to the consideration of this convention for the Chairman for next year a man whom you all know, a man who has been one of the closest students of safety in the United States. That man has shown us today his ability in the wonderful address he has given, and without further remarks I place in nomination Mr. Thomas H. Carrow, of the Pennsylvania.

MR. BRENNAN: In rising to second the nomination of Mr. Carrow, I think he has demonstrated, I might say, that we have passed beyond the initial stage of safety and have entered the field in the scientific line. In doing that thing he has conferred upon not simply the men who are engaged in transportation service but upon the whole human race a lasting obligation.

He has invented a compass and a chart for us and I think if we follow that chart, ultimately developed into a scientific practice, we shall have the privilege of knowing that we have working at the head of the organization one of the noblest men in practical and real knowledge of railroad practices and conditions in the whole world.

MR. J. C. CLARK: Mr. Chairman, during the past year I have had the very great pleasure of a rather close association with a superintendent of safety on a certain line in the Central Western Region. I have come to admire greatly this man's ability, his personality, his energy. It seems to me that during the coming year we are going to face a rather vital situation with regard to the Railroad Section of the National Safety Council.

I think we should have a man at the head of our Section who is able and willing to work and work hard for the Section, a man who has the personality to put himself across, a man who has the energy to work all the time, a man who has the initiative to work for the best interests at all times. I believe the man I am about to nominate has these qualities and I am convinced that he will not hesitate to do anything that is within his power to put across the work of the Steam Railroad Section of the National Safety Council. I wish to place in nomination, Mr. Fred Meyers of the Wabash Railroad.

MR. WEBB: I rise to second that nomination.

MR. E. R. SCOVILLE (Baltimore & Ohio): So that there may be some rivalry in the selection of the Chairman, I rise to nominate a gentleman who has had several years' experience on one of the trunk lines of the East as a superintendent of safety and welfare, and who is now the Vice-Chairman of the Steam Railroad Section of the National Safety Council, Mr. John T. Broderick.

MR. CARROW: I rise to second the nomination.

CHAIRMAN RICHARDS: Are there any more? If there are no further nominations, the Chairman will declare that the nominations are closed.

We have before us now the names of Mr. Carrow, Mr. Meyers, and Mr. Broderick. Shall we vote by ballot, or how?

MR. CARROW: Mr. Chairman, I must interrupt for a moment to say a word.

Mr. Clark, my dear friend from Salt Lake, not eloquently but sincerely has undertaken to delineate the character, the sterling worth, of a gentleman connected with a big railroad. My aspirations for the Chairmanship of the Steam Railroad Section are always subordinated to the interests of the Council, and for that reason, and knowing my lovable, energetic friend, Fred Meyers, as I do, knowing that he has sat with us in the dark days when interest was lagging, knowing that he has put forth every intelligent effort that a good, virile American citizen could put forth to forward the cause of this great movement, I take pleasure in withdrawing from the nominations and in leaving the field open to Fred Meyers.

CHAIRMAN RICHARDS: After the very magnanimous talk of Mr. Carrow, which makes us feel prouder than ever of him, the question still remains as to how we shall take this vote.

(It was voted, upon motion duly made and seconded, to take a rising vote.)

CHAIRMAN RICHARDS: It has been decided to make it a rising vote. All those in favor of Mr. Broderick will please rise.

(There were eighteen votes for Mr. Broderick. The balance were cast for Mr. Meyers, who was elected Chairman of the Steam Railroad Section of the National Safety Council.)

MR. FRED MEYERS: Mr. Chairman and Gentlemen: I am deeply grateful for this honor. I appreciate very heartily the election to the Chairmanship for the ensuing year. We have been favored, in the past year, by having in the Chair one of the pioneers, one of the finest and one of the best men in safety that I know. He was signally honored, last night, by being elected President of the National Safety Council. That is a tribute worthy of this great institution. We all know Ralph Richards, and we love him. I can only say that in my service as Chairman for the following year, I will endeavor to do my very best. If I can secure the same help and cooperation that was given the Chair the past year, I will assure you that we will do as well as, if not better than, we have heretofore.

CHAIRMAN RICHARDS: I take great pleasure, now, gentlemen, in turning over this Section to the new Chairman.

(Mr. Meyers took the Chair.)

MR. SHEDD: This convention of the National Safety Council, and particularly this Steam Railroad Section, to my mind, seems to have been fraught with good things, things beyond the anticipation of most of us, and yet we were looking for something high, noble, and splendid. I believe that when they elected that grand old man, that Christian character, who lives for others first, President of the National Safety Council, that splendid organization simply showed again that it was composed of men of the highest character, men of the keenest perception.

I am going to suggest that we all rise and give Ralph Richards, that grand old man whom we all love, three cheers. God bless him and further his every effort.

(Prolonged applause and three cheers for Ralph Richards.)

MR. RICHARDS: That is all very kind of you, Gentlemen, and I thank you.

CHAIRMAN MEYER: Gentlemen, we will proceed to the election of a Vice-Chairman. Nominations are open for Vice-Chairman.

MR. STAPLES: I desire to place in nomination the name of a man who is not as big as Mr. Meyers physically, but who is just as big in his energy and his efforts, a man who has devoted years of his life to this work, and for the last ten years he has worked twenty-four hours a day for the safety movement. I place in nomination Mr. Robert Scott.

(The motion was seconded by Mr. Shedd.)

MR. CLARK: I move that the Secretary be instructed to cast the unanimous ballot of the Section for Mr. Scott as Vice-Chairman.

(The motion was duly seconded and carried, and the Secretary cast the unanimous ballot of the Section for Mr. Scott as Vice-Chairman.)

MR. ROBERT SCOTT: Gentlemen, this is an honor that I very much appreciate. I don't know that my shoulders are broad enough to wear the epaulets. If I had a hale constitution and a physique like my friend from the Santa Fe, if I were endowed with oratory like my good friend from the New York Central, if I had the power to shed tears like my good friend from the Rock Island, if I were rich enough in Irish wit like my good young friend Richards, I would make the welkin ring. But, Gentlemen, this is the age of service. That has been the keynote to everything that has been said here during this convention, and if service means anything to the Steam Railroad Section of the National Safety Council, I am here to render it to Mr. Meyers.

MR. WISE (Dallas, Texas): Mr. Chairman, because of the natural modesty of your Regional Supervisors, we do not like to talk about ourselves, but there is a time when I think either bashfulness or undue regard for others has to be put in the background.

I say this because I want you to understand that in bringing to you the man I am about to name, it isn't because we are trying to get some one

from this particular region; it is because we are in a great and wonderful work. I want you to elect him as your Secretary. He is a man who has served those around him, who has won their honor and confidence, a man of literature, an editor, a newspaper writer, a thinker, a man whose heart is in the safety work, who has occupied responsible positions, who can serve us better, perhaps, than any man in the United States, Mr. Henry M. Mayo, Superintendent of Safety of the Southern Pacific Lines, of Houston, Texas.

(The motion was seconded by Mr. Shedd.)

(Upon motion made by Mr. E. Richards, of the Cotton Belt, duly seconded and carried, Mr. Mayo was elected Secretary by unanimous ballot cast by the Secretary.)

MR. H. M. MAYO: Mr. Chairman and Gentlemen: I think you might have spared my modesty, at least, because you must realize that we people down in the Southwestern region are modest if nothing else. While I feel that I am under intense obligations to my friend, Mr. Webb, for the most delicate manner in which he called attention to my qualifications for this high office, at the same time, I was blushing all the while he was doing it. It is my natural innate modesty to blush when somebody accuses me of something I don't possess.

I very heartily appreciate your electing me Secretary of this Section. I promise you that to the best of my ability I will do my duty and more, if possible, but I also want to call up your sense of duty in this particular. I know that my friend Whittemore went up against this same thing. Your Secretary represents you. You boys have to come across if you want to make your Secretary a success and hence your Section.

MR. CARROW: I make a motion that we rise and express our appreciation collectively for Mr. Richards and for Mr. Broderick, who have acted on the Committees in a quiet but in a very enthusiastic way, and for Mr. Whittemore, the efficient Secretary, who had to do most of the work, and any others who have contributed to the success of the Eighth Annual Congress of the Steam Railroad Section of the National Safety Council.

(A rising vote of thanks was given to the retiring officers.)

(Because of the lateness of the hour, it was voted to adjourn, and to hear, immediately after convening at the afternoon session, the paper on "Methods of Selecting Committees and Maintaining Interest in Safety" by Mr. Robert Scott, which was to have been delivered at the morning session.)

FRIDAY AFTERNOON SESSION

THE meeting was called to order at 2:00 p. m. by Mr. Fred Meyers, Superintendent of Safety, Wabash Railroad, the newly elected Chairman of the Steam Railroad Section.

CHAIRMAN MEYERS: Our program indicates a round-table discussion for this afternoon but in view of the fact that a special order of business cut off a completion of the morning session we will, if it is your pleasure, pro-

ceed to complete the morning session, there remaining one subject by Mr. Scott.

METHODS OF SELECTING COMMITTEES AND MAINTAINING INTEREST IN SAFETY

ROBERT SCOTT, SUPERINTENDENT OF INSURANCE AND SAFETY, ATLANTIC COAST LINE RAILROAD, WILMINGTON, N. CAR.

Before touching upon the methods of selecting committees it seems proper that some consideration should be given as to what is expected of them. SAFEGUARDING and EDUCATION represent the essential elements of any safety organization, which naturally requires efficient planning, direction, and supervision.

While safety committees of foremen or men from the ranks have demonstrated their value as a medium for detecting misplaced guards, poor housekeeping and minor structural defects, their value as an educational factor is also worthy of utmost consideration.

The writer has, during his brief experience in accident prevention, observed a tendency on the part of safety committeemen to confine their attention to the obvious mechanical and structural conditions, which should have been remedied by the foremen or supervisors, instead of studying the broader and more productive field of dangerous practices. Even when directed to consider only the latter, it has been the experience that their reports were still almost entirely given over to recommendations regarding supposedly unsafe conditions. In other words, there is always a tendency to superficial inspection which is difficult to overcome.

Mention is made of this with a view of laying emphasis on the importance of exercising care in selecting committees. It should ever be kept in mind that men selected for this work of safeguarding and educating must themselves be capable of becoming "Safety men" and also be able to impart to others the knowledge they have gained by experience.

After selecting as head of the organization a man who has an abiding faith in the necessity for the work, it is apparent that next in importance is to place upon the committees only such men as are believed would prove loyal to the cause and can grasp the real meaning of Safety, i. e., that it deals with human nature and human relations more than with structural or mechanical conditions.

In the formation of committees one aim should be to have them well balanced. While such qualifications as loyalty, level-headedness, and enthusiasm should be common to all members, attention should be given to the peculiar fitness of committeemen with respect to temperamental characteristics as well as special training along some particular line of work.

It is believed that if safety committeemen, or safety workers, as they might properly be designated, are of the type mentioned in the foregoing paragraph, they will create an atmosphere of intolerance of careless and reckless habits in the territory in which they work. Not only will they be active aids to the Safety Department, but they will serve in various ways

as the connecting link between the management and the rank and file men—between staff and labor. These are the men who will come to the assistance of the management in time of stress; who will come forward with information beyond the officials' vision, and who, in countless ways, will promote the unity of the entire organization.

While it is possible to lay down some general principles to be followed in the selection of committees, the real work of picking out individual men must necessarily be left to the local chairman, who in most instances is the supervising officer and usually has an intimate acquaintance with his men.

GENERAL SAFETY COMMITTEE

This committee should be composed of general and division officers, chosen in such a manner that the different departments of service shall be represented on that committee. The Chief Operating Officer usually acts as Chairman. It is desirable that this committee shall have general supervision of the Safety Organization.

One thing that it might be well to point out is that the General Safety Committee, as well as other safety committees, possess no executive power but are purely advisory.

It may not be found practicable to have representation of all branches of service on the General Safety Committee, but it is especially desirable that the heads of such departments as Transportation, Maintenance of Way, Mechanical, and General Claims shall have places thereon, since these are the men who are held responsible for the results obtained, while the General Claims Department is in fine position to keep in close touch with personal injuries to employees and others.

The selection of this, as well as all other safety committees, should be in the hands of some one who has intimate knowledge of safety work, its aims and objects.

DIVISION SAFETY COMMITTEE

A Division Safety Committee, composed of division officers, with the Superintendent as Chairman, and one or more representatives of each of the different classes of service, should be formed. The same good judgment should be exercised in selecting members to place on this committee as in the appointment of general committeemen. The Division Safety Committee can be of much assistance to the General Committee, provided it has the proper conception of its functions, and will with intelligence and zeal seek to perform these functions.

SHOP SAFETY COMMITTEE

At all shops employing more than several hundred men a Safety Committee, composed of the principal officers of the shop, with the ranking officer as Chairman, and one or more representatives of each of the different classes of service, should be formed. If the shop is under the jurisdiction of the Division Superintendent, the Committee should report to the Division Safety Committee, otherwise to the General Safety Committee.

Eighth Safety Congress

Too much care cannot be exercised in the selection of men to serve upon shop committees: this is not so much on account of the problems encountered in safeguarding the machines, but rather because of the necessity for having intelligent and enthusiastic committeemen who will take it upon themselves to instruct and advise new employees or older ones who are not inclined to follow safe methods in the performance of their work.

TERMINAL SAFETY COMMITTEE

At each large terminal a Safety Committee should be formed, composed of the officers in charge, with the Superintendent or ranking officer as Chairman and one or more representatives of each of the different classes of service. If the terminal is under the jurisdiction of the Division Superintendent, the Committee should report to the Division Safety Committee, otherwise to the General Safety Committee.

This Committee, like most of the others, should be made up of men well qualified to act as leaders and who, by their exemplary habits, encourage safe practices on the part of others.

ADDITIONAL SAFETY COMMITTEES

Where conditions require, local committees may be organized in yards, roundhouses, smaller shops, large freight houses, etc. In all cases the same general principles as outlined above should be followed in selecting committeemen.

MAINTAINING INTEREST

Upon taking up the work for the first time some few months ago I sought interviews with the foremost members of this Council so that I might learn something about Safety from those who had made accident prevention a specialty instead of a side issue. Without exception these men told me that the very nature of the work was such that it could not be carried on successfully unless accompanied by intense active interest on the part of all concerned, and I am now able to testify to the correctness of this after almost a year of experience.

Much has been said and written on this phase of the work in recent years, and many of you are already familiar with the various methods employed by progressive safety organizations in propagating the germ of Safety so that it will eventually overcome the Accident germ. About all that is left for me to do just now in the treatment of this subject is to reiterate some of the things that have already been told you, and to place thereon the stamp of approval of one who has found them effective.

INTERESTING THE OFFICERS

Needless to say, no accident prevention work can be successfully carried on without the hearty support of executive and supervising officers. As a rule, however, difficulties are not encountered through failure to gain such support, but rather through failure to make this support clearly manifest. Officers on roads, especially those on which much safety work has been done, naturally feel that their men know that they do not want

accidents. They may be mistaken, however, in the depth and permanency of this impression and in any branch of the service there may be newer or less perceptive staff men to whom a direct expression of purpose would bring enlightenment, as well as others who would derive from it encouragement to renewed efforts. It is satisfying to feel that our executives are backing us in our daily work, but when we are made to know rather than feel—when we realize that they look to us for results—the work goes forward.

The first and essential step, then, in inaugurating a safety educational movement, or in "waking up" the men, should be a clear, unequivocal statement by the management as to where it stands. Now, as to how this can be brought about is the question for us to consider. It is well known that these men are intensely occupied with problems requiring immediate attention, in other words, the things that to them seem most pressing. Therefore, properly to maintain interest in Safety among the officers it is necessary that the man in charge of the work of accident prevention must be possessed of a compelling personality and that he will with diplomacy, tact, and perseverance keep the subject of Safety ever before these officers, and present to them such interesting facts as will not only command attention but will actually cause them to become and remain deeply interested in it.

There is no more successful way of doing this than by the use of statistics, either in statement form or by graphic chart, showing the common causes of accidents and the class of employees suffering injury therefrom. Data of this character soon begins to reveal that if accidents are occurring in any given locality with greater frequency than at other places where the same work is performed, investigation and study of the conditions surrounding the method and manner of doing this work is in order and may make it clear that some special treatment is necessary.

Again, if the staff or supervising officers are allowed to leave the whole matter of accident prevention to the Safety Department, there will be very distinct limits to what can be accomplished. The more efficient a Safety Department becomes, the more likely is such a situation to arise. The change takes place imperceptibly, but the educational work is in the end devitalized, accidents do not decrease, and the Safety Department is directly blamed for not accomplishing what was never within its power to accomplish. Freedom from accidents cannot be brought about by a repetition of direct attacks conducted by the Safety Department; it is attained only through work by the entire organization, inspired by the enthusiasm and efforts of the Safety Department. Let this be clearly made known to all officers of the road to the end that their interest may be gained and held to a reasonable degree.

It goes without saying that any operating officer of a railroad will become interested in the promotion of safety work just so soon as some one has convincingly pointed out to him that the prevention of accidents means not only the prevention of untold mental and physical suffering, but also a great economic saving. He should be informed that accident prevention has passed the experimental stage, since it has been demon-

strated beyond doubt that personal injuries, just like disease, result from some cause and that just so far as these causes are determined and eliminated, in the same degree will accidents disappear.

Sometimes it is necessary to put before these officers the more serious side of the question, i. e., their moral responsibility for the safety of men working under their direction. This refers both to remedying unsafe conditions and to seeing that workmen are properly instructed as to the safe way of doing their work, and pointing out any special hazards connected with the plant or its operation.

Officers should be constantly and forcibly reminded that accidents destroy that which has been created, and that accident prevention preserves not only property but human life as well.

INTERESTING THE EMPLOYEES

The most convincing argument that comes to my mind just now in connection with awakening interest among rank and file men in the cause of Safety is the one that has been used a great deal of late. Ask any man in train, shop, or roadway service, "Who suffers most as a result of personal injuries brought about by unsafe conditions or dangerous practices?" There is but one answer, and when this is brought home to them they invariably begin to think, and this is the first step in the right direction.

Another important thing is to impress upon all employees the fact that the safety organization embraces every man connected with the road, and that all of them are expected to do their part in carrying on the work of accident elimination.

Next comes the task of educating the men as to how all this can be done without undue interruption of their work. It can be accomplished by personal appeals to the men by head of the Safety Department or some well equipped representative. It can also be done by the distribution of literature on the subject, but this method is not so effective as the former one.

Now, after having aroused the interest of employees, a more difficult problem arises as to how this interest can be held. I am convinced this cannot be done by following any one scheme, but can only be successfully accomplished by the employment of a combination of methods such as the following:

- (a) Well prepared bulletins posted on Safety Bulletin Boards.
- (b) Safety Rallies, with a good program, effectively advertised and supported by hearty cooperation of officials.
- (c) Introduction of special papers on live topics at regular meetings by employee members.
- (d) Acknowledging receipt of all suggestions by letter, and advising those making them of disposition in each case.
- (e) By having SAFETY discussed at Brotherhood Meetings of Labor Organizations.
- (f) By judicious distribution of SAFETY propaganda through the means of Employee's Magazines or Circular Letters.

- (g) Through the employment of a Motion Picture Car, accompanied by a capable lecturer.
- (h) By personal work among the men: this to be done only by those peculiarly fitted for converting influential unbelievers in the doctrine of SAFETY.
- (i) By the rotation of committees, thus bringing new life into the organization.
- (j) By issuing Membership Cards and SAFETY emblems to all members of safety committees.
- (k) By awarding medals or trophies to either individuals or committees, divisions or shops, for special accomplishments in connection with the Safety Movement.

Among the things that have been used with the greatest success is the Motion Picture Car, accompanied by a lecturer, on account of the benefit that accrues from placing the importance of SAFETY before employees and their families, also in enlisting their interest and support in accident prevention. It is almost universally agreed that education in safety work is more vital than anything else, and that the majority of accidents on railroads can only be prevented when employees have had instilled into their minds the important principles of safety. When the human element can be made as nearly one hundred per cent safe as our mechanical devices and as our physical conditions have, accidents will be reduced to a minimum. There is no better way of making an indelible impression upon a person's mind than by exhibiting a picture of conditions. In many ways in everyday life motion pictures have proven to be of great educational value, so it is in accident prevention work, and even more so for when a railroad man sees a picture of an accident it seems to write the conditions and circumstances more deeply in his memory than anything else could possibly do.

SAFETY SUPERVISORS

It will be noted that nothing has been said about the travelling agent or supervisor, and here I would like to touch upon the value of the service that is capable of being rendered by these men. We are all aware of what personal work means in any line of endeavor where the human element is to be dealt with. These representatives of the Safety Department are in position to do a great deal of good in maintaining interest in the work of the department both among employees and officials, and it speaks well for any safety organization that has seen to it that only men of clean character, high principles, clear intellect, and a keen knowledge of human nature, coupled with practical railroad experience are selected to handle the field work. These men can either do or undo, and they should have a clear conception of their responsibilities, for it rests upon them to do a large part of the moulding of sentiment in favor of Safety. It is their task to seek out the unbeliever and convince him of his error, likewise to look up the lukewarm and do the needful, as well as to locate and make use of the enthusiastic leader who can be used on a committee to good advantage in maintaining interest among the rank and file.

These field men are close to the pulse and can in many ways aid the head of the organization in diagnosing special cases of lack of interest and are often able to suggest the remedy. While, as for getting valuable cooperation at the hands of supervising officials, there is no one better able to do this, since on account of frequency of contact which brings about a close relationship, they can convince foremen that service and supervision that permits men to get hurt is a mockery not to be tolerated. They can encourage foremen to give their workmen the things that money cannot buy and thereby satisfy their craving for human recognition, since they are bound to pay back in kind.

In conclusion let me say that I consider it a distinguished honor to be called upon to take part in the proceedings of this Council, and I want to acknowledge it here and now with grateful thanks. The high calling of our task is indeed an inspiration to me and should be to all of us. Every obstacle we meet ought to spur us on with renewed and stronger vigor. The daring of our enterprise to create safety where peril has so long thrived should bring us to a clearer realization of the value of our service. Let us be firm in the conviction that the principles underlying our work are correct, for we know beyond doubt that our cause is a just and noble one. Therefore, let us apply the acid test by endeavoring more than ever, if possible, to make this idealism a realism. It can only be done by the application of such common-sense methods as are capable of being applied to our present physical conditions and to human relations as they exist today.

Our common enemy is CARELESSNESS, and Carelessness has slain, crippled, and blinded more men, has made more widows and orphans, has left on the face of this earth more hands outstretched for charity than all the great wars or other calamities that have befallen mankind. Let us fight it with all the intelligence we are capable of developing and with the full strength of our manhood to the end that the world will be a better place for our having lived in it.

CHAIRMAN MEYERS: We will have a discussion on the paper, led by Mr. Peter Groome, of the Union Pacific Railroad.

MR. PETER GROOME: In view of the fact that this subject has been entirely covered in a very able manner by Mr. Scott, I am going to leave off the discussion of this paper.

CHAIRMAN MEYERS: I will now turn the meeting over to Mr. J. T. Broderick, Supervisor of Safety, Baltimore & Ohio Railroad, who will act as Chairman of the round-table discussion.

ROUND-TABLE DISCUSSION

CHAIRMAN BRODERICK: It is my privilege to have the task of acting as Chairman of the round-table discussion and I am very glad to enter upon that work.

The first subject on the list is, "Prevention of Accidents at Highway Crossings." Mr. Reynolds, of the Pennsylvania Lines West, has very kindly consented to open the discussion on that subject.

PREVENTION OF ACCIDENTS AT HIGHWAY CROSSINGS

H. B. REYNOLDS, SUPERINTENDENT, SAFETY BUREAU, PENNSYLVANIA LINES,
WEST

Up to the present, and for a considerable period in the future, highway crossings have been, and will be, a necessity in the operation of railroads. This is true because of the item of expense involved in their elimination.

When the present roads were first constructed, the financial aspect bore the same relation to their elimination as it does in this day and age. In fact, the financial burden would have been so great as to have precluded their building had an attempt been made to do away with them when they were first constructed.

My source of information reveals the fact that there is approximately one highway crossing for each mile of railroad in operation. I am also informed that the average cost of eliminating these crossings is in excess of \$50,000 each, which, when considered in connection with the thousands of crossings, indicates very clearly why the financial burden is too great to permit of an immediate correction of the condition. However, all railroads are constantly engaged, as far as their finances will permit, in effacing these crossings at points where the need is most urgent, and we may expect, at some time in the future, a practicable solution of the proposition through the doing away with of all grade crossings. This may occur solely through the efforts of the railroads or through the initial assistance of the Federal or State governments, backed by an awakened public, demanding that the needless slaughter of human beings be stopped.

The railroads are privileged to share highway crossings with the public through the medium of legislative enactment, and each has its responsibility to bear in the prevention of accidents occurring thereon. The time for mutuality of action has arrived, and to my personal knowledge, the railroads stand ready and willing to meet the public far beyond the halfway mark. The trouble today lies almost wholly with the indifferent manner in which the public in general views the situation.

We are all aware that accidents at grade crossings are increasing at an alarming rate. Rarely do we peruse our daily paper but what our eyes are greeted by a news item, generally local, conveying the information that one or more lives have been snuffed out in a grade-crossing accident. A majority of us are wont to consider practically all of these happenings as being due to some fault of the parties involved and more often this is the truth. However, a careful consideration of all the factors having a bearing thereon indicates that quite frequently the fault lies either with the railroad or its employees.

The railroad company is often primarily responsible on account of faulty construction, poor maintenance, or because of some condition it has permitted to exist, such as shrubbery alongside the right of way that obstructs the vision, or because of large advertising signs so common to all railroads, that afford the same condition. I might add at

this point, that we have corrected the latter condition on the Lines of the Company I represent by having a careful survey made, and requesting the owners of all signs that interfered in any manner with vision to remove them. They have furnished us excellent cooperation in this respect, and, as a result, there has been a rearrangement of these signs at all points on the system.

Carelessness on the part of the railroad employee is also an important factor. Quite frequently we learn upon investigating an accident, that the engineman failed to sound the whistle or ring the bell. Oftentimes, in towns or cities, he was travelling at an excessive rate of speed. We also learn that other members of the train crew are often responsible, due to their failure to protect properly a crossing in backup movements, switching operations, etc. We are also confronted with the fact that in numerous instances employees whose duty it is to protect crossings are inefficient or fail to have a thorough understanding of the requirements of their positions. Such shortcomings on the part of the railroads and their employees can readily be detected and corrected by the application of the means which lie within the authority of railroad officials. Unfortunately this is seldom brought to notice until an accident has occurred.

MOST GRADE-CROSSING ACCIDENTS ARE PREVENTABLE

We are all acquainted with the fact that most accidents at grade crossings are entirely preventable, some being due to conditions or practices for which either the railroad or its employees are responsible. However, you will agree with me when I state that the vast majority of such occurrences are due to practices indulged in by the public, especially the travelling public. Naturally the public has a right to use grade crossings jointly with the railroads, but from the reports which reach us, we are forced to the conclusion that at least a considerable part of it is unwilling to concede the railroads any rights whatever, when they themselves are desirous of using the highway. This quite frequently leads to disastrous results as far as they are concerned. We are all familiar with the fact that it appears to be an inherent trait of human nature to endeavor to beat a train over a railroad crossing, disregarding the first principle of self preservation. No doubt you have witnessed, the same as myself, some one hurrying over a crossing, either on foot or in a vehicle and stopping on the opposite side to watch the train pass by. This same spirit seems to be rampant in most of our fellowmen when in the vicinity of railroads, and no doubt accounts for the actions of the individual, who, when crossing gates are lowered, will pass under them, in the full belief that he is quite able to take care of himself.

Another trait of human nature that is responsible for thousands of deaths yearly, both in industry and in everyday life, is the failure to "Stop, Look and Listen," in the presence of impending danger. This one trait alone is probably responsible for more accidents and casualties at highway crossings than any other. This failure on the part of the individual is usually traceable to the fact that the party involved has his

mind occupied by some one subject to the exclusion of all others, which momentarily permits him to disregard his immediate surroundings. Perhaps he is involved in an interesting conversation with some one, or if alone, perhaps he is revolving some proposition over in his mind, and endeavoring to reach a conclusion. Another important factor, from the public standpoint, is the permitting of children, by careless and indifferent parents, to play about or on railroad premises, thereby inviting disaster.

NINETY-FIVE PER CENT INVOLVE AUTOMOBILES

The largest proposition of all, in considering highway-crossing accidents, is the automobile. Since the advent of the latter vehicle accidents have increased yearly by leaps and bounds, and will continue to increase until some remedy, not yet applied, is placed in operation. Statistics indicate that more than six million automobiles are in service today, and that the rate of production will add to this number more than one million cars per year for an indefinite period. With the addition of each car to the everswelling ranks, the potential source of highway crossing accidents is increased in the same proportion. I can state from a knowledge of the accidents occurring on the Lines I represent, that fully 95 per cent of all the crossing accidents involve automobiles. This percentage will increase rapidly under present conditions, as the automobile industry is fast crowding other means of conveyance off our streets and highways.

Before prohibition became a reality, we frequently heard that a majority of crossing accidents to automobiles were due to the driver being intoxicated. No doubt this was oftentimes true, but the fact remains that such accidents are still occurring and their diminution is scarcely noticeable. The one factor, in all such accidents, which stands out above all others, is the carelessness of the driver. It has been my experience that no matter how careful a man may be in the ordinary affairs of life, no matter how strongly he may denounce someone else for the careless and reckless manner in which he may drive an automobile, he himself will be noticed to be as careless or as reckless within a short time after coming into possession of such a vehicle. This, of course, is not true of every individual who owns an automobile, but my observations have led me to the belief that it is applicable in most cases. The ability to drive a car seems to breed a speed mania with its attendant disregard of those principles which make for personal safety.

It is my belief that such a condition exists only through the apathetic attitude of the general public. Let the public be aroused to its responsibility in connection with these accidents, and I feel sure that within a remarkably short period of time such calamities will be decreased below our fondest hopes. No man can hope successfully to compete against an aroused public opinion with its attendant features, laws, etc. But how is the public to be awakened? No matter how great the slaughter it seems to be an impossibility to prod its slumbering form into action.

No law that can be devised is stronger than public opinion. No law that will ever be enacted will cure this evil unless it is backed by public

opinion and strict enforcement. While laws have been placed on the statute books of various states to regulate traffic at highway crossings, some meritorious, some worthless, yet they have failed of their purpose, due to a lack of enforcement. We are aware that one reason for this is the apathetic attitude of the public, but did you ever stop and consider that the various railroad companies are in a way responsible for present conditions, and that they too are almost as indifferent as the public? Naturally we cannot expect to enlist public support unless we make an effort to secure it.

THE ILLINOIS LAW

Recently the legislature in the state of Illinois placed on the statute books of that Commonwealth an excellent law designed to prevent the many highway-crossing accidents occurring within the confines of the state. This law provided a heavy penalty for anyone operating a vehicle who failed to stop before crossing railroad tracks, and assure themselves that they would be safe in proceeding. There has been no decrease in grade-crossing accidents within that state, so I am informed, because the law is neither obeyed nor enforced. Recently while attending a meeting of the safety supervisors in the city of Chicago, the application of this law was brought up for discussion, and a canvass of those present indicated that not a single railroad represented at the meeting, was making an effort to enforce its provisions.

Inasmuch as the railroad companies of this country are as vitally interested, if not more so, than anyone else in the elimination of grade-crossing accidents, it seems to be a queer condition, indeed, when they fail to even furnish their moral support in the enforcement of such an excellent law. It is quite understandable why the public fails to interest itself when the railroad companies make no attempt on their part to see that laws in which they are vitally interested are enforced. Laws such as the above would prove of wonderful value if enforced, but under present conditions, they are valueless, as far as their immediate value is concerned, although they are an excellent thing to have on our statute books when the time comes that action will be demanded by an outraged public.

We have been installing at some particularly bad crossings wigwag signals, a signal with which no doubt you are all familiar. The peculiar maneuvers of this signal rarely fails to attract the attention of the driver of any vehicle approaching it, and has proved of considerable value in preventing injuries at crossings where they are located, especially among that class of people who are absent minded, or are oblivious to their immediate surroundings on account of something else occupying their attention. However, these signals have but very little effect, if any, on that class known as chance-takers, who regardless of any warnings, are always willing to risk their own judgment and trust to the mechanical perfectness of their vehicle to carry them to safety.

We have also in a few instances, at particularly bad crossings where the view is obstructed on account of natural conditions, erected warning signs a few hundred feet from the railroad right-of-way. However, as

this is a condition that properly should be looked after by the state authorities, I do not feel that the railroad companies can properly attempt to construct and maintain such signs, to say nothing of the necessary expense entailed.

CROSSING GATES ON LONG ISLAND RAILROAD

I have been told that the Long Island has practically solved the proposition of crossing accidents on that particular road. My information is to the effect that a crossing gate has been devised, the principal feature of which is a telegraph pole, used as a barrier, which is lowered on the approach of all trains. I am informed that this arrangement has proven to be very effective in keeping vehicles off the track until the train has passed, for the reason that the barrier is of sufficient strength to wreck the machine or vehicle, and prevent its passage. This method, no doubt, would prove effective in thickly-populated districts, where of a necessity crossing watchmen or towermen are stationed at all crossings, but of course would have no effect at other points. A similar arrangement could be used to advantage in our cities as it is a daily occurrence for drivers of automobiles to drive through the present gate maintained by the Company I am representing. Such drivers seem to have no respect either for gates or flagman, as twice recently flagmen who were endeavoring to perform their duties and attempting to save the driver of an oncoming machine from his own folly have been deliberately run over and seriously injured.

There is a factor in the automobile world that is actually assisting to better present conditions. I refer to the various automobile clubs and organizations. Most of these bodies are fully aware of the seriousness of the situation, and are endeavoring in every possible way to impress upon their membership the necessity of using care. These bodies have also erected at their own expense thousands of warning signs and have distributed tons of literature. No doubt their influence has had a wonderful bearing, nevertheless they have not as yet solved the problem. However, they are worthy of our most serious cooperation, and we should assist them with every means at our command.

EDUCATE THE PUBLIC

Another feature that has been overlooked is the publicity end. We take up our morning paper and read that some unfortunate individual has been killed at a grade crossing and the subject immediately escapes us, and is forgotten. We consider it as an incident in the country's affairs and let it go at that. If we could furnish the daily papers with well written articles at different times, to be published as a news item, setting forth the needlessness of such accidents, their great number, and the methods to be pursued in their prevention, I feel satisfied that such a procedure could not fail to make an impression upon the public and assist in crystallizing sentiment.

Some one has well said that "The public school is the hope of the future." Such a statement is true, to a large extent, in the elimination

of carelessness of our future citizens if proper methods are employed to influence the young and plastic mind. I know of no better opportunity to advance the interests of Safety than in our schoolrooms. I feel sure that when the day comes that Safety will be made a part of the curriculum we will notice a great falling off in the number of personal injuries suffered unnecessarily. This is true with respect to the highway-crossing proposition, the same as in industry. Form careful habits in youth, and they will remain with you throughout life. In this connection we have been advancing Safety in the public schools, served by the lines I represent, at every point and upon all occasions possible. In fact, we have been so successful that we were able to persuade the great commonwealth of Indiana to incorporate a course of study, devised by us, in their teachers' manual, to be made a part of the curriculum. We are also meeting with considerable encouragement at all other points and our safety agents quite frequently address large bodies of teachers or school children.

To my mind education is the great feature in the prevention of crossing accidents. Laws have proven inadequate. All other means have either been total failures or only partially successful. Our hope lies in the education of the public, backed by proper laws that are vigorously enforced, both by railroad companies and public officials. We will never be entirely free from such accidents until the grade crossings are entirely eliminated, which will be at some distant date in the future. However, it is my belief that by a proper consideration of the principles I have enunciated in this paper, and a serious attempt to apply them, we will be able to make a wonderful reduction in this distressing class of accidents. We should keep the subject before the public and continue to prod its sleeping form until the great body is fully awakened to its responsibility and duty, after which, I am sure, that adequate action will be taken successfully to meet the situation.

CHAIRMAN BRODERICK: Gentlemen, you have heard the interesting paper prepared by Mr. Reynolds. We are quite anxious that some of the other members here give us the benefit of their experience in this line. Will some member please start this discussion?

MR. BRENNAN: Mr. Reynolds spoke of the crossing gates that had been devised by the Long Island Railroad. Now the safety organization has recommended that we adopt those gates for general use where it is possible to use them because we have only five hundred miles of railroad.

We have to take care of nearly 500,000 automobiles registered in the state of New York besides the visitors coming in to see us. Of 371 cases of grade-crossing accidents for the year ending September last, we had 283 that ran through the gates. A number were run down while crossing man stood there. The only way to do is to put something there to stop the machine.

The majority of people who drive cars don't drink to excess. They didn't do it even before the 2.75 limit was put on.

During the war, men from Camp Mills and Camp Humphries and some of the aviation camps driving these big army trucks would drive right

on when they were in a hurry. Several trucks have been smashed and a few men killed. Some of the accidents can be excused because they happened at night and they didn't know there was a grade crossing there.

MR. H. E. MCGINNESS (Pennsylvania Lines West): I can't help but feel that one of the greatest, if not the greatest, weapons we have before us today to fight this enemy of carelessness is through our schools.

Since I have been identified with the Safety Department of the Pennsylvania Lines West, I have done considerable work in the schools. As Mr. Reynolds mentioned in his paper, we have been able to get the schools of Indiana to print in their annual for the instruction of teachers, a course of study in accident prevention from the first to the eighth grade.

I didn't know just how to get it to the parochial schools, so by inquiring of a friend, I found that all of the parochial schools in a certain Sisterhood were taken care of by the Sisters of St. Mary of the Woods, Terre Haute, Indiana, and by calling at that school and explaining to them what we were trying to do. I was asked by the Sister in charge to come to that school and give the Sisters, who would be there at the summer normal course, a talk on safety and she assured me that they would put the safety course of study in their schools. I had the pleasure, one evening, of addressing eight hundred teachers of that Order and those Sisters are teaching safety to 25,000 school children in their schools between Chicago and Boston. This Sisterhood teaches in a district which covers the area between Chicago and Boston. In addition to that, I was asked to come this Fall and talk safety to the pupils of St. Mary's School. St. Mary's School is a school for girls, and the Sister told me she thought a safety talk would help them considerably.

MR. E. M. SWITZER (Chicago, Burlington & Quincy Railroad): We must get more publicity. It is a serious matter and the most immediate publicity we can get is through the local newspapers. I don't mean the big city newspapers, I mean the country newspapers. We all have hundreds of them along our line. There is a man on my staff, a safety agent, or safety inspector, as we call him, who has a knack at writing and who has been around to the local newspapers on our lines and he is able to get an editorial in any of those papers any time he makes a visit. We had editorials, I think, in all of our papers. Now I don't know how much publicity that gets but it certainly must get a great deal.

You might think that the publicity that is given every time one of these horrible accidents happens ought to serve the purpose but it doesn't because the newspaper reporters, in reporting an accident, do not print the true cause, and the impression is very often left that the accident wouldn't have happened had the railroads elevated their tracks or put their tracks in subways or done something else that they didn't do. The underlying fact that the automobilist was careless and did not stop, look, and listen, is passed over.

I would like to suggest that all the railroads take this matter in hand and go at it something in the way we have gone at it. The amount of publicity that you would get would be tremendous. You would have

no difficulty at all in getting local newspaper editors to publish an article either as a news item or as an editorial. You will find that those men are very glad to get an article of that sort and they will be glad to cooperate in so important a movement.

I would like to propose that we get busy and get some more publicity on automobile highway crossings.

MR. E. S. CHAPIN (Pennsylvania Railroad): One thing which has impressed me in studying grade-crossing accidents, is the fact that when grade-crossing signs are erected they are put right on the right-of-way along side the crossing. Now we know when we put block signals on our railroads, we place those signals so that a man seeing one would have time to stop before he got to the danger point, and I believe the signs should be such that they could be seen at night.

MR. J. G. FITZGERALD (G. C. & S. Fe): I would like to state that we have on a campaign in the state of Texas for the prevention of automobile accidents. We have had sent out 335,000 letters to individual automobile owners. This letter is sent by the Texas Automobile Dealers' Association. It states the number of accidents and solicits support for the prevention of these accidents. This same letter is being sent to the various states in the Southwestern region. There has also been appropriated \$10,000 for the Southwestern region for newspaper publicity—full page in the form of advertising. We feel that a great deal of good will be accomplished by this.

MR. WERNER: I want to agree with Mr. Switzer in what he said a while ago. We tried that editorial proposition and we only had one incident where we had any difficulty at all. My experience has been in all the country papers that if the editorial is made live reading, they are glad to get it. We did that from one end of our lines to the other and right now we are in the middle of a campaign which I believe has wonderful possibilities in it.

About a week ago we put out a letter personally addressed and personally signed. I first got the names of all the clergymen on the lines that I have the honor to be associated with and then I signed these letters myself and sent them to the clergymen. The answers that I have received are absolutely wonderful.

One great preacher in New Orleans, who has the largest Sunday school in that territory, told us he was not only going to preach a sermon on that subject but he was going to lay it before his Bible class and follow it up in every way he could; that he was with us heart and soul.

The response of the ministers to that appeal has been marvelous. We have learned that the personally addressed and signed circular going to the men as a letter will bring results.

MR. ANDERSON: In the Southern region we inaugurated a very unique scheme by getting the interest of the ministers in this grade-crossing proposition. Possibly some of you have heard of the success of some of the lines in the Southern region. When I have finished I would like you to call on some of the gentlemen here who represent lines in the Southern region and let them tell you of their experience in this cam-

paign. We also have a grade-crossing committee, of which Mr. Beatty of the Southern Railroad is Chairman. If he happens to be in the room I would like him to say something as to the activities of that committee and just what they have in view and what they are going to do in the way of handling publicity towards the grade-crossing proposition in the Southern region.

I would like you, Mr. Chairman, to call on Mr. Robert Scott of the Atlantic Coast Line, one of the roads that conducted the minister campaign, and I believe he will tell you that it was very successful.

CHAIRMAN BRODERICK: Mr. Scott, will you enlighten us on that?

MR. SCOTT: I addressed a personal communication to between 4,500 and 5,000 ministers along our line of road, and it was a startling revelation to me to find how these men, engaged in a pursuit so entirely different from ours, so readily responded to this cause.

In addition to calling upon the ministers, we gave all of our activities along that line as much publicity as we could through the newspapers. Mr. Switzer referred to the country newspapers. We found these publications very anxious to get our copy. They wanted something to put in their papers that would be of interest to their readers and we had no difficulty at all in getting them to publish everything we sent them.

MR. WEBB: I would just like to read for the benefit of the gentlemen present this particular letter from a minister:

"My dear Sir:

"Your letter of the twentieth is very much out of the ordinary. It is at once official, brotherly, and instructive.

"Like every other pastor, during the last two years, I have received an immense volume of mail from various official sources requesting me to do my part in putting over drives. To all of those I have tried to respond as best I could, not to neglect the essentials of a divine calling.

"You are the first man to get right down by my side and discuss things in the real phase of life.

"Very unfortunately I have but little success with that class of people with whom you are most concerned. As a rule, the very same automobile which carries people to death and destruction on your tracks, carries those people out joyriding at the preaching hour on Sunday morning.

"Only a few days ago I was sitting by my window where I had a full view of the crossing. The fast train at noon was running in from the West. There was not even a freight car on the road; there was not anything to obstruct an open view of two hundred yards down the line, yet two men in an automobile rushed onto the track right in front of the engine and were knocked off.

"I will be glad at any time to receive your letters and help you all I can."

That is typical of the letters we have received. The original has only been out some four days.

MR. ANDERSON: Any one who would like to get a copy of the letters that we have issued to the ministers, can secure these by writing to me or to Mr. Scott.

MR. WEBB: We would like to add that for the Southwestern region and we recommend that some of the things we have down there would do some good.

MR. W. J. ORR (Toronto, Hamilton & Buffalo Railroad): I want to endorse what the gentleman said here in regard to signs being always near the crossing. I wish to say that some years ago our traffic manager, Mr. Martin, suggested that they should be placed a distance from the track. We find that has been done in some cases. Now he wants me to suggest having a board or a mark of some kind put across the roadway so an automobile coming down a side street might see it. Recently we had a young boy killed coming from the side street and crossing over our tracks. He should not have crossed there, of course, but he came down there and ran in front of a passenger train and was killed. The Ontario Safety League sent a moving-picture man down there to make a picture of how the accident occurred. A boy took the place of the boy who was killed and ran as far as he could that the engine wouldn't hit him and then they put a dummy up there and the engine came along and ran over the dummy. Those pictures are going to be shown in our schools around in Hamilton and other places, and, of course, in Hamilton the boys all know this particular place and we believe it will be a source of profitable education.

MR. BELL: I just want to say a word in regard to the matter of locomotives giving proper signals. I have in mind the engineer sounding the whistle nine seconds from the time he starts to sound it at the whistling post until he gets through, on the theory that any one near the crossing will be bound to hear it.

MR. J. A. PEABODY, signal engineer for the Chicago and Northwestern Railroad, has come to our meeting to gather what information of value he could, and like all Northwestern men, it is rather difficult to get him on his feet but I believe he would be very happy to tell you some of the things he has learned in listening to this very interesting discussion.

MR. J. A. PEABODY (Chicago & North Western Railroad): Perhaps, first, from a signal standpoint you would be interested in my viewpoint, or lack of viewpoint at the present time because I haven't got my views in proper shape yet as to what should be done in the protection of a crossing. Some one here has already spoken about an approaching signal or advance signals to a crossing. That has been called to my attention several times and I rather opposed it, and when so stating I want you to understand that a crossing bell or a wigwag at a distance from the crossing, it seems to me, is a very good thing. You can place that at the crossing and still give the indication at a distance of two hundred feet, which is ample as a general proposition. I believe the wigwag has come nearer giving such information at crossings where they are very busy or in the vicinity of towns. The bell is not a good protection because with our larger and inclosed automobile it is almost impossible to hear it until you are very close to it and even then, bundled up in the winter time and in the closed cars, it is doubtful very often if it is heard at all. In order to be economical in our expenditures, I feel that we very

often install but one signal wigwag or bell at a crossing instead of two. That is particularly true where a crossing is at an angle to the railroad. We could well afford to put the extra money in for two.

This point of education by publicity or through the schools has attracted my attention a great deal. I have heard, and I think it must be true, that prohibition was brought about largely through education in the schools and Sunday schools. I don't think that fact has been brought out very clearly as a general proposition, but I do believe it is a general fact and it has taken nearly two generations to accomplish it.

Now on the Long Island Railroad they installed these poles. I went down there some four or five years ago to look at the first crossing that was so installed and they had a barber pole effect which has since been adopted all over the country and everybody in that region knew that those poles were there and they stopped for them. The crossing man told me that from the time they were installed to the time I was there, which was only a short time ago, there had been no crossing accidents, whereas before they had been unable to stop the automobile or the joy-riders. Now that was fear that caused that: fear of an accident to themselves.

A short time ago I went out to look at a crossing where it is felt that more protection should be installed. We had crossing bells and had had them there for some years. An automobile drove up with ten people in it, three women and seven children. The crossing bell began to ring and the women immediately started across the crossing to beat the train. Now that is madness and nothing else and we have got to cure the people of that madness.

If through publicity we can create a public feeling which will cause our legislators to pass laws which will require not that the railroads but that the public prosecutors shall prosecute these who disobey our flagman, our gates, or our signals, and attach something to it like a good heavy fine, we possibly will get obedience to these things but until then it looks as though we would not.

Mr. D. K. RAWLINGS (Oregon Short Line): There was an experiment conducted on a road in Los Angeles of placing the bell from the track 250 feet. Out of ten passengers that came by with their cars, there were nine, when the bells started to ring, immediately stepped on the gas in order to beat the train over. In the month of May, there were 447 gates broken off on the Southern Pacific. The people come down to the gates and immediately drive through them. In Corona we had a motorcycle that tried doing that; this man was a motor policeman. He rode through the gates and was killed, breaking off one of the gates. I think the solution is a good heavy pole or an iron roller gate. They have been trying to invent a roller gate to roll the same as a door.

Mr. SHEPP (Rock Island): The Rock Island has not been lax in its efforts to do something to prevent such accidents. We have placed signs, we have distributed literature and we have done many things to overcome them along educational lines. We seem to have made appeals in vain. One of the real satisfactory results, or rather arrangements that we have is at Cedar Rapids in Iowa, Moline in Illinois, and just re-

cently in Sallisaw, Oklahoma. We have men on the crossings with police authority and we are having very little trouble at Cedar Rapids in particular, and Moline where this arrangement has been in effect for some time. The crossing men at Cedar Rapids and Moline are uniformed men and given police authority while in the performance of their duty on the crossing with power to arrest, and they use it.

The Common Council of Sallisaw, Oklahoma, have recently enacted an emergency ordinance limiting the speed of automobiles approaching crossings in that city to eight miles an hour, giving the crossingmen police authority and even going further, giving our switchmen police authority while in the performance of their duty, switching and doing other work on the crossings. I believe therein lies the real solution of a great deal of trouble. I further believe that we should look to our property and put our crossings in good shape. The automobile driver soon learns where the good or bad crossings are. I believe there are times if he knew he could go he would go. If it is rough, he finds it out and naturally halts a little. The old horse and mule would do the same thing when he came upon the hump.

The American Railway Association made certain recommendations regarding the placing of additional signs. I know I am not alone in the thought that we, as railroad men should not absolutely advocate that we go beyond our property and place signs, and, as the gentleman said, or at least as I got his meaning, that that should be done by somebody in authority of the right-of-way of the railroad. I am mighty proud to see that Illinois has followed practically the recommendation by the special committee on grade-crossing accidents of the American Railway Association, and I know the other railroads in Illinois have been ordered by the Utilities Commission to place a sign at what they term extra-hazardous crossings. This sign is located at a point on the public highway designated by the Utilities Commission representatives and a representative of the railroad. It is just a half disc containing the word "Stop." The law places a penalty on the driver who fails to stop, and then farther back on the public highway they place a warning sign; that is a disc with four sections with "railroad" up in either the right or left hand corner. The great trouble is that the law is not enforced. While we are willing to do everything in our power, it does look a little bit like straining a point when we have to see that the state of Illinois or any other state enforces its railroad laws. While we may have to do that, I am not against it, but Mr. Switzer has a splendid idea; he didn't tell it but I am going to.

We are going to have a lot of copies of that law printed (of course this applies only to the state of Illinois) and circulate those copies generally, putting them in the hands of our agents at various cities and towns along our big railroad, asking them to get them in the hands of automobile drivers and automobile associations and in the newspapers. I believe when we do that we have performed a real service.

When you begin to talk about talking to school children, or any other children for that matter, you get way down into the depths of the souls of those fellows on the Rock Island lines who are handling the safety

work—myself and my four capable supervisors. There is one of them in this room now who has personally talked to upward of a thousand teachers assembled by themselves at county conventions and other places, and between 75,000 and 100,000 school children, and never lost a minute from his work. His talks were cordially received and later commended.

In some of the schools he had to really break in. In one school, in a large town on our railroad, the principal said he didn't believe he needed him, but he would let him talk to the small children and hear what he said and if he liked it he would take him up to the bigger children.

Now I do not say this pessimistically, but I believe that we need something more than literature, more than preaching, more than personal appeal to reach the fellow who, like myself, is controlled by his bad habits. He is a speeder and he is going to remain a speeder until he goes across one of those telegraph poles unless we do something through barriers or legislation to stop it.

My thought is this: Let's put our crossing in the best possible shape and then we will have done a great service. Our engineers have been instructed that in addition to using the regular crossing whistle—2 long and 2 short blasts—when they see an automobile approaching the crossing they sound the stock alarm to give the automobile driver the benefit of the doubt at least and not wait, supposing that he is going to stop, because many of our good engineers think that the man will stop when he will not stop. Our idea is to give him the benefit—what you lawyers call (if there are any lawyers here) "The doctrine of the last clear chance." You will pardon me if I made a mistake, but unless some of you are lawyers you won't know the difference. In other words, we are going to carry the burden as far as we can and we have asked our men to do it. They will do it all right. We are going to help as far as we can to carry the burden of the other fellow.

CHAIRMAN BRODERICK: Mr. Fred Custis, of the Chicago Northwestern has requested that this question be presented before the body: "What is the best method of protecting road crossings at grades and rural districts where gates, bells, and other devices are not practical?" Does any one wish to say anything on that point? If not, we will move on to the next subject.

Gentlemen, as you all know about the National railroad accident prevention drive that begins on October 18 and is to continue until October 31, inasmuch as that is a paramount subject at this particular time, we thought it proper to bring it up before this body, and we are going to ask Mr. Duffy to say a few words on the subject and then invite a general discussion from the members present.

MR. DUFFY: I was so gratified with the no-accident prevention drive, first in the Southern country, and later in the Southwestern country, followed later by the Central and Northwestern countries, owing to the good efforts of you gentlemen in your respective countries, and the great number of lives and limbs through your efforts, that you saved, that I conceived the idea of putting on a national railroad accident prevention drive, and the Washington office laid their plans before the Director General of

Railroads which he approved and sent a letter out to the Regional Directors.

Now, then, Gentlemen, it is up to you. We have started what has never been undertaken in this, or any other country—one of the largest safety drives. The whole nation will be stirred by your personal efforts, and I have abiding faith in every one of you good fellows whom I have met at the various meetings I have had the pleasure to attend. I feel that I have made no mistake; that even though you may not be first, you may not be second, you may not be third, you may be seventh in the race, but when you are all through with your best efforts, I am satisfied that not one of you is going to renege but will give every coöperation that lies in your bodies.

I might say that we have written to the forty-eight governors of the states and we have a reply from each and every one of them that they are going to give us their earnest coöperation. Some of them have sent men to Washington, and other governors have men on the way, to confer with us in what way they may be of assistance to us, so you can rest assured, as far as the Washington office is concerned we have done our duty. Now, boys, I know you are going to do yours.

CHAIRMAN BRODERICK: I am sure you have all listened with a good deal of interest to what Mr. Duffy said about the national drive. We would like to hear from some of the members as to how they think the most gratifying results could be obtained in conducting this drive. I think it would be useful and helpful to all of us.

MR. SWITZER: Before we do that, Mr. Duffy has asked for our coöperation, our enthusiastic coöperation. May I not express the opinion of this whole section to Mr. Duffy that he will have that coöperation?

CHAIRMAN BRODERICK: We will give a rising vote of evidence to that. (The audience arose.)

CHAIRMAN BRODERICK: I want some of the members present to give us their views now as to how they are going to conduct this campaign in their particular territories.

MR. S. M. GALATY (Chicago & Northwestern): There is one matter I wanted to bring up here in connection with this drive and that is it seems to me if we are all going to do our best that we need all the assistance we can get; all the publicity that we can get.

The thought occurred to me while Mr. Duffy was speaking of the governors, if it wouldn't be possible to get the President of the United States to issue a proclamation, calling the attention of the country to what we are going to do and asking the people for assistance. The governors might do the same in their respective states.

CHAIRMAN BRODERICK: You have all heard the suggestion made by Mr. Galaty. Does any one want to second that and put it in the form of a motion?

(The motion was seconded by Mr. Herrington.)

CHAIRMAN BRODERICK: You have heard the suggestion and it has been seconded that the President of the United States issue a proclamation asking for the assistance of the whole country in putting forth this great

undertaking of the national railroad accident drive in order to make it an unqualified success.

MR. H. M. MAYO (Southern Pacific Lines): Mr. Chairman, the question arises whether the resolution should go from here to the President or whether we should not take it for granted that the representative of the President, the Director General, who has already taken action in the matter, would be sufficient.

MR. GALATY: I might say that my idea for that would be to have it transmitted in the form of a motion to the Director General and the President and have a proclamation issued in a formal way.

MR. CARROW: That is perfectly proper, Mr. Duffy has heard the request, and he will take the proper and immediate action to get a proclamation from the Director General.

CHAIRMAN BRODERICK: Any further discussion on that subject?

Will some of the members present give us their views about how they are going to conduct this campaign?

MR. MAYO: It is possible that I may voice the views of a great many of the people here in suggesting that they do not like to divulge the methods that they are going to put into effect because each line is practically going to make an effort to get the high point in this contest and they may not want to give away their thunder. That might be a rather selfish way of looking at the situation. So far as our region is concerned, our cards are on the table. We would be glad to tell you everything we have done and everything we propose to do, but I am merely suggesting that it may be embarrassing to have figured out a splendid scheme for getting the first place in this campaign, and then to be called upon to cough it up.

MR. J. B. ROBINSON (Southern Railroad): It may be that some of our brother workers have thunder up their sleeves but I don't think it is the right spirit for any safety worker to have anything under cover. If I have an idea you are all welcome to it. I wish I had a whole lot of them.

MR. SWITZER: Mr. Chairman, I don't think any of us are trying to conceal anything, while we all want to be first, we are willing to let anybody use anything that we can use, and if you are interested, I am perfectly willing to say what we are going to do and what we have already done on the C. B. & Q. Railroad.

We have a letter from the regional directors announcing the no-accident drive, and we have a letter from our Federal Manager announcing it. I have a letter from our General Manager announcing it; so it has plenty of authority back of it. I have drafted a letter, which our General Manager signed, addressed to officers and employees, making the announcement and asking for the cooperation of all. That has gone out and has also been posted everywhere we have safety bulletin boards in every section tool house, round house, freight house, etc. That will be followed by another letter which has been drafted and which the General Manager has signed, addressed to the man in charge, asking, and even directing, that they shall give their cooperation in making this a success and pointing out how important every individual man in charge is to the success of this movement. That letter will go to all officers, fore-

men, conductors, locomotive engineers, section foremen, and to every man who has charge of other men, and attached to that is a receipt which the man in charge will sign and return so that we will know that no man in charge of other men has been overlooked. That is the method we used last time. It was very effective. Now that puts it up to the officers and foremen.

The whole scheme is to put this thing up to the man in charge of the work. That was successful before and I believe it will be again.

MR. J. C. CLARK: Coming from a region that has made the best record so far in no-accident drives and representing the road that secured record No. 1 in that region, I want to say just a word. You can put out all the bulletins and circulars and everything else of that nature that you want to and they will do good, I believe, in advertising, but in order to make a success of a drive or to make a success of safety work in any way, you have to get right down and work. You have to get out among the men, get the cooperation of every officer, every employee on the road. You can't do that by written words. You have to get out and do it by personal contact with the men and I believe firmly that the organization that can get right down to the men, secure their interest and their cooperation, is the one that is going to win first place in the coming accident-prevention drive.

MR. ROWE (Lackawanna): We, in addition to the things which Mr. Switzer has spoken about—having letters written by the Federal Manager to heads of employees, etc., have required that from the Federal Manager down, every supervising officer, etc., must call in at a special meeting all employees under his jurisdiction and give them a personal talk upon the safety drive. We believe that the personal contact is absolutely necessary.

We are going to have over 700 preachers along the Lackawanna Railroad preach at least one sermon, many of whom have promised to do so; we are publishing editorials in our newspapers along our line, we are calling noonday meetings of all our employees wherever twenty-five or more men can be gathered together, we are advertising a special train to run over the entire system, ours being only a thousand mile system, that train being composed of a suitable number of cars properly decorated with advertising, we are going to have a brass band upon the train, we are going to have some good speakers who can talk for two minutes (I don't know whether I am in that class or not, I will be told very soon), and we are going to do everything possible to bring out the interest of the people in our community.

MR. FRED MEYERS: I might tell you a few things the Wabash intends to do in reference to carrying on this drive. As Mr. Switzer stated, we have out letters from our General Manager, the superintendent of motive power, the superintendent of maintenance of way, asking the men for their cooperation. In addition to that, we have issued a number of press notices to be published in all the papers along our line every three days, beginning about October 5. We have already secured the active cooperation of the preachers and we have set aside Sunday, October 19, for a sermon on safety in all the churches. In addition to that, we have pro-

vided the celluloid buttons for all the employees. We are not going to hold any rallies but we are going to hold noonday shop meetings in all our principal shops and local division points. We have already circularized the membership of the various organizations and those gentlemen have responded most heartily, saying they would give their active support and the question of safety would be discussed thoroughly, and particularly this drive, at all lodge meetings that are to be held up until that time and during that period.

We have also arranged to put out a train order daily to all transportation employees. a different order will be issued at twelve o'clock every night and the enginemen and trainmen have been requested, after they have read this order, to throw it off to section men. We hope, gentlemen, to make 100 per cent.

MR. MITCHELL: Our policy is going to be to reach every individual employee to make him realize his obligation to assume his responsibility for that period. We have started very much on the lines outlined by Mr. Switzer. The Federal Manager has put out a circular letter that has been sent to every officer, employee and assistant. We are going to see that it reaches every one of them and then we are going to follow it up through the heads of each department clear down through and see that those policies are in force.

MR. RICHARDS (North Western): Now you have heard about the many things that are going to be done. Our new Chairman has told us what they are going to do on the Wabash. We are going to do all those things, including the furnishing of celluloid buttons to every employee on the system, but it seems to me the place to start the drive, the way we are going to start it, is to hold meetings in the various states in which we run, have every superintendent, master mechanic, division engineer, foreman, trainmaster, and men that have supervision over men get their employees together and tell them what we want to do so that everybody will have a good start and understand the theory upon which this drive is going to be carried and then to get them to go home and carry the message and see if they cannot bring out the results that are wanted.

One of the things we are going to furnish them at that drive is the statement of the accidents that occurred in their territory during the same period in 1918, and also a statement showing the accidents by division and occupation during the no-accident week drive so that they will know exactly what they are up against, how many accidents they had before and what they have to do to improve their record. We are also going to send to every supervising officer on the railroad, a letter from the Central Safety Committee calling attention to the matter, and also letters to every member of every safety committee on the road.

MR. SHEDD (Rock Island): I think most of us, at least, are going to do the same thing. The first thing we are going to do is to follow out the wishes and the outline of the organization. I take it from Mr. Duffy's circular that he wants us to put our own initiative into the drive as far as possible and not expect some one to outline it and hand it to us. We

are going to carry it out the same as we did before. We were not first, nor seventh, but we did a good job.

We are going to get the greatest publicity possible. Our General Manager has already issued a circular, a personal letter I should say, instructing the men who are in charge of men to go out without delay and explain the movement, the idea and the desire to them. We want 100 per cent and we are going to try for it. We are going to reach the preachers, the school children and everybody else. We are going to lay a special emphasis on getting Bill either by the hand or by the nose and get something into his head from our head by coming in personal contact just as far as possible. We expect to have a good record.

MR. STONE (Erie Railroad): I am proud to say that our organization at the present time is very enthusiastic about the drive. We are going to conduct our safety drive along the same principles that we have conducted them in the last six months and we have had a record second to none of any road in our Eastern region. Our method of conducting drives is to select men for our committeemen who are practical and who are men that have a bearing with their fellowmen.

MR. STAPLES (Southern Railway): Did I understand Mr. Meyers to say he is going to issue a safety bulletin in the form of a nineteen order?

MR. MEYERS: Yes.

MR. STONE: Don't you think there is an element of danger there?

MR. MEYERS: Absolutely not. Do you think the same of a slow order?

MR. PETER GROOME (Union Pacific): The Union Pacific Line, I believe, was second in the Central Western region in the last drive and we are going to hold all our safety committee meetings, forty-eight in all, before this drive comes off. We will hold meetings in all our shops and in all our terminals where the master mechanic, general supervisor, and supervisor of motive power will address the men. We are going to try to get in touch with every man. The trackmen are an element nobody seems to think much about but we are sending our general road master over the line to talk to every section foreman and every lineman in the track gang and also the bridge gang. We are reaching everybody and I am going to serve notice on these men from other regions that when the vote is counted you will hear from the Central Western region as in the first rank.

MR. RAWLINGS: During the last drive we went over the entire system with motor cars of the Salt Lake, Los Angeles, and Oregon Short Line and we got in touch with every man on the road, the station agents and all the section men and in this drive we have the cooperation of the superintendent, the trainmaster, and the master mechanic and we are going to take the inspection car and go over the entire line and stop and talk with every man we come to on the right-of-way. We also have a number of stickers that we are placing on every letter that leaves the office, and we have bulletins besides the National Safety Council bulletins which will be posted during that week.

MR. J. A. McNALLY (Wabash Railroad): I see a chance to slip over two extra minutes. The boss just sat down and they cut him pretty short. I

want to say that the Wabash Railroad is going to do something this time that we did before, that is we blow the whistle for a period of one minute at the shops and it causes the people to wonder what it is and when they ask questions they soon find out what it is for. It is a daily reminder to the employees.

We have the superintendent of motive power issue instructions to the master mechanic and shop superintendents to hold a daily inspection of tools in the shop, not only previous to the no-accident drive but all the time, and we have men going over the road on motor cars making talks to the section men along the line and we have also taken it up with the automobile drivers of the country by having posters made and placing them in the garages and other places, and there is one other thing we are going to do. We are depending on the women to help us out in this no-accident drive. We are going into their lodges and auxiliaries, telling them the object of this drive. In view of the fact that the Interstate Commerce Commission are showing that 27 per cent of the accidents are caused by quarrels in the family before the man leaves, we are trying to get these women to follow the old proverb, "Always leave them laughing when you say, 'Goodbye.'" That is what we are getting into the safety movement on the Wabash; we are going after the women. God bless them and help them always.

MR. ISAAH HALE (A. T. & S. F. R. R.): With the possible exception of the special train and the brass band, I do not know of anything that has been spoken of here as being under way or going to be undertaken that the Santa Fe is not going to undertake. We expect to make some noise working on this drive on the theory that "the wheel that does the squeaking is the wheel that gets the grease."

MR. ANDERSON: I want heartily to endorse what Mr. Richards, of the North Western Railroad has said about having meetings of heads of departments and their subordinates. Start it right. That is one of the fundamental and most important things to do. Now the point I want to bring out that has not been touched upon is this: If you all recall the man who served at our Section last year, whoever he was, got up and made a talk to you all and he appealed for a clean-up week. I want to say to you if you want to get real results in this campaign, have your clean-up week just prior to your national railroad accident-prevention drive and then when you begin talking and preaching safety to the men in the yards and on the line of roads, you have something to show them in the way of clean yards, clean rights-of-way, and clean shops.

MR. ARTHUR KIRKENDALL (Regional Supervisor of Safety, Allegheny Region): We have had many examples of publicity during the last year or two, more than we have ever had in the history of the world, through these campaigns that were conducted. During the war all the literature put out by the Red Cross, Liberty Loans, etc., wouldn't have gotten them very far in accomplishing what they intended to if they hadn't gotten right down on the ground to the man. They got hold of them individually and talked to them. Some men said, "I can't buy a bond," but through a little persuasion and explaining the matter to them they

bought bonds and they got away with it. We can do the same thing in this safety campaign; tell the men right on the ground what we want them to do and enlist their coöperation and we can get that coöperation in any degree and I am sure the results will surprise us.

MR. BRENNAN: I am impressed with the remarks of track conditions. I might say that on the Long Island we have been having mid-day discussions, with moving pictures (as a great number of our track men are Italians and not familiar with the English language) on track conditions.

We are circularizing all the churches and schools, and the General Manager is sending out to every employee in the service a letter enclosing the celluloid button and we are going to go on driving with every possible effort. We have a small road and we hope to get good results.

MR. T. F. BARRY (Chicago Junction R. R.): In connection with our activities in the no-accident campaign we have shown our employees that they are in the right place by starting a clean-up campaign. In two weeks we loaded up 300 carloads of dirt from our right-of-way and it was still going on when I left.

MR. H. H. HAWES (Union Pacific): I speak as an employee. The way to put this drive over is to show these men you are going to do something, none of this camouflage. I have heard agents get up in here and say their roads are perfect and representatives have told me that the conditions are rotten. Clean up your own back yard and then look at your neighbors.

MR. F. C. HUNTER (Union Pacific): I believe it is the duty of every safety man and every safety committeeman to see that his house, as far as safety is concerned, is clean at all times. I fear that our committees are not doing what they should for themselves. Let us watch that condition and impress upon our committees that they must have a clean house.

I know my friend, Hawes, is not talking about the Union Pacific at Council Bluffs. We have called attention to transfer lines not receiving the attention that they should and if any of the directors of safety on those roads have received those suggestions I hope that they will get busy in order that we may maintain our organization in its full capacity on our line.

CHAIRMAN BRODERICK: The time is getting very short and we have several more subjects to discuss. The discussion of, "How to induce members of Safety Committees to report unsafe practices among employees" is next. Won't someone start the ball rolling?

HOW TO INDUCE MEMBERS OF SAFETY COMMITTEES TO REPORT UNSAFE PRACTICES AMONG EMPLOYEES

MR. FRANK E. OLDS (Union Pacific): Now you are getting into a question that deserves a lot of attention from the most conservative members of this organization. "How to get employees to report unsafe practices among employees?" That sounds like you are going to jeopardize some man's position in train service. Those things have taken a great deal of my attention. I haven't reported many a man but have personally consulted and talked and pleaded with him and tried to teach and show him

the necessity of not practicing what he was doing, such as sitting on the brake staff and doing other things which we all know are very dangerous and hazardous. I have done that to no avail and I have felt at times in my own heart that such a man is a detriment, not only to my organization, but to the railroad that is advocating safety first and to competent employees. What can you do with those men? You know they are unsafe and not competent and you can plead with them until the dawn of day, finally you will see them with a foot off or a hand off, or they have fallen and broken their back or their leg.

It seems to me that the operating officials of the different roads should, in some way, take those men, after their examination is over and they are entitled to receive their switchkey and their book of rules, and give them a lesson upon those unsafe practices which they are bound to go out and commit immediately in order to class themselves as old-timers or as old-heads.

I would like to hear from somebody on this who has had more railroad experience than I.

MR. WENDELL H. STILLWELL (Chicago, Rock Island & Pacific Railroad): We have no trouble whatever to get employees to report unsafe practices on the part of other employees. The committeemen come to the meeting and do not hesitate to say, "I saw John Brown yesterday riding on the pilot step of a locomotive, contrary to the instructions, and I talked to him about it and I saw him do it again this morning: now I think you should talk to him."

We work along those lines and we don't have any trouble because they know it is all done for safety first. They are not going to be disciplined but they are going to be talked to.

MR. ORR: Every fireman and every brakeman employed come to me for instructions in safety first. We have first aid boxes on all our trains and they are instructed in the use of those boxes.

CHAIRMAN BRODERICK: Has any other member anything to say on that subject?

MR. MAYO: We have found a great deal of difficulty on our lines to secure reporting practices by members of safety committees. However we are getting by that to a very large extent by providing each member of the safety committee with two forms which he uses each month. This form is a record of what the individual committeeman accomplishes during the month. They give a record of the unsafe practices of employees during the month. They do not furnish the name, we do not care about that. They report something like this: "Saw a brakeman kicking draw-bar over with foot. Cautioned him. Promised he would not do it again." That is merely an illustration of the manner in which these forms are used and they are bringing to us practices that we never would have gotten any other way.

MR. V. M. PACKWOOD (Wabash): Now my experience along that line in getting men to turn one another in has been a pretty hard proposition.

We carry no discipline whatever. Whenever I catch a man doing an unsafe thing I turn in a safety card and the superintendent will write

that man a letter. In that way we are advertising to those men that there is no discipline and it is not held against them.

CHAIRMAN BRODERICK: If there is no further discussion on this subject we will pass to the next. "Best method of conducting 'No-Accident' Campaigns. Should train accidents be included?" Will some one start the discussion?

BEST METHOD OF CONDUCTING "NO ACCIDENT" CAMPAIGNS

I might say that the B. & O. has conducted, what we term, no-accident campaigns. One is going on right now. It started on July 15 and will terminate on October 15. We are including in that campaign, accidents of all characters with the exception of injuries to what is designated as other person's injuries. As you all know, railroads don't have full control over accidents happening to other persons. We are not including accidents of that class in the totals but we are including what are commonly known as train accidents and a train accident is charged when the wreck train is called out to help put things right. If the wreck train is not called out, then it is not classed as a train accident. With those train accidents we are also including the casualties to employees.

The Eastern lines conducted a similar campaign which ran for three months and terminated on August 31. In both cases the results have been very gratifying.

The last report of the Western lines that I received before leaving Baltimore, as of September 20, the last record made up, showed that of all those accidents, train accidents as well as accidents to employees, they had a reduction of fifty-nine and seven-tenths per cent compared with the same period of last year. That is conducted on the basis of gross ton mileage for the period of this year compared with last year, and the division making the best improvement will get the pennant flag that will be offered as a prize in addition to a dinner that will be given to one hundred employees from the division winning that particular prize. Those one hundred employees will be arrived at by selecting thirty-three employees from the maintenance of way department, the maintenance of equipment and the transportation department, and the division officers and the general officers will be invited to be present. It has caused a great deal of rivalry. The divisions are on their tip-toes and endeavoring to win the prize and make the best showing.

That is what we have done and if any other roads have had similar experience we will be glad to hear from them.

If there is no discussion on the subject, of course, we will pass it along and go to the next one.

MR. ANDERSON: Regarding the question, "Should train accidents be included?" I believe the Railroad Administration means personal injuries and casualties and train accidents.

CHAIRMAN BRODERICK: Of course, if it is a personal injury as a result of a train accident, that would be included, but of course there are a lot of train accidents where there are no personal injuries involved.

MR. H. A. ADAMS: Do I understand that you mean by accidents: One wreck, two wrecks, three wrecks, etc.

CHAIRMAN BRODERICK: I mean where the wreck train is called out to clear it up.

MR. H. A. ADAMS: The question was whether or not that should be included in computing this no-accident campaign.

CHAIRMAN BRODERICK: Not in this particular campaign. It wasn't intended to apply that way.

MR. WEBB: I personally do not think the train-wreck accidents would come within the original scope of this thing.

CHAIRMAN BRODERICK: Does any one else wish to express his views on this subject?

The next is, "Should Safety Agents be clothed with authority to require correction of unsafe practices?"

Mr. Mitchell of the New Haven road has kindly consented to start the discussion on this subject.

SHOULD SAFETY AGENTS BE CLOTHED WITH AUTHORITY TO REQUIRE CORRECTION OF DANGEROUS PRACTICES?

FRED W. MITCHELL, SUPERVISOR OF SAFETY, NEW YORK, NEW HAVEN, AND HARTFORD RAILROAD, NEW HAVEN, CONN.

No person will question the necessity for effectively correcting unsafe practices or conditions with the least possible delay.

The New Haven Road's safety work is conducted on the basis that supervising forces understand that safety is the first consideration and that their responsibility in this particular is as exact as in any other and can be subordinated to no others.

Safe practices are inseparably yoked to safe conditions.

The safety agent must be interested in both.

Forbidding the use of defective tools without providing suitable ones, has no place in a Safety program. Neither has the criticism of wrong practices without pointing out the right ones.

His work is humanitarian and is based on the second commandment "Love thy neighbor as thyself." Therefore the safety agent's work includes the giving of advice or words of caution to the uninformed or the reckless.

He should have permission to talk to employees on duty with a view of promoting confidence in the work, but he should not abuse the privilege or become annoying.

He needs no authority to command correction of unsafe practices or conditions except through the proper supervising officers. His knowledge that they prevail, reported to those in authority takes the burden from him and places it with responsible officials working under definite instructions. But the fact that he (the safety agent) is no longer responsible does not relieve him from following the matter to a conclusion.

He should suggest and recommend, not direct and compel.

Coöperation is what we want not coöpposition.

No man can serve two masters—the foreman is responsible to the general foreman, the general foreman to the master mechanic and to no other. Any attempt to compel recognition of direct orders from a safety agent except through the supervising officer, tends to demoralize effective supervision and delays the correction of wrong practices and conditions through a possible feeling of antagonism to usurpation of authority.

When our safety inspectors visit a shop, roundhouse, terminal or yard, they note all things unsafe and suggestions or recommendations made by employees toward safer working conditions, and before they leave the plant they submit a copy of these notes to the official in charge who is expected and required to handle the suggestion promptly.

A copy of the notes is also sent to my office and each item is followed up until final disposition is made.

The safety inspector is informed of the action reported and on his next visit sees that proper handling has been given.

We are getting the right kind of coöperation by following these methods. Working harmoniously with all departments has done so much in advancing our work that I feel any changes would be detrimental, and I therefore am opposed to clothing our safety agents with authority to correct unsafe practices except through the proper supervising officers.

In fact, I think we can answer that in just about two words: They should be clothed with authority to correct the unsafe practices. The question is, how should they correct it? I don't know what the training of most you representatives has been and what department you came up through, but I came up through the operating department and I believe our theories are correct. There is one thing you will have to bear in mind if you are going to get the coöperation of the operating officer: I was talking to the general superintendent on our lines the other day and he was discussing certain positions. He referred to a trainmaster and he said, "That trainmaster is the fellow who can roll the most wheels."

That is what the operating officer has in mind first: Move your track. The first thing the trainmaster has to do is to "roll the wheel" and that is the first thing to which he is going to give his attention. I believe we have got to recognize the practical side of the safety efforts as applied to the operating department.

CHAIRMAN BRODERICK: Does any one want to discuss this subject?

Mr. BRENNAN: I think it is self-evident to every railroad man that when you make a suggestion it is made for a particular reason and that the element of courtesy should enter into the solution of the matter. I think, as Mr. Mitchell said, you should coöperate to a certain extent with the foreman; otherwise, you will antagonize him and your best efforts will be in vain.

CHAIRMAN BRODERICK: If there is nothing else on the subject we will pass to the next one.

Mr. J. C. Clark is to start the discussion on that subject.

TO WHAT EXTENT SHOULD SUPERVISING FORCES BE
HELD RESPONSIBLE FOR THE SAFETY OF MEN
UNDER THEIR DIRECT SUPERVISION?

J. C. CLARK, ASSISTANT TO GENERAL MANAGER, OREGON SHORT LINE AND LOS
ANGELES AND SALT LAKE RAILROADS

The supervisor's forces work under different conditions in different departments on a railroad. Take the mechanical department in the shops and the men of the various gangs work under the direct supervision of a foreman. The foreman is in a position to see what each man does almost every minute of his working time. That same thing applies in the case of section crews and in bridge and building department crews. In cases of this kind where the individual workman is under the constant and watchful eye of the foreman, I think that he should be held responsible for the safety of those men for the reason that he is able to determine, by personal contact, the men who are safe and the men who are unsafe. If he has a man whom he considers unsafe for the work he is doing, he should get rid of that man, transfer him to some other department where he is not hazardous or else relieve him from the service entirely.

On the other hand, we have trainmasters, for example, who have supervision over men scattered over the entire division. It is not possible for a trainmaster to watch constantly the performance of all the conductors, brakemen, engineers, firemen, and other employees in that line while they are out on the road. He soon becomes familiar with very foreman; he knows in a general way what men are safe and what men are unsafe. Of course, it is his duty to correct the unsafe methods of the men when they come to his attention, but it is not possible for him to know continually what these men are doing. Therefore, in the case of a trainmaster or other supervising officer who has men scattered over a large territory, I don't believe it is possible to hold a supervising officer responsible to any great extent for the safety of the men under his supervision.

The question of securing safety men is one that is of vital importance to all the railroads and in all the departments. It seems to me that we should go at the selection of employees in a more scientific and definite manner. As a rule, the employing officer takes the man whom he thinks can do the work. That opinion is based very often on previous records which he secures from other companies with which this man was working, but there is no test given, so far as I know, by any railroad in the United States to determine the capabilities of a man. It is possible to apply intelligence tests to test new men who come into the service, but, of course, that wouldn't determine whether he has good judgment, it wouldn't determine whether he is capable of leadership but it would determine the general intelligence of the man.

It is not so difficult to train a man of good sound intelligence in a safe and efficient method of doing work. If we have a man who is not up



to the average of intelligence. it makes the task of educating that man immensely more difficult.

In the recent draft of men into the United States army, such an intelligence test was inaugurated and put through. More than 1,000,000 men were given this intelligence test. After these men had been assigned to the various regiments and sections of the army and navy, the Secretary of the War Department, who had charge of this test, asked the officers of various companies, and the various units in all the departments, for a rating of these men. This was in order to check up the results of the intelligence test and they found that in about 90 per cent of the cases their intelligence test showed the same results as the report of the officer in charge of the man.

It seems to me that the whole question of organizing an efficient railroad organization depends upon getting the right man to begin with; next, it depends upon the proper education and training of that man. The education and training is largely up to the supervising force, although there should be an educational department in every railroad to follow up, particularly, the education of the employee. In any event, the supervising officer is the man who has the best opportunity to train the man. If the employing officer has the good sense and the good judgment to select intelligent men, energetic men, who have a common school education at least and who are capable of development, the supervising officer will, in 90 per cent of the cases, do good work; where he is given good support, he will secure good results.

When it comes to the direct question, though, as to what extent the supervising officer should be held responsible for the safety of the men under his direct supervision, it is hard to give an answer. Very often the supervising officer has nothing whatever to say about the employment of the man. He asks for a man to fill up his gang and they send him some one. He didn't hire him; he doesn't know anything about where he came from, but he has to take him in a great majority of the cases. Where that condition exists, I don't believe it is fair to put too much on the supervising officer.

CHAIRMAN BRODERICK: You have all heard Mr. Clark's talk on this subject which was very enlightening. Has any one else anything to say? We will be very glad, indeed, to hear from any one present.

Mr. Baltzell, I understand, has a proposition to bring before this body on the subject, "Reaching the children in schools in educational work."

Mr. C. H. BALTZELL (St. L. & S. F. Ry.): I am a division superintendent on the Frisco Railroad down at Fort Smith, Arkansas.

This is the fourth year that I have had an opportunity to attend these wonderful safety meetings. I was, just wondering how many other division superintendents had visited this Congress this time. It does seem to me that every division superintendent throughout the country should make a special effort to attend these meetings because the division superintendent is certainly the mainspring of the whole proposition when it comes to safety on his division. If he is a real honest-to-goodness safety man, it is going to be a safe division; that goes without saying.

The division that I had up to the last three years was between Springfield and Memphis. When they began the safety work on the Frisco Railroad, my division won the safety-first prize three years in succession. That in itself was a mighty good showing.

Since I have gone over to Fort Smith on the Central Division, we have continued to make a splendid showing in the reduction of personal injuries, and in the May drive throughout the Southwestern district, my division made the best showing of any division in the territory.

I am strong for organization in all the departments, and especially in the safety department. I believe that your safety committee should be selected with the utmost care and if you find that you have made a mistake after careful consideration and a fair try-out of the man, don't keep him on the team. Get the right kind of men, but you must be tolerant and patient as it takes a number of years to bring about satisfactory results in safety work. We see it now in a way that we didn't recognize it in the first year by any means and it is growing stronger and stronger. Not only the railroad companies, but the industries throughout the land are recognizing this wonderful work in safety.

REACHING THE SCHOOL CHILDREN IN SAFETY WORK

I want to tell you briefly the plan that I put into effect at Fort Smith some time ago. Our division meets once each month; I have a good strong committee of about thirty men (you can't have too many if they are the right kind): we move from one point to another on the division, and towns along the line are making bids for these meetings, we have applications five and six months ahead to hold these division meetings at the various towns. We hold our regular business meeting in the morning, and at one o'clock I make arrangements with the superintendent of the schools to have my entire committee there with the boys and girls in the assembly room, or if it takes two rooms we use two rooms, but we reach all of the school children in that town.

I introduce my committeemen and tell them, "This is Bill Jones who runs 5 and 6. He is an engineer and Tom White here is a conductor," and so on all the way down. It is interesting to them and then we point out to them, in a way that they thoroughly understand, the dangers that surround them when they are on the right-of-way, the danger of hopping trains, passing under the cars, in and around and about them, etc.

I have a printed slip that I place on their desks and I say to them, "I have a printed slip on every one of your desks and I want you to fill in your name, your age, and this date, and I ask you to pledge yourselves in the interest of safety, and to use your influence with other boys and girls to do the same." We gather those slips up and I make those children a part of my auxiliary committee.

Right now I have 1,050 high school boys and girls who are on my personal committee. You can't beat it. They go home and tell about the superintendent and his committee who came to the school house, what they talked about and the folks at home say, "If the railroad men are taking an interest in my boy and my girl like that I am for them."

In the evening we have a meeting, as most committees do. If there is a band in town we have it out and we make it a kind of a community picnic.

Make your meeting attractive to your committeemen and not have that old thing thrown up to you. "Well, here is another date for a safety meeting." Make it so attractive that when these dates are set the men will look forward with pleasure to that particular meeting, and those men must be trained by the superintendent and others to never let go of the job to be a safety man day and night, always on the job.

I want a rigid investigation conducted, perhaps, by myself. I want the foreman of the job to tell me all he knows about this case, what he did to prevent such an accident to one of his men. If a section man gets hurt, I want the section foreman to tell me what he did to prevent the accident of that man.

When you get your section foreman, your bridge foreman, your train-master, and every man in charge of men to really and truly work for safety, not only once in a while, but every day and every night, they are going to get results.

Another thing, I put it up to my committeemen like this: When you see a man taking chances, doing things in full violation of the safety rules and principles, caution him against those things. If that man gets hurt or killed, I want you to feel that you are responsible. You helped contribute to that man's injury or death. Now make that strong to the fellows in their meetings, in a general way you understand. Make that thought predominant constantly, that they are their brother's keeper and that they must get to the man, in the right sort of way, the man who is violating the rules, before it is too late. We make it a very friendly game but we certainly get results.

I must not take up any more of your time, but it is a real pleasure to me to see so many new faces and some of the old-timers whom I met in Philadelphia, New York, and St. Louis.

MR. J. J. HENRY (Pa. R. R. Lines): I make a motion that the association give a resolution of thanks to the superintendent for coming down here and addressing us.

(The motion was seconded and carried.)

MR. BALTZELL: Gentlemen, I thank you very heartily and kindly and I wish you could see my safety committee when I tell them about this resolution.

CHAIRMAN BRODERICK: Gentlemen, is there any business any of you would like to bring up before this session closes?

MR. CHAPIN: Gentlemen, I know we are all tired but I want to take a minute to place before you for your consideration and for your action, a topic which, I believe, deserves our future consideration and that is whether there is a need in the Railroad Section for a man or for a committee, if you please, to give expert advice on general questions which may bother us. To illustrate my point, I might say that on one of our divisions we had an accident which resulted fatally: A workman was adjusting the cross-head of a locomotive, which was under steam.

equipped with a valve gear. In so doing he had the bar and the cross-head and he pulled against the lap and lead lever. That moved the valve. The cross-head came back and he was killed. That was a very peculiar accident. We had four of those accidents and we found we were up against a real proposition.

It was put up in the form of instructions to the motive power department that in case a workman was repairing a valve gear on a locomotive so equipped, that he should disconnect the valve. The fact that we knew about those accidents enabled us to forestall other accidents potentially on other divisions.

Isn't it possible that some of us in this Railroad Section have had problems which have baffled us? We do not know that these problems are going to arise but if we can get some information from some central source which will point the way where danger lies we can perhaps head off potential accidents. My thought was that there certainly is material in this Section for such information. The proper method of getting that material or information would be to publish it so that it will be of use to all of us. It seems to me it would be worthy of consideration.

CHAIRMAN BRODERICK: Gentlemen, do you wish to discuss that subject? If not, and if there is no further business, there is a gentleman here by the name of Mr. J. D. James. He has some sort of a patent belt for preventing accidents that he wants to demonstrate before this body of men in this room.

(Mr. James gave a demonstration of a safety belt.)

Adjournment.

SATURDAY MORNING SESSION

THE meeting was called to order at 9:45 A. M. by Mr. Fred Meyers, the Chairman of the Section.

CHAIRMAN MEYERS: The first thing on our schedule this morning is an address by Mr. G. L. La Fountaine.

IMPORTANCE OF PROPER INSPECTION OF TOOLS USED IN SHOPS AND BY MAINTENANCE OF WAY GANGS

G. L. LA FOUNTAINE, GENERAL SAFETY SUPERVISOR, GREAT NORTHERN RAILROAD, ST. PAUL, MINN.

When I first learned that I had been designated to present to this meeting my ideas upon the importance of the proper inspection of hand tools used in shops and by maintenance of way gangs as a means of accident prevention, I was considerably disturbed, to say the least. Because the question had been so thoroughly and frequently discussed from every possible angle, I was rather inclined to minimize its importance and to feel that there was no possible further suggestion in the matter worthy of presentation to a body of expert Safety Men, but as I delved into the subject, I began to realize that, par-

adoxically speaking, its importance lay in its apparent insignificance—that merely because the question has been so widely discussed we are apt to “lay it on the table” and quite lose sight of it in the press of the more formidable phases of our work.

The Interstate Commerce Commission records for the year 1917 inform us that fifteen railway employees were killed and fifteen thousand two hundred and ninety-six were injured during that year while using hand tools, and certainly a very considerable portion of those accidents were due directly to defective and worn tools which would have been discovered and the unfortunate results of their use prevented had a proper inspection been made.

Of the entire number of persons injured, the shopmen were the heaviest sufferers, with five killed and eleven thousand four hundred fifty-one injured; maintenance of way employees were second, with a total of three killed and three thousand two hundred twenty-three injured.

In view of the above facts, I have come to believe that the subject is worthy of careful thought and, in my opinion, the only means of eliminating or at least reducing to the lowest possible minimum this ever-present source of accidents is by a well defined and carefully planned method of inspection.

METHOD OF INSPECTION

For the purpose of formulating a definite plan of inspection, all hand tools used in shops and engine houses may be roughly divided into two classes—those which are circulated in general use and those which are regularly assigned to individual workmen.

In connection with the first class, I would suggest that every shop or engine house employing any considerable number of workmen maintain a tool room in which all hand tools of general use be assembled at the close of the day's work. A competent man should be placed in charge of this room with the care and inspection of those tools as his sole duty; he should maintain his stock in a good, serviceable condition at all times, and any tools worn to any appreciable degree, such as a chisel with a burred or mushroomed head or a wrench with rounded jaws, the further use of which invites one or those minor accidents, should be repaired or replaced at once. It should be impressed upon this man that the primary purpose of his being employed is in the interest of accident prevention, and that the responsibility for any accident resulting from the use of a worn or defective tool which left the tool room in that condition must lie directly with him. We all know from experience that the average workman becomes calloused to repeated warnings and cannot be relied upon to inspect his own tools, but by thus making one individual responsible for their proper inspection, I believe we shall have done much toward reducing our minor accidents.

In respect to those tools regularly assigned to shop employees, we encounter, I believe, our greatest difficulties. These tools are kept in private lockers, and in a great many cases are subject to no other inspection but that of the employee himself. You will find as a rule, although he is known to be a conscientious and thoroughly dependable workman, that

his tools have been gathered during a long period of selection and he regards them with not a little pride—they have served him long and well and he resents the inspection which may question their further serviceability. He is perfectly aware of their little imperfections, but is loath to replace the old with new, feeling that the tool that he may get in exchange will not be to his personal liking. While it is true that he may continue using the old tools to the end of his working days with never a mishap, the chances are strong that sooner or later one of those imperfections of the tool will result in an injury to the user.

It is this ever-present possibility of accidents that demands our attention, and to meet that possibility we must have frequent and thorough inspections. Since the majority of workmen cannot be relied upon to inspect their own tools, that duty must devolve upon the shop foreman. Here again, of course, safety depends upon the attitude of the individual. The foreman can accept that duty in its higher light, as an opportunity to render real service to those in his charge by removing potential danger in the form of imperfect or worn tools, or he can accept that duty as an unpleasant task to be performed with the least possible inconvenience to himself.

To my mind, the foreman can make the most effective inspection of tools while they are in actual use because of the opportunity this affords him tactfully to demonstrate and explain the elements of danger in the imperfection, thereby teaching the employee by example, as well as precept, which would leave a lasting and favorable impression with him. This is much more desirable and productive of good, in my opinion, than the inspection of the tools in each individual locker, as the latter method does not care for the educational feature, which is of paramount value. Also such an inspection may be regarded by the workman as an intrusion upon his private property, even though such an assumption is entirely unwarranted.

The inspection by the foreman might well be supplemented by a competent Safety Committee, such as now exists in practically all well-organized shops. Inbued with the proper spirit, the members of the committee can make frequent inspections of their fellow-worker's tools with their own daily experiences as a guide.

TOOLS USED BY MAINTENANCE OF WAY GANGS

The importance of keeping the tools used by the maintenance of way gangs in good, serviceable condition is just as essential as that of every other department upon the railroad, and what I have said in connection with the method of inspecting tools assigned to individual workmen in the shops, will serve equally well with the maintenance of way gangs. The foreman of the gang should inspect the tools daily and know that they are in first class condition before permitting the employees to use them, and should be held strictly responsible for all accidents resulting directly from the use of worn or defective tools.

This inspection by the foreman should be especially severe during those seasons of the year when "green" men are added to his gang. Many of these men are absolutely inexperienced in the use of tools of any kind.

and defective tools in their hands are a cause of far greater concern than such tools would be if their use were confined to experienced men.

Not only are such inspections an absolute necessity in the interest of safety, but they all should contribute much toward economy and efficiency. A well conducted method of tool inspection serves a double purpose: Safety and Efficiency, the two great factors of modern industry, which go hand in hand. If a tool is to do the work it was originally designed to do, it must be kept in its original entirety. The more it lapses from that state, the less efficient and more dangerous it becomes.

In conclusion, I can only reiterate that which we already know so well, that in this class of accidents, as in all others, the human equation is the greatest problem—a problem that can only be solved by educating each man to supervise not only his own safety, but that of his fellow-workman as well, by convincing him that the principles of safety are designed only for his benefit and that his failure to observe them may work as great an injury to his family as to himself—by instilling those principles so deeply in his mind that their practice becomes automatic and instinctive. When men have been educated in safety to that degree, then and then only will safety supervisors take their place in the sun, along with the other great contributors to the welfare of mankind. Only when that millennium of safety and efficiency arrives may the safety man relax his ceaseless efforts and contemplate with pardonable pride the perfection of his work.

CHAIRMAN MEYERS: We will now have discussion of this very able and constructive paper by Mr. Broderick.

DISCUSSION

MR. JOHN T. BRODERICK (Supervisor of Special Bureaus, Baltimore & Ohio R. R., Baltimore): Mr. La Fountaine has covered this subject very thoroughly. We all appreciate the great importance of having tools of all characters, in the railroad shop, in the proper condition. We all know that by their proper maintenance and care they do contribute to the reduction of a great many accidents. Different roads, of course, have different methods of taking care of tools.

I suggest, Mr. Chairman, that you call upon Mr. Clark, of the D. M. & N., who, I understand, is a practical mechanical man and can tell us something on this subject that will be beneficial to us.

MR. W. A. CLARK (General Car Foreman, D. M. & N. Railway): I want to compliment Mr. La Fountaine on touching upon and covering a very vital and important subject that is not generally recognized as being as important as it is.

Speaking as a foreman in charge of shopmen, I can say that I have found the statements that he has made to be correct. I find that the key-note of safety lies with the foreman in our department. Our supervisor of safety adopted a system of calling the shop foremen together and holding weekly meetings. Over some of these meetings I had the honor of presiding.

We made a special point of emphasizing the necessity of the foremen

checking the condition of the tools and equipment that the men are using, also calling to their attention the fact that they are responsible not only for the output of the work in the shop but for the safety of the men in their charge.

It took us some time to get them to realize that that was a condition that we wanted them to observe at all times and under all conditions of service.

I might tell you that we have found that certain materials that were being used in the manufacture of certain tools were not suitable. That was taken up through our Safety Department, and through the Purchasing Department a better grade of steel was furnished for the manufacture of chisels and wrenches, thereby materially reducing the accidents from battering of mushroom faces and chips flying from chisels, chisel bars, and punches. We also found that it was very necessary to make a daily and a close inspection of hammers, particularly sledge-hammers.

We found that the grade of material which was used in the hammers was not that which was suitable. From a lot of them, little slivers and small pieces of steel flew off and men became injured. Through our Safety Department, that matter was called to the attention of the Purchasing Department and the conditions were improved. The same is true of the grade of materials—the wood or lumber—furnished in the handles of hammers. A lot of hammer heads flew from the handles. We were successful in obtaining a better grade of lumber and more care in fitting the sledges in the handles. We reduced our accidents along that line.

In addition to our foremen having realized that they were responsible and expected to make a careful check, we put on one of our men—a tool room man—who was thoroughly familiar with conditions of all our tools and the shop requirements. He is required to and does make a daily inspection of all tools. He not only goes through the lockers but he goes through the shops and examines the different tools that the men are using. In that way, we discovered that we could check up a number of defective tools that the foreman did not always find otherwise and which the men did not report.

I wish to emphasize Mr. La Fontaine's statement that the men do not think of their tools or examine them or pay any attention to their condition. We found that it was not until a man was injured or one of his fellow workmen was injured that he made any comment or report as to the condition of the tools he was using. Then, invariably, his comment would be that the tools were defective, showing that he knew it beforehand. In some cases, workmen have said that the foreman told them to use those tools and do it in that way.

I don't wish to take too much of your time, but to any and all of you who have charge of men and to the safety supervisors, in particular, I want to say that there is no more important part, in my opinion and in my experience which has carried me through various departments of railroad work, that will pay larger dividends or do more to reduce accidents in the shop than the careful and close inspection of tools.

MR. WENDELL H. STILLWELL (Chicago, Rock Island & Pacific R. R.): This matter of tool inspection is of vital importance to safety supervisors and superintendents. It may assist some of the men to get information as to how the different supervisors are handling this matter. As Mr. La Fontaine has recommended, a committeeman or some one designated by the foreman, who is a member of the Committee, inspects these tools in our plant. At one of our shop safety meetings last Monday, where between 550 and 600 men are employed, the Safety Committeeman who had been instructed by the general foreman to inspect the tools reported that a year ago he found thirty-three defective tools in the hands of workmen who were working with them. He immediately took steps to have them taken away. The month previous to this meeting, the Committee inspector found, in one of our shops, where a workman had taken a flat file and made a chisel out of it and was pounding it with a hammer. Another had taken a round file and was using it for a punch, pounding it with a hammer. Those things have been eliminated. Through a campaign of education on the part of the safety committees in that shop, and with the assistance of the general foreman, that kind of work has been stopped.

As regards tools in the hands of the maintenance of way men: Our maintenance of way department supplied the hand car tool houses with a Keystone grinder. I think the first intention was to sharpen their tools with this Keystone grinder, but our safety supervisor immediately got busy, when he found they had them, and insisted that they should also trim down the heads of their track chisels that were battered. It is being done with good results.

I merely mention these as some of the experiences that we have had. Possibly lots of others have had the same experience, and I think we ought to give such information to the supervisors.

MR. E. S. CHAPIN (Pennsylvania R. R.): I have found from inspections in sixty or seventy different shops, that the blacksmith's tools are the ones that need dressing, and he is the one who is busy dressing the tools that belong to the rest of the fellows.

Another point of attack that I have found in this question is the subject of the tool room with the engine house. The engine house tools are used by all gangs in all sorts of weather, indoors, outdoors, and frequently they do not receive the attention that they should. As an aid in that connection, the orderly tool room is greatly to be commended. You can tell when you walk into a tool room if that man has his tools in good shape. If he has them arranged so that he can see them readily and can pick them out without any hesitation, he is in a position to know whether or not they are in good shape. If they are piled in the corner or on racks, racked up one behind the other, he can't see them and they do not receive the inspection they should in his odd moments of comparative leisure when the tool room window is not busy. If we are to give proper attention to this subject generally, we must give the tool room our careful inspection. I never make an inspection without going over that point.

MR. J. A. McNALLY (Wabash R. R.): Mr. La Fontaine hit the nail

square on the head when he said that a good bit of responsibility should rest on the foreman in regard to the tools. In view of the fact that there had been some accidents in the shop on account of defective tools, we found it necessary to put this proposition directly up to the superintendent of motive power on the Wabash Railroad, and it was through the safety section that we had the superintendent issue an order to the master mechanics and shop superintendents over the road to cause a daily inspection of tools to be made, as well as a monthly inspection of all tools that the men had in their lockers.

We are holding the tool room foreman, where we have one, responsible for the condition of these tools. In small places, where we have a helper handing the tools out and taking them in, we hold the foreman responsible.

At the opening session of the Steam Railroad Section, Mr. Richards requested that if any of us have any accidents, he would be glad to have us relate them as they might be of benefit to the rest of the people. I have in mind one or two. There was one occasion when we had a man from the laboring ranks (he was not a skilled mechanic) who was placed on a job of wrapping steam pipes, that is, all the steam pipes on locomotives and throughout the shop. We had one main steam pipe running from the boiler in the blacksmith shop over to the machine shop. It was a six-inch pipe. It crossed two tracks. It would not clear a man on top of a car. The Safety Committee turned in a card to the effect that this wouldn't clear, so they had that pipe raised and they used an expansion joint. It was in the summer and there was no hurry to wrap the pipe. The foreman waited until such time as he could have a few spare moments for a certain man to do this work—the man I mentioned who was not a skilled laborer, and he put that man on the job. He got up there on a twenty-foot scaffold and was wrapping the pipe. When he got up close to the joint, unfortunately the joint blew out; the man fell off the scaffold and broke his thigh bone. He was a man of about forty-two years of age and had five children.

The question came up yesterday in regard to carelessness and a statement was made that 87 per cent of the accidents were caused by carelessness. Was that accident due to the carelessness of that man or was it due to lack of efficient supervision on the part of the foreman who would let a man work on a steam pipe under pressure? The only information he was given when he went up there was to wrap the pipe. The steam should have been shut off before he was permitted to work on it. No man should be permitted to work up on a high scaffold on a steam pipe with the pressure on.

I have in mind another accident—the only one of its kind that I know of on our railroad. A man was turning down a brass bushing on a lift shaft box. It was sweated together, and it was made long enough so that he could make two out of the one piece. You know what a piece of brass sweated together will do when it gets a little warm. He took a clamp and used a three-eighths stud, putting one on each end. He put the nut flush with the stud and ran the nuts down on the other end of the stud, leav-

ing about an inch and three-eighths of that stud sticking out in the center of this bushing. Then he started to file right-handed. He had on a new jacket. It buttoned at the wrist and turned back, leaving a little gap in the sleeve. This stud, revolving around, caught in the jacket; the jacket was new and it didn't give; it wrapped his arm around and broke his arm at the elbow, tore the muscles in each arm, injured him across the back over the shoulders, and the tool he was working with flew up and made a hole in his neck so that when he was given water to drink it would come out through this injury in his neck.

It so happened that within two or three weeks after the injury he was back in the shop working around, although at first it was thought he wouldn't recover. That is another case where both the man and the foreman, I believe, were careless. The man should never have put a clamp of that kind on with a stud of an inch and three-eighths, and he should not have filed it right-handed. The foreman should never have permitted a man to allow that condition to exist if he had an opportunity to see it.

Besides the daily inspection, there is one member of the Shop Committee in the department where the inspection is made. They have the machinist on the Shop Committee go through the shop with the tool room foreman and through the tool room and make this inspection. The boiler maker in the boiler shop goes with the tool room foreman and makes the inspection on the tools of the boiler makers.

We have been able since April 1, (that was the day this order was issued by the superintendent of motive power) to hold this daily inspection and reduce the number of accidents by defective tools 63 per cent.

I went over the road on a motor car and made a personal inspection of maintenance of way tools, and it was indeed surprising to find the conditions of the tools in that department. In five weeks, I caused to be turned in to the supply department 485 defective chisels, spike mauls and wrenches and crow-bars. That was over 260 more than had been turned in to the supply department in the previous eighteen months.

Another thing you meet in regard to the tool inspection is to find the man occasionally who knows it all. I recall one instance of a man who was doing a small piece of work with a saw, a hand saw. He was wearing gloves that came out over the end of his fingers and dangled. The wind from the saw was moving the ends of the gloves. I waited until he got through because I was afraid if I spoke to him he would hurt himself. When he finished, I said, "Brother, don't you think it would be better for you and for your fingers, the only ones you have, if you would remove your gloves when you are sawing? I wouldn't take that chance in a hundred years." He said, "Let me tell you something, kid! I bought this saw nineteen years ago, and I have run it for nineteen years. They didn't furnish me with one when I came here so I bought my own and put it up myself. I pretty nearly know what I am doing. And let me tell you, if they cut my fingers off, they are going to pay me." I tried to talk to him later, but he wouldn't listen to me. The next time I went back there, I talked to him again. The third time I went back the

fellow in charge down there gave me a card from this man with five items on it and they were all good ones. Today, he has his saw guarded, and he told me that that glove stuff was off.

MR. WILLIAM D. LENDERKING (Baltimore & Ohio): In connection with the paper just read, we have instructed all our tool room men to make a careful inspection each day. In fact, the tools, as they are passed back after having been used by the man in the shop, are examined before being placed in the racks. If they are found defective in any way, they are laid aside to be sent to the proper department for such corrections as may be necessary. The matter of chisel bars, cutters, punches, tools of that kind which formerly gave considerable trouble and which we all know caused many minor injuries and sometimes very serious injuries, is being taken care of now to such an extent that it is scarcely necessary for the safety agent, in passing through the shops, to call attention to defective tools. There was, however, a time, and that very recently, when maul handles and sledge-hammer handles were giving us considerable trouble.

My understanding was that because of the conditions which the war brought about, proper materials were hard to obtain; I mean materials which otherwise would have had ample time to season were placed in ovens and dried, and in that way the life of the wood was sapped out. After having had a number of maul handles break, the engineer of tests told me that such things, under war conditions, were not to be overcome then, and we have found since then that the materials received for this kind of work are very much improved.

The matter of mauls was also giving us considerable trouble. I recall two cases where an entirely new eight-pound maul was taken out and two licks struck with it and the maul fell into four pieces. That was due to imperfection in the manufacture. We immediately traced up the entire purchase, and we found many of them that wouldn't stand the test. We found some had been shipped out on the road to the various shops, and upon inquiry in the various tool rooms where they had been used, I found they were giving trouble. In one place, seven of them had completely crumbled just as though they were made of clay. Most of this has been eliminated.

We find that our tools from one end of the system to the other are in much better shape today than they have been for a long while, and it is simply due to the fact that the men who heretofore were willing and satisfied to use a tool in any condition are now realizing the importance of having all such tools dressed and placed in perfect order before using. I have seen men who, in fact, when somebody would try to slip a tool through with a burred head, would flatly refuse to take it out and work with it. That is true because the spirit of safety has gotten into the men themselves. They begin to realize more clearly that the safety movement is one for their particular benefit and they appreciate it.

MR. E. RICHARDS (Cotton Belt Route): I want to ask if the use of emery wheels or Keystone grinders for dressing up burred chisels is con-

sidered satisfactory. My experience is that when you grind a burred head on an emery wheel or any kind of a grinder, it camouflages the burred head and the crystallized particles are still present. Little flakes will fly when you strike it. That manner of dressing burred heads, I find, is not satisfactory. It has to go to the shop to be heated and annealed before the tool is safe.

MR. W. H. STILLWELL (Chicago, Rock Island & Pacific R. R.): Two of our roadmasters requested that goggles be furnished track men and section gangs to use while doing this work. The matter is now before the general committee.

MR. LENDERKING: The matter of dressing tools is one that possibly too many men think lightly of. No tool that has been used long enough to be battered at the head and have burs should be put on an emery wheel and dressed up. It should go into a forge and be properly annealed before being sent out for use again. Otherwise, the crystallized heads will do the very thing we want to get rid of, and the only way to treat them is by putting them into a furnace and properly annealing them.

MR. CHAMIN: When I was Chairman of the Safety Committee of one of our shops before I was in this game thoroughly, the question came up as to how far down they should permit a head to be hammered before the punch or cutter was discarded. It was found that if a man had a favorite cutter or a favorite sized punch for a certain job, he would take that back and ask that it be dressed, and he would do this so many times that he would be working with a half inch of metal if you would let him. A limit was made in the neighborhood of an inch and a quarter or an inch and a half, depending upon the size of the tool, below which a tool could not be redressed.

Another question which has been discussed here is the matter of tool inspection. This was brought up in our shops and the practices are not exactly uniform, but in general, regular inspections are made either by some man appointed by the foreman or the master mechanic, as the case might be, or by some member of the Safety Committee. The responsibility of the condition of the tools is kept upon the foreman no matter who makes the inspection.

MR. C. W. MOYTS (Union Pacific): I am not a blacksmith, but I have watched the tool game pretty closely. This thing of grinding burs off of chisels is not dangerous at all. If the proper material is used to start with, the chisel will stand burring over as far down as you can bur it and hang on to it. However, if the tool has been burned in the blacksmith's fire, the metal becomes hard and the sparks begin to fly right away, which is a dangerous thing.

Where the men are using files and one thing and another around through the car department, there is only one thing to do and that is to have the safety supervisor keep track of them. If you leave it up to the foreman, he will let good enough alone. He will be in a hurry today and will pass them up thinking that he will take care of them tomorrow. Tomorrow never comes. Have the supervisor of forces hold the man who

is using the tools responsible, and if he won't use good tools, get rid of him.

As a general thing we inspect our tools every day. Of course, there are regular monthly inspections made, but every day is the time to keep these tools in proper shape. Tools that are continuously being used are bound to get defective, and there is only one thing to do and that is to keep them lined up.

Mr. F. C. HUNTER (Union Pacific): With reference to the maintenance of way department tools, we have a pretty good scheme on our road. We run a supply car over six divisions once a month. That supply train is accompanied by the storekeeper, the roadmaster, the supervisor of signals, the trainmaster, the superintendent, one of the members of the Safety Committee or Department. We find that by giving a thorough inspection of everything the conditions have improved. One of my first trips on a supply train developed the fact that there were a number of defective tools in the maintenance of way department. I immediately interested the general roadmaster on that division in the matter of safe tools. I had the pleasure of going over that division a month ago with the supply train, and it was impossible, by the closest inspection, to find a defective tool on his division. I feel that that man has done a great thing to protect his men in the matter of unsafe tools. I think that we can do that on every division. There has been an improvement in the matter of repair tracks. One of my first inspections of the repair track developed the fact that there is something about all railroad men that makes them want to collect and accumulate something from somebody else. Repair track men, in a great many cases, will pick up chisels and things of that kind that we are unacquainted with in that department and will use them. On my first inspection, I found a number of defective tools. I got next to the Safety Committee, the foreman, the sub-foreman, and demanded an inspection be made at the end of each day after the work was over of all the tools. Not only that, but whenever a member of the Safety Committee was going through that part of the terminal or wherever the track foreman was moving about on the track, he would pick out a set or a few sets of boxes and go through the tools thoroughly. I find that that has made a great improvement in the condition of tools.

Recently, I looked through twenty-five boxes of tools with the result of finding three burred chisels, probably the effect of work during the day, but the men had put them back in the boxes and expected to dress them up that afternoon, while eight months ago, there were more than that. I believe that is a scheme that can be used universally. If a man is up against a surprise test at any time, not knowing when he will be called upon to account for the condition of his tools, you are going to have a better condition than you will have under a stated inspection period.

Mr. D. K. RAWLINGS (Oregon Short Line): In regard to the repair track, I would like to say that on my first visit to Pocatello I got in touch with the general car foreman and his assistant. We went over

the repair track to make an inspection of the boxes. About the third or fourth box that I got to was enough for the men to know all about it, and it spread over the track like wildfire that we were making an inspection of the tools. Wherever we found a tool short, we supplied it, and wherever we found a hammer in a handle that didn't fit, we had a man put a new handle in. We improved their tools, I would say, 90 per cent. On the next inspection, every man on the track was asking, "Are you going to inspect our tools today?" We said, "Yes." They said, "Our boxes are open." We went through every box on the track and supplied them with new, good tools and equipped them to such an extent that they were mighty glad that we went over their boxes. In doing that, we got in closer touch with every man on the repair track. I took the name of every man on the repair track and talked to him personally. There isn't a time now when I go over the track that these men don't come to me and say, "Come look at my tools. Tell me if I can make any improvement." They are keeping their boxes clean; they are keeping out the oily waste and the things that are hazardous and cause fire, such as an accumulation of dirt, grease, and the like in the boxes.

I have the cooperation of every one of those men along the repair track. I have been in close touch with them, and today I think I could go over the track and make an inspection of something like 240 boxes on the track and I don't think that out of the 240 I would find 200 bad tools other than those burred in the day's work.

At Milford, on the Los Angeles and Salt Lake, after holding a second or third meeting in the Milford shop, one of the men of the pipe shop came to me and said, "You gentlemen are preaching safety first and you are telling us about what to do. I wish you would come to the pipe shop and look at the tools we are working with." After the meeting was over, I went to the pipe shop. I am sorry to say that I did find a bad condition there. I talked to the man in charge of the shop, and we went to the store department and found enough material there that had been in the store department for nine months to repair every one of their tools and put them in first-class shape. It showed them that we were actively engaged in the things that were necessary to make it safe for them to work.

MR. CARROW: How long ago was that?

MR. RAWLINGS: In January of this year.

MR. F. S. BARCOCK (Pittsburgh & Lake Erie): I would like to ask the previous speaker whether his inspection of tools includes inspection of jacks. I would also like to ask what method of inspection he pursues in going over these jacks and determining whether they are in proper shape for lifting a load.

MR. RAWLINGS: All of our jacks on the repair track are inspected monthly. The jacks have all been painted red. They start in at the bottom, and they put a ring around the jack for each month that it has been inspected. When we come to a jack in the seventh month that has only six stripes on it, we take it out and send it to the shop, and we have a man at the shop who does nothing but work on jacks. We use

nearly all Norton screw high-speed jacks. They are taken down and the threads are examined and all the levers and latches and ratchets are gone over to see that they are perfectly square on the ends and not rounded. The jack is then oiled; we put a special grease in the head of the jack that keeps it moving all right.

MR. BARCOCK: With reference to the ratchet jack, I want to say that on several engines, shortly after the jacks have been inspected, we have had men hurt by a slip of the ratchet, the handle flying up and striking the man's jaw or some part of his body. We try to make the best inspection possible, but sometimes there is a defect in the ratchet which is not detected in the inspection. It is pretty hard to determine a defective jack until you really give it an actual test under load. Do you do that?

MR. RAWLINGS: Ordinarily, if a jack should kick or anything else happen to it, it would be taken out of service. The men would report it themselves. We make this monthly inspection, oiling and testing, but we don't test under load other than in service. If there is anything defective, it is reported. We have a card that goes on the jack immediately if it is defective, but whether it is defective or not, it goes under inspection. The jack is taken down and oiled, the cases are taken off the side and the ratchet is taken off to see that it is square on the end and not rounded. Sometimes they become round on the end. That very often causes a slip.

MR. DAVID MORE (Union Pacific): I want to tell you how far we have gone into this tool inspection. Our general manager gets a tool report from every shop on the U. P. every morning. The greatest trouble we have is among the men. There are two men in this country that we have to fight, and we have to fight them hard. One is the ignorant foreigner who doesn't know anything, and the other is the self-satisfied, conceited American.

We sent a man over the road to put safeguards on every machine that he could possibly get his hands on so the operator couldn't possibly hurt himself. He went up to one old man's machine and put a safeguard on it. The old man looked at the machine and said, "I don't want that on there. I have run that machine for thirty years and I don't require it. I know how to run that machine." When the safety man was gone, he took the guard off and threw it away. He was the self-satisfied, conceited American. The consequence of that is this: The guard was put back on that machine again and he took it off again. Two weeks from that day, our self-satisfied, contented, conceited American came up minus two fingers. He forgot what he was doing. Now we can't tolerate that. A man of that kind shouldn't be retained. We don't want such men.

The other fellow is the ignorant man. We have one man in our car shop who was injured with tools twenty-seven times in ninety days. That was a fact. He was an ignorant man and you couldn't talk to him. That was some years ago, when I had charge of the safety work in the U. P. shops in Omaha. I just know that to be a fact because I checked

up on it. I got the doctor's records and I got the records of the accident clerk and they couldn't fool me. I have the record of every employee on the U. P., whether he is a safe or unsafe man, and I can tell how many times he reaches the doctor. One morning, when I was in the doctor's office, he told me that he had had this same fellow back again. I asked to have him dismissed. He said, "What is the matter with me? Don't you think I'm a good man?" I said, "Yes, you're all right, but suppose all the employees on the U. P. were to be injured twenty-seven times in ninety days. We could not get enough doctors to attend to 32,000 employees." We don't want that kind of men.

I will tell you another thing that we have, and I will ask you to consider it. At one of our terminals, we have a novel method of checking up accidents. This is the way it goes: we post as follows: "For the last so many days, we have had no accidents in this plant." I look at that every time I go to that terminal. I go and see what is on that board. It is up there where everybody can see it. There were sixteen days in that plant, one time, when they had no accidents. One day they had an accident, and they all wanted to find the guy that broke the record.

At the bottom of that board is written "Safety Committee". Nobody's name in particular is put on it. It just reads "Safety Committee". That bulletin creates enthusiasm in the boys and they help us.

CHAIRMAN MEYERS: We have with us this morning Mr. Hawley, General Secretary and Treasurer of the Brotherhood of Locomotive Firemen and Engineers. Mr. Adams tells me that he succeeded in getting him to take part, this morning, in our program in place of Mr. Shay, who is the President of this organization, and whose presence is required elsewhere. We would be very glad to hear a few words from Mr. Hawley.

MR. A. L. HAWLEY: As I look among the members present, I see some of those whom I met years ago when I was engaged in the Interstate Commerce Commission work in the inspection of safety plans. I was the fourth inspector appointed. I stayed with the Commission eight years until I accepted my present position. I believe that I had a very good opportunity of seeing the advancement in the work of trying to protect the railroad employees. I know some railroads were in very bad condition, and I believe it only needed a little stirring up on the part of the government to have those railroads begin to look after their equipment. At the time I left the Commission, the improvement in the condition of cars and engines on the railroads over which I traveled was so noticeable that the average employee was speaking about the advances that had been made in looking after the interests of the employees in so far as the safety feature of it was concerned.

We closed our convention in the middle of July, in the city of Denver. There were about 540 delegates present. They unqualifiedly went on record unanimously in favor of the Safety Section in connection with the railroad employees, so that if the work is continued, as we hope it will be, you will have the hearty cooperation, in so far as the officers can prevail upon the members, of the Brotherhood. I hardly feel that it will

be necessary for them to put forth much of an effort. I do feel that you will have the cooperation of all those who are members of the organization which I happen to represent this morning.

I talked with a good many of our delegates at the convention in connection with the safety movement and the safety feature of it, and those who had taken a prominent part seemed to be enthused over the manner in which the safety features were being handled. They seemed to feel that all that was necessary was a continuance of what had already been done and what had already been put into effect, and that there would be less injuries and less deaths on account of neglect or something of that kind in connection with the employment.

It has been over ten years since I left the service of the Commission. I am going to take this opportunity of saying that my experience during the years that I was with the Commission showed that there was a lack of the railway companies furnishing the proper repairs in order to maintain equipment as it should be maintained.

Inspectors, as they pass through this city, whether they be new or old, generally drop into the office to shake hands with me, and I naturally ask them how things are going. They tell me that many bad things have been eliminated. If that is true, no one can say that the work is not redounding to the benefit of all the railway employees. That was one bad feature that we found during my time with the Commission. If the railroad companies will furnish the necessary supplies in order to make repairs when they are needed, I feel satisfied that the accidents will be reduced very materially.

All that is necessary, I believe, in order to make the Safety Section a pronounced success is a hearty cooperation of officials and employees.

I listened with interest to the remarks of the gentleman from the Union Pacific with reference to the cooperation of everybody, and especially that feature of his remarks where he said the bulletin was up there where everybody could see that they had gone for such a long time without an accident, and how everybody got around the board when they found one accident put up there. That shows that there is an interest being taken by nearly all of the employees, and if that work is continued that interest will grow, and I feel satisfied it will redound to the benefit of all railroad employers in so far as accidents are concerned.

I am glad that I have had this opportunity to say a few words to you, even though it came unexpectedly. I sincerely trust that the work in which you have been engaged this past week will result in much benefit to every one, that you will go to your homes carrying with you the thought that there is renewed vigor on the part of everybody to try and reduce the number of railroad accidents, no matter how large or small they may be, and if you carry to everybody the thoughts that have been expressed to you by the many who have addressed you and the thoughts that have emanated from your own body, I feel satisfied that as time goes on, you will find the accidents reduced almost to a minimum, and the railroad employees will feel that there is an interest being taken in them by the officials. They will come back with the same interest and

will try to avoid every accident, and soon you will have good reports of a month or more passing without any accidents.

CHAIRMAN MEYERS:—I know we all appreciate the very interesting remarks made by Mr. Hawley. We are very glad to have had him with us this morning, and we hope that he will be with us again.

The next number on the program is a paper by Mr. J. L. Walsh.

HAND AND MOTOR CAR ACCIDENTS

J. L. WALSH, SUPERINTENDENT OF SAFETY, MISSOURI, KANSAS AND TEXAS
RAILROAD OF TEXAS, DALLAS, TEXAS

When railroads were put in operation it was soon found necessary to provide some means for getting maintenance material, tools, and men to and from the work, and the means at first provided was a small car somewhat similar to the push car of today. This car was awkward, slow, and required considerable effort to operate. From this beginning hand cars were developed on the principle of a windlass transmitting the power to the wheels through a belt. Improvements were gradually made, developing the present-day hand car with a walking beam, transmitting the power to the wheels through gear. These improvements increased the speed at which the cars were operated, saved time and labor, but also increased the number of accidents and injuries.

About twenty years ago when the gas engine was brought out, experiments were begun in fitting these engines to push cars, and improvements made until we have today quite a selection of more or less efficient motor cars which provide the modern means of transporting maintenance men and material. Motor car manufacturers are spending considerable time and money in perfecting their cars and are of course anxious to put out the safest practical car possible. As this is very much to our advantage. I would suggest that railroads will materially benefit by coöperating with these manufacturers to develop a safe car, and that this can probably best be done by periodically giving the manufacturers a synopsis of the number and causes of motor car accidents, probably through the Safety departments.

With the increasing cost of labor and the pressing need for increased efficiency in all departments of railroad work which is to be brought about by increased supervision, the field of the motor car, already a wide one, is being extended very rapidly. They are not only now being used to advantage by track department employees, but by telegraph department linemen and repairmen, tie inspectors, stock claim adjusters, maintenance and valuation engineers, car inspectors and repairmen, painters, fire patrol men, signal maintainers, as well as by superintendents, roadmasters, supervisors, train masters, and others for whom it is necessary to get over the line, making frequent and irregular stops. The gasoline motor car is to the hand car what the automobile is to the horse-drawn vehicle, and I believe it will be but a comparatively short time until all railroads will adopt the motor car as standard over the hand car, for the reason that the motor car has demonstrated its value as

a time saver, as well as a labor saver. A section or a bridge gang pumping an old style hand car eight or ten miles to work have but little energy left for their regular duties, and in addition, the prospect of the return trip when the day's work is finished.

Injuries incident to the operation of hand and motor cars on the lines I represent for the year 1918 were about 5 per cent of the total. I find in classifying 275 of these fatal and non-fatal injuries that the principal causes were as follows:

Collisions

Train and Motor Cars.....	27
Train and Hand Cars.....	16
Motor Cars	11
Hand Cars	4

58

Derailments

Motor Cars	35
Hand Cars	9

44

Falling From

Motor Cars	15
Hand Cars	18

33

Getting On and Off

Motor Cars	46
Hand Cars	2

48

Lifting

Motor Cars	13
Hand Cars	32

45

Persons Struck By

Motor Cars	15
Hand Cars	24

39

Other Causes

8

275

Total Motor Car Accidents.....170

Total Hand Car Accidents.....105

The greater number of serious injuries are sustained in motor and hand car collisions and derailments, and it will be noted there were 102 such accidents, injuring 37 per cent of the total. The great majority of all motor car accidents are caused by main failure, that is the failure to comply with the operating department's rules, lack of ordinary care and

good judgment in operating the car, or in operating a car that is in defective condition, which could have been noted by a proper inspection, and corrected. This is the human element which has been mentioned so often and which can only be corrected by education.

When efforts are made to reduce the number of hand and motor car accidents, the first consideration is usually given to the rate of speed at which cars are operated. When accidents occur, such as collisions and derailments, the rate of speed at which car is being operated certainly has a great deal to do with the severity or extent of the injury sustained, but the speed of the car is not usually the primary cause of the accident. While division inspection cars might be operated safely at twenty or twenty-five miles per hour between stations on straight track, I think the general rule for section and B & B cars should provide a maximum speed of fifteen miles per hour between stations, and a maximum of ten miles per hour over road crossings, through yards, over frogs and switches, in cuts, on curves, and during foggy weather.

ORGANIZE MOTOR CAR DEPARTMENT

Railroads adopting the motor car as standard for the maintenance of way department, and others having occasion to use them, should organize a motor car department, in charge of experts to keep the cars in repair, to make frequent inspections, and adjustments from time to time, and to educate the employees using the car in its proper maintenance and safe operation. The expense of such a department should be offset by less delays and greater efficiency in cars in use.

On some railroads it has been the practice in the past to allow foremen to purchase their own motor car or gasoline engine with their personal funds, and in the latter case, a foreman usually fits the engine to a dismantled hand or push car, and creates a home-made motor car. This practice I think should be prohibited, as it is wrong in principle to require the employees to purchase their cars, and it leads to bad practices on the part of the foremen in many cases. Instances have developed where a section foreman made a monthly charge on his men for taking them to and from their work on motor car, in order to reimburse himself for the cost of the car. Other bad practices have also developed in this connection that have probably cost the Railroad Company more money than the purchase of a car would amount to besides encouraging dishonest methods among employees. In addition to this, hand and push cars are not constructed sufficiently strong to stand up well in service under the strain and pounding to which they are subjected when equipped with gasoline engines. These home-made motor cars in many cases are not properly equipped with the necessary safety devices, such as seats, guard or hand rails on the front of the car, toe-boards, and proper hand breaks.

The service for which a motor car is intended should of course be taken into consideration when car is ordered. Thus, the car intended for use of the superintendent, supervisor, or trainmaster in making inspection trips on the district, might well be fitted with an automobile type body, free running engine, electric starter, electric lights, signal

horn, etc. These facilities however greatly increase the cost and weight of the car, and make its operation and maintenance the work of expert mechanical ability, which we cannot expect among the rank and file of our maintenance of way employees.

For general use the motor car should be as simple as possible, fool proof, easy to operate and maintain. These cars I think should be of the direct connected type, two-cylinder engine with its few parts to get out of order and adjustment. If possible to attach a speed governor restricting the speed to a maximum of fifteen miles per hour to these cars, one that cannot be easily disconnected or tampered with, one that is simple and will not cause engine trouble, would suggest that all cars for general use be so equipped. There should be a curved hand rail or guard extending to the floor in front of car, and also a toe-board, to prevent tools and material from bouncing off and derailing it. The wheels should not be more than sixteen inches in height, and the floor of the car should be extended flush with the outer edge of the wheels to prevent men getting their feet under the wheels in attempting to board the car from the side. Last but not least, each car should be fitted with a positive acting, effective hand brake.

The surest method of keeping hand and motor car accidents to a minimum after adopting a practical, properly-equipped car as standard, best suited for the purpose intended, is I think, to promulgate a practical set of rules covering their inspection, maintenance, and operation, and see that they are strictly complied with.

I will not attempt to outline a complete set of rules or instructions in this matter, as they would necessarily vary under different conditions, but the following are some of the points that should be covered:

SUGGESTIONS FOR INSPECTION, MAINTENANCE, AND OPERATION

Some member of the gang using the motor car, other than the foreman, should be assigned and trained to operate the car, thus leaving the foreman free in going over the line to make necessary inspection of the track, bridges, right of way fences, etc., and also allow him to act in the capacity of conductor. The foreman, of course, should be equipped with the current time table and standard watch.

Each member of the gang should be assigned a certain regular place on the car, overcrowding avoided, and expected to keep a sharp lookout for trains in each direction. Certain members of the gang should be charged with the duty of flagging in either direction if necessary, and equipped with the necessary flagging equipment.

The men charged with the responsibility of putting the car on the track and taking it off should be assigned to a regular position with reference to the car, instructed and frequently drilled in the most practical and safest manner of handling the car, somewhat similar and for the same reason that boat drills were held on our trans-Atlantic steamers during the submarine warfare. This will result in less confusion, and increase the cooperation in cases of emergency.

Certain members of the gang should be assigned the duty of starting

the car from the rear, the other members of the gang taking their seats on the car before it is started.

Instructions should be issued and the men trained in the safe manner of loading tools and material on the car in such a way as to avoid chance of it falling off and causing derailment.

Motor cars should not be operated at night except in cases of emergency, and then only when protected by a red light that can be seen from both directions.

Employees should be prohibited from standing on the car or attempting to mount or dismount from same while in motion.

If truck or push car is attached to the motor car, it should be coupled close, and the men pushing the car to start, must push from the rear of the truck or push car. The truck or push car should never be placed ahead of the motor car.

Motor car should not be set off on public highway as serious injuries have occurred to drivers because of teams being frightened.

When necessary to apply brakes in emergency cases, warning should be given to all occupants of the car to prevent chances of their being thrown off by a sudden slackening of the speed of the car.

Motor cars should not follow a moving train closer than one thousand feet, nor follow another motor or hand car closer than five hundred feet.

The use of motor car should be confined strictly to Company business and should not be taken off the section on which it is assigned, except on instruction from superior officers, or in case of storm or emergency making it necessary to file report at nearest telegraph office and secure instructions.

Motor and hand cars should be thoroughly inspected by operator daily before starting to work, and necessary repairs and adjustments made.

The gasoline motor car has come to stay, and I believe all the railroads using them have issued rules and regulations governing their operation, but there is a general neglect in enforcing them, and little attention is paid to maintenance forces until a serious accident occurs, when for a short time the matter has more or less attention, followed by a gradual relaxation, until another accident occurs. We must bring about a realization that an injury or death among our maintenance forces is just as serious as in any other department of railroad service, and make a consistent effort to prevent them through safety education.

DISCUSSION

MR. D. C. SULLIVAN (M. & N. Railway): I notice that Mr. Walsh has said nothing about cars carrying torpedoes, which I think every car ought to carry.

MR. J. C. CLARK (Oregon Short Line): If I recall Mr. Walsh's statements correctly, they were to the effect that the car should carry full flagging equipment which would include torpedoes.

CHAIRMAN MEYERS: I would like to have this discussed by Mr. Johnson.

MR. O. F. JOHNSON (M. & St. L.): This paper gives in a very clear and concise manner the way motor car accidents occur and how they should

be avoided. I will make a few remarks as to how that is handled on our railroad. I might state, for your information, that we have approximately 265 hand and motor cars on 1,600 miles of railroad. One hundred and sixty-three of those cars, or 69 per cent, are equipped with motors. The balance, or 31 per cent, are common, ordinary hand cars. On only about one dozen of these cars that I mention are the motors owned by the railroad company.

It has been the practice for years to have the section men, the foremen, and possibly some of the men, purchase their own motors and install them on the handcars by removing the handles and part of the frame. This worked out fairly well. However, in a good many cases, we find motors are attached to hand cars that are not in very good condition. As a result we have accidents. The motors we have on our railroad at the present time comprise probably twelve or fourteen makes. I think you will find that quite a number of accidents are caused on the railroads in the United States through the fact that the car body is not of sufficient strength to handle the motor. Like a good many other lines, we make car bodies in the shops, and sometimes we have found that the section man used a battered up car and before we knew it some accident happened.

The paper that has just been read has a classification of 275 fatal and non-fatal injuries. The principal causes shown under the following classification are:

1. Collisions. I might call your attention to a few accidents that have happened on our railroad. In one case, the car was running about twenty miles per hour in a fog. Two cars collided. We found, upon investigation, that one of the cars had no light on the front end, which, of course, is against the rules of our company.

2. Derailments. In one case, a car struck two dogs on the right-of-way. That is something that could have been avoided by proper care on the part of the men. In another case, a car jumped the track due to the fact that the man operating the car was an unfamiliar person with the route and the track was also more or less rough. In another case, they ran into an open switch, throwing the men off. This could have been avoided by care. We had one accident where a car was derailed on account of a loose wheel and because the gage of the track was a little too wide on a curve, in other words, wider than standard gage.

Here is one case where a car jumped the track due to the fact that the engine was placed on an old hand car body. The body was badly worn and should not have been used. The foreman used his own judgment about using an old hand car body, and instructions were gotten out to discontinue that practice. We had one more case due to mechanism out of order on a motor, and as a result it was necessary to operate the car full speed in order to move over the railroad. The section men took a chance and as a result they had a derailment.

3. Falling from car. We have had several accidents from that. While riding on a hand car in front of a gas car, a man tried to stop the hand car by holding on to the gas car and was pulled off on to the center of

the track and run over by the gas car. That is rather an unusual stunt.

4. Lifting. The section man and laborer were putting a car on the track. While turning the car around on the track, the man assisting the foreman, dropped his end and as the result the foreman fell over.

5. Persons struck by. We had one case where a car was struck on a public crossing. There was a cornfield on the west side of the track and an automobile was coming along. The section man bombarded over the crossing and struck the automobile.

6. Other causes. We had several cases where the men got on the motor car from the front end instead of the rear, which resulted in three reportable accidents.

In this room, there are representatives from almost every railroad in the United States. Every railroad has a different set of conditions with which to contend. Some roads have tracks that are ballasted with rocks, others with slag, others with cinders, some with dirt, some with mud. Whenever you find those conditions existing on railroads, those roads are in line for accidents that would not apply to the hard-grade railroads. A good many railroads have a heavier rail than others. They have straight tracks, very few sags and hills. In the Spring the roads get rough and a man has to exercise a great amount of care to keep his motor car on the track.

For some reason or other, we have had quite a number of motor car accidents within the past six months, and I believe a lot of other lines have had the same trouble. I am unable to tell what is the cause of it. Except what few rules are in the operating rule books, our railroad has gotten out no special rules in the way of a booklet, except that we have issued one or two bulletins.

I will call off a few of the instructions to our men: Inspect cars before leaving tool house. See that tools are properly loaded before starting. See that men are seated on the car, both motor and trailer, so their feet will not get caught in frogs or switches. Have pushers get on from behind and not from sides. Do not overload the car. Run car yourself. Do not permit others to operate it unless they are capable. Obey flagging rules. Watch the speed. Fast speed spells danger. Approach highway crossings at slow speed. The more obscure the view the more need for caution.

Unsafe practices: Trying to beat an automobile or team to a crossing. Trying to get to a crossing either ahead of or against an approaching train in order to get an easy place to get off. Racing cars one behind another and running them too close together. Pushing a carload of either men or materials ahead of the motor car; the load should be pulled behind always. Leaving a car on the track any considerable length of time while doing work in the vicinity. Taking parties out for joy-rides or carrying passengers. Parking cars on a public crossing, and many other practices.

I don't know what information I can add to what has already been said. The subject is a big one, and I know that there are others who would like to discuss the matter.

One other thing, first: There are no hard and fast rules that can come

out of the book of rules that is issued, and any of the special rules that are gotten out in regard to handling motor cars, except that all men should use extreme good judgment the same as they do in other work, should be well applied to see that everything is done along safe lines.

MR. STILLWELL: I would like to ask a question. I assume from Mr. Walsh's paper and from this gentleman's statement that they are using a motor car that is direct connected, that the men have to push and then jump on after they get the exhaust started. There are cars with belt transmission where they crank the car and they don't start until every body is on, and they can go at any rate of speed they want to and there is no danger of anybody getting caught in attempting to jump on. What I would like to ascertain is this: Do the gentlemen present find that there are a greater number of accidents in the use of either one of these styles of cars?

There has been nothing said about an audible signal, approaching highway crossings. We have had a great many recommendations to equip our motors or motor cars with the Klaxon horn. I have opposed it, claiming that with a Klaxon horn on a motor car, at crossings in the city, if a horse-drawn vehicle or automobile were to approach and hear a Klaxon horn, they would assume it was another automobile on the highway and wouldn't look up and down the railroad track. It has been contended that we should equip them with a bell. I claim that we ought to have a gong. I think we ought to have something different than those used on automobiles and loud enough to be heard quite a distance away.

MR. JOHNSON: I might say that we have no audible signals on our motors except those on two Ford cars that we use for our superintendents. Those two particular cars are equipped with a whistle signal like the automobile signals.

Practically all of our motors are direct connected. In fact, all of them are, and it is a case of getting out and pushing.

MR. WEBB: Following up what Mr. Stillwell said, we are tremendously interested in this thing. We have had a regular epidemic of accidents the last three or four months, due not to the speed of the cars but to tools falling off. At the last meeting of our general committee, the general superintendent was instructed, together with the chief engineer, to design a standard for our motor car equipment, looking to the proper safeguarding of that feature. After digging into the matter, I find that there are two or three different kinds. I would like to know from some of these men who have the cars already if they find satisfactory that type that has an arch over the front with a bar running through the center to the back, high enough for the men to hold to, and then an arch at the rear, closed in, or a standard at the rear.

The point was raised that the man getting on after pushing the car, unless we left it open at the rear, would find it difficult to get on and in case of an accident it would be difficult for the men to unload.

I want to know what has been the experience of these men. Do they have the safeguard at all? Perhaps you who are running and using a perfectly guarded car can tell whether the type of motor car in use is

successful in keeping the tools on the car as they have it guarded, whether those cars have provision made in the shape of a receptacle or some other way for the tools, or are the tools placed on the car depending upon the guards in front and rear to keep them from falling off, and whether the installation of such guards, particularly in the rear, would interfere with the men getting on and off the cars.

We are designing a standard to be used on our line. If there is a successful standard, I would appreciate knowing it tremendously, because we are paying for the fact that we have no real guards on our cars at the present time.

MR. CLARK (Oregon Short Line): I would like to answer that question partially at least. A few years ago, we equipped our motor cars with the hand railing. We used it complete in front. In the rear we had just an arch to the box that houses the motor; that left the platform at the back free.

Just a word of warning: After we had equipped a large number of our cars with this hand railing, which was designed by one of our own men, we found the device was patented and had been for sale by a railway supply firm. You might get into trouble if you don't observe that point.

With regard to the free-running engines, we have a large number of Buddha engines or cars which have a friction drive and are free-running engines. We have a large number of Sheffield cars that are direct connected. I haven't analyzed our injury reports to determine if one car causes more accidents than the other, but looking at it from a practical standpoint, I think there is no doubt that the free running engine is preferable from the safety standpoint.

There is another point that Mr. Walsh brought up in his paper that I think is of very great importance. A year ago this month, we had a section man killed. It happened in this way: They were starting out to work in the morning, and the foreman was running the car. While he was doing that, he was watching the track. They came to a road crossing, and some of the men saw a team approaching on the highway, but they supposed that the foreman would see the team also. The driver of the team saw the motor coming, but he got up so close that the end of the tongue, or probably the neck-yoke, was so close that it struck one of the men on the car. It knocked him off and he was killed. It broke his back. There is a case where, if the foreman had had some one else running the car or some man assigned to look out for what might be on the track and approaching on the highway, and give instructions, the accident might have been averted.

That is just an illustration of the point Mr. Walsh brought up, and I think it is very important.

Another thing that I wish to mention is the speed at which motor cars are operated. Mr. Walsh showed that out of the total, there were 58 per cent, I believe, due to derailments and collisions. It is very probable that some of the collisions could have been averted if the speed had not been excessive, and no doubt a large proportion of the derailments were due to excessive speed. On the line that I represent, I am

convinced that the speed—the high speed—at which the motor cars are often operated is the cause of a great many injuries. I have found that it is practically impossible to get the men to hold down their speed. They are in a hurry to get home, and in a great many cases, we have them call the dispatcher to find out what trains are on the road. It frequently happens that the dispatcher will tell them that a certain train will leave a side-track maybe eight or ten miles away at a certain time, and they will run at excessive speed to make that distance first, because if they don't get there, they will have to take their car off and cause a lot of delay.

There is a governor appliance that will, if applied, give the necessary power to climb hills and also get a maximum speed, holding the speed down. I have seen one of them. In order to go on record, and possibly get some action on this important question, I wish to offer a resolution.

RESOLUTION

"WHEREAS, The largely increasing number of accidents and personal injuries result from the operation of track motor cars, and

"WHEREAS, A large number of such accidents are the result of excessive speed in the use of these cars, therefore, be it

"RESOLVED, That the Steam Railroad Section of the National Safety Council, assembled at Cleveland, October 1-4, recommend and urge that motor cars be so constructed and built that they will not exceed a speed of fifteen miles per hour, and be it further

"RESOLVED, That a copy of these resolutions be placed in the hands of all the principal manufacturers of track motor cars."

I move the adoption of this resolution.

(The motion was seconded by Mr. Robert Scott.)

Mr. Geo. L. Wmerr (Chicago, St. Paul, Minneapolis & Omaha): I would like to ask Mr. Clark if there is not an engine manufactured now that makes it impossible for the section foreman to exceed fifteen miles per hour. We have such an engine on our line, and it is impossible for them to exceed that speed. It is the Fairmont, manufactured at Fairmont, Minnesota.

Mr. WALSH: Mr. Chairman, we have those same engines, but we find that they are easily tampered with. If the section foreman wants to go thirty miles an hour, he can do it. We must get away from the use of a governor that they can regulate. We must get something automatic that cannot be monkeyed with.

Mr. CLARK (Salt Lake City): All this is a gas engine proposition. Every tractor that is manufactured has a governor on it. I happen to own one and operate it myself and I know that the governor is effective and cannot be tampered with easily. You have to take the whole case of the engine off in order to get at the governor. I have looked at the governor on a good many gas engines, and I know that there are several kinds that are effective. They are inside the case of the engine, so that you can't get to them without taking the engine down. They are

not sensitive; that is, they are not easily out of adjustment. If you get them set once, they will run as long as the engine will, practically, without being adjusted or tampered with at all, and it would be impossible for the ordinary man to get into that governor and make any changes.

MR. CARROW: Mr. Chairman, I have followed that resolution very carefully, but I am afraid that I didn't digest it.

(The Chairman reread the resolution.)

MR. CARROW: I have had something to do with this subject. I was in touch with it several years ago. I don't know anything about it from a technical standpoint, but I do know there are many divisions on our railroads where we operate the motor cars by train orders, and fifteen miles an hour would be simply out of the question under such circumstances.

It seems to me that the resolution has some features to it that might involve some delicate points. I doubt the propriety of subordinating efficiency to that extent. I can't see where a motor car, if it is going between points on a straight line on a good track, could be benefited by that. I don't think the efficiency of the railroad operation should be curtailed unnecessarily by curtailing the speed of the motor.

As I said, I am not speaking with any definite technical knowledge, but that is just the way the matter appears to me from a general impression of it.

MR. ROBERT SCOTT (Atlantic Coast Line R. R.): I was partly responsible for this resolution. I would like to clear up just one or two little points. We don't want to sacrifice efficiency, but we do want to introduce safety in the operation of motor cars.

On our line, we have had some very bitter experiences during the past six months, whereas up to that time we had enjoyed almost absolute freedom from motor car accidents. Those who followed the reading of this resolution very closely must have observed that we are not making this thing mandatory on any manufacturer or on any railroad. We are simply attempting to have this resolution passed for the moral effect which it will have in the reduction of these motor car accidents.

MR. DAVID MORE: On our railroads it hasn't been a question of speed that has caused the accidents, but it has been two other things that were brought up. One is a question of man failure, and the other a question of a car not being built mechanically right. We have proved that. There is a car that is centrally driven, with an engine in the center of the car, delivering the power to the two wheels or two sides, and there is the side-driven car. Our accidents on the Union Pacific Railroad have been altogether caused by the side-driven car, which is a mechanically imperfect car. I can prove that to you. It is a question of the engine driving the car on one side and having a tendency to push the car off the track: to overcome that in that style of car, they have a concave wheel which has a tendency to hold the car on the track. The outrigger wheel is set at an angle of $\frac{3}{8}$ inch to curve that car over to the side on which it is driven so that the car is kept up against the wheel.

We had an accident at Lindenwood, about seven miles east of Lawrence, Kansas, where a car was derailed and a man fell off. We made an investi-

gation and found that the concave wheel got in between the point and the stock rail, and the three men sitting on there were of sufficient weight with what was already on the car—950 pounds, we figured—to hold the concave of that wheel between the point and the stock rail and throw the outrigger wheel off. One man fell off and his leg was broken.

It is a mechanical proposition with me. I took that car out with the supervisor. I told his man to just push it straight along and let us see what effect that had. There was a little recess between the point and the stock rail, and that car followed the same process that it did when the man fell off. These cars right themselves at eighteen feet, six inches. We took that car, made a mark, measured off eighteen feet, six inches and put the car to the outrigger wheel, and at eighteen feet it was righted. That car was properly lined for business then and there was no defect.

We had another case in Kansas where a man took one of those cars of that type out to test it. He had another man with him. The two of them sat on the seat, and one of the men, unfortunately, turned around to face the back suddenly; his weight lifted the outrigger wheel off the track and it shoved the car off; he fell off and was killed.

I am here to say to you men who are discussing this question that a side-driven car is not a mechanically perfect car, and until you get a centrally-driven car, you are going to continue to have these accidents.

Take the other side—the man failure. Up here on the Kansas Division, to show both sides of the question, we had some foreigners. Unfortunately, we have to have those men for that kind of work. Coming through there, the Rock Island runs on our track. These foreigners were out on a motor car. They had a time table and they knew that the Rock Island train was on time, but they got off of the car, like fools, and stood there arguing as to whether they should take it off the track there or at a point about two feet further away. The engine struck the car. That was an accident due to ignorance or bull-headedness.

We have analyzed these statistics. Mr. Groome, who has all the statistics of motor-car accidents on the U. P., will no doubt find some of them listed under too-high speed. That isn't the trouble on our railroad; neither is the trouble due to tools falling off. It is a case of mechanical imperfection in the cars used.

In the case of a joint that is $\frac{1}{8}$ -inch higher than the rail: I have tried this out at twenty miles an hour, and when you strike that high joint, the outrigger wheel will jump out from $\frac{1}{2}$ to $\frac{3}{4}$ -inch. The faster you go, the higher it jumps and the greater danger there is.

I took it up with the Fairbanks and Rand agent. We will have to change that imperfection in the construction of the car before we reduce our accidents on that line.

MR. FRANK E. OLDS (Union Pacific): I just heard the remark that motor cars on a line were operated under train orders. I would like to ask Mr. Carrow if the men have passed the standard rules and regulations examination.

MR. CARROW: Yes. Mr. Murphy can tell you about that.

MR. MURPHY: They are operated under train orders and the persons stand the examinations.

MR. CARROW: It has been some years since I handled that question; I presume that everywhere between New York and Pittsburgh and on many of the larger branch lines the motor cars are always operated under train orders.

MR. GROOME: It is a fact that we are having too many motor-car accidents on our road, and almost all of them, if we trace them down, reveal the fact that they are being operated at too-high speed for the load they are carrying. Men start out and when they see a train coming, they open up to beat it. We have tried, without much success, to get a car that will reduce to a speed of fifteen miles an hour, but we seem to have more cars that will run forty-five or fifty than fifteen, especially going down the mountain grades. The men like to run and get home.

We have a number of minor accidents, men falling off the cars and getting their feet or their hands run over. The thing we have to do is to get a car, as Mr. Clark indicates in his resolution, that will not exceed fifteen miles per hour.

I know there is some discussion about operating a motor car by train orders. I don't think that a track motor car ever is operated by train orders. We have an automobile car that runs on the track—an inspection car—and that we handle with train orders. In such cases, there is always a man with the car who has passed examinations on train orders. I think that on Mr. Carrow's road that is the kind of car they are referring to. It would be utterly impossible for a man to handle a motor car on train orders.

MR. MURPHY: We do handle all our motor cars on single track with train orders, and other motor cars, too.

MR. MERCALFE: There isn't a question that we discuss more frequently at these gatherings than this motor car question. To my knowledge we have discussed this same question in about much the same way for four years, and we are in exactly the same place we were four years ago as far as any real action is concerned.

Personally, I don't believe that resolution submitted by Mr. Clark is going to be good. It is a question that each individual railroad has to handle for itself. On the Northern Pacific, there are more employees injured on motor cars than by train accidents; that was the case last year. Every motor car involving injury is made a special report to our general manager, who, last April, appointed a Motor Car Committee, composed of the mechanical superintendent, mechanical engineer, signal engineer, the engineer of maintenance of way and, I think, the general foreman of the telegraph department, so they had all the departments represented operating motor cars.

The purpose of that Committee was evident. It was formed upon my suggestion. There are mechanical defects that caused those accidents, and we all know what they are pretty well. A great many of the accidents are due to the improper construction of the car or of the engine. There are, of course, a great many accidents due to carelessness on the part of the foreman and the operator of the car, but I think what this section ought to do is to draft some sort of a resolution, if you want to

get it through collectively, that could be presented by the safety representative of each railroad to his general manager, giving the general managers an opportunity to see what united action ought to be taken.

We are furthering our activities with that Motor Car Committee by temporarily putting on inspectors of motor cars. We have one to every two divisions. Each man devotes his entire time to going up and down the road on those two divisions and keeping things in proper shape.

MR. WEBB: I understand the purpose of Mr. Clark's resolution to be that we go on record as endorsing the installation or use of motors which will make the maximum speed of the car fifteen miles per hour. The fact that there is a road that works under train orders and has different operating conditions seems to me ought not to cut the little fellows out who haven't those conditions.

If this Section of the Council goes on record recognizing a hazard due to undue speed and suggests a remedy in the shape of the installation of a motor, if there be such, geared to a maximum speed of fifteen miles per hour, I believe that will give me, personally, moral support to go to my general manager and say that the safety section discussed this thing generally and went on record as in favor of installing that kind of a motor. There are probably a good many of us who do not work under train orders, some of whose accidents are due to speed and which could be helped by the passage of such a resolution. I think that the resolution as presented is a most excellent one. It will not interfere in any way with the Pennsylvania standard. It doesn't undertake to establish and make mandatory any standard at all anywhere, but it suggests, recommends, endorses this action. I, for one, should like to see the resolution passed.

MR. ADAMS (Reginal Supervisor of Safety): It seems to be the consensus of opinion that a great many motor-car accidents are due to excessive speed. That fact is conceded by all. That being the case, why wouldn't the moral support of this resolution work and redound to the great benefit and not take away, as Mr. Webb has stated, any of the rights of the Pennsylvania system. I can't conceive why the Pennsylvania system, even though they do operate their motor cars under train orders, would want to run at such a speed that would carry with it hazard. If the train order does give them a certain right of track but at the same time permits them to go at a rate of speed that would carry with it hazard, it seems to me it is not practicing safety.

It occurs to me that this resolution is a valuable one with regard to this motor-car accident proposition.

MR. CARROW: As Mr. Adams' remarks were not made with any effort to discredit what I said or reflect on the Pennsylvania system, I might say that we have 40,000 maintenance of way employees, and our record of accidents wouldn't correspond in any particular with the figures that I have heard read here from some of the smaller roads.

I presume, if you have looked into the matter, that you realize that our supervision of operating these cars is such as to guarantee a maximum of safety, even though we have reasonable speed.

So far as I am concerned, I don't see any special objection to speci-

fyng or suggesting that there might be a speed limit to the engines on roads where it is necessary. I don't think that would bind any road where it wasn't necessary or desirable to adopt such an engine.

MR. ANDERSON: As Mr. Metcalfe has said, you have been discussing this problem for the last four years. I move that the resolution be adopted and made retroactive.

(The motion was seconded.)

MR. METCALFE: Wouldn't it be better for a Committee to be appointed to frame up the entire objection to the motor-car operation as it is now instead of passing that resolution to reduce speed? There are enough other features besides speed that are hazardous to justify general attention to them all.

MR. CARROW: That is an imperfect resolution, with all due deference to my friend.

(The question was called for and the vote resulted in a tie. The Chairman was requested to cast the deciding vote.)

CHAIRMAN MEYERS: I dislike to do this. I have no doubt that the Pennsylvania Lines are well equipped in every way to handle these cars satisfactorily according to the conditions and physical characteristics of the road, whereas a railroad such as I represent, with long divisions and heavy tonnage, where we have an unusual amount of work for our train dispatchers, would find it necessary, in many instances, to divide the territory if it were to attempt to operate the motor cars by train orders, especially on our heavy single track territory. Therefore, under the conditions, I would be compelled to vote for the resolution.

I am of the opinion, as Mr. Webb has stated, that the only benefit it would be to us would be found in the moral support of having the advantage of recommending to our general safety committee that other roads of the same mileage are having as many motor car accidents as we are having. I am frank to admit that we are having quite a number. They are distressingly large.

If it is left to me, I will have to vote for the resolution.

We have with us this morning Mr. Baltzell, Superintendent of the Central Division of the Frisco Lines, who is very much interested in this work. He gave us a little address at our round-table meeting yesterday afternoon. It was at a time when the majority of our membership had left the room, and I have asked him if he will not talk to us a little this morning regarding his experiences and his viewpoint in this work as a superintendent of one of the big trunk lines in the United States.

MR. C. H. BALTZELL (Frisco Lines): I feel highly honored in having a second opportunity. As I told you boys yesterday afternoon, this is my fourth year in the National Safety Congress. I was at Philadelphia, New York, St. Louis, and Cleveland. Yesterday afternoon, I asked how many Division Superintendents were present. There were none at that time. I am still wondering if there is a Division Superintendent in the room.

(There were two Division Superintendents present.)

MR. BALTZELL: The reason I asked that question is because I can't see how a Division Superintendent anywhere in the United States can over-

look the importance and the advantage in attending these meetings. I came a long distance—from Fort Smith, Arkansas, to Cleveland, Ohio, to meet with you and hear what you have to say in regard to this wonderful work.

The first three years that I was taking part in the safety work on the Frisco Lines, I won the safety prize each year in succession. The first year's work I remember very distinctly. Of course, it was all new to all of us, but I made a reduction of 63 per cent as compared with the previous year. That was very satisfactory indeed, and the Saturday Evening Post had two stories throughout the year 1914 in regard to some of the unique methods employed to secure results.

That is what we are after—results. I never diminished my efforts in the safety work. Really, that is where I get the fun out of the job. I have a big, heavy operating division—765 miles in four different states with about 2,000 employees on the pay-roll.

During the month of May, when the drive was made in the Southwest region, as most of you know, the Frisco Lines made the best showing in that group, making a reduction of 71 per cent, and my division had the honor of making the best showing of any division on the Frisco Railroad. So you see we are still keeping up the work.

I believe in organization in safety work just the same as in any other work. We haven't the time to go into a lot of details in connection with that work at the present time, but I have observed that men whom you get interested in the safety work immediately begin to show better results in their particular line of work. If you succeed in interesting a brakeman in the safety work, he is more careful, more cautious and does a better job. A conductor interested in the safety work is more careful and cautious and does a better job as a conductor. In every line it is the same. I believe in getting in personal touch with everybody; know every man by his first name. Get acquainted with the men, and every time you are with them, let them understand distinctly that you are for safety first of all. It doesn't cost you a cent. Whenever you find a man doing unsafe work, using unsafe practices, caution him in the right kind of a way.

If you can get all your section foremen, your bridge foremen, every man who is in charge of other men, to be a real, honest-to-goodness safety man not only once in a while but every day and every night, you are going to show fine results.

Above everything else, be careful about selecting your Safety Committee on your Divisions. Get men who will secure results. That doesn't always mean to put on your Committee men who are known to be safety workers. Pick out men who have influence with their associates and educate and drill them in safety work and make them safety men. In that way, you will certainly get fine results.

There is one thing that I think we should never overlook. We should impress upon the staff officers on the Division and the Committeemen on the Division the responsibility that they carry when they observe infractions of the rules; we urge them not to turn their backs on viola-

tions of the rules but to get behind the man who is at fault and caution him in the right kind of a way. If they fail to do their part and later on a man gets hurt because of that, I want them to feel that they have contributed to that man's injury or his death. I put that up pretty strong to the fellows and the Division men. When an accident does happen, I want to know all about it, and I want to know from the foreman or the general foreman or the trainmaster or the master mechanic what effort he made to cause that man to be more careful. If somebody has neglected to watch that man and help him, we are all disgraced and we have all contributed in a certain measure to his accident. In that way, I get a very intense interest in the work constantly.

The transportation book of rules is really the foundation of safety, and when we discuss, as we do at our meetings on every occasion, the cardinal rules of the work, we serve to keep that alive. Every week, I get out some circular pertinent to the work—Rule 99, Rule 210, and other rules of that kind. Every time that we read in the *Railway Age* or the newspapers about some big railroad accident, we take that and discuss it thoroughly.

We have to do something to overcome the automobile accidents that are piling up on us and on you. They must be cut down. One of the best methods I have found so far is by the "Stop, look, and listen" to the public, urging them to be more careful and to anticipate the danger which surrounds them when they are crossing the tracks.

At the same time, every engineer on my division is constantly alert, anticipating a man paralleling him or crossing ahead. We urge upon them to slow down, if necessary, but in any event to try to avoid the accident.

There is one other rule that I want to mention about which I have not heard a single word at this meeting. That is in connection with Rule 88, trains of the same class have absolutely no variation at all; the inferior train by direction simply clears the leaving time of the superior train. That, to me, has always been a very serious proposition. I remember distinctly that investigation on a neighboring division developed the fact that one fellow's watch was thirty seconds slow and another fellow's watch was thirty seconds fast. There was a sharp curve right at the switches, and that slight variation of watches, which you know and which I know frequently is to be found among the men, caused a head end collision because one edged out a little ahead on account of his watch being wrong, and the other fellow was using the last second to get in, and they hit.

Every one of my watch inspectors on my Division has Rule 88 printed in typewritten sheets and pasted under the showcase. I talk to the men about their watches and tell them to be careful with them and be absolutely sure and certain that they have a good watch and are keeping up with their comparison cards, comparing time frequently. I tell the men, "Don't take it for granted that because you have had your watch a long time that it is infallible. Be absolutely certain, safe and sure."

CHAIRMAN MEYERS: Gentleman it is indeed refreshing and inspiring

to hear such words of wisdom from a man who has served so wholeheartedly and shared the reward of safety with the public as well as his men. A man with that spirit and determination never fails to get results. Mr. Baltzell, we thank you and feel honored for the address and your presence.

MR. WEBB: I want to ask Mr. Baltzell a question. He touched on the point of being careful in the selection of the committeemen. Recently, on one of the lines under my jurisdiction, one of the committees asked that their men be allowed to select, or that their order be allowed to select, their own committeemen in the future when we were replacing those who resigned or left for various reasons. I wonder if you have found that that has been done elsewhere.

MR. BALTZELL: That has been entirely in my hands.

MR. WEBB: That has been the case with us heretofore. I wonder if any of the other lines are allowing the brotherhoods or crafts to select their own men.

MR. WRIGHT: It is our practice, Mr. Webb, to allow the men to vote for their representatives, the trainmen for the trainmen, the conductors for the conductors, and so forth. We find that we get better results by allowing them to handle it in that way. I think the North Western also handles it in that manner.

MR. ANDERSON: I think we should very much appreciate Mr. Baltzell's coming so far to attend this meeting and to give us such a splendid talk on the viewpoint of the superintendent.

I would like to ask you, Mr. Baltzell, whether or not, from the standpoint of a superintendent, you feel that operation has been slowed up on account of this new safety work or intensified safety work and also whether or not it has added any additional burden on you to handle.

MR. BALTZELL: I am glad you asked that question. A good many of the superintendents on our road, from time to time, have remarked to me, "Baltzell, how do you get so much time to attend to safety work?" My answer has been invariably the same. "I don't miss the time that I devote to safety. It is amply made up in other directions, because I know from experience that the work has been speeded up because of our safety work." As I mentioned a while ago, if you get a man in every department interested in safety rules and principles, his regular line of work immediately comes up. Higher efficiency—an absolute fact.

MR. ANDERSON: I was convinced of that fact myself, Mr. Baltzell, and I just wanted to verify it. I am glad to have a man from your side of the house confirm my feeling and opinion and belief in the matter.

CHAIRMAN MEYERS: I notice that we have with us Mr. Webb C. Ball, General Time Inspector on the Eastern Railroads, and we will be glad to hear from him.

MR. WEBB C. BALL (Cleveland): I am certainly glad to see you here in Cleveland. We have a beautiful city and it is a great inspiration to see so many young men interested in this safety work visiting our city. I have attended all of your sessions and I have accumulated a lot of valuable information. I have also got my storage batteries recharged fully with

enthusiasm and inspiration which factors are very important in the work of safety.

My work for the last twenty-eight years has been among railroad men, officers and the rank and file, and my particular activities have been directed towards improving and standardizing the safety appliances known as watches carried by the employees entrusted with the responsibility of moving trains. I feel that I am justified in saying that the quality of watches has been improved at least 50 per cent, and the prices have been reduced at least 50 per cent, all of which is progress in the right direction.

I have had the support of the railroad officers and the railroad men. I am fortunately located here in Cleveland where the headquarters of three big brotherhoods have their offices—the Engineers, the Trainmen, and the Firemen. My efforts have been directed towards educating the men of these organizations who are the men who really carry the watches.

STANDARD WATCHES

We want the engineer, the fireman, the conductor, and the rear flagman to have standard watches. We aim to have those watches regulated to such a degree that they will be brought into what is considered a pretty safe standard of varying not more than thirty seconds per week. I am pleased to say that on some of the railroads where the service has been established a good many years, the New York Central, for instance, we have 11,000 men with standard watches. I believe I am justified in saying that I can find 5,000 men among them whose watches will not exceed ten seconds variation, some of them less than that, in a month. That is correct time.

The dial is one of the most important things in connection with the railroad man's standard watch. It should be plain and distinct and not confused with a lot of red figures and other irregularities that make it difficult for him to note the time. When an engineer is out, looking after signals, going seventy miles an hour, perhaps, he has no time to stop and go over the multiplication table and count the various red figures on the dial.

There is one thing on every dial that represents two things. That is the five-minute division point. That not only represents that, but it represents the hour point. If the railroad man is able to see the five-minute point, and there is nothing else confusing it, he becomes so accustomed to his dial that he can note the five-minute point or the hour point quickly and get the time correctly.

There are three dials made by the different watch factories. One has a very large square emphasized dot over the five-minute point. Another has a diamond and the other has a round mark. Either one of those characters represents the five-minute point and the hour point. If they are emphasized as they should be, with the five-minute dashes in between, a man can read the time easily and quickly. That is one of the safest features in connection with standard watches.

When I first got into this work twenty-eight years ago, the best watches we had on the market were fifteen jewels, flat hair-springs, single roll escapements, garnet jewels, and not adjustable except with a punch and

a hammer. I soon learned that those watches would not keep time. There would be committees up at Mr. Stone's and Mr. Lee's offices frequently, and they would send for me and tell me the various difficulties they had with the watches. I immediately went to work to encourage the watch manufacturers as much as I could to improve these faults, or eradicate them.

Standards have been adopted of ten seconds limit in five positions. That brings a watch in such condition that a railroad engineer or conductor or any one else will get the correct time. Recently, since the first of the year, we have reduced and simplified the standards. Up to the first of this year, the Elgin people had twelve standard recognized watches; the Waltham had twelve, the Hamilton twelve and the Springfield twelve. That was very confusing to a railroad man or any one else who wanted to get a standard watch. On the first of the year, we simplified and revised or standardized them and brought it down to three of each kind or three of each company. The Elgin best grade is a twenty-three jewel; the Waltham best grade is a twenty-three jewel. There used to be, until we revised this, three grades—nineteen, twenty-one and twenty-three. That made it very confusing for a man with pride who wanted to get the best watch he could. He would go to a jeweler and would say, "I want the best Waltham watch." The jeweler would pull out whatever he had in stock, perhaps a nineteen jewel if he was out of the others, and he would tell the fellow that was the best. The party might not be satisfied and might go to another jeweler and find a twenty-one jewel. Finally, he might land on the twenty-three jewel. That is eliminated now. The watch companies have discontinued making them in any other way.

My efforts have been to educate the watch inspectors to educate the men, and I have nothing to do with the sale of watches. That doesn't interest me. All that interests me is the safety features in the watches used by the men who are responsible for the movement of trains.

When we get the support of the superintendents and trainmasters, we will be in a fair way to make greater success. I would like to make the suggestion that you gentlemen who are at the head of these Safety Committees, when you are in a town where there is a watch inspector located, invite him to become a member of this Safety Committee or Section. He is in touch with your men more than any other individual on your system. He has an opportunity to see them every day.

We aim to select the best watch inspectors on the railroads who are the best citizens and the most useful citizens. If you can get them into your organization, it will help them and it will help the efficiency of the service.

I have been very much interested in this convention. I have received a lot of valuable information and a lot of enthusiasm, and I wish I could have had my watch inspectors here.

Mr. BRENNAN: Mr. Chairman, we have been the guests of the Statler Hotel people, and the word "Statler" in hotel parlance means the standard of perfection almost. We have no perfect railroads, and I suppose we have no absolutely perfect hotels, but there are so many perfect things about the hotel that we might say it is perfect.

Yesterday afternoon, the Regional Supervisor of the Allegheny Region asked the members of that region represented here to go up to his room for a few minutes. In doing so, after returning from the room, we took the elevator. Some of us were getting into the elevator to come down, and the elevator operator shot down with the gates open. It occurred to me that is one defect, and it is possible to kill a man in the elevator with the doors wide open. I think it would be a courtesy on the part of this organization to the Statler people to call their attention to that. In most hotels, it is impossible to do that, because the doors are closed and locked. We are here for safety. I am new in the safety organization, but I am old in railroad work. I have practiced safety nearly all my life. I think this is a courteous suggestion to the Statler people, if we make it. I recommend that you submit that in a polite way to the Statler Hotel.

CHAIRMAN MEYERS: Gentlemen: We have completed today's program, the last of our three-day session and are now ready to say good-bye with never-to-be-forgotten memories. We can all feel a just and lasting pride in our membership; in its efforts and accomplishments in helping to make the world a better and safer place in which to work and live. This session has been the largest in attendance, interest, enthusiasm and results. We cannot measure at this time the influence and benefits that will follow in the years to come, but it is coming strong—a reward for service to our fellowman.

As your Chairman (I take the liberty of including the vice-chairman and secretary, Messrs. Scott and Mayo) we wish to express our sincere appreciation to those who have honored us with their presence and addresses—a lasting inspiration to the great cause. What my predecessor said at the opening of first day's session are my sentiments. "This is your section. It depends upon you for Success." Let's make it the very best. We can do it. We need real thinkers offering their suggestions and advice; we need real workers giving their active and loyal cooperation. With each and every member thoroughly alive to his obligation, duty and responsibility we can make the Steam Railroad Section of the National Safety Council paramount.

I wish also to express our sincere gratitude to the beautiful City of Cleveland, its officials, and its splendid citizenship for its generous hospitality and our best wishes for its future growth and prosperity.

There being no further business we stand adjourned until the next session of the Council. Good-bye—good luck.

Textile Section

October 2, 1919

DAVID S. BEYER, Chairman

Vice-President and Chief Engineer, Liberty Mutual Insurance Company,
Boston, Mass.

William S. IDE, Vice-Chairman

S. Slater and Sons, Inc., Webster, Mass.

JOHN RENNIE, Secretary

Safety Engineer, Joseph Bancroft and Sons Company,
Wilmington, Del.

THE meeting was called to order at 9:45 A. M. by the Chairman, Mr. David S. Beyer.

CHAIRMAN BEYER: The past year has shown some interesting developments in safety work among the textile plants, although the textile industry, as a whole, has been rather conservative in taking hold of accident prevention work. One of the lines of activity of the Textile Section this year has been to collect data in an effort to establish a standard accident frequency rate among textile workers, and thus determine whether the accident rate for a given plant is high or low as compared with the average for the industry. We have some rather interesting data along that line, accumulated and compiled from the reports of accidents in a number of textile plants during the last two years.

In the past, there have been, on the average, about six "tabulatable" accidents (that is, accidents involving loss of time in the day or turn following that in which the accident occurred) per one hundred workers per year. We now have a number of plants that have improved on that rate very materially and there are a few charts here that I will run over hurriedly; just to give you an idea of the progress that has been made along these lines.

Here is a cotton mill with about 600 employees that has an accident rate of 4 per cent for the year 1918, and 1919 finds it decreased to 3.8, which is about half the ordinary accident rate for the industry. Here is another one covering the years 1917 and 1918 with an initial accident rate of about 5.5, which has been reduced to 3 per cent, a reduction of almost

one-half. Here is another plant with 1,200 employees; in the year 1916 they had an accident rate of 4.5, but now show a rate of 2.7, a reduction of 41 per cent. I have another chart here of a cotton mill having about 3,500 employees. Since 1917 their accident reduction has been 4.6 per cent, from 5.5 to 3.0. Another cotton spinning and weaving plant having 4,000 employees, whose accident rate for 1918 was 2.8 per cent, has reduced it for this last year to 1.6 per cent, getting under the 2 per cent limit.

So, we have records here of plants that have already reduced their accidents 40 to 75 per cent below the average for the industry.

Another interesting feature is the reduction in the cost of compensation for these plants, several of which are now receiving a reduction of approximately one-half in their insurance rates as a result of their accident prevention work.

Perhaps some of those present have brought records with them of the work along these lines done in their own organizations; if so we would very much like to get their records, for comparative purposes.

The officers of the Textile Section have had two meetings during the year, in addition to considerable general correspondence. The Secretary, Mr. Rennie, will submit a memorandum of the detailed activities taken up at those meetings.

(Secretary Rennie gave a brief account of the meetings held in Boston during the year. On motion the report was adopted.)

(A nominating committee was appointed, consisting of Mr. Scully, Mr. Coffey, and Miss Wilson to submit names of officers for the Section for the coming year.)

CHAIRMAN BEYER: The first of the formal papers that we have on the program for this section is, "Plant and Machinery Layout as Affecting the Accident Hazard in Textile Mills."

PLANT AND MACHINERY LAYOUT AS AFFECTING THE ACCIDENT HAZARD IN TEXTILE MILLS

KENNETH MOLLER

LOCKWOOD, GREENE, AND COMPANY, BOSTON, MASS.

It is obvious that the best insurance against accidents in a cotton mill or any other manufacturing establishment, for that matter, is to educate the help properly so that they will use ordinary precaution in pursuing their duties. It is also obvious that human nature solely is too frail to rely on for the prevention of accidents. Mill owners and others in authority must do all possible to make the surroundings in which the help work as near accident proof as possible even if people are careless and forget the danger which always exists even in the best protected mill or factory.

There are two elements to be considered besides the campaign of education which must be carried on unceasingly and the general welfare work such as hospitals, physical examinations, etc., which we are to take for granted.

The first of these is the proper guarding of certain moving parts of machinery and machine drives. The second is the plant layout and upkeep, which is a tremendous factor in the accident hazard of any factory. The question of the detail guarding of textile machinery is being treated in a separate paper and it is my intention here to call your attention to a few features of plant layout and upkeep which tend to reduce accidents and safeguard the workers.

One point which I wish to call to your attention is the fact that practically all of the features brought out are cardinal rules for increasing production. It is a fact that in plant layout and upkeep almost all accident-prevention work is production increasing work. If you don't want to put these ideas into practice for the first reason do it for the second reason and kill two birds with one stone.

As it seems simplest to discuss one type of plant in this paper I am going to confine these remarks to cotton mills although they would apply in general to any other type of textile mill. I want to describe first the elements which make for safety in a cotton mill, discuss each one briefly and then illustrate as many of these ideas as possible by showing the layouts of a new cotton mill in which these points were given careful consideration.

The principle elements which go for safety in a cotton mill layout are as follows:

1. Proper lighting both natural and artificial
2. Proper alleys which are obviously definite lines of travel
3. Proper prevention of short cuts
4. Proper spare floor for trucks and material in process
5. Proper heating and ventilating
6. Proper dressing, toilet, and rest facilities for the help
7. Proper care and use of all of these facilities after they are installed

LIGHTING

Let us consider the lighting first. One of the most prolific causes of accidents in cotton mills is poor light. Natural light is always the cheapest and best to work under. How are we to make the most of it? First have ample glass area, just as much as you can crowd into the walls. Second, have a sufficient story height to use the light admitted by the windows. Third have the working alleys run across the mill with windows at each end. Fourth eliminate as far as possible overhead drives and fifth spend money in keeping the mill painted. You get accidents in old dingy mills and you get poor production, a coat of paint once every two years will always pay for itself in increased production and saving in artificial light. Where possible use general lighting, it is best and cheapest. Where this will not work out use individual lights in the alleys but up too high for the help to touch them. Keep the windows clean, it is a very cheap way to get light and light always means increased production and decreased accidents. Keep the mill clean. Dirty floors strewn with waste and bobbins cause accidents; scrub the floors but

be careful when scrubbing that people do not slip. This is difficult and must be handled through your educational campaign. Scrub the walls, it is almost as good as a coat of paint.

ADEQUATE SPARE FLOOR AND ALLEY ROOM

Now as to alleys. Most accidents occur when help are away from their machines. A card hand loses a finger in a speeder frame, a weaver gets burned by a slasher. Most mills do not have definitely-defined lines of travel and help will take short cuts. You must have perfectly clear broad alleys along which people and material must go and it must be impossible for them to go by any other routes. The routes which they are to take must be made safe.

Congested floor space is probably the cause of more accidents than any one other thing. Of course, we all want to get the maximum production off a given floor area and there is a very prevalent idea that in order to do this it is necessary to cover every square foot with machinery.

This is absolutely not so. In your crowded spinning room you would probably get pounds more production if you took out some of your machinery and rearranged the rest. You certainly would reduce accidents. You must have adequate spare floor and alley-room. You must have space to handle the product in process, as much as space for the manufacturing itself. This space is just as much an adjunct of manufacturing as the area covered by machinery and don't skimp it. Have perfectly definite space for full and empty trucks and see that they are kept there and not in the alleys. A good plan is to have stalls marked out on the floor and insist that trucks be left in the stalls until wanted. A better way still is to install a conveyor system wherever possible even if it does not reduce the number of men necessary to handle the product. It does keep the work in perfectly definite channels and gets it away from the machines as soon as it is finished. The proper place for work in process is behind the next machine it is going on, not in front of the last one it came off. It is no good there.

HEATING AND VENTILATING

Proper heating and ventilating have a big effect on the condition of the help and doubtless tend to reduce accidents on this account. By far the best arrangement is one which heats and humidifies the air at a central point and circulates it through the mill. Give the help proper atmospheric conditions and they will not get so tired. Tired people are careless people and careless people cause accidents.

It is important that facilities be provided for the help so that they will not have to change their clothes in the mill or near the machinery. They must if some special arrangements are not made. We must provide adequate locker rooms and wash rooms and see that they are used. How often we go through a mill and see women doing their hair near a belt or moving machinery. Don't permit help to dress near moving machinery, but they will, unless you provide other space.

SYSTEMATIC INSPECTION MUST BE MAINTAINED

All the precautions listed above will fail of their purpose unless you see that they are kept up and used to their full extent after they are installed. Spare floor is no good if trucks are left in the alleys. Locker rooms are no good if the help leave their shoes on the spinning creels and hang their coats on the radiators. A systematic inspection must be maintained to see that the mill is clean, is in good repair, and all the precautions taken to prevent accidents even after the ideal layout is installed.

In order to analyze the layout of a cotton mill to minimize accidents, let us start at the beginning of the cotton manufacturing process and go through the various rooms studying the layout of each room with the idea that when we get through, we will have done everything possible which will have any effect in reducing the number of accidents.

I am going to take as an illustration the new Jackson Mills of the Nashua Manufacturing Co. at Nashua, N. H. This mill is being designed, erected and equipped by us, Lockwood, Greene & Co., engineers, having taken a contract to turn over a complete cotton mill ready to run and assumed all responsibility in the matter. The mill is to produce the famous Indian Head sheeting and is to contain 50,000 spindles and 1,200 looms. (See pages 1346 and 1347.)

On account of the peculiarities of the site it was impossible to incorporate all of our ideas in this mill. For example we could not run the spinning frames across the mill on account of the restricted width. Also a good many changes have been made since the drawings have been made. It seems as if every time we studied the layout we were able to improve it some way. I think you will be interested in the exterior of this plant, feeling that the exterior of cotton mills had been given very little consideration (They are probably the worst looking buildings in existence next to shoe factories). Lockwood, Greene & Co., engineers, have a large architectural department working only on exteriors of manufacturing plants and industrial housing of which we are doing a great deal.

The cotton arrives in cars at the storehouse siding where there should be a wide covered shipping platform. For best arrangement, the storehouse should be of concrete with concrete floors and no wood top floors. The cotton will probably be carried on hand trucks although in a great many cases it works out best to handle it on electric trucks which can be run right on to the elevators and when the bales arrive at the proper location, they should be stored on the floor one high. The proper stud for a cotton storehouse is about eight feet and it should be built of flat slab construction without beams. Never pile cotton. Many accidents and costly handling will always result. The opener room should be on the ground floor of the storehouse. Cotton ready to be opened is put on each side of the opener apron; the bales cut with snippers and the cotton thrown on the opener apron. The delivery from the openers is automatic either to bins or to the pickers direct. The drive for all openers is usually by one motor driving a group. In this paper, we are talking

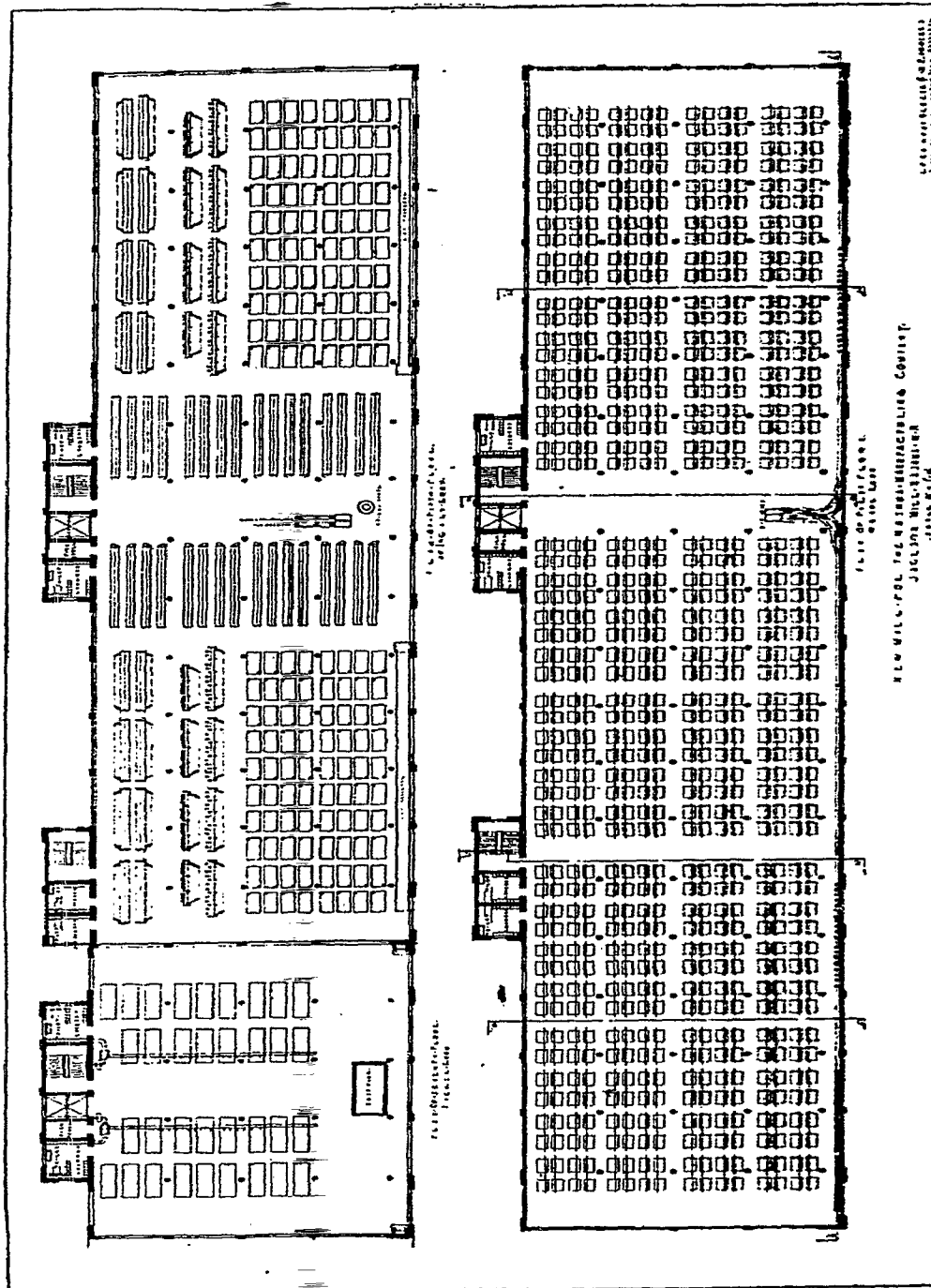


PLATE I. COTTON MILL LAYOUT

The upper cut shows seventh floor plan at left, fifth floor plan at right; lower cut shows first floor plan.

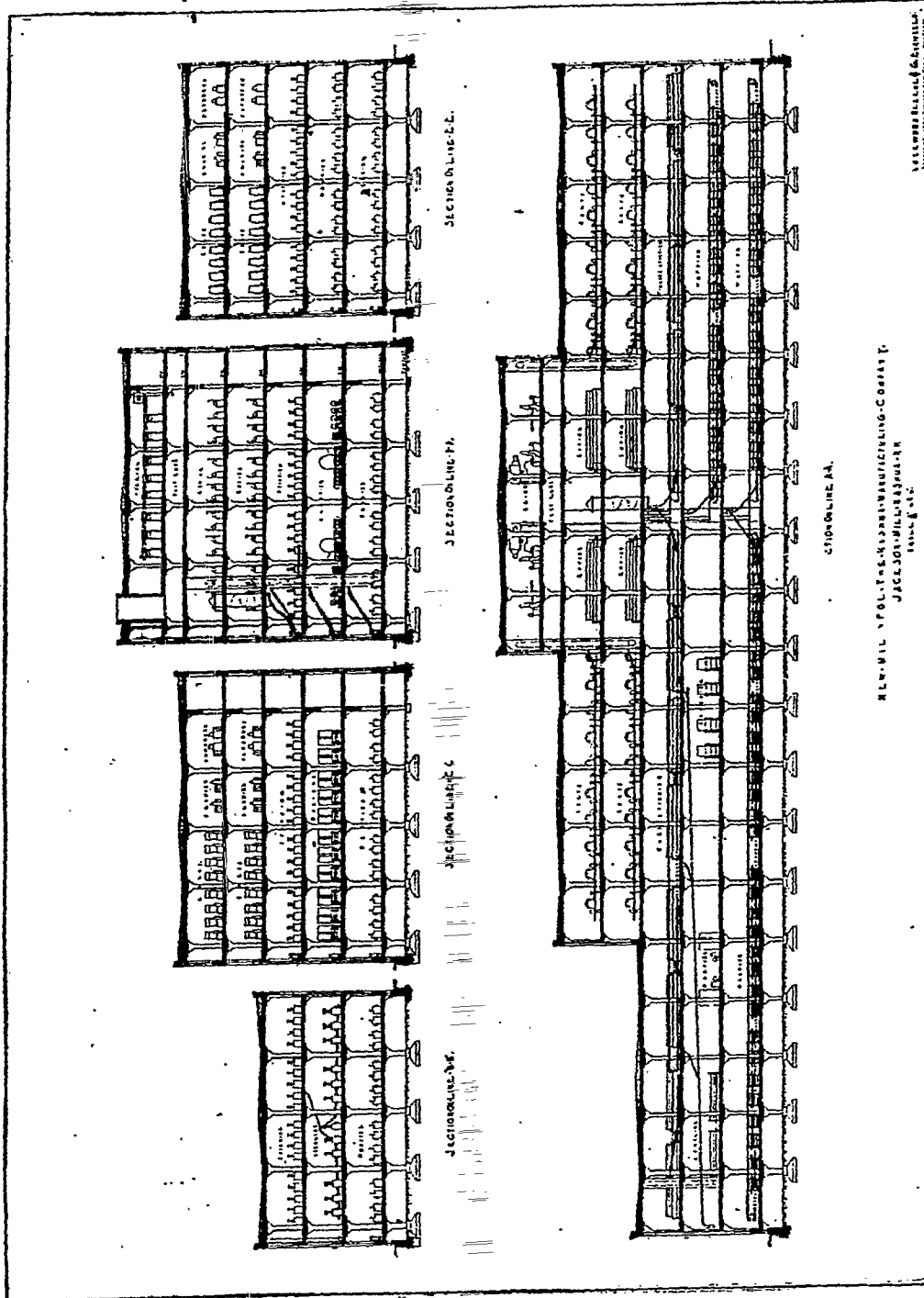


PLATE II. COTTON MILL LAYOUT

Above, cross-sections; below, longitudinal section. See first floor plan on opposite page.

about ideal conditions only and the best which can be had so we will start out at once by considering only electric drive and individual motors wherever practical as I do not believe there is any one who will dispute the fact that this form of drive is at once the safest and gives greatest production and is the one which should always be used where these two considerations will outweigh the added cost.

The most interesting feature of this plant is brought out by the fact that we have turned the conventional cotton mill upside down and with the first process on the roof and the finished product coming out on the ground floor. This allows us to blow the raw cotton to the top floor and let it fall by gravity from process to process making extremely cheap handling and reducing accidents by keeping the material moving in perfectly definite channels. As soon as it is off one machine it is on its way to the next. As we have said the proper place for the product of each process is in front of the next process where it is to be used, and not in the room where it has been manufactured. It is no good there.

The cotton is blown to the picker room and by far the safest and most economical way to handle it is by some form of automatic distributor which places it directly in the hopper of the picker. There is no reason in a great many cases why the cotton should be touched at all in this process. Each picker should be driven by an individual motor directly mounted on the machine and the machines should be arranged either so that it is impossible to walk between them or so that the clearance is so great that there is no danger from moving parts. If there is a passage between the machines, it should be at least five feet wide. Adequate space should be left in front of all machines so that the laps from one machine will not block up the passage ways before they are put on the next machine. The best system is to have racks between the breaker pickers and finisher pickers where the breaker laps may be stored.

After a lap is taken off a finisher picker, it should be put on a truck or a conveyor at once. A lot of accidents are caused by stock in process and full or empty trucks blocking spare floor, operating floor or the space between machines. Incidentally, if the work is kept in motion and there is a steady flow between machines, the inventory is kept down to the lowest point.

THE CARD ROOM

The card room should be laid out if possible with all working alleys running across the mill so that we will get the maximum light and the cards should be placed so close together that there is no chance of anybody trying to walk between them, leaving just sufficient clearance for the working parts. Every eight cards, there should be an alley at least four feet wide which will be an obvious and safe passageway. There is practically no hazard in the back or front alleys. The working alley should be four feet between coilers and the back alley five feet wide to allow full lap trucks to be handled without injuring the laps. Around the drawing frames, there must be sufficient space to take the cans of card sliver and the full cans of drawn sliver. It is very important that adequate space be left around this machinery as it is too common a fault

in cotton mills that the congestion due to a desire to crowd in machinery causes alleys to be blocked by material in process. Leave at least six feet clear behind the breaker drawing; six feet between the breaker and finisher drawing and six feet in front of the finishers. This should give adequate space to prevent congestion. The same is true of slubbers. There must be sufficient space allowed to take care of the material in process. Leave four feet between slubbers in the working alleys and six feet of spare floor behind the machine.

As the card room will probably be driven by group drive, care must be taken to see that the shafting is properly located so as not to bring the belts low in a working alley. If necessary, run two lines of shafting rather than have one line run in two directions and so bring belts at a low angle in a working alley or where people work. Have perfectly definite spare floor for slubber roving next to the speeders and have full slubber trucks delivered to this floor as soon as they are doffed.

Cut out trucking where you can. You will notice in the layouts shown, there is a spiral chute in the center of the room near the speeders. As soon as a frame is doffed, the boxes are carried immediately to this chute and sent on their way to the spinning room. There is no reason why there should ever be boxes of roving cluttering up the floor of that card room. The floor should be clean all the time. Roving frame drives are usually so well guarded that there is little danger from that cause and it is usually an advantage to have an alley at each end of the frames. It will be seen that the full roving boxes when they leave the spiral chute run on a gravity conveyor along the wall in the spinning room. There is constantly a supply of roving the whole length of the spinning room. A conveyor under this shelf of gravity carries the empties back to the card room.

THE SPINNING ROOM

There are apt to be a good many accidents in spinning rooms. Put the drive end of the frames together and make it impossible to walk between them. Have large alleys on the other end or between every two frames, at least five feet wide. Use individual motor drives if possible, otherwise four frame drives. The frames should run across the mill so that the light will shine down the alleys and provision should be made to take the full bobbins away from the machines at once so that the floors will not be congested. The proper place for full spinning bobbins is either in the weave room or the spooling room. It might be interesting to note that in the plans attached hereto there are chutes in the floor located at convenient places and as soon as a frame is doffed the yarn is on its way to the next department. These chutes lead directly to the weaving for the filling and directly to the spooling for the warp. Return conveyors carry the empty boxes back to the spinning room.

THE WEAVE ROOM

The looms should have individual motor drive if possible and be arranged with the alleys running across the mill if possible if the weaving

is carried on in the lower stories of a mill. Of course if the weave room has a saw tooth roof, this is not essential. Have perfectly definite lines of travel: alleys which are obviously meant to walk in and have all other spaces too small to get through. Front on working alleys should be about 2½ feet wide so as to make it easy for a weaver to run looms on both sides. Back alleys should be at least two feet six inches clear and cross alleys should be three feet. At convenient points, broad cross alleys and broad back alleys at least five feet wide should be located which are obviously the main arteries of travel.

There is no reason why the alleys should not be kept clear all the time except for trucks carrying filling from the conveyors to the looms and the beams from the slashers. A conveyor carries the cloth from the weave room to the cloth room.

People have been in the habit of thinking of a cotton mill as machinery placed in a building: As a matter of fact it is a building placed around machinery. The layout is the most important thing. We spend sometimes months on the layout of a mill. I think until the Jackson Mills plant was designed that there has not been a radical change in cotton mill design for years. The Jackson is only a start. Nobody knows what can be done in reducing accidents and costs by proper machinery layout but we mean to find out.

CHAIRMAN BEYER: I am sure that Mr. Moller has covered the subject so well that few here will be able to improve on his clear exposition of the matter. However, the subject is up for discussion and any questions as to plant and machinery layout are in order. Mr. Moller, I know, will be glad to make any further explanations desired.

DISCUSSION

MR. HENRY A. OWEN (Whitin Machine Works, Whitinsville, Mass.): Mr. Moller, what kind of floors do you put in?

MR. MOLLER: Concrete floors, covered with wood.

MR. OWEN: How is a wooden floor put on the concrete?

MR. MOLLER: Two inch hemlock was used fastened to screeds set in cinder concrete. A layer of tar paper is placed on the hemlock and maple flooring nailed on the top. We consider it is the safest flooring in a plant of this kind. Of course it is very expensive, the flooring alone in this case costing a hundred thousand dollars.

MR. OWEN: What do you think of cement floors?

MR. MOLLER: These will always crack. Help much prefer a wood top floor. We believe it is worth the extra money.

CHAIRMAN BEYER: There are no fire walls in that building?

MR. MOLLER: There is a fire wall here (pointing to picture with pointer).

MR. J. J. COFFEY (Inspector, Department Labor and Industry, Philadelphia, Pennsylvania): It seems to me that an expensive up-to-date building like that should be equipped with fire towers.

MR. MOLLER: You couldn't put in any more towers there without

taking up too much space. Of course, these plants are protected by automatic sprinklers.

MR. COFFEY: I should think where there is no question as to the cost of the plant, there ought to be sufficient fire towers in addition to using the fire escapes.

MR. MOLLER: These two doors (pointing to picture) give sufficient means of exit. This door would open into a horizontal escape and is easily gotten through, and, with the other facilities, is about all anybody would want. On the second floor there is a bridge which goes over to the other building.

Drinking water for the men and others working in these mills is also very important. I understand some mills spend as much as twenty thousand dollars installing cooled water systems.

I don't know whether you consider this information appropriate or not, but in the Alaska Mills we have built a nursery that cost fifteen or twenty thousand dollars, where the help can leave their children during the day time with good nurses in attendance. I don't know the actual cost for taking care of their children, but you can figure that three meals a day runs into money. (Laughter.)

CHAIRMAN BEYER: Most of you know the firm of Lockwood, Greene, and Company either by reputation or through actual business dealings, and I am sure you are not surprised at having one of their representatives give us such a valuable paper on this subject. I think there is a great deal of helpful information in the material he has presented.

The next paper will be by Mr. Owen, in which he treats of mechanical guards, and which he illustrates with mechanical slides.

STANDARD GUARDS FOR TEXTILE MACHINERY

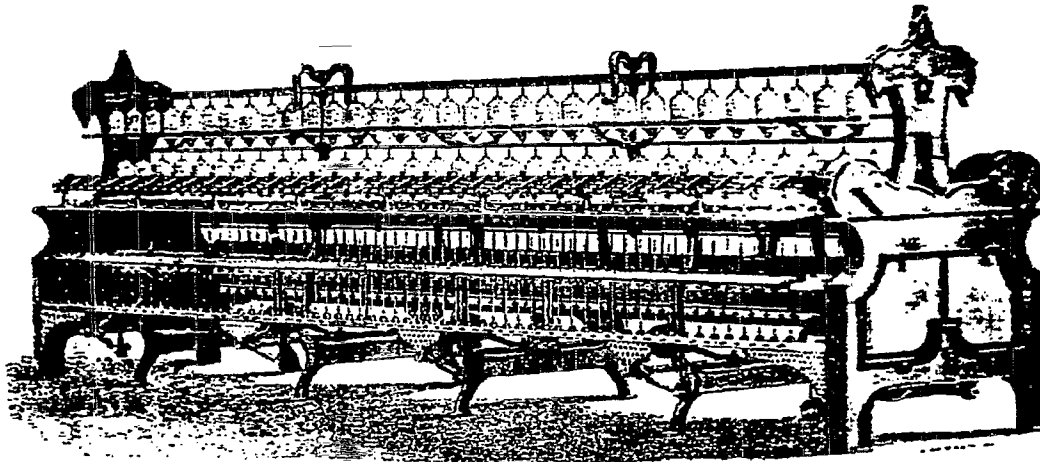
HENRY A. OWEN, GENERAL ENGINEER, WHITIN MACHINE WORKS,
WHITINSVILLE, MASS.

Among the earliest recollections which I have as a boy during the late '70s around a textile plant with which my father was connected, is an accident whereby a man was terribly injured. He was working on a picker and the machine started up unexpectedly, catching him in the fast-running beater, which resulted in the loss of his arms. The safeguards now attached to this machine make such an accident impossible, but this has only been accomplished in the last few years, though the mechanical parts necessary to prevent such accidents are few in number and simple in design, showing it was not for the lack of inventive skill that this improvement was delayed, but rather for the idea to come that it was worth while to put such devices onto machinery.

To show the growth of the protective idea, consider the early type of gear-cover, which covered the law better than the gears. It covered only the gear faces and "bite" of the teeth, leaving opportunity for a pinch between the revolving gear and the stationary casing, to say nothing of the chances of being caught and drawn in by the catching of

cleaning waste and brushes, for at that time to stop a machine to clean it was waste time indeed.

A little later when gear-covers were somewhat improved, there were holes in them, thought too small to get one's fingers through, left so as to hold up the core to make molding in the foundry easier, and they were not closed up until the loss of fingers by some unfortunate stood as a monument to the fact that every conceivable avenue of approach must be closed before a gear-cover fulfilled its proper function.



A. 1880 WHITIN SPINNING FRAME

The cut "A" shows a case where a cover supporting slot proved a finger-nipper and many were put on the market before the weakness in design developed. These slots show over the word WHITIN on the front roll gear-cover on the 1880 Whitin spinning frame.

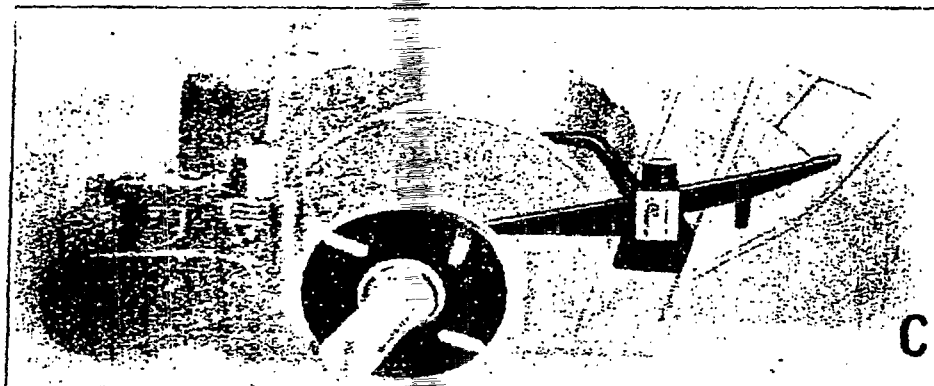
A comparison of this spinning frame made in 1880, with one of today, is worth studying, as it shows what the years of experience have brought out in the art of safeguarding. The idea of separate or bolted-on gear-covers has long ago disappeared and in its place we find the head-end or frame made deep enough and of the so-called "boxed type," entirely to cover all the gearing except the draught gears; these are slow running and wholly covered by a hinged casing, which in some frames cannot be opened while the frame is running. The gear studs are attached to the back or web of the frame, with oiling tubes sticking outside, safely accessible and it is impossible to get a brush or waste caught in either the arms or teeth of the gears; nor will one's clothing catch while passing through even a narrow alley.

The frame-covering panels are without dangerous holes and often provided with devices which prevent the belt being thrown on to the tight pulley when the panels are not in place; the panels cannot be taken out when the machine is running. This saves many fingers, and even hands,

as the fixer may be down behind the head out of sight, working on the gearing, when the operative or overseer concludes to throw on the belt without looking about to see why the frame is stopped.

On the pulley or driving end we find outriggers, to guard against bumping into the revolving pulleys, and guards to stop clothing being drawn into the belts or getting caught in the spokes. The loose pulley runs on a dead bushing, so is stopped while the speed is on. Belt shippers take the place of a stick or brush handle to start and stop the frame. The operating parts are designed so as not to be too high for small help; in fact, the whole machine is designed so as to protect the operative from danger, and to make his labors easy and comfortable.

The class of help in the textile plant today makes the need of protective devices more necessary. In the old day, even the most ignorant laborer understood English, and could be told where the danger spots were, but now, no one knows from what the operative says whether he understands or not. In the old days the ignorance of the laborer was one of the greatest causes of accidents and he was blameless in the matter, for he could do nothing to help, but the mill manager who well knew



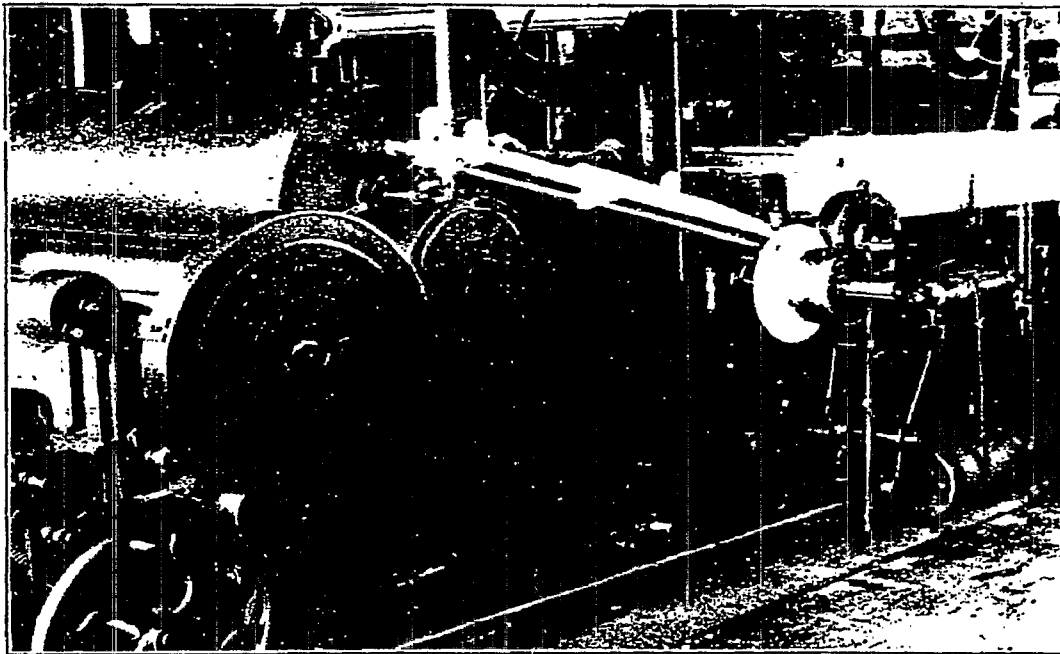
11. SACO-LOWELL BEATER LOCK

his employees were working under dangerous conditions was surely to be blamed, because most of the improvements in this line were the results of demands made by the mills until the operative sought the aid of the law. This has been the politician's opportunity; he has pushed punitive legislation as far as the times would allow, and that is evidently but half of what he expects and probably can do, in the fast coming days of labor's domination, when the slightest opening will give politicians the chance to push through drastic and unreasonable laws at the expense as well as inconvenience of manufacturers.

Let us consider cotton machinery, with which I am personally best acquainted, starting with the picker and card rooms. Mr. Swallow of the Amoskeag Mills tells us that while these rooms only employ about 10 per cent of the mill employees, they furnish 25 per cent of the acci-

dents. Here we find the greatest danger lurks around the fast running pullers, particularly where the belts "take on"; the laws of some of the states make it obligatory to have these belts guarded six feet high from the floor, so in most cases it has been found more practical to have the guards made of bound expanded metals, or better still, of wire grill to which cotton lint does not stick and is so much easier to brush off. Means to take off the belts must be provided, but without lowering the protective qualities of the guards.

A tendency to the use of web pulleys and gears has begun to be evident, as this removes the possibility of getting caught in the spokes. All draft holes on pickers should be covered with wire grids wherever one can get a hand through into the beaters. Beater locks are now applied so that pickers cannot be started with the beater bonnet or glass doors open, nor can these be opened while the machine is running.



C. AMOSKEAG MILL BEATER LOCK

These devices are simple in construction, and meet the requirements of the liability insurance rules.

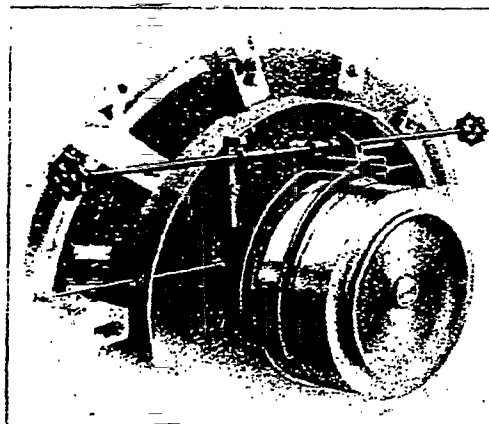
The Saco-Lowell beater lock "B" consists of a sliding dog having three legs and a slotted disk tight on the beater shaft. When two of the legs lock the beater bonnet and glass door, the third is out of connection with the beater slotted disk. Before either the bonnet or glass door can be opened the machine must be stopped and the dog slid sideways, with the beater disk in a position so the locking pin can

enter the disk slot, holding the beater against rotation. As the locking dog cannot be pushed out of the disk with the doors open, it can be readily seen that an accident is impossible under any condition.

The Amoskeag Mills on their old pickers employ a lock on a plan somewhat similar to that shown in cut "C." but the construction allows connecting bonnets located farther apart. As the cut shows, the lock consists of a long casting bolted to the machine frame, having a shaft with gears which throw racked bolts into notches in the bonnets, leaving the locking pin out of the beater disk. To withdraw the bonnet bolts, the pickers must be stopped so the beater locking pin can enter the holes in the beater disk, locking it against rotation. The sprocket chain drive between the feeder and opener should be better protected; a good design is made by the Amoskeag Mill.

Beaters are built so they can be turned end for end to save repairs and the unused keyway end should be covered with a tin sheath to save any one being caught and wound up. This is necessary as the shaft extends well towards the alley.

Cards. The revolving flat card as now manufactured is a much safer machine than many of the older type we find in the mills. It was never considered necessary to have belt shippers on a card but there were so



D. WHITIN CARD BELT SHIPPER

many accidents caused by the operatives getting their arms caught in the belts when starting up, that practically all the machine builders now have shippers which can be applied to their make of card.

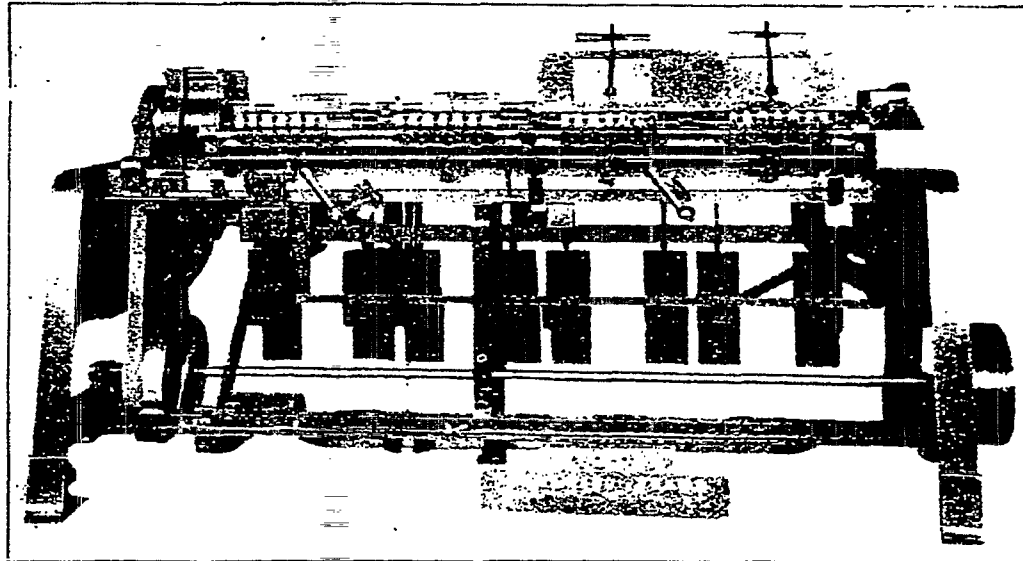
This shipper is constructed with a shaft extended front and rear far enough so the card can be started from either alley. The crank and link motion locks the belt on or off and is very easy to operate. Cut "D" also shows a door lock, making it impossible to have the door open with the belt on the tight pulley, thus avoiding accidents to the hands by coming into contact with the fast revolving cylinder.

The Saco-Lowell Shops include a round shaped ball binder with their shipper motion, by which pressure can be applied to the belt after it is on the tight pulley to help the belt "take hold" in starting.

It has been suggested that the Burrow Pulley which drives the doffer and doffer gear motion be made with a web in place of spokes and that a cover be placed over the side shaft small bevel and feed roll gears: the location of these gears is such that if a man's overalls get caught, his privates are drawn into the gears causing a very bad injury as well as an expensive one to settle.

Combing machinery has only been manufactured in this country within the last few years, so the designers have had the safeguarding idea well in mind and have left few points for criticism, for the gears are all covered, and the points of danger well out of the way; webs are used on pulleys and large gears in place of spokes.

Drawing Frames. This was one of the first machines on which the



E. WHITIN DRAWING FRAME GEAR LOCK

scheme of locking the gear covers by use of the belt shifting mechanism was first put into general use, and was covered by patents issued to H. A. Owen and O. L. Owen.

As cut "E" shows, stops are placed on the shipper rod at a point which brings them into position so the covers cannot be moved while the belt is on the tight pulley; neither can the belt be moved onto the driving pulley when any of the covers are open, making one of the most completely guarded machines on the market today.

Many shops furnish lower shaft, pipe covers and a pulley and belt

guard for the drive from this shaft—the outside pulley is usually of web construction and is covered by a guard usually furnished by the mill.

Speeders. The old style speeder was a machine on which many of the gears were poorly guarded.

The Amoskeag Mills in their safety work use covers of No. 16 sheet steel joined at the corners by an autogenous welding torch; this is only one of the many useful purposes this scheme can be used for in textile plants.

The textile machine manufacturer of speeders has looked after the weak points in gear covering by putting casings from the floor to the table, to be sure to get everything protected. The head end has for years been of the "boxed type," but it recently has been reinforced by pulley guards and out-riggers to prevent bumping into the belts, with trucks, etc.

The flyer spindle gearing covers, which in years back were made of wood, are now almost wholly made of steel, which is stiffer and holds its shape much better. Some speeders have means for interlocking the belt shipper and casings so the latter cannot be opened when running.

Spinning and Twisting. Some of the things accomplished in guarding these machines I have previously stated.

Fales & Jencks Co., Pawtucket, R. I., safeguard their spinning head end and draft gear covers in a manner which is very effective as it takes care of all the gearing on the frame. While these gear cover locks of all makes are a simple proposition to put into the design of a new machine, it would be practically impossible to rig over an old machine with them without going to great expense.

Among the textile machines, the latest to be re-designed is the spooler, which now appears with a "boxed end" similar to the spinning frame, and has all of the good points of that design. Metal bobbin boxes, with their freedom from slivers, have been on the market many years. One manufacturer reports the use of hollow safety set screws on all moving parts of the frame, and head end doors which cannot be opened when the belt is on the tight pulley.

Warping and slashing machines have but few danger spots and these are well covered by guards on the machines put out today. The main driving belts must be covered up six feet from the floor in some states, but this calls for special expanded metal construction in every case. Safety blow-off valves must be applied to take care of excessive steam pressure.

Weaving. Many of the danger spots on the loom have been safeguarded—for instance, injuries from flying shuttles were very largely stopped by use of the Sullivan Shuttle Guard, shown in cut "F."

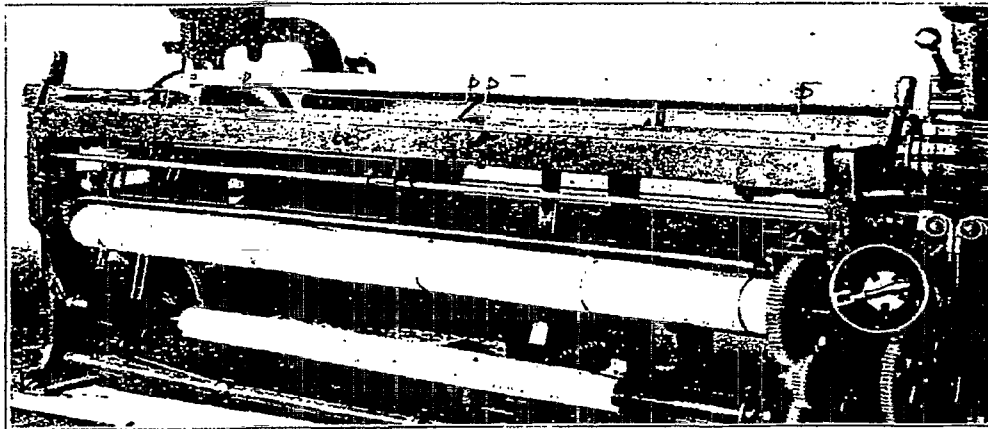
This guard is simply a stiff wire attached to the hand rail running parallel with the race, high enough to be out of the way of the properly travelling shuttle, but low enough to hold it from flying out of the shed. The patent on this guard has expired and we now see many modi-

fications of the first design; this, in fact, might be called a standard equipment for looms.

The Northrop and other automatic looms in 50 per cent of the mills, have made the threading of the shuttle by the operative unnecessary, but as the laws of some states make the use of plain-eyed shuttles unlawful, we find on the market many kinds of the self or hand threading type. With this shuttle, the operative simply draws the filling through and back under the thread holding beak and the threading is complete without danger or loss of time.

The doing away with of sucking filling through the eye of the shuttle has been one of the most far-reaching steps to safeguard the operative's health in what might be called one of the most unhealthful departments of the textile plant, for here we have noise, flying lint, hot, humid, stale air, besides the usual dangers of getting into running machinery.

The danger of the operative getting caught in the gearing of the loom is not as great as when he is working on some other types of machinery, for most of the danger spots are well back from the working alley out of reach, and besides, we find most of the gears covered. The fixer,



P. CROMPTON AND KNOWLES LOOM

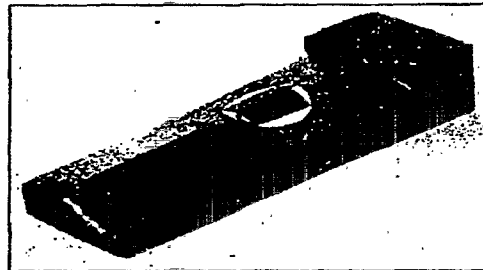
however, who must get close to the moving parts, is often in danger from the weaver starting the loom without looking to see whether the fixer is out of the way.

The Amoskeag Mill furnishes each fixer with a red wooden plug, as shown in cut "G." This plug fits the loom shipper handle stand slot and is plugged in before a start is made to fix the loom; it makes it impossible for the loom to be started and also calls the weaver's attention to the fact that some one is in danger. for the weaver, in his ordinary round of duty, almost unconsciously goes from loom to loom, starting them without looking, his only thought being to keep them going.

Many of the very heavy duck looms, in fact some fairly light ones, are being driven by motors which do away with the dangers from belt drives. The mills often place wire or expanded metal fences between these heavy looms to take care of flying shuttles.

One danger on looms fitted with harness head motions, is the fast revolving shifting hand wheel with its crank; this could be corrected by some form of clutch motion so constructed that the wheel would be thrown into action by the pressure of the hand on the handle, so it would only be in motion when needed.

Finishing Machinery. These machines, particularly the heavy calenders with their massive gears and frame work, even in the machine of today are not designed with the usual type of cast iron cover so common to textile machinery, but the makers generally leave it to the many firms who make expanded metal covers to attend to the guarding proposition after the machines are set in their places in the mill. This is done from an expense point of view, but they might as well be designed safe as to be fixed up after installation.



G. LOOM SHIPPER PLUG

Motor drives have helped out by doing away with the large belt risks and most of these gears have been amply covered by suitable cases.

The Cloth Folder in cut "H" shows the influence the mill has on textile machine design; this comes from the fact that running a machine brings out its weak spots and many times we find the corrective features are made by the mill and later adopted by the builder. In this case some one got caught by the folder crank and the result was an apparatus to make it stop every time in the same place, also, its arc of swing was covered by a circular casing.

The experience told regarding the Cloth Folder holds good with the Cloth Winder. Here the accident was caused by both ends of the pulp board not being secured, so when the machine started the board flopped about and injured those near it. An attachment now prevents starting the machine until everything is secure; this is another application of the shipper interlocking idea.

Acid Carboy. The Amoskeag Manufacturing Company, to whom I am indebted for much I have brought to your attention, particularly on

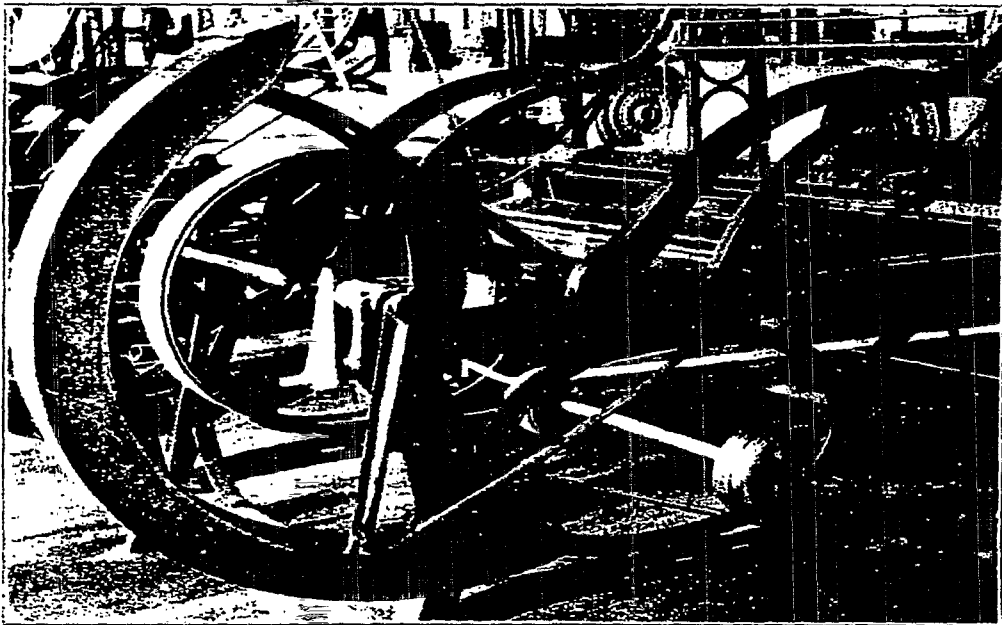
what has been done on machinery already installed, has evidently solved the way to handle dangerous acids by use of their carboy pouring stand. The carboy box is firmly held by straps into the pouring fixture, and the back slap of the liquid is well attended to by the use of the glass shield which does not interfere with watching the flow of the acid.

Pneumatic lifts properly designed and placed can save many a strained back and muscles—accidents easy to claim and hard to disprove.

A few ideals to strive for in textile machinery guarding might be summed up as follows:

Gears should be completely covered.

Covers that have to be opened often should be protected by devices interlocking them with the shipper motion.



H. CLOTH FOLDER

Bolt on all covers which protect danger spots that should only be looked after by the fixer.

Use web pulleys and gears where not covered by casings.

Use safety set screws on all revolving parts.

Belts should be covered by screens, particularly where they "take on" to the pulley.

Be sure the belt guards are stronger than the force produced by the breaking belt: if not, the danger from flying pieces may cause more injury than if the belt were left uncovered.

Do not allow covers and protective parts to be taken off and not put back again.

Do not allow any exposed keys or keyways.

Be sure a cover is not a trap; some are.

Prevent accidents before they happen.

Keep ahead of the law.

CHAIRMAN BEYER: Mr. Owen has had a wide experience with machine design and construction for textile work, and I am sure we are very much indebted to him for the thorough way in which he has handled the subject. We will have an opportunity to discuss his paper later, and I think we had better proceed with the next item on the program. It is only comparatively recently, so far as I know, that safety education has been taken up to any considerable extent in the textile industry. It was long felt by the executives that the problems in this industry were different from those of the iron and steel and other industries where there had been safety organizations.

One of the concerns which, within the last couple of years, has organized safety committees to combat accidents in its mills is the concern of S. Slater and Sons, Inc., of Webster, Massachusetts, and Mr. Ide is going to tell us something of the splendid work they have done in that direction in the last year.

SAFETY EDUCATION IN THE TEXTILE INDUSTRY

WILLIAM S. IDE, S. SLATER & SONS, INC., WEBSTER AND FARNUMSVILLE, MASS.

HISTORY OF THE PLANT

The Slater Mills were founded at Webster, Mass., in 1812, by Samuel Slater, who had already established the first commercially successful cotton mill in the United States, at Pawtucket, R. I.

The first mill operated at Webster, Mass., was for the manufacture of cotton yarns. These yarns were woven into cloth on hand looms at the homes of the farmers in the neighborhood, for at that time the power loom had not come into use.

In the year 1815 Samuel Slater, associated with Edward Howard, started a mill for the manufacture of woollens, and soon established an enviable reputation for the manufacture of broadcloths and uniform cloths, a reputation which continues to the present time.

In the process of time these mills were enlarged, and as they stand today comprise the Woolen and Worsted Mill, employing some 1,350 workers; the cotton mill, employing about 600, and the Cotton Finishing Print Mill, employing about 400 workers. In connection with these three mills, a mechanical department is operated, employing about 150 men, and a farm branch, employing 50 men, all at Webster, Mass. The mill at Farnumsville, Mass., employs 450 people, and is engaged in making Cotton Worsted Narrow Goods. The employees of all these forces number 2,000 men and 1,000 women.

There is no doubt whatever, that the Slater Mills were the pioneer

mills in the textile industry. Neither is there any doubt that the Slater Mills were the pioneers in safety work. Originally, it is said, pails of turpentine were always kept convenient for cleansing scratches and cuts; while this protection measure today may seem crude, yet it indicated forethought and business acumen. Today safety work at Slaters is recognized as one of the vital links in the chain of manufacture.

RESULTS OF HIGH ACCIDENT RATE

When the Liberty Mutual Insurance Company rendered its analysis of our accidents for the year 1917, we were very much disturbed to find that our plants had more accidents per capita than the average Massachusetts textile plant.

We had our first-aid rooms, our nurses in attendance, etc., and had guarded our machinery as the State Police required from time to time. Our machinery was as modern as similar plants, our overseers were capable men of long experience, and we were at a loss to understand just why we should have more accidents than others had.

We realized, however, that this high accident percentage was costing us money in high insurance rates, that there was a considerable loss of production occasioned, and that our labor turnover was not being improved by having our mills known as dangerous places to work.

Right here let me state that Webster, Mass., is one of the finest mill towns in the country. The relations between the employer and the employee are of the best. A large percentage of our employees have lived here all their lives and have always worked for S. Slater & Sons, Inc., and know their interests and the company's interests are one and the same. All of the old families are personally known by the officials of the Slater Corporation and personal concern is taken for their happiness and general welfare; and so in taking up safety work, there has been that intimate personal interest of the officials in the matter, which has perhaps made it easier to make this work as successful as it has been.

We were advised by our Insurance Company and consulted with other experts as to what we should do to cut the high rate of accidents, and the consensus of opinion showed the desirability of starting a safety campaign.

This advice was accepted and on June 1, 1918, we began under the direction of the Safety Department of the Insurance Company and formed our Safety Organization as follows:

SAFETY ORGANIZATION

A safety inspector was appointed to conduct a propaganda campaign of education among the employees and their families to follow up all accidents and learn how they happened, why they happened, and if a similar accident could be averted.

Three committees were formed to meet once a month, with duties as follows:

A General Committee composed of the Treasurer, and Superintendent of each mill; the Overseers' Committee composed of one overseer from

each mill and the overseer of all outside work; the Workmen's Committee composed of one workman from each mill and the Chief Electrician.

The personnel of the General Committee was made permanent, while the Overseers' and Workmen's committees are constantly changed by the dropping of one member of each, every month, and replacing with new ones, so that eventually a large number of men will have served, and will have learned to feel that this work can be a one-hundred per cent success only by each and every one doing his share.

The Overseers' and Workmen's committees meet regularly on the company's time every month at the General Office with the Safety Inspector for the purpose of going over accidents which have happened since the last meeting and taking up any matters which the Inspector may wish them to consider. At these meetings our Treasurer drops in and makes a few remarks which become food for thought. Every effort is made to impress upon each member the importance of this work.

The Committee then proceeds for an inspection through one of our plants—there being four plants and two committees, each plant gets an inspection once in two months—and later submits to the Safety Inspector any recommendations it wishes to make. These suggestions, good or faulty, reasonable or otherwise, are gone over by the Inspector and Superintendent of the plant affected and finally come before the General Committee. Practically all of the suggestions are good, and any that the General Committee do not approve are sent back to the recommending committee with full reasons for not carrying them out.

EDUCATIONAL WORK

Bulletin Boards have been erected around the plants and an effort made to keep bulletins of interest posted. Most of our bulletins are received from the National Safety Council and the Liberty Mutual Insurance Company. Newspaper clippings of accidents are followed up and then posted where a similar accident might be liable to occur.

First-aid rooms are fitted up at each mill where the minor cases and daily dressings are attended by a nurse. Considerable safety work can be done by the nurse; for instance, an employee has a septic finger caused by a neglected scratch and reports for daily dressings, the attention of each one coming in for treatment is called to this and the patient is generally willing to tell just how it happened, etc., and the chances are that any one who sees a case of blood poisoning will see it in his own mind when he gets a cut or scratch.

However, we have had several lost-time accidents due to blood poisoning, occasioned by neglected cuts and scratches, even recently, and it is our experience that about the hardest thing to eliminate in safety work is the human tendency to take a chance. We are all natural gamblers, to a certain degree, and few consider carefully the odds against them, when tempted to take a risk in work or play. So this is one subject that must be continually agitated, and brought to mind in striking ways. A great deal of time, thought, and money have been put into the guarding of machinery, and while the guarding of machinery is, of course, neces-

sary and helpful, it does not compare in protective value to the educational work on safety.

GENERAL HOSPITAL

A general hospital is maintained, completely equipped, with two rooms and four cots, being centrally located for the mills at Webster, and used for the more serious accidents. The nearest Public Hospital is at Worcester, sixteen miles distant.

SAFE CLOTHING

Every effort is made to have the employees dress in safe clothing. About 40 per cent of our help are women and for these we provide womanalls and caps. The girls are advised to wear these, but it is not made compulsory; about half the girls take advantage of this clothing.

MOVING PICTURES AND SPEAKERS

Through the Liberty Mutual Insurance Company we secured the moving picture scenario written by David S. Beyer, and entitled "The Outlaw," and ran it afternoon and evening for two days at Webster, and one day at Farnumsville, for the benefit of our employees and their families. We believe that this picture gave our safety work a tremendous start and we are planning to arrange for other pictures of this nature at regular intervals. The week following this picture show there was not one lost-time accident at any of our mills, whereas the average had been six per week.

Our overseers get together for a smoke talk occasionally, at which time we have some one present from out of town who can give a short informal talk on Safety. At these meetings each one is asked to contribute his ideas and to ask questions.

These meetings are profitable, we believe, in that they tend to get the men better acquainted with each other and with the management. Furthermore each overseer is made to feel that safety work is just as much a part of his work as production.

COST OF ACCIDENTS

We tell our overseers that every lost-time accident costs the Corporation one hundred dollars (\$100.00) or more, seventy dollars (\$70.00) insurance charge (which I believe is the experience rating basis) and thirty dollars (\$30.00) for the loss of production, etc. Really, money talks and no overseer cares to see his department lose a hundred very often, particularly when he knows that records for each department are being carefully kept and from time to time will be read at the general meetings.

Our nurses and doctors are impressed with the cost of lost-time accidents, not only to the Corporation but to the injured, and are requested, when an employee is so injured as to incapacitate him from his regular duties, but not from some other useful work, to advise him to return to work, when his overseer will give him something he can do.

We believe this policy is best for the employee, for several reasons, because he loses no pay, by being occupied he suffers less from his injuries, and gets back on his regular work at the earliest possible moment.

The Corporation benefits by not having the accident charged against it and has gone some way toward making the employee feel that a personal interest is being taken in him. All of this accrues naturally to the advantage of employer and employee.

The safety organization must deal with accidents very much as the health authorities deal with contagious diseases; the origin must be discovered and some definite steps taken to prevent further cases.

There are some cases that seem absolutely hopeless. We have in mind one man in particular, a very good workman, steady and sober, but always getting hurt; we finally had to release him as too heavy a risk.

The foregoing material will give you an outline of the general way our Safety Campaign has been worked. Now as to results.

RESULTS OF SAFETY WORK

During the six months previous to starting safety work there were one hundred seven (107) lost-time accidents, an average of more than four per week; for the first six months after safety work started there were fifty-three (53) lost-time accidents, or an average of two per week, and the doctor who had most of our accident work began to revise his estimate of what his income tax would be.

During the six months ending June 30, 1919, or the second six months of safety work, the lost-time accidents totaled thirty-two (32) or not quite one and one-fourth per week.

Our lost-time accidents for 1919 to date, figured on a yearly basis are 2.24 per cent of the total employees, and we have every confidence that this figure will be cut in two, one year hence.

For the purpose of knowing just what progress is being made from every standpoint, accurate record must be kept of all accidents and their cost. This data should then be summarized and comparisons drawn, and the facts as developed, brought to the attention of the safety organizations.

Such reports as are posted through the mill should be simple statements of the number of accidents each week occurring in the different department or mills.

The principal factors in making safety work successful are the same as in making a success of any other work; you must believe in it, you must get every one else to believe in it, you must put a lot of enthusiasm in it, and you must keep everlastingly after it. Nowhere can the maxim, "eternal vigilance is the price of safety," be applied with greater force or effectiveness than in a large modern industrial establishment, such as S. Slater & Sons, Inc., where the exercise of continual caution with manual skill means a high degree of productive efficiency, and where, on the other hand, carelessness of employees, with lack of alertness on the part of supervisors or foremen in the matter of preventable accidents, may mean heavy loss to both employer and employee in money and morale.

CHAIRMAN BEYER: Mr. Scully of the nominating committee has to

leave shortly and we will postpone the discussion of Mr. Ide's paper until this can be disposed of. The nominating committee will please report.

REPORT OF NOMINATING COMMITTEE

MR. SCULLY: The nominating committee submits the following names: Mr. H. L. Robinson, Crimpton and Knowles Loom Works, Worcester, Massachusetts, Chairman; Miss Ida May Wilson, Service Department, Lockwood, Greene, and Company, Bay State Cotton Corporation, Newburyport, Massachusetts, Secretary; and, Mr. A. E. Conrath, Chief Inspector and General Foreman of the International Harvester Company, St. Paul, Minnesota, Vice-Chairman. By way of a little explanation, I want to say that Miss Wilson was put on this committee, and she objected quite strenuously to submitting her name, but Mr. Coffey and myself held a special meeting, and we unanimously decided she was the person whose name should be submitted, and we are very glad to be able to do that, Mr. Chairman.

CHAIRMAN BEYER: I see we made no mistake in selecting as the Chairman of the nominating committee, one who did not hesitate to use the steam roller to secure desirable candidates when necessary.

(These persons were unanimously elected.)

CHAIRMAN BEYER: We would like to hear a discussion, or any questions that any one would like to ask, on the last two papers which have been read, or on Mr. Moiler's paper, as the formal business of the meeting is now accomplished, and further discussion is in order.

DISCUSSION

MR. COFFEY: One of the hardest things to guard successfully is the carding machine. I should like to have a little detailed explanation given on this.

MR. OWEN: There are not many women working around those machines, and outside of keeping away from the belt and so forth, the risk is comparatively small. As a rule, we haven't done much on the carding machine, because, to be frank, I don't know how it could be guarded successfully.

MR. COFFEY: We don't find many accidents occurring around the carding machine.

CHAIRMAN BEYER: Don't you think the belt shifter itself serves as a sort of guard?

MR. OWEN: Yes, it takes care of it very largely.

MR. COFFEY: We haven't got a record of the belt accidents in the textile industry, but in that one industry, we have not had a belt accident in a couple of years. Are there any statistics available on the subject?

CHAIRMAN BEYER: We have some such statistics. I made a study of the matter a few years ago, and found that the mechanical accidents in the textile industry were more frequent, comparatively, than in most other industries. Yet, educational work has been just as efficient and important as in any of the other industries. Some data on accident statistics were given in the 1917 Annual Proceedings of the Council.

SECRETARY RENNIE: I think the best way to prevent accidents is along the lines of the last paper—safety education.

MR. O. M. CARTER (Daily News Record of New York, Cleveland, Ohio): Has it ever been tried to reduce accidents by offering a bonus to the fellow that didn't have an accident?

CHAIRMAN BEYER: Yes, I think I can answer that. I was just at a meeting of the Midvale Steel Industry, which is divided up into committees, and the committee that has the fewest accidents during any month receives a bonus. There is also a bonus for the committee that shows the greatest decrease in the number of accidents in that period.

MR. ROBINSON: I don't think it pays to use that kind of incentive.

MR. MOLLER: Almost anything that will afford the sought-for protection is worth the price.

MR. ROBINSON: I can't see how it would take care of the carelessness of another employee.

CHAIRMAN BEYER: Double the bonus if he didn't injure anyone! (Applause.) "The proof of the pudding is in the eating." I think that anything which helps to prevent accidents is worth while, and sometimes the novel and seemingly impractical does do good work through arousing interest among those concerned.

We have some representatives from "across the border,"—Mr. Payne of the Empire Cotton Mills, Welland, Ontario.

MR. J. D. PAYNE: This is my first attendance at the National Safety Council. As a matter of fact, in Canada we have been a little bit backward with the safety movement, and it is tried out up there more on the statements of our neighbors in the States. Recently, however, it has come into more popularity and I believe is proving very successful. That is the situation in the eastern part of Canada, where we have one line of action just opposite, almost, to the western part. The trouble is that we really have no standards upon which to go.

A MEMBER: Perhaps it is a case of two men going toward the same point, and both meeting head on.

MR. PAYNE: That is just the point, but during the last three or four years we haven't gotten far enough along the road, and the travelling seems rather rough and unsteady. Our accidents in the mills have been cut down to a place where a fair improvement is shown, but by next year we hope to be able to give some very good figures to the National Safety Council, and also give more details of the work, than we can do at the present time.

CHAIRMAN BEYER: I am sure the fact that you are here shows that your plants are taking a great deal of interest in safety work, and where there is such interest there is bound to be results in a very short time, Miss McLaughlin may be able to tell us something of interest about the work at the Imperial Cotton Company, at Hamilton, Ontario.

MISS MONA McLAUGHLIN (Imperial Cotton Company, Hamilton, Ontario): About six months ago we organized a safety committee and, like everybody else, we think it is going to be a wonderful agent in the reduction of accidents, and we are going to put the good work across. Our fore-

men are going to be the real boosters and I believe will cause the greatest gain in this work, because a foreman is in closest relation and contact with the help and if he is a real enthusiast in the work of reducing accidents—and we believe ours will be—it is going to impress the value of the work more upon them than anything else and they should be more responsive to the benefit to themselves. We hope to have some very interesting statistics for the convention next year.

CHAIRMAN BEYER: I wonder if Mr. Newton would not care to add something to the discussion, as I am sure that he could give us some valuable thoughts.

MR. H. A. NEWTON (Assistant Superintendent, Pacific Mills, Hampton Mills Department, Columbia, S. Car.): Mr. Chairman, I don't believe I will add anything to the discussion, but I will say that all that has been said by the speakers has been very interesting indeed, and is going to prove of considerable value. Most of our accidents have been caused by belts and I had hoped to hear a little more along that line.

One unpleasant thing that we have to contend with down in our district is the fact that the employees almost always try to take an unfair advantage of the employer, and they do not seem to want to coöperate, and are really not very much interested in welfare work, as they take the position that we are trying to impose upon them. For instance, if a man gets a scratch, or any little thing like that, he will lay off two or three days, when he could just as well work, and probably goes home and works around his own house. And often those minor injuries develop into something serious because they do not have them attended to in time.

We have no workmen's compensation law and when a case comes up for settlement, we have to try to please all parties the best we can. We are trying to give as much publicity as we can to safety work and are endeavoring to secure the confidence of employees so that we may be able to give them greater assistance, and not only effect a considerable saving to them, thereby effecting a saving to ourselves, but to help them in every way possible.

CHAIRMAN BEYER: You don't have a compensation act in either of the Carolinas, do you?

MR. NEWTON: No, sir.

CHAIRMAN BEYER: I think we ought to have a word from the coming Secretary of the Textile Section, Miss Wilson.

MISS WILSON: I am afraid I can't add anything to what has been said. We have a safety committee in our organization, the members being the heads of the different departments of the plant. We add new members every six months, but no one is ever taken off the safety committee. We have very few serious accidents. When an employee comes into our plant, she is carefully instructed in the proper methods, and the accidents liable to happen are explained. She is also carefully observed and our employees are now very careful, thus proving the success of this plan of education. We show them the right way and the wrong way, and

insist on the right way of doing things. Since the time of 1930 we have had twenty-two accidents, though none of them were serious.

Our people are very much interested in the work. Every member on the safety committee considers himself individually responsible for any accidents happening under his or her jurisdiction, or in their department.

As soon as an accident is reported, it is kept under close observation, and the worker is visited regularly and his condition known and watched at all times, which has prevented serious complications in many cases.

CHAIRMAN BEYER: That is a very interesting and helpful summary of the work that is being done in your plant, Miss Wilson.

There are just one or two points that I would like to mention before the close of the meeting of the section. I remember that at the meeting last year there was some discussion as to the desirability of adopting standards for safety work in the textile industry, standards that could be followed by any mill, with the certainty that it was using the best safe practices now available. You have heard this morning much definite and detailed information that could be used in such standards. There was one paper dealing with plant and machinery layout, another took up the matter of guarding machinery, and the third covered the educational work, so that the field has been pretty well outlined, and in a tangible and definite form.

I believe that with the skeleton material given in these papers it should be possible to go ahead with the development of more definite standards, and that gives the succeeding officers of the Textile Section some suggestions to consider in carrying along the work during the next year.

TEXTILE BULLETINS

Another point that I should like to bring to your attention is the importance of the bulletins that are issued by the home office of the Council during the year. These bulletins are based on the experience of the different mills and members of the National Safety Council, and contain valuable data which can be used by all of us. The Council can work to much better advantage if you will make contributions during the year of bulletin information based on practices that you find in your own plants. This will further the work of the National Safety Council in the most effective manner.

Mr. R. H. GERRANT (Safety Engineer, National Safety Council, Chicago, Ill.): I would like to impress on you the importance of sending in to the Council headquarters the data that you collect in experimenting with various guards and any other interesting work in reducing your accident hazards; also in your educational work in safety. My time is limited, as I have about five other meetings that I am trying to get around to before twelve o'clock. There were however three or four remarks that I have heard in your discussions which are extremely interesting, such as the guard for shuttles, for eliminating shuttle accidents; this will surely be suitable for a bulletin. All members should realize that this is simply a

coöperative body, and the more you contribute the more all will be benefited.

CHAIRMAN BEYER: I will say in closing that I am sure I express the sentiment of the entire section when I thank the Vice-Chairman, Mr. Ide, and the Secretary, Mr. Rennie, for their time and effort in behalf of the textile section, as well as the speakers for preparing the interesting program that was presented in the furtherance of safety work this morning. They insist on giving me the credit for some of it, but I cannot accept it because I merely got the others to do the work.

I know you want to hear from Mr. Robinson, the next chairman of the section, before the meeting adjourns.

MR. ROBINSON: If the meeting next year is as great a success as this one has been this morning, I will be inclined to take quite a little credit for it. The program this morning has been a splendid one, and I feel sure it is due to the direct efforts of Mr. Beyer. He disclaims the credit for it, by saying that he got the others to do the work; but he used very good judgment in selecting the workers. I make the motion that Mr. Beyer, Mr. Rennie, and Mr. Ide be given a vote of thanks for their splendid efforts.

(The motion was seconded and carried.)

The Section adjourned at 12:35 P. M.

Women in Industry Section

October 2 and 3, 1919

MISS TRACY COPP, Chairman

Director, Women's Department, Industrial Commission of Wisconsin,
Milwaukee, Wis.

THURSDAY MORNING SESSION

CHAIRMAN COPP: We have the honor this morning of an address of welcome by Mrs. Bishop. Mrs. Bishop is the President of the Cleveland Federation of Women's Clubs and has been appointed by the Mayor of Cleveland as Chairman of the Women's Committee of the Northwestern Ohio District of the National Safety Council. I am honored in presenting Mrs. Bishop.

Mrs. Bishop: I am always proud to receive any invitation to represent the Cleveland Federation of Women's Clubs and additionally proud when I am asked to come before any gathering to represent Cleveland women.

I consider it a distinct pleasure to come and talk to you for a few moments this morning for two reasons. The first reason is that I am tremendously interested in the entire work of the National Safety League—it always appeals to me very strongly when any group of men and women undertake such an important piece of work or campaign, if you will, for the pure sake of the public good. Another reason is that the women have been given two morning sessions of one precious week's stay in Cleveland!

Because I know we all feel the necessity of this great movement, I am going to take the liberty of offering to this National Safety Council League the earnest, loyal cooperation of the women not only of Cleveland and of this Northeastern District of Ohio, but of the whole United States. In conclusion I wish to say that we Cleveland women wish to feel as hostess and wish you to feel that we are your hostess during your trip and sojourn in our city.

CHAIRMAN COPP: I have the pleasure of introducing to you Miss Wright of the State Department of Health, New Jersey. Miss Wright is eminently qualified to talk to you about the "Responsibilities and Oppor-

tunities of the Industrial Nurse"—as she has had years of experience in that work.

THE RESPONSIBILITIES AND OPPORTUNITIES OF THE INDUSTRIAL NURSE

MISS FLORENCE SWIFT WRIGHT, R. N., NEW JERSEY STATE DEPARTMENT OF HEALTH, TRENTON, N. J.

Three years ago it was my privilege to prepare a paper for this organization. Industrial nursing was still in the pioneer stage and the industrial nurse was often on trial. The great war has brought changes, not the least being a much more general appreciation among employers of the value to them of the trained nurse as well as recognition in circles of organized labor of her services to the workers. Today I shall not, as was the case three years ago, try to convince you that you *need* the industrial nurse; instead, I hope to show what may attract a nurse to work in industry as a means of self-expression which allows her to use for humanity all of her training and experience.

PREPARATION FOR SERVICE

To meet her responsibilities and take advantage of her opportunities she must prepare herself as a *public health* nurse by acquiring some familiarity with the principles of psychology and applied economics and an open-minded insight into present day social conditions. She must learn to understand all kinds of people and she can only do so by making herself familiar with their past condition, their ambitions, limitations, opportunities, and needs. She cannot understand the various types of Poles unless she knows of the partition of Poland and of the various factors which have consequently influenced the thought and habits of the Polish people. A knowledge of their history is also essential with the Russians, the Hungarians, the Italians. The people she deals with she must study daily. The American may be able to explain himself, but the immigrant can hardly become a good American citizen unless we understand his needs, if not his tongue, and make him know that we understand him.

FIRST DUTIES OF THE INDUSTRIAL NURSE

As an *industrial* nurse, the trained public health nurse on taking a position in a new industry, should acquaint herself as rapidly as possible with the processes of that industry. She should make herself familiar with its less obvious health and accident hazards and with the indirect effects of work and methods on the vitality and future health of the workers, especially young people and women, as well as with the hazards that force themselves upon the attention by their ever-recurring *visible* results.

A nurse who is allowed the privilege of studying the industry will, *providing* her records are well kept and efficiently used, become increasingly valuable in all her contacts.

Her further responsibilities are:

First: To herself, that she develop her powers.

Second: To her employers, that she perform faithfully what they have seen for her to do, while demonstrating the economic value of broader activity.

Third: To the workers, that she serve them acceptably and with the authority that will win their heed to her teaching.

Fourth: To the industrial physician, that she carry out his medical orders exactly and that she cooperate with him in all matters.

Fifth: To the community, that she act in the best and broadest meaning of the term as a good and progressive civic as well as industrial servant.

But I believe that the great responsibility of the industrial nurse who has a vision of the broader aspects of her work is a duty to our country for the best use of her opportunities in the making of good American citizens. Her privilege of rendering personal service gives her rare opportunity to understand the worker and puts this duty squarely on her shoulders. I consider her opportunities to be her responsibilities.

THE NURSE A PART OF AMERICANIZATION PROGRAM

How and why the public health nurse must be a part of the Americanization program has been told so concisely by Mrs. Haasis¹, of the National Organization of Public Health Nursing, that I quote her words.

"First: The Public Health Nurse enters the home of the foreign born at a time when there is trouble. Service is needed, and needed badly, too. Her uniform proclaims her as a worker, and to the men and women who have toiled and sweated in workshop or field, there is no passport to confidence like a pair of working hands. The uniform also proclaims a knowledge above their own, a familiarity with scenes of life and death, a kinship to the "professor," to which they are willing to trust their dear ones for care. Some, coming from countries where ministry to the sick is the field of the church, recognize in the uniform the added sanction and beneficence of religious service. . . . There is trouble, sore trouble, and she has service to give and her service assures her welcome.

"Second: Nine times out of ten her visits bring immediate and tangible benefit. Even if not in the recovery of a sick one, at least in increased comfort and in the confidence of the family that they are doing the right thing. A few simple admonitions and baby begins to gain weight. A burned hand dressed three or four times and the father is able to go back to work again. 'Hope deferred maketh the heart sick,' but immediate results are a wonderful help in gaining confidence and obedience to one's teaching.

"Third: Once the gratitude of the family and their confidence are gained there is no subject on which they will not ask or accept advice. And here lies the opportunity of the public health nurse to win the family over to such American standards and habits as are better than their own. The Italian mother can, after a time, be persuaded to take off the

¹"Public Health Nursing an Aid to Americanization," by Bessie A. Haasis, Educational Secretary, National Organization of Public Health Nursing.

"fasch" which binds her new born baby's little legs up into a tight mummy shape. The Polish mother, after patient teaching, can be induced not to give her three months' baby a taste of cabbage, stew, or whatever else is on the family menu. . . .

"There is no reason why the advice of the public health nurse should be limited only to matters of health. Public health nursing states as its aim: 'To remedy not only the case of illness, but *whatever is wrong* with the family.' And so the public health nurse may be the one to get the young wage earner into lighter work so that he can attend night school. If she has nursed his brother through a critical case of pneumonia he is likely to do what she advises. Or she may be the one to urge the father to take out his naturalization papers, knowing that in the hazardous industry in which he is employed he stands as good a chance as any other man of being killed and leaving his wife ineligible for a widow's pension. If she has cared for the wife when the last baby was born, he is likely to do that, too."

This is all true of the *industrial* public health nurse as well and her opportunities are even greater for two reasons.

First: Her services are free from any possible sting of charity as she is employed as a necessary provision for industrial safety and health; or if employed by the workers themselves, through mutual aid associations or labor unions, her presence shows the need of her service to have been so plainly seen by those she serves that they have already paid her for it.

Second: Her close relation to her patients, while at work as well as in the homes, during health as well as in sickness, makes it possible for her to become a friend before she becomes a nurse, with all the advantage of knowledge and understanding which the double relationship will bring.

GENERAL DUTIES OF INDUSTRIAL NURSES

Today the trained nurse is employed in most industries; in mining settlement and bank, laundry and hotel, tannery and department store, rolling mill and candy factory, packing house and silk mill. Her duties are equally varied. Most often we find her giving first aid and assisting the industrial physician; caring for the sick in the home and teaching there bedside nursing, home management, child care. However she is equally concerned with accident prevention, sanitation, health education, employment problems. Seeing cause of illness and misery, she is able to aid in finding the remedy.

In the plant she may have a large responsibility in searching out the more remote causes of injury, illness, and unhappiness, together with an obligation to enforce necessary precautionary measures. Her daily contact with the workers in plant and home, together with her neighborly, personal service to them, puts her, if she respects their racial traditions, in the best possible position to demonstrate the wisdom of change in habits which will make for healthy, rational life. If she is wise, she will not seek to do this by ruthlessly uprooting cherished custom, but rather by friendly interchange of ideas will strive to alter only that which is actually harmful while preserving the good to enrich our own national life. She will not fall into the error of the social worker in the old story who,

returning from a visit to an Italian family, reported that they were not yet Americanized as they were still eating Italian food. Rather, she will try to teach her American friends the value of the Italian salad, French soup, Swedish bread, Hungarian stew.

She will, by her understanding of the parents, almost unconsciously strengthen family ties by fostering in the minds of the young people respect for the opinions and customs of their elders, the loss of which is often a sad feature in the lives of the foreign born which gives dangerous freedom from restraint to their children and is the direct cause of much lawlessness among those of foreign parentage.

The industrial visiting nurse, already known to her patients, comes to them in their homes when they need her, and while her service to them is a friendly, neighborly one from a fellow-worker, her training and uniform give her words weight as suggested by Mrs. Haasis. Her co-workers and their families come to love and trust her and to depend on her to smooth out many rough places. She is a connecting link of understanding sympathy between employer and worker. Knowing both intimately, she is sometimes an unofficial mediator, explaining to the worker the aims of the employer and bringing to the employer what she has learned to be the needs, the handicaps, and the ambitions of the worker. Having the advantage of being on a common footing with them as a fellow employee and rendering, without any thought of charity, as special a service as a machine tender, the workers readily understand that her interests are theirs.

VALUE OF NURSE TO EMPLOYERS

In the plant the nurse may render many valuable services to her employers. Her records have shown ways of improving and strengthening their organizations. By seeing the benefits of a little attention to the care of health, employers are led to increase such service. First aid and health work, beginning with one nurse, have time and again grown in a few years to a large department providing full-time medical service with physical examination of employees and constructive work for the betterment of health conditions.

For the protection of the future of America, the welfare of girls and women in industry should be the special care of the industrial nurse. She should be able, ultimately, to show by her records the types of work which cause nervous exhaustion or undue physical strain; she can do much by proving the poor economy of the employment of mothers of young infants, and so help to keep for each young American his first birth-right, breast feeding by his own mother. Even in prosperous communities, the infant mortality rate is always high where many women are employed outside the home. Dr. Julius Levy, Chief of the Bureau of Child Hygiene of the New Jersey State Department of Health, shows that poverty is not the most important cause of infant mortality, but that any factor which separates the mother and her infant (whether employment in in-

¹"Education and Economic Adjustment for the Reduction of Infant Mortality," by Dr. Julius Levy (the National Conference of Social Work, 1919).

dustry or social life) by preventing the breast feeding of the baby, causes a high infant mortality rate.

The industrial nurse will see other than health needs. Efficiency is so dependent on health, health and happiness are so inseparable, that she will also take an active interest in the recreational and educational needs of the employees.

HER WORK IN THE HOME

Especially in the homes will her work yield results. More or less has always been done to educate foreigners in industry by means of settlements, societies, clubs, and night schools, but the foreign mother in her home had little general consideration. Hers has always been a heavy burden. Obligated to rear her family in a house unlike those of the homeland, with accustomed foods of prohibitive price or impossible to obtain, surrounded by opportunities she does not recognize and temptations she does not understand, it is no wonder that her children sometimes lack the health of their parents and often fall short of good American citizenship. The industrial visiting nurse reaches these mothers. Coming when she is needed, she is welcomed and her next visit is anticipated with pleasurable expectation. Having already seen the household at its worst, the nurse is treated with little reserve and is consulted freely on any subject, from how to manage schooling for the eldest child to the best way of keeping the children off the street or how to get good milk for the baby. The nurse who is alive to her opportunities for service will not be found wanting. If suitable means for recreation and education and a good milk supply are available, she will be able to advise. If they are lacking she can provide concrete instances for use in pointing out local needs.

HER WORK IN THE COMMUNITY

For their communities industrial nurses have been the indirect means of securing schools for foreigners, settlements, visiting nurse associations, child hygiene stations, open air schools, health leagues and medical inspection in schools, industrial clinics, better housing.

How shall the industrial nurse meet her responsibilities and seize her opportunities? By coöperation, first, with her employer, who, if she gives evidence of ability and if she is careful to show by means of facts, through her records and reports, the wisdom and economy of each step she takes, will allow her reasonable initiative and freedom to coöperate with other department heads in the plant and who will aid and abet all she does to become an efficient employee and a helpful friend to her fellow workers, a capable assistant to the industrial physician, and a good American citizen.

CHAIRMAN COPP: The members of the nursing profession have been very seriously developing the qualities in the nurse that are essential in industrial work: they are very eager that the employers in selecting industrial nurses should recognize those qualities and hire the nurses because they have them. I have asked one of our Wisconsin employers to give us a word or two of testimony regarding the qualities of their industrial nurse. I have the pleasure of having you hear Mr. Frank Shattuck of the Kimberly-Clark Company of Neenah, Wisconsin.

MR. SHATTUCK: It seems that the Chairman heard of a letter which went out from the Company last Friday to employees of one of our mills which employs 850 men, the purpose of which was to give them the results of the past year's work of the First-Aid Nursing Department. I will just read a portion of it:

REPORT OF KIMBERLY-CLARK COMPANY FIRST-AID NURSING DEPARTMENT

"Two years ago the Directors of this Company voted to place a nurse in the Kimberly-Clark mills. Miss Kirby was engaged, with Miss White as an assistant. Miss Kirby's figures have just come to me for the last twelve months and they are so important I want each to share with them.

"During the influenza epidemic Miss Kirby was on the job day and night. It was estimated that she took 5,000 temperatures during the days the disease was raging. Only three deaths out of the 840 people that were working in the Kimberly-Clark mills is the testimony of the good work which was done.

"During the past twelve months there have been 3,567 treatments given in the Kimberly-Clark First-aid Room by Miss Kirby. If this number of people had had to leave the mill in order to go to their homes or to the doctor's office, they would have lost about 11,000 hours of time. Before the First-aid Room was installed, there was an average of 20 per day out because of sickness or poor health; this is now cut down to an average of 8 per day. If we take the average lost wages before we had the nurse as compared with days lost on account of sickness, we find that the First-aid Department saved about \$13,000 last year in wages to the men and women in this mill. In many cases the nurses have saved the added expense of a doctor's bill.

"We have large numbers of employees thrown together in the mills and there is always the danger of the spread of contagious diseases—at one time it was the mumps, another time the measles, and I am quite confident that the spread of both of these diseases was cut off by the good work of these nurses. Miss Kirby also helped to prevent the spread of tuberculosis and to send the patients to a place where they could get the proper care, thus safeguarding the health of the fellow workers.

"If the First-aid Room should be abandoned and if the nurses in it should be abandoned, the expense and salary—and all expense and salaries is included—if put into the pay envelope would amount to a trifle less than one cent per day per employee."

CHAIRMAN COPP: Ladies and Gentlemen, the meeting is yours.

DISCUSSION

MR. S. W. ASHE (General Electric Company, Pittsfield, Massachusetts): I was very much interested in Miss Wright's paper.

The problem of an industrial nurse is difficult. We maintain an emer-

gency hospital and we have some very excellent nurses in charge. They handle about 100 cases a day of all sorts.

MR. A. H. CRAPSEY (A. T. Crapsey Company, Rochester, N. Y.): Industry owes a great deal to the married woman—a great deal more than she has heretofore been given, and I would like to hear some discussion on that point.

In regard to the health end of it, I think that industry ought to take care of a married woman at the time of maternity.

Then too, I would like to hear what the women have to say about the five-day week for women. We employ women in our plant and we have now worked for three years on the five-day week, giving the woman—the married woman, especially, a day in which to take care of her home and one day for recreation. This hasn't hurt our production in any way, but I would like to hear something about the five-day week.

MISS NESTA C. EDWARDS (Chicago, Ill.): I don't believe it's a function of industry to look after maternity. I am willing to see industry pay toward a community nurse and a visiting nurse, but I am not willing, as a worker in industry, to see the factory nurse do the functions of all the other organizations. It's the function of your factory nurse and your social service worker to bring your people in conjunction with the institutions that do the work.

DR. J. J. HARVEY (Akron, Ohio): I practiced industrial management for nearly a quarter of a century, both in industry and out. I think Miss Edwards is right. The industrial nurse has a function to perform and the industrial worker has a function to perform. There is no question but that there is a place in industry for the industrial nurse practicing her profession. The nursing profession until recently did not develop the industrial nursing profession—the nurses in industry were the pioneers in developing the industrial nurse. The profession has been taken up and they are developing splendid results in nurses.

CHAIRMAN CORP: I regret very much to have to announce to you that Miss Van Kleeck is unable to be with us this morning on account of illness in her family. Mr. Knoeppel has sent his paper, and printed copies are available.

HOW TO EMPLOY WOMEN SUCCESSFULLY IN INDUSTRIAL OCCUPATIONS

C. E. KNOEPPEL, INDUSTRIAL ENGINEER, NEW YORK CITY

Although the great war crystallized many conditions connected with Woman's industrial life, it remains for the post-war period to clarify them. The chemist generally clarifies his mixtures by filtering out the grosser particles or by absorbing them into a precipitate which can later be removed to leave the clear liquid. It is therefore fair to use somewhat similar analogy in respect to women industrial workers.

In justice to all concerned we ought to "filter out" as speedily and completely as possible, the individuals whose utter selfishness so often be-

gins with unrest and ends with unrestraint. To rid a business of these malcontents is much more difficult than to prevent their engagement in the first place. Some men acquire indifference to being discharged; but comparatively few women can consider discharge in any light but that of enmity. The other class of unsuitable employees which "absorption" removes, embraces those in whom personality and willingness are satisfactory but whose training has been insufficient, or whose physical condition is not adapted to their assigned duties.

Even above the purely industrial aspect of the subject of woman's work, there must always come the humanitarian aspect. Against strong opposition—sometimes on the part of the very class sought to be helped—laws were slowly formulated (and even more slowly extended from state to state) by which the labor of women and children was sought to be regulated as to hours and other conditions. It may be disastrous if we undo the good thus accomplished in an attempt to raise restrictions that were imposed for woman's own good, and our watchfulness in this connection ought to precede actual employment.

Here then is the first division of my subject "How to Employ" in the sense of *selection for employment*. A little later we will consider the second division that refers to *keeping them employed*.

It was my privilege about eighteen months ago to present some conclusions drawn from questionnaires answered by representative Americans. In that presentation I considered the subject under ten headings which I venture to repeat here, viz.:

- a. The work to be performed by women
- b. Finding the women
- c. Selection of women
- d. Training women
- e. Wages, hours, and fatigue
- f. Working conditions
- g. Living and social conditions
- h. State laws
- i. Coöperation of—
 1. Labor Unions
 2. Women's Organizations
 3. Government
- j. Post-bellum consideration.¹

Of course it is in the light of the last heading (Post-bellum consideration) that we are now viewing the preceding nine problems; but their relative importance has not been greatly altered in America's transition from war-time to peace-time activities. Yet enlightenment has come to us in the interval. Some of our hopes did not materialize and some of our fears were exaggerated; but in the main, things came to pass very largely as had been expected by those of us who had no personal "ax" to grind and who had sincere desires to serve America.

¹Women in Industry: An address delivered at Chicago in March, 1919, made under the joint auspices of the Society of Industrial Engineers and the Western Efficiency Society.

That American women rose so nobly to the demands of war is already history and if they were spared some of the harrowing overseas' experiences that claimed eyes and limbs and lives of the men-folk in those fateful years, we may yet conclude that even those sacrifices would have been made by our women in due course in the face of overwhelming Germanic domination.

Let us compare the present subdivisions of the subject with those of early 1918.

THE WORK TO BE PERFORMED BY WOMEN

Few manufacturers had any well-defined views as to the scope of work which women could perform in the plants. Therefore we could not say, "Here's the job! Where's the woman?" Instead, we had to analyze the operations that needed long-trained skill and those where short intensive teaching might take the place of longer normal experience.

Where such analysis was made intelligently by a Planning Department familiar with every (but not unduly favorable toward any one) department, the classification allowed more definite selection of women workers, and consequently with lower percentages of misfits and smaller labor turnover. Factory inspectors and women physicians were called upon in many instances to help decide what operations were or were not suitable for women's work.

Coincident with this effort was a wide awakening to opportunities for mechanical lifting and carrying of product-in-process. This not only relieved the emergency women workers from greater physical exertion, but it actually reduced production costs—and continues to reduce them even where women workers have retired in favor of the returning men. A number of other permanent improvements and advantages that arose during the stress of war, have remained to expedite and cheapen subsequent production. Jigs and fixtures were in this way further developed and both automatic and semi-automatic single-purpose machines were perfected and utilized. Incidentally certain laborious operations previously performed by male labor exclusively were analyzed to permit making labor-saving tools that could be handled by women.

In no small number of cases it was found desirable to vary intermittently the occupation of women where over specialization produced the nerve fatigue that follows continuous repetition of monotonous operations.

We may assume therefore, that a desirable division of work should be

1. Experienced men for difficult and complicated work;
2. Laborers for heavy manual work;
3. Women for light, simple or semi-complicated operations, wherein men set up the work.

Either the various trades, each for itself, or the government itself (for all leading trades) could compile and list the desirable or permissible operations suited to women's work. A field seemingly ideal for women would be that of tool-making, wherein her qualifications are manifest: accuracy, precision, neatness, dexterity, and quickness.

FINDING THE WOMEN

The questionnaire (already referred to) suggested a number of avenues of approach—chiefly the industries non-essential to war; the ranks of household servants, etc. Though the most obvious sources, the two named were somehow disappointing in the number of recruits obtained. This was partly due to assumption of war work by plants formerly engaged in non-war lines, and partly to a distaste among the better educated classes to enter gainful employment at such a time—"to accept pay from Uncle Sam while so much remains to be done which I feel I ought to do for nothing," as one bright woman expressed it. Largely from this class the Red Cross and similar ranks were recruited and the great majority of such workers have already returned to purely social or household duties.

The household servant class was a like disappointment. Near industrial centers the scarcity of such servants even before the war began was locally felt and the servants from non-industrial zones did not seem to possess or acquire readiness of hand and eye in industrial occupations.

But be it said to the honor of our women workers, that they entered war work more willingly than the parasite class of men servants who usually stuck to their sinecures until pryed loose by the famous "work-or-fight" order. Very likely this was due to the high percentage of aliens or partly naturalized individuals—those subjects from professedly neutral countries being the most loath to undertake war work, even at the tremendous wage attractions offered.

Women's societies, as a possible source of permanent additions to our industrial force will be well worth cultivation. Until now the Y. W. C. A. and similar organizations have drawn the bulk of their membership from office and store workers—and despite present high compensation, some such women still feel it a social "come down" to enter industrial plants.

SELECTION OF WOMEN WORKERS

No detailed qualifications for prospective women employees can be undertaken without considering the nature of the industry and its processes, but most of us feel that simple forms of both physical and mental examinations are desirable—together with some tests for deftness, skill, fatigue, and strain. Generally speaking, however, qualifications to be considered are: Age; adaptability; past experience; type; nationality; education; physique; health; intelligence; strength; moral character; looks; cleanliness; social standing; general aptitude.

The higher cost of training workers in these days of "paid learners" may lose much of its seriousness *when more careful selection raises the average quality* of such learners. It is fair, too, to credit the instruction-cost with full manufacturing value of salable product made by them. In this way each "taught worker" means lower net expense—or conversely allows engagement of higher grade instructors without raising the "cost per 'unit' taught."

To list the various "jobs" and let the incoming learners compare

them—and when practicable, to observe them during actual performance—helps to give clearer ideas of the employer's expectations, and lessens "choice by impulse" rather than after consideration. Unlike many men, women are not likely to select work chiefly because it "looks easy." It is altogether desirable that close supervision of learners should continue for from two to six weeks—and if the employment manager or welfare agent can get the foremen and superintendent to join in this observation, so much the better; especially if there is prospect of a job in another part of the business as an alternative.

Whether prospective industrial workers ought to be lured from the ranks of school teachers opens a field for serious discussion—especially in view of the proverbial underpayment of teachers and the proportionate attraction of industrial wages. But consensus of opinion is decidedly against such a draft upon so necessary an adjunct of modern life. Better by far raise the teachers' salaries and at the same time exact proper and higher qualifications that promise wider practicability of the teachings of instructors and their supervisors.

There is advantage oftentimes in seeking additional women workers from among the daughters of skilled workmen. Students of heredity claim that daughters favor father's traits and inclinations—and somewhat limited observation in this direction appears to bear out the view that daughters inherit latently, certain manual skill of their fathers. Other things being equal, such a daughter will become a better worker than one who undertakes operations in a different enterprise.

TRAINING THE WOMEN

Several phases of this aspect of industry have already been mentioned: and at least the nucleus of a corps of instructors should be organized before actively seeking women workers.

Preferably the instructors should be selected from the faster workers, in order to demonstrate dexterity; but the disposition of the teacher is also important. The "knack" of teaching is not confined to the "three R's" and one who has that knack will train a greater number and more competent workers than the teacher who has personal dexterity alone, without the gift of being able to impart the "how" of things.

Of scarcely less importance is, that the new woman worker ought to have a full trial; and if she does not show reasonably prompt aptitude in performing the operation in the "job" first assigned, she should be transferred to some other operation. In this respect women are even more than men amenable to the effect of immediate surroundings and activities.

The grouping of women workers is also important. A group of men of mixed nationalities may get along fairly well; but in case of women such arrangement is always risky and usually undesirable.

Keeping the instructors themselves under close observation and training allows each teacher's "special competencies" to be extended for use by other teachers, and the final net result is correspondingly improved.

It is nearly always fatal to best results if a newcomer is only par-

tially taught, and then left to continue as best she can. Striking examples of the seriousness of such a course may be found in the army of incompetent stenographers who boast of "making up their own" systems, because of their lack of study and training in one of the competent systems of authors whose text-books were merely skimmed (or largely misunderstood) by the student in haste to reach a "position."

If the worker is to be taught at all, let the instruction be continued long enough to prove competency—or the lack of it. It may seem superfluous to mention it, but qualifications of the instructor warrant consideration as well as in the case of prospective workers. Perhaps no other example of training workers offers more suggestive value than the telephone business, where the "quits" (due to marriage mainly, and to engagement for private exchanges) produce a very steady and considerable exodus month after month. There, as elsewhere, it is found that the teacher must possess, pleasing personality; tact; patience; sympathy; consideration for the rights of others; ability to perform the tasks, as taught.

It seems almost superfluous to urge the advantages of industrial training schools; but up to this time both Labor and Capital have looked askance at most proposals for their establishment. Labor apparently fears eventual encroachment upon its present strength by influx of too many apprentices; and Capital fears inability to retain a sufficient number of the newly-trained workers against attractive offers from competitive plants. Of course the "middle-of-the-road" viewpoint, as in other things, is the way out of the difficulty—for here again the honest co-operation of capital and labor will advance the interests of both.

WAGES, HOURS, AND FATIGUE

As I have stated upon former occasions, final success or failure of any specific case of women's employment must rest upon mutual satisfaction with results. The wage must be sufficient to attract and retain the right sort of workers; and the work done must be reasonably worth the wage paid. I am of the opinion that the balance between satisfaction and dissatisfaction is apt to be more finely drawn in case of women workers than with men. Yet the same prerequisites apply to both. The procedure must be—to determine standards and pay according to performance.

That the pay should be graded upon quality and quantity of performance and not made dependent upon whether the worker happens to be a man or a woman (to keep the question of sex out of compensation problems to the greatest possible extent) is generally agreed upon, and more and more frequently practiced every year. And this condition is being helped by the attitude of the more intelligent women workers themselves, who seek compensation based upon abilities, and not in any sense as an exploitation of their claims as women.

Trade customs, seasonal exigencies, sustained posture during work, and relative fatigue induced are fundamentals which demand attention in setting working hours.

Today, with the extension of the eight-hour day—and in intimations from some quarters that a six-hour day will be demanded just as soon as the trade unions acquire sufficient power—it would be ill advised management that sought to force women to work the old-time "long day," even if beneficent legislation had not forbidden it.

It is notable however that the desire for an 8-hour day is largely in the nature of demanding a 48-hour week, whereof the Saturday afternoon shall be a half holiday; and with reasonable precautions against unfairly heavy work, the consensus of Industrialists' opinion is that nine hours a day, for five consecutive days, is not harmful to women in good health if the day-and-a-half week-end intervenes. Therefore, present conclusions favor (for women):

1. No night work: —
2. No overtime (beyond 9 hours in any one day; or 48 hours in any one week); —
3. No Sunday work (in mechanical plants);
4. Half Saturdays off;
5. A 48-hour week; —
6. A rest period (varying from 5 to 20 minutes, depending upon the duties performed, during the morning and again during the afternoon; being in addition to the lunch period).

Plants employing large numbers of women will find it advantageous to employ resident nurses and to utilize their service also for preventing overstrain and nerve-tension, as well as for the first-aid help in emergencies. It is not necessary to have either the plant doctor or the nurse actually treat the patients (excepting in case of surgical emergency); but merely have them examine, diagnose, and advise the employees—so that actual treatment, where necessary, may be administered by their own family physicians—and this service by plant nurses should especially consider the eyes, teeth, and feet, yet the employer ought to know that the physician so called upon is reliable; and in case of prolonged illness, the employee may be visited by the plant doctor with advantage to both patients and employer.

WORKING CONDITIONS

Even the best pay will not suffice to retain the best workers unless working conditions are right. Just as good lighting, well spaced, helps the speed and accuracy of work during dull days, so does generous use of white paint on upper walls and ceilings accomplish wonders in avoiding cross shadows and dull spots. Until recent years it was often difficult to convince manufacturers that the slight additional cost of fuel, which would be required for quicker changing of the inside air is excellently invested in the results obtainable from the better-ventilated rooms. Force of example has spread the gospel of fresh air; and laggard management that pooh-poohed its advantages has seen employees lost to other plants where the good ventilation allowed operators to accomplish more—and thus earn more—because of avoided fatigue.

Sometimes working temperature must be partly dependent upon proc-

essing conditions. Any temperature between 55 and 90 degrees F. can be made satisfactory for sustained work if proper thought and judgment are given to clothing and ventilation, *and provided the temperature is kept reasonably constant.* It is the *variable* temperature that induces "colds."

Position at work affects health and endurance. In large departments grouping of employees according to height and build helps the worker's comfort, and therefore quality of output. It is not always practicable to alter the bench or table height, but both long and short chair-legs can be made available, and (unless absolutely impracticable through some peculiarity of the operation) the seats should be provided with backs. The low-back which reaches only to the sitter's waist-line can be adopted for many operations which require full freedom of arm and shoulder motion. There is evidence that for some kinds of work the high or medium-high stool is coming again into favor because it permits a half-sitting and half-standing position that is convenient during performance of some assembly operations.

The two excesses most earnestly to be avoided for women workers are excessive reaching (especially upward) and excessive lifting. When work-in-process is carried on racks or platform tote boxes, most or all of the lifting time is saved.

Standardization of work-clothes for women is helpful in lessening desire to outdress one another and also permits greater safety precautions to be taken against hanging loops and folds likely to catch in conveyors or other shop equipment.

LIVING AND SOCIAL CONDITIONS

Unless the community's industrial life is dominated by one or two very large enterprises, it is difficult to do very much affecting living conditions of worker without seeming to adopt a paternal attitude, and working women abhor that! The higher the percentage of workers whose homes are at a distance, the more need for the employer to provide entertainment that will relax nerves and muscles. Music for some, dancing for some, books for some—every plant has workers with these three preferences.

Some simple food, obtainable during the rest periods, *and only then*, pleases many women; especially the younger ones. Chocolate in cake form; a few well-chosen varieties of crackers; and good milk—these are universally appreciated. Any employer can buy them (excepting perhaps the milk) at wholesale and resell to the "consumers." Giving away food is scant advantage to the employers; and waste will be considerable. Keeping charge accounts with individuals is sure to end in arguments and recriminations. Let the women pay cash for what they eat, and keep the prices down to cost.

Cut out the accounting. Charge the "storekeeper" a gross total for original packages bought. Allow a small percentage for breakage and loss; and pay "storekeeper" a reasonable sum for the trouble of retailing the items. Two storekeepers are usually desirable, especially during risk of absence of one of them.

The average woman's contentment is said to be based on:

One-third *working conditions and wages*;

One-third living conditions; and

One-third amusement.

When the worker finds congenial, healthful amusement nearby, outside working hours, she seldom of her own accord seeks to leave the vicinity.

It is unwise and generally disastrous to combat class distinctions among women. Let the women fix their own social strata and run their own organizations. Advice in such directions is resented.

There is less need than in earlier days to encourage physical exercise among women employees; but help from the competent woman gymnasium teacher is appreciated by most women, *provided the classes are not made compulsory*.

It may often prove an excellent move to appoint a social secretary whose help the women may obtain about problems outside working hours, just as the matron is called to help on the problems during the work itself.

STATE LAWS

Present lack of uniformity among state laws, together with regional peculiarities of climate, and local racial conditions, make any universal recommendations of doubtful worth. Perhaps some of these days we shall have appropriate federal laws covering employment routine, but it is yet a long way off.

State legislatures can scarcely be expected to devise altogether wise provisions for women workers until women legislators sit in conference to supply more intimate knowledge of women's industrial needs.

With the present strength of organized labor, there is less danger than formerly of overworking women and children by too-long hours, or unhealthful and very fatiguing operations. And since the sharp barriers are being so rapidly broken down between "men's work" and "women's work," as our fathers and grandfathers distinguished them, we are learning to realize that almost any industrial occupation may be followed (by either men or women) without real danger to health, after proper safeguards and protective measures have been provided.

Industrial sanitation does not make blatant claims about its own progress, but every year sees improvement. In many instances, the shop committee and the welfare committee may be credited with the good results accomplished.

COÖPERATION OF LABOR UNIONS

Nearly twenty years' experience as laborer, moulder, draughtsman, office manager, cost accountant, and consulting industrial engineer convinces me that whenever Capital and Labor differ widely upon any subject, some misunderstanding has occurred by which each does not fully appreciate the exact position or aim of the other; and I can see no aspect of the whole question of women in industry that alters my conviction.

I do not believe that the leaders of organized labor will oppose the introduction of women in any suitable industry, provided:

1. The pay equals that for men on equal work
2. The shop day is no longer than that for men
3. The women are allowed to organize

Instead of becoming the object of investigations, there is increasing evidence that before long labor will become an investigator on its own account; and when that comes to pass, the whole subject of women's work will necessarily be inquired into because it is a factor of the labor problem as a whole.

I do not think we need to fear the outcome: for however strongly labor may seek to further its own interests, it will realize that the product of women's labor (as such) is no different from men's; and that the skill and experience which many women acquired during their war work can be made a real asset to organized labor if it is continued and developed under competent direction. This extension of women's work in industrial plants can be made such an asset provided Labor utilizes the opportunity to promote capable women whenever they can replace less competent men; whereby instead of diluting the "average labor competency" of a trade as a whole, farsighted Labor-management can markedly raise that average by admitting competent women workers to the unions.

Quite probably a good many of the less competent men may find it impossible to continue top-notch wages in such a competition, but that would only hasten by a few short years the time when Labor (in its own best interests) must classify its membership into two or more grades based upon relative value of service rendered. At no point in the development and advancement of women as industrial workers does it appear that their replacement of men has lowered the average wage of the average man worker; for as soon as women have entered some hitherto "man's domain" and demonstrated equal or greater ability in it, the men have found employment elsewhere at an equal or higher wage.

COÖPERATION OF WOMEN'S ASSOCIATIONS

To a great extent, unprejudiced observation leads to the belief that up to this time women's associations have coöperated willingly rather than capably, and the fault seems to be due to divided objectives. Undoubted good has come from the effort, however, and if once the women workers themselves can be made to understand that their own coöperation is necessary for best results, future progress will be greater.

Apathy toward any help used has been disappointingly common among women in manufacturing plants, and may not wear away fully for some little time. Well-meant but very patronizing manners on the part of the "social uplifters" is responsible for a large proportion of the resentment that follows concerted effort to improve working conditions. Too often the good intentions of the uplifters have been nullified by their investigating-committees assuming an attitude somewhat as they would take during a slumming party, on the theory that women work-

ers are of baser material. Jealous and sensitive as is the American workman toward anything that even remotely resembles charity, the working women show these feelings more strongly than their brothers—and it may be taken as a fact that women workers will not stand for being patronized; because it seems like being looked down upon.

Carefully planned programs, upon which concerted action is based is the only means by which the women's interests will be cemented to those of their well-wishers in the achieving of results worth while.

GOVERNMENTAL COÖPERATION

With cessation of actual war work, the Government's chief interest in sponsoring women's work was naturally lessened. When the semi-official organizations were demobilized, the opportunity—and perhaps some of the incentive, as well—began to be circumscribed.

Perhaps it is the Government's proper mission to undertake positive measures in improving labor conditions (for men as well as for women); but I incline to believe that if the Government will obtain the necessary statistics, and verify them so they will be compiled promptly and distributed soon enough to make their data usable in a practical way, the present non-Governmental agencies will be able to make the actual utilizations to excellent advantage.

Therefore, as the Governmental bureaus arrive at a post-war basis, I hope there may be a closer interchange among them of all important data that possess "secondary" or deferred value. By means of such interchange other departments can handle current industrial information in much the same way as the Department of Agriculture now distributes statistics of regional accomplishments and forecasts of tendencies.

To make such information generally public (and not merely to make it available to a limited number of persons) will allow both employer and employee to cultivate personal opinions upon all the facts instead of upon a few facts and unlimited surmises.

Since surmises encourage suspicions and suspicion breeds enmity, only a fair, full, and free presentation of essential industrial data can induce intelligent study and use of it. The importance of the subject demands nothing less.

CONCLUSION

Throughout our entire prospective consideration of women's industrial activities let us not overlook probabilities of Governmental use of men for army and navy service. Opinions are not yet settled as to whether America is likely to have a comparatively large standing army or whether the policy of universal military service will call from industrial life for a short term every able-bodied male during his military training. Personally, I incline to favor the latter plan because a large army may naturally turn to thoughts of war; while a large ready-trained force goes no further than the degree of genuine preparedness which (had we possessed it in 1914) might have deterred Germany from inciting the great war.

To withdraw the young men for such military or naval training is equivalent to a labor shortage for the time being; and to supply this shortage by industrial use of women serves a twofold purpose:

1. It occupies the girls after their school days and before the normal marriage age—thus increasing the industrial worth in the country as a whole; and
2. It broadens the young men under training by teaching them the value of method and the real meaning of organization—thus encouraging them to develop ability.

CHAIRMAN COFF: Our next speaker, is Miss Mary Anderson.

THE WOMAN'S BUREAU

MISS MARY ANDERSON, DIRECTOR, WOMEN'S BUREAU, U. S. DEPARTMENT OF LABOR, WASHINGTON, D. C.

A great deal has been said this morning about the women in industry and how care should be taken that the greatest possible efficiency may be had from women workers. From that standpoint, when Miss Van Kleeck was with the Women's Bureau, U. S. Department of Labor, we thought out a standard for women working in industry. We got this standard out from the experience gained during the war and before the war, and also with the fact in mind that the number of women in industry is growing larger and larger every day,—we have now approximately twelve million women in gainful occupations.

In 1910, when the last census was taken, there were eight million women in gainful occupations. It might be safe to say, and we will know next year after the census is taken, that probably one-third of the workers of the country are women. It behooves us, then, to see that some standards are made for the employment of women.

THE EIGHT-HOUR DAY

The first standard we got out was the eight-hour day. I am happy to say that since the Armistice was signed a great many industries and a great many factories where women are employed have instituted the forty-four-hour week, and the eight-hour day. We have the great garment trade working on the forty-four-hour week. Some of them are working five days a week with Saturday and Sunday off; some of them are working five days a week and some of them are working six days a week, with a half holiday on Saturday. The textile industry—an industry that employs women to a very large extent, has in a great many instances gone to the forty-four and the forty-eight hour week. The boot and shoe industry, with which I am connected, where one-third of the employees are women, now have the forty-eight hour week and in some cases the forty-four hour week.

You speak of the married woman in industry. In most all cases now the women when they marry finally come back to the factories at some time or other, and there is a growing need, I believe, for part time work. If we have the institution of the forty-four hour week, and we work five days a week, we find the married woman doing her work on Satur-

day, with possibly a little rest on Sunday. I believe we have to realize in this country, as other countries have realized, that the married woman is the worker, whether she works in her home or in the factory.

WAGES OF WOMEN

I want to speak about the wages of women. I believe this is a Safety Congress, and to my mind there is nothing that is more safe than good wages. The question of equality of wages comes up—wages of equality, whether of men or women. I am going to repeat this story—probably many of you have heard it, but it was a personal experience and I think it illustrates the point very well. Just now there are some States that have prohibition of night work. During the war one manufacturer, in particular, applied for permission to work women at night, and I was sent out to inspect the factory. They were doing very essential war work. Both the superintendent and the general manager in the factory assured me that the women had made good; that the women were the best workers they had in the factory, and they stayed on the job and came in every day and worked very thoroughly; and together with that, they showed me a barrel of parts of machinery that had been spoiled in the night because he said he had men working at night and they were no good at all, and if he couldn't employ women at night, he would give up the night shift and the Government would have to do without the very essential commodity. I asked him what he paid his workmen at night. "We pay them 40c an hour, with a 7c a hour bonus." "What are you going to pay the women you want to work at night?" "Well, we will start them out with 25c an hour." I told him then that he had just told me that the men couldn't do the work and that the women were better—and asked him if he didn't think that he ought to pay them the same wage that he was offering the men, and he said, "No!" He said they never did and if they did it would bring on revolution in industry, and he added, "Furthermore, the women have not the same family responsibilities that the men have." I asked him if he knew what family responsibilities the men had that were working there. "No, I don't—I haven't gotten into that phase of it." "Do you know what family responsibilities the women have?" "No, but I do know that we have one or two widows working here that have families to support."

I know that younger women who stay in their homes take much more family responsibility than the younger brother working right beside the girl, and they are usually the ones who are left in the home to take care of the old mother and father when the boys go off and get married and get their own homes. In the report issued by the Department of Labor some years ago, this question was investigated. They took in part of the garment trade and part of the glass works and they found that 6 per cent of the women had family responsibilities, and either supported in whole or in part, families or other dependents. They found a very small percentage of the boys that had any such responsibilities, and they also found that the men employed in those industries, only 57 per cent of those men had family responsibilities. Now the question that we

face all the time is the question that the wage of women ought to be fixed on the individual and the wage of men ought to be fixed on family. It is a very serious question, and in order that we sometime will get an equality of pay that industry ought to give to both sexes, we have to know exactly what part the women are taking in the family life. It's very serious to the family life of the nation to have women underpaid and have the very large responsibility they have to their family curtailed by the low wage that they are receiving.

I want to say something about the Women's Bureau in the Department of Labor. We are working in very close cooperation with the State Departments of Labor and we want to see that a square deal is given to the women in industry.

CHAIRMAN COPP: Mr. Sanford, of the General Electric Company, is here to talk to us informally this morning about some of the experiments that they have tried, and following his informal talk we shall resume the very interesting discussion of Miss Wright's paper and add to it the discussion of Miss Anderson's paper.

MUSIC IN INDUSTRY

MR. G. E. SANFORD (Safety Expert, General Electric Company, Lynn, Mass.): If any one had suggested fifteen or twenty years ago that pianos be placed in plants doing general manufacturing for use of operatives, he probably would have been gently led away by a couple of husky men in brass buttoned blue coats and taken to some place where his sanity could be tested. At such time the words "factory" and "work" were synonymous and little if any thought was given toward bringing harmonious spirit or a feeling of good fellowship into the rank and file of the organization.

A few months ago some of the employees in one of the departments of the Lynn Works of the General Electric Company received permission to put a piano in that department for use during noon hours and at other times outside of regular working hours.

The idea met with enthusiasm among the employees in general, especially in departments where a large percentage of the employees are women, and the employees of other departments also purchased pianos. There are at present sixteen of these pianos in various departments of the Lynn Plant, all being in rooms where girls work. The noontime concert is a regular thing now and it is not uncommon for employees in some of the departments occasionally to request permission to hold dances for a while in the afternoon at the close of the regular working period.

Before the pianos were put in there seemed to be more or less of a tendency among those who carried their dinners and stayed in the factory noontimes to get together, knock the high cost of living, and air their discontent in other respects and now such people forget their personal troubles and gather around the piano as soon as their dinner is eaten. From time to time a department will advertise that a special concert will be held and on such days it is noticeable that a large num-

ber bring their dinner who do not ordinarily do so. The music idea has spread so that in addition to the pianos, some of the large departments are now forming orchestras and where practicable dancing at noon is frequently in favor. Small departments may also take care of themselves, if the employees so desire, by phonographs and in such cases those who have subscribed to the purchase of records may obtain permission from proper authority to take such records home for an evening for the benefit of the family. One small isolated department of five employees has recently put in a phonograph.

Many of the women employees work entirely on routine or mechanical operations without having to use any brain work to accomplish results, the jobs being a matter of habit after they are once learned. Many of these girls operate machines and occasionally are idle for a short time for such reasons as machines break down, finishing an operation where machine adjustment for the next operation is necessary, this having to be made by one of the male employees, or running out of stock temporarily. These girls who are idle under such conditions have been given permission to play the piano if they so desire during working hours. At first there was a noticeable slowing up in the work due to the extreme novelty of music during working hours and the other operatives stopped to listen, but inside of a few days the novelty completely wore off and there appears to be no reduction in the amount of work, in fact one or two of the foremen estimate that there is a noticeable increase in the amount of work. That matter, however, I have no definite figures on as the subject is entirely too new for sufficient authentic data to have been collected.

I do not wish to convey the idea from these remarks that the pianos are continually in use during working hours for such is not the case, but a piano may be in use for approximately one hour per day during working hours and on many days there is no occasion for any one to use it. The playing of pianos during working hours is not and should not be permitted in departments where persons have to do mental work, or otherwise concentrate their attention on the work, such as punch press operation for example. The machinist too would have a hard time to read his drawings or micrometer and get out his work safely and efficiently if there was a piano ten feet away from him playing rag time, but where the operations are purely mechanical there appears to be no objection to occasional music during working hours. It seems to break into the monotony which is otherwise experienced and appears to rest the nerves of the girls at the machines.

I was in one of these departments recently in the middle of an afternoon where a popular song was being played on the piano and thirty or forty girls were all singing without even any slowing down of their machines.

DISCUSSION

Miss Wright: I believe that most industrial nurses in large towns are coming rapidly to the idea that they must in some way arrange

coöperation with local agencies so that they do not overlap. In my work I see it more and more that the industrial nurse will refer cases to local agencies.

I don't think it's any of our business how the people live in their homes or how they conduct themselves, except as it would be our business to render assistance to our friends, and if we are friends we must know how people live and in a friendly way change the method of the workers so that they may be adjusted to different conditions. The nurse goes to the home because there is a need. She is employed in the plant to manage a First-aid Room, and if she sends a girl home because she is sick, her very human sympathy will force her, perhaps after hours, to see what happened to that girl after she got home.

Some people say that you map out too large a program for the industrial nurse, but within the last week I have seen several industrial nurses who have said they weren't busy enough and would like to go into some broader program where they would have more to do. Personally, I believe they have plenty to do.

MR. BISHOP: I am very much interested in the five-day week for married women, perhaps from a very different point of view than you may have in mind, and that is not only that the married woman may be overworked or that she may neglect her baby but the fact that after all, the woman is the mother of men of tomorrow, and if the mother isn't at home on Saturday, her children run wild. I think we are continually alarmed at the prevalence of crime and viciousness among the youth. The criminal or vicious youth, I am told by social workers, is the result of an unwise training or an unwholesome home atmosphere, or no home atmosphere during the early years of his youth. You people are dependent upon the city's tomorrow for the success of your industries and for the well-being of the nation.

MISS EDWARDS: I think there is one point in that remark which is absolutely dangerous. If our industries need women so badly, pay them enough to have a housekeeper—let them have a housekeeper seven days of the week.

MR. C. B. AUEL (Westinghouse Electric Company, Pittsburgh, Pa.): May I tell you a few of the things we are attempting to do, whether successfully or not we can only judge? At our East Pittsburgh works we have close to 3,000 women in the various departments and all those women are required to undergo a physical examination not for the purpose of rejecting them but to endeavor to keep from putting a square peg into a round hole.

The women have the same hours as the men except that we dismiss them a quarter of an hour sooner in order that they may reach the street cars and trains and avoid the crowd. We actually pay them for that fifteen minutes away from their work, but you can see that that is a small item for a single individual, but at the same time, a total of from 2,500 to 3,000 women at ten or fifteen minutes amounts to something like \$75,000 or \$100,000 in a year.

We have so-called Relief or First-Aid Departments scattered through-

out our works where all of the women are perfectly free to go at any time for advice from our nurses or from our surgeons. We have a sickness association and that is divided into a half a dozen classes and no employee is allowed to join that association except in a class commensurate with his salary, taking the highest class where the dues are \$1.50 per month; in the event of sickness that woman will receive over \$75.00 a month; if she was hopelessly disabled for the rest of her life, she would still receive that \$75.00 a month up to the age of seventy years, when she would eventually retire. We pay our women workers exactly what we pay the men. We have visiting nurses but we do not attempt to intrude into the home, and only act upon receipt of word from departmental foremen that so and so has been absent the previous week and is again absent on Monday morning. We at once send a surgeon or nurse to see if we can be of any assistance in any line.

We have a number of restaurants for our employees and I may tell you that if anybody goes without, it is the men and not the women. We have a small restaurant at the present time that accommodates 300 men; We have a lunchroom for women that accommodates 1,200 women. We give them all the coffee, tea, milk and sugar gratis, and it costs us about \$1,200 a month to do that. In one particular dining room the women bring their own lunches. We have another dining room in which we feed 1,750 women every day and their lunches average from 17c to 22c a meal—less than the cost of the food alone, and in that particular dining room we give the supply of the coffee, sugar and milk gratis, and it is operated at a loss of \$5,000 a month. We are now putting up what we believe to be the largest dining room in the world, with a seating capacity of over 3,000 places at one time, and the best we can hope to do is to incur a small rather than a large loss.

A LIVING WAGE

DR. F. E. SCHUBMEHL (General Electric Company, Lynn, Massachusetts): A living wage for women in industry—would that differ from the living wage of the man in industry? Not at all! What is the living wage or what shall the living wage be of one man who has a family of one or two children and another man who has a family of ten or twelve children? Will it be the same for the man with one or two children as the man with ten or twelve children? You can chase this living wage up one stairs and down the other and cost of living will follow, and when you get through the cost of living will be upstairs and the wage downstairs. The living wage isn't the problem—it's the wage and conditions that will permit people to live. I feel very strongly about this thing. I am just a doctor, spending my time in the conditions that arise in industry and with the employees that I come in contact with every day. I see the problem both from the standpoint of women in industry and men in industry and the nurse in industry, and I want to say that industry as such is not a convalescent hospital. Don't forget that! It isn't running a hospital for the benefit of the community. Industry has a function to create material for the world that needs it and it should

pay whatever an individual is earning in the industry, whether man, woman, boy, or girl.

The question of wage is a serious thing to get into, because people that are interested in it as much as we are have been going after this thing for years and years, and we are still further away from a proper wage than we ever were before—we are getting nowhere, and it's a question of a general misunderstanding. If I give a man \$5.00 or \$6.00 more today and charge him \$10.00 more tomorrow for the things that he needs, you know where that will end. The more money the people get, the less they can buy with it, and it increases the whole problem—they get less in proportion to the increase.

The fundamental thing underlying this whole problem and the reason we are here today is because we are beginning to feel that there is a human problem in industry that hasn't been taken care of. It's the human thing that is in industry that industry has just begun to recognize, and they are recognizing it, and they are doing very well. Industry doesn't need a nurse—it needs something that can put into industry that element of human relations that has been neglected, and we hope that the nurse in industry will bring that thing into industry and make the managers and the men who are busy creating large things see that there is an element that they can utilize to a very much better purpose than even their steel, iron, coal, or wood, or whatever they use. If they begin to recognize the qualities of the human element our production will begin to increase and wages will be sufficient to take care of it and everybody will get what they earn. If they don't earn much, you can't expect to give them what the men and women who are capable are earning, but we can correct inefficiency—it's more or less a question of misunderstanding. I am delighted to have heard this discussion because it convinces me that we all have our ideals of what ought to be done and I believe that many of these discussions will centralize us and correct some of these misunderstandings that are constantly coming up, and if there is a human being that is essential in industry today, it's the man or woman who can see the two points of view and centralize them—bring them together, and when you can bring them together and give them both an opportunity to say what they have to say or show what they have to show, you will find the problem will be easily solved.

Mr. J. M. Eaton (Continental Motors Company, Chicago, Illinois): I think I have had a unique experience with women in industry in a plant where some 1,200 women were taken in and trained in a very short space of time to do very important work, and I think that we have looked upon our women in industry, in the particular plant which I represent, in that we put the man on one side and the women on the other. I rather agree with Mr. Ashe in the great necessity of educating the men, and yet I think that the big thing that industries have to keep in mind is the fact that women ought to have, or must have equal pay for equal work, and I am rather inclined to think if we stick to that principle we will pay our women just as much for the work which they do, and if we did that, we would have mighty little trouble. We have a lot

of so-called welfare work, but it seems to me that the thing that industry has to do for women is that one thing—give them equal pay for equal work.

MISS ANDERSON: During the war one of the women from London went down and talked thrift to the women in the munitions plant, saving, etc., and when she got through with her speech she asked if there was any one who had anything to say, as it is the custom in England, and one of the girls said, "I am Maggie, and I have something to say. You talk about thrift and the large wages. I do get large wages to what I used to get and I am making more money than I used to, but this is what happens to that money: The first wages that I got I went out and bought a whole roast chicken for my Mother on Sunday. My Mother had never seen a whole roast chicken before in her life, and I am going to buy, as long as I have the money, a whole roast chicken every Sunday for my Mother." Then she said that she went out and bought a silk blouse and "he" came home from the trenches, meaning her fellow, and "he" said, "Why, Maggie, you look so different to what you used to", and as long as he says I look different, I am going to have a silk blouse as long as I can buy it", and the manufacturer added that it showed that better standards were being obtained by these women, better home conditions, and better citizenship, and that's all there is to it.

CHAIRMAN COPP: We have run over our time. May I remind you that this session continues tomorrow morning in this room.

FRIDAY MORNING SESSION

CHAIRMAN COPP: Mrs. Burdick has not arrived as yet. With your permission I am going to change the order of the speakers this morning and put the second speaker on first. Miss Maynard Downes, who is the Service Secretary of the Robert A. Johnston Company, Milwaukee, will speak to you this morning about the employment, training, and supervision in her factory. It gives me great pleasure to introduce Miss Downes.

SUPERVISION OF WOMEN INDUSTRIAL WORKERS

MISS MAYNARD DOWNES, SERVICE SECRETARY, ROBERT A. JOHNSTON COMPANY, MILWAUKEE, WIS.

The company which I represent in Milwaukee is a candy and biscuit manufacturing concern. At present we have about 1,000 employees of which 700 are girls and the remaining 300 are men.

In putting in such a department, and in all of our work conducted by this department, we had in mind the business as well as the philanthropic viewpoint. It pays us, and it pays any concern to do all the things that are necessary in order to keep their workmen or girls in good condition. Every bit of the money that is expended in improving health conditions in

the factory, in making more sanitary surroundings, in giving the employees an opportunity to perfect themselves in this work, will come back to the firm in greater production. More competent employees means larger production and anything we can do in order to make our employees more competent will benefit not only the employees but the concern as well.

HEALTH SUPERVISION

First of all, in the health supervision, we have a very well equipped First-Aid Room with a trained first-aid attendant. Our work being all hand work, we don't have major accidents, and being situated within the city limits, we are within ten minutes' automobile trip to the hospitals and doctors, so we don't feel it is necessary to have a trained nurse in our First-aid Room, instead we use a girl that is trained in first-aid work. To our First-aid Room come all of our accident cases. Of course there is where the compensation law comes in—we have a very fine compensation law in Wisconsin and it pays any employer to put in a first-aid room, because having such a room and arranging it in such a way that the employees will come to this room means that he is going to save its cost in compensation which otherwise would have to be paid out. It is also going to save the employee lost time, lost wages, and suffering. I try to make our First-aid room as attractive as possible. I want the First-aid Room at the Johnston Company to be used by every employee in that plant whenever he has any need to come to us. No employee is scolded for coming with a trivial matter. We want every one to come, because that means we can anticipate troubles and we can make our First-aid Room of real value in the plant. Our foremen have explicit instructions that if at any time an employee asks to come to the First-aid Room he has no right to question him—he simply must give his permission to that employee to come. Also, we permit no first-aid in the different departments; no foreman or forelady is allowed to administer first-aid work. We can really avoid a great deal of waste time by judicious first-aid rooms. No girl is allowed to go home on a plea of illness without first getting permission from the First-aid Room. I think that also does away with a great deal of a girl getting away from work after she comes to work.

Not only in providing for first-aid do we provide for the health and comfort of our employees but we also provide, to a certain extent, medical supervision. We have partial medical supervision and I hope that some time in the near future we can arrange medical supervision for all employees.

As Director of the Service Department I make inspections of the factory and I have made a great many suggestions which have been followed out along different lines in which we can improve equipment so as to make for greater comfort, and with comfort, greater efficiency and more work. If a girl is sitting on a high stool which has no back, she becomes tired and her work slackens. If by providing a comfortable chair for that girl we can increase her efficiency and production, I think

that money expended in that way is well spent, and that is one thing the Service Department is responsible for. We ought to see that the proper working conditions are provided, that the rooms are properly ventilated, and so on. I know it takes a ventilation expert to determine the ventilation of a room, but you or I can determine whether the air in that room is good or bad and then we can refer it to the proper authorities. Proper dressing rooms, proper washrooms, proper toilets—all of these matters should come under the care of the Service Department.

CLEANLINESS

Another matter which concerns us very keenly at the Robert A. Johnston Company is the cleanliness of the factory and the cleanliness with which our food materials are handled, and that is a matter which requires constant watching.

I am supposed to make a daily inspection of the factory to see that everything is clean. Our floors are scrubbed every night and our other work places are kept clean. We want to make our factory as clean as a home can be kept. It means that there must be some one constantly on the job, keeping after the foremen, foreladies, and even the higher officials, in order to keep the food factory in a clean condition. That work falls upon the Service Department.

SOUP AND COFFEE KITCHEN

Another function of our work which also is planned to give comfort to our employees and to improve the health of our employees is the lunchroom, or, as we have it, a soup and coffee kitchen. We have not space enough in our building at present for a lunchroom; in the new factory which we are building and which we expect to be in by Easter, we will have a well-equipped lunchroom. We are supplying our employees with hot coffee or hot soup every day—it is only a supplementary lunch. Our kitchen is run on a self-supporting basis—we charge our employees cost price for the food. Our coffee sells for 1c a cup, which is almost a pint in size, and our soup sells for 3c a bowl, and we do it without a deficit, and in the operation of our soup and coffee kitchen we are supplying something to almost every employee in the plant. It is impossible for all of the employees to get to the coffee or soup kitchen located centrally in the building, so we have to send our coffee or soup to the employees. We have percolators and those are sent to the different departments throughout the factory, thus making it possible for every employee in that factory to get a hot drink at noon, either in his own department or by going into the next department.

EMPLOYMENT DEPARTMENT

Under our service work also falls the large problem of employing. I do all the employing of the girls. An employment department must be well organized and then, too, it must have authority: your employment

department, unless it has the proper authority, is worse than useless, and I think I can safely say that in our employment department at the Robert A. Johnston Company we have the earnest support of the management, and that's a thing that is necessary in order to make an employment department a success. The management stands back of us in all things that we wish to do in the employment department. In the employment department you must have an adequate record system. I try to make our system as simple as possible. I have an employment card with the bare facts as to residence, age, place of birth, and previous employment. In previous employment it is sometimes very difficult to get any information because it is a sad fact that some girls cannot remember a year back where they have been employed—so far as any real information is concerned, I feel that it is not of much value, especially when we ask an employee why she left. We have a space showing the reason for leaving her previous place of employment and frequently I ask that question but I don't attach much real value to the answer I get because nine out of ten times the employee "left because she was being mistreated or because she wasn't properly appreciated," and that answer is not always a true one, but knowing the places where the girl has worked before does enable one to place her with some better accuracy into the different departments.

We also have a production card and dispensary card. Our production card and dispensary card are used only when the employee leaves our employ. I have an envelope system and into this envelope I put her original employment card, her production card and the number of hours she worked for the four weeks previous to leaving our employment, and also the dispensary card which is taken out of the dispensary files in the First-aid Room. I keep that production card because our work is all piece work and the production card will enable me, if that girl comes back to us and asks for employment, to see at a glance whether or not she was a skilled worker at the time she left us.

In Wisconsin at present we have a minimum wage law which sets the lowest limit that an employer can pay his employees, and I think our production card will be of value to us on that score in avoiding taking girls back who were not good workers when they left us.

After you get your records all in, or your department well organized, then I think you want to forget them. Some departments are so organized that there is so much red tape connected with it that the employment manager or secretary has little time for anything else than to keep records, and I want to use our records simply as a means to better the people we have in our employ. For that reason we need accurate help in taking care of our records. It is an impossibility for the employment secretary to be loaded down with the employment work in keeping absentee records or the employment records. After we have the record system well planned and after we have the proper authority in the employment department, we can then start in the actual working of the employment department, and first of all is the selection of the employees.

At present, with the labor situation as it is and with labor so scarce, we can hardly make a very careful selection of employees. The best thing we can do, of course, is to give every girl or woman a chance—some are always ruled out, but we are more inclined to give every one a chance, and the best selection I can make is after I get that girl into the department to try to put her into the department where I think she will be able to do the best work. Our work is of such variety that if a girl doesn't do good work in the candy-packing department, she may be able to do well in the cookie-icing department, or in the chocolate-dipping department, and so I am enabled to put her into the department where she will do the best work and where she will be most happy and will stay the longest.

FOLLOW-UP WORK

After a girl has been placed in a department, the next thing to do is to follow up her work. We have a sliding scale in our work in the teaching of the girls. We have no vestibule schools but we do have in each department a certain girl who is not a forelady but who is simply a teacher. It is her business to teach the new girls that we put into the department. This teacher devotes her entire time to the new girls; she instructs them not only in their work but also instructs them in regard to the customs of the factory, where to find the First-aid Room, where to get soup, and all the different things she ought to know in order to feel at home in our factory. On our sliding scale we start the girl in at a flat rate; the next week we cut that flat rate and give her a certain amount per hour plus everything the girl can make. The third week we drop that amount a little per hour and by that time her skill should have increased in that work so that her earnings will run above what we guarantee, and so we continue this gradual dropping until a certain time when we feel the girls should go on piece work altogether, and the result has been that very few of our girls will ever drop if they are any good at all. In order that the girl herself may see that she is gaining every day, that she may see that increased effort on her part is bringing her increased earnings, we keep a day record of every person in our employment so that we can see at any time how much that girl has earned for the day. I can go into any department in our factory in the morning and find out what every girl made the day before and I wouldn't have to consult the payroll. Every foreman has the record and every girl knows the next day what she has made the previous day. There is no uncertainty with her as to how much she ought to have in her pay envelope at the end of the week and I think that in keeping such a daily record it acts as an incentive to the girls to bring up their earnings day by day, and it also enables us to check up on our work and it is especially important since we have a minimum wage law because we can know at any time if a girl is falling below the minimum wage scale at any time, and our minimum is higher than the minimum wage law as set by the State, but we have our standards set of what we wish each girl to earn

during the day and if we find that it is dropping below that standard then we can take steps to find out why that girl is falling below the standard and correct it.

The employment department also receives all complaints regarding shortages in pay. I think that is one cause of trouble in the factories. We also receive all complaints of dissatisfaction and dislike of the foreman, trouble with other girls, and anything that may come up which will disturb a girl in her work. Formerly, before we had service departments or an employment department there was no one to whom a girl could go with her troubles—she could not very well go to the foreman or superintendent with these troubles, but now she can come to the Service Department and we can many times clear up all of these little difficulties in which otherwise she would have no other alternative except to leave.

No person should be discharged without passing through the employment department. In fact, the foremen should not have the right to discharge. They should only recommend discharges, and the employment department should hear both sides of the story—the girl's side and the foreman's side—and the employment department should judge from the merits of it. Any one who quits voluntarily has to pass through the employment department and no person can receive her pay without first receiving her time card O. K.'d by myself, and that is where we can check up all the difficulties. A system like that is useless unless you are really getting the fundamental reason for the employee leaving the department. The interview of the employee at the time of quitting is of no value unless you win the confidence of the employee, and then it is of infinite value because you can prevent a recurrence.

We keep a turnover record and we have an absentee record and these are of great value to us because we find a number of employees are leaving for certain reasons which we can remedy.

Our employment department is not perfect as yet but we are working, we are trying, and we want to make our employment department and our service department something that is of real benefit not only to the firm but to the employees as well. We want to treat our employees as human beings and we want to consider and put in all the things that we can that will make for the comfort, for the wellbeing, and for the happiness of our employees, and we feel we also benefit ourselves as well as the employees, because we will get more efficient employees and it will result in a bigger production throughout the plant.

DISCUSSION

Mrs. WASHBURN: (Printz, Biederman & Co., Cleveland, Ohio.) In speaking about the records kept in each department, are those records figured in the payroll department and sent to each department?

Miss DOWNES: Those reports are figured in the different departments

and we have rather an elaborate cost system and in the departments where we have this cost system the one who does the cost work figures them. In other departments the work is done by one of the girls who is chosen for that class of work, and in some departments the girls figure their individual earnings and report to the foreman who enters it on the card and the cards are then sent to the cost department. We have one or two errors which come from the girls figuring their own records but it doesn't amount to more than two a week, and we figure that the percentage of errors is so small that it isn't worth counting.

Mr. S. W. ASHE: How many of your employees do you serve with coffee and soup a day?

Miss DOWNES: I think we are now distributing coffee to at least 350 a day—we rarely sell soup and coffee to the same individual. During the winter we sold our coffee to as many as 500 a day, and at present we are serving soup to over a hundred a day. In our kitchen we also sell ice cream and we make a few sandwiches, not many, and among the coffee, soup, and ice cream, I am confident that almost every one in the factory receives something from the kitchen every day.

Miss FLORENCE S. WRIGHT: In your interviewing the girl, do you have any questions that bring out the economic status of the applicant, for instance, as to whether the girl lives at home or whether she boards?

Miss DOWNES: We have very few girls who are boarding. I always ask the applicant if she is living at home or if she is boarding, but I never ask her what her previous income has been. Most of our girls do live at home and very few of the girls are boarding unless they are with relatives.

Miss BROCK: When a girl boards she has to have a larger wage than if she lives at home.

Miss DOWNES: Well, our rates are so set that we couldn't make any distinction for that girl if she is boarding. We are paying what we consider a living wage for a girl. We don't take into consideration whether she lives at home or not. The only distinction that is made is on account of age: the girls at 16 are started at a certain rate, and the girls at 17 are started at a certain rate, and so on.

There is one point that I failed to bring out in regard to the Service Department and that is that the head of the Service Department ought to be the person who assumes all responsibility regarding hours of labor, the ages of the workers, the minimum wage, the compensation, and any other State laws that touch the health and the welfare of the employees.

CHAIRMAN CORP: I shall have to interrupt this discussion in order that we may have Miss Tarbell speak to us. Dr. Cutler will speak to you now on a paper which we have not heard. I have asked Dr. Cutler to confine her words to a very few minutes in order that we may have a recess before Miss Tarbell speaks to us.

(Mrs. Burdick, who was unable to be present, sent an abstract of her paper, which is here inserted.)

ABSTRACT OF PAPER ON

TRAINING AND UPGRADING OF WOMEN FACTORY
WORKERS

MRS. ANNA LALOR BURDICK.

SPECIAL AGENT FOR TRADE AND INDUSTRIAL EDUCATION FOR GIRLS AND
WOMEN, FEDERAL BOARD FOR VOCATIONAL EDUCATION, WASHINGTON, D. C.

- I. Employment of women during the war was but an acceleration of a normal development.
- II. An immediate demand for increased production and a shortage of experienced workers exhausted our usual "labor reserve."
- III. Women were the only members of the community from which large accession to the ranks of industry could be expected.
- IV. The extent to which women were employed in basic industries—textile, garment making, metal trades, and transportation—shows rapid increase during the four months preceding the signing of the armistice.
- V. The employment of large number of untrained women in war essential industries has resulted in:
 1. The establishment of employment service departments dealing with
 - (a) the personnel of the working force.
 - (b) standardized conditions of employment necessary to safeguard the health, hygiene, and safety of the workers.
 2. Improvement in processes of production. This necessitated:
 - (a) Realignment of tasks suitable to workers in order that quality may not be sacrificed for speed.
 - (b) Increased subdivision of processes.
 - (c) Multiplication of inspectors.
 - (d) Increase in number of supervisors.
 - (e) Increase in number of foremen and forewomen.
 - (f) Changes in construction and equipment, such as, the installation of lifting and transporting devices, conveyors, etc., with the ultimate aim of making the job hazard-proof and error-proof.
 3. The inauguration of systems of training or inducting unskilled women workers into industry and upgrading them during their period of employment. The larger the plant the greater the tendency for these functions to become departmental and specialized into
 - (a) The employment service, or personnel department, supervising the hiring, placing, and releasing of workers.
 - (b) A production division, and
 - (c) An educational and training department.
- VI. A description of a few types of training departments instituted in different establishments manufacturing widely diverse products will

illustrate types of training which may be expected to persist under normal times:

1. Experimental shops under the railroad administration
2. The government school for training precision optical operatives.
3. A vestibule school for women employed in the manufacture of aeroplanes.
4. Training machine operators and metal workers on the production floor.
5. A combination system of training women workers in the textile industry.

1. An interest in women as a possible supply of labor on the part of certain railway officials including the shop foreman, the superintendent of motive power, and Federal manager has resulted in successful experiments in organizing a shop force of women and training them for a department requiring a high degree of skill and technical knowledge necessary to carry on their work. The result is recorded in the annual report of the director general of railroads in the section devoted to labor.

2. A government school for training precision optical operatives is organized under governmental control, maintained by funds appropriated by Congress, conducted in a private school, the president of which acts as director. The student learners are employed for pay during the instruction period and are assigned to the operations for which they are best fitted mentally and temperamentally. The instructor was chosen from one of the plants for his experience, skill, and ability to instruct. A committee from the five local plants co-operating in the enterprise determined the processes to be taught. The expense of materials is prohibitive of productive work for beginners. The graduates are pro-rated to the co-operating firms.

3. A plant under contract to provide motor trucks for the army faced the problem of producing a standard product with a constantly diminishing force of experienced workmen and the addition of woman labor. The problem was handled in two ways: first, by the establishment of a three-weeks' course of training for inspectors and machine operators. Tool room attendants and other workers all took an initial course which covered thorough instruction in the system of organization in the plant itself, involving such practices as the use of time clocks, method of checking work in and out, terminology of parts needed for work, routing of work and interpretation of operative cards.

The learning for the manufacturing division included blue print reading, the operation of automatic and special machines which would enable a transfer to be made according to the needs of the plant.

The inspection group were taught the reading of blue prints, the use of precision measuring instruments, decimal equivalents, and such auxiliary information as would enable them to understand the underlying principles of the job.

This presents the best type of a vestibule school.

4. The need of space, the production demands and the foremen's insistent call for workers forced the abandonment of this method and the new worker was immediately put upon the production floor, and given only such instruction as was necessary to do the specific job at which she was employed. To note the product and report any deviation from the normal, the number of supervisory foremen was increased to one for every seven workers. The efficiency of the training on the production floor depends upon the instructional ability of the supervisory foremen.

5. In the cotton industry supposed to employ lesser skilled operatives, the change of product in the mills and the taking on of new workers has led to a system of inducting new workers and readjusting the experienced ones to changed conditions in the plant and upgrading them in their labor. This system provides for a combination of training on machines designated for the learners on the production floor. This is necessary in some processes because of the long line of spindles they must tend. The worker progresses in degree of skill at the same operation and passes through progressive stages or grades with corresponding related rewards. After maintaining a stated production rate for a given period she becomes a regular worker.

VII. A liberal interpretation of that section of the Federal Vocational Act dealing with part-time education admits that persons who are definitely scheduled for employment in a trade or industrial occupation by a written agreement with the employer may be given instruction in a class fitting them for advantageous entrance to such a trade or industrial occupation—subject to the provisions of the law.

DR. ALICE S. CUTLER: Mrs. Burdick's paper was on the training of women factory workers.

As I said yesterday, by the first of the year the Government expects there will be about 4,000,000 men going back to Europe—there is an acute shortage of women. When I got up yesterday and told the audience there was an acute shortage of women in the West, Dr. Schubmehl jumped up and said there was always a shortage of women in the West, but let me tell you there is a shortage in the East. I was in Boston, where we have 50,000 more women than we do men, and the condition there was just the same, so it isn't only in the West we are having a shortage of women but all over the country and why? Simply because there are so many men going abroad and we have to assimilate women in our industry.

I believe in vestibule schools—they are one of the biggest assets we have and you certainly have to train your women if you are going to assimilate them in jobs that men are doing, but the thing is that you want to have the right kind of instructors in your schools because if you don't have the right kind of instructors, in the first place, the majority of women are timid.

CHAIRMAN COPP: I have the honor of presenting to you Miss Ida M.

Tarbell, who will talk on the subject of "The Future of the Woman Industrial Worker."

THE FUTURE OF THE WOMAN INDUSTRIAL WORKER

MISS IDA M. TARBELL

I have been asked to prophesy—and prophesy before experts. I possibly do it with more facility and assurance than I would be able to command if I knew more of the subject. I am not going to attempt to make a thrilling prophecy but rather to call attention to certain things that have come out of the intensive experience with women in industry that we have had in the last five years—things which I am convinced will be influential in shaping the future. This experience was striking in the countries of all the belligerents—and similar.

NUMBERS OF WOMEN AND VARIETY OF THEIR WORK

No doubt the two facts which have most impressed observers of women in the war industries have been the numbers drawn in and the variety of work which they have undertaken.

No sooner had France begun to mobilize in August, 1914, than we began to hear amazing reports of the way French women were instantaneously taking up the work that had been left behind by the men. Almost at once street car lines, the Paris subway, the street-cleaning department, the taxis were taken over by women. A little later we began to hear of women in French factories, where they had never been seen before, and particularly great numbers in munition works. At the end of 1914 there were 44,161 women in French munition factories. Three years later, 1918, there were 399,631. The same thing happened in England. There were towns that were entirely women-run, and there was no industry where they were not used. We all remember, I am sure, the English shipbuilder who declared he could build a ship from start to finish with women's labor. In our own country, we had them going into such unlikely things as the lumber business. The general observer was inclined to feel that the like had never been seen in the world before; but if the general observer had been a little more inclined to compare what he saw going on with what has gone on in every country in the past in war time, he would have been less amazed. War has always forced women to fill places vacated by men. Study our own Revolution—the war of the Rebellion, and you will find women doing all kinds of unexpected things. You see the same in past French and English wars. The difference this time has been the scale on which the great enterprise was carried out, the number of countries engaged in it and, too, the great difference in the operations now and in previous wars. That is, in spite of the fact that these are the two things that stand out most prominently in any consideration of women in war industries, they are simply the things that were to have been expected. They do not, in my judgment, affect the future nearly as deeply as many people are inclined to think. As we

return to a normal peace basis, the numbers of women in industry will drop back. That is, many women will not stay and not want to stay. There are no doubt many of the industries in which they have been active and useful from which they will entirely disappear.

There are, however, certain phenomena in the experience which are bound to have a permanent and important influence on the future.

WOMEN DO HIGH-GRADE MACHINE WORK, AND LIKE IT

Among these are the fact that for the first time in the history of industry, women have proved themselves to have the capacity to do high-grade machine work—and not only to do it, but to do it well. And, what is quite important, to like it. It has generally been believed by men and I think no less by women that they could not handle machines. And yet the War was not many months old in England before employers were seeing with surprise that women were being taught to handle machines and to handle them satisfactorily.

There were difficulties to be overcome in the way of training. One of the most interesting reports that I saw from any country during the war of experiences in preparing women came from Mr. John Upp of the General Electric Company.

TRAINING OF WOMEN IN INDUSTRY

Mr. Upp wrote with surprised enthusiasm. He had foreseen that he would be short of help, decided that he must use girls, and realized that he must train them. He notes some of the difficulties that had to be overcome. One very interesting and important one was the fact that a woman, as a rule, has no sense of measurement, that she does not distinguish between an inch and a quarter of an inch. Another is her lack of appreciation of the sharpness of a tool. She will go to work with a dull tool as quickly as she will with a sharp one, and have no sense of what is hindering her. But, having overcome her feminine blind spots about certain common things, having trained her to the technique of an operation, Mr. Upp's experience was that she was a more exact workman than a man. She did what she had been taught to do in the way she had been taught to do it.

If the men were surprised to find that a girl could be taught, I think there has been no less surprise on the part of women that they could go into machine shops, do the work satisfactorily,—and like it.

Possibly the greatest effect on the future of any of the experiences of women in industry during the War—that is, the greatest effect on the woman herself, will come from just that, that many women have found that the higher processes of industry interest them—interest them more than certain ~~tasks~~ ~~that they have been accustomed to doing~~. If this be so, now that the war is broken, I believe that it means that in the future a certain ~~number~~ ~~of women~~ at least will be seeking work which they have always ~~regarded~~ ~~as closed to them~~. That is, the war will have opened a new field of labor to women.

STANDARDS GOVERNING WOMEN'S WORK

Another development in the war that is bound to have much influence is the strides that the standards governing woman's work took in every country. From the moment that it was realized that she was bound to play a large part in war production, that she was being called into many trades and positions where women had never before been seen, the public began to demand that she should be protected in her new undertaking. England's experience of course is familiar. A year had not passed before the Government had a commission at work observing the effect that the unusual labor was having upon the health of women. The result of the investigations there was drastically to change hours and conditions. This was done, primarily, for the sake of production. It was found that the long hours which she had been willingly working for the sake of the cause were not so productive as shorter ones. And England went on through the war developing regulations, prohibitions, adjustments which should protect the woman in her new tasks. The same thing happened in France. Altogether the best set of regulations and ordinances governing women in industry that France has ever had was worked out in the years 1916-1917 in order to meet the public demand that women should be cared for. We had the same thing happen in this country. From the opening of the war, one of the grave concerns of the country was the protection of women. The Women's Committee of the Council of National Defense, which was organized by the government to pull together all of the great organized bodies of women in this country in order that they might carry out coöperatively the requests that the Government might have to make of women, established in May, 1917, a department of Women in Industry in order to stimulate all of the great women's agencies to keep an eye on the conditions under which women were working and to aid in correcting them if they were wrong.

As soon as the Government had approved a set of standards for women in shops and factories, the Women's Committee undertook to make these standards generally known. It was able to put them before ten or twelve million women, and it is probable that in nine-tenths of the cases these women for the first time were put face to face with a high set of standards and were made to feel that they had a personal responsibility in supporting them. That is, all over the country there was an enormous expansion of the ideas of what proper industrial conditions are for women and a tremendous pressure was brought to bear upon all sorts of people to see that these conditions were secured.

Now, it is inconceivable that after such an education in this matter as England, France, and the United States had during the war that we should ever fall back to where we were before the war. Certain standards have been made known and accepted. The whole future of women in industry will be influenced by this. The tendency will be to improve and extend these standards. That is, in the future women are bound to be more thoroughly safeguarded than they have ever been before. Every ten years, in my judgment, is bound to see a very substantial advance in this particular over its predecessor.

THE FACTORY WELFARE WORKER

Another important development from the war that cannot but affect the future profoundly is the general recognition that has been given to her that we sometimes refer to as the factory welfare worker,—the woman employed not only to supervise the health of working girls, but to train them to better habits of life and to lead them into a happier and more civilized manner of living. Most of us are familiar with the way in which a few women in this country, thrown into factories, neither they nor their employers knowing very definitely what could be done, and yet all feeling that there ought to be a kindly and intelligent supervision of the girls, have developed their positions to what might be called a professional standpoint. They have proved of the greatest service to both management and workers.

One of the most intelligent undertakings of the Government in its effort to bring the management of war industries up to the highest point of scientific and humane efficiency, was training women for these positions.

TRAINING CLASSES FOR WOMEN FACTORY SUPERVISORS

In the Spring of 1918 the War Industries Board started classes in industrial management. Women were admitted to these classes. Many more applied than could be accommodated although the requirements were severe. One requirement of admirable good sense was that no woman would be admitted who had not had two months' actual experience in a factory. Here in this city of Cleveland women of education and social position sat at machines in one of the great factories through the summer of 1918, getting this preliminary experience. Many employers of large bodies of women in different parts of the country who had trusted women working their way more or less blindly trying to develop the position, hearing of what the Government was doing, asked permission to send these women into the classes.

The thing that our Government realized and attempted in this very thorough way to meet, was realized in other countries. England and France both developed training classes for women factory supervisors where bodies of girls were employed.

Now, I cannot believe but that the future of women in industry is bound to be very profoundly influenced by this experience. In past years it has been the habit to collect great groups of girls helter-skelter and throw them together in great work rooms. They came in without instruction, they passed their days without any particular supervision. If they were ill they must drop out or be dismissed. Nowhere was there an effort to prepare them for the work which they were to do, to see that their health was properly cared for, to try to explain things in the shop that would reach out to their life at home. The occasional modern employer has, as I have said, tried to meet the very obvious need if he were to build up a stable body of working girls.

A NEW PROFESSION FOR WOMEN

But the War came. Its needs were so great that every effort had to be made to improve and stabilize labor. The value of these women supervisors was immediately recognized, and what had been a sporadic, private enterprise suddenly becomes a government policy. This not only means much that is of value to the working girl herself but it means the introduction into industry of a high-grade woman whose vocation will be not only that of a physical and intellectual but a moral teacher and leader. It is hard to conceive of a position in which a woman can be of more genuine value to society than in this relation to 500 or a thousand girls whose opportunities in life for health and decency and for future usefulness and happiness are so limited. It means much to the girls, to society, and it is a great thing for the women themselves. It literally opens a new profession for women.

Now these are very fundamental gains for the future.

(A rising vote of thanks was given to Miss Tarbell.)

CHAIRMAN COFF: Miss Tarbell's time is limited with us but she will be glad to answer any questions you may have.

DISCUSSION

MRS M. H. VARNUM: The Michigan University is establishing a department to train women to become teachers in trade schools. It is doing this for the express purpose of standardizing women in industry and putting her on par with the professional women and the women who are not in business. It is operated by funds, part of which are furnished by the United States Government, and it is to be established in Detroit where they have the temporary courses and there are hopes of being able to establish in all of the big industrial plants in Detroit trade schools so that the work will go on in industry, and that will eliminate a great deal of this timidity and cautiousness because she doesn't know what to do, and she won't spoil a lot of material and she will be taught to use her natural facilities in the best way. I believe the same funds are available to all universities and all schools.

MARK M. JONES (Edison Industries, Orange, N. J.): While Miss Tarbell found most of those women to represent the leadership in those countries, the same thing has been somewhat general among the women in this country. In other words, it seems to me that the ability among the factory workers is something that wasn't appreciated by women as generally as it might have been. Was that the situation in the foreign countries?

MISS TARBELL: I think to a good degree, yes. In England there has been a strong feeling about it and that has been very largely due to the very bad conditions under which women have worked and the very low pay they have had in the great industrial towns like Manchester. There isn't any doubt that there has been a strong feeling against it, and I think that feeling had something to do with England's activities, where a good many women went into industry and said that things had to be

changed. In France the attitude of the women is different, but in any kind of business or occupation, to the French women it doesn't make any difference—if the thing is to be done, she does it, and she has always been accustomed to doing exactly those things—she works on the farms and she works on the streets. Her great occupation in France is the sewing trade; but women rushed out to get into the factories to a surprising extent and one of the interesting things I noticed this Spring was the difficulty they had in getting the women back into the sewing trade—they said very frankly they didn't want to sew any more, the factory being more interesting. They knew that they wouldn't be getting the wages they had been getting, but they didn't want to sew any more and they wanted to stay in the factories. Whatever prejudice there was against the factories as a place of work for women in France was, I think, pretty nearly overcome. There was some objection on moral grounds.

MR. S. W. ASHE: I would like to ask about the physical examination of women in industry. In some places I understand the women are rather averse to having physical examinations, at the same time, I believe it is absolutely necessary to have the physical examination in the factories into which they are going in order to ascertain their condition and know the kind of work which they are capable of doing. I would like to get some information on that subject.

MISS TARBELL: Miss Copp, I think that question ought to be answered by some one who has had more experience in that line. I have had that question come up in different factories and my observation has been that while the women when they had this thing sprung on them might object, if the employment manager was tactful and if she explained to them why it was and what it meant, it could be brought about.

MR. S. W. ASHE: Did you find, Miss Tarbell, in France that the introduction of women in industry had any bad effects over them in any way—whether they lost any of the home atmosphere and what means was taken to prevent that?

MISS TARBELL: In France, in the munitions factories they were pretty well scattered and a good many of the workers were brought to Paris. It was in the munitions factories around Paris that I made most of my observations. There were two classes, a great many married women that came in from the provinces and there were also a great many girls—girls that had never been in the big city before—they had always lived in small towns at home before and they were working night and day shifts. In general there was an enormous amount of recklessness—I think that is war psychology, at least, part of it—you see everything going to smash. Now that did happen to some extent but only to a comparatively small extent. A surprising number of these untrained girls got the idea they could go into clerical work. I spent some time in the Government Employment Bureau and I was perfectly surprised by the number of untrained girls that came there seeking positions. They had a little bit of typewriting, they could read and write, and they thought that was all that was necessary.

MR. ARTHUR T. MOREY (Commonwealth Steel Company, St. Louis, Mo.): You will be pleased to know that at the Executive Meeting of the Council yesterday a woman was elected Treasurer of this organization. (Applause).

Miss Hunt will not have a small job inasmuch as the receipts and disbursements are in the neighborhood of \$100,000 a year.

Another matter that you will be interested in is the matter of whether or not we should elect a woman as an executive on the committee of the National Safety Council. It was left in this way—under our organization the chairman of a section automatically becomes a member of the committee and it was felt that if the women themselves felt that there was a need, and the women were interested enough, we could organize a woman's section.

ORGANIZATION OF A WOMAN'S SECTION

The organization is a very simple one, and has its chairman, vice chairman, and secretary, who, with others, would be the executive committee to adopt by-laws, etc. We have in the Council a sectional service and this section would be expected to develop its own problems and work out its own salvation without any assistance, if possible, from the headquarters staff.

MRS. M. H. VARNUM: Who would be eligible to the women's section—what are the qualifications necessary for membership in the section? Is it necessary for the women to represent industrial establishments or may they join as individuals?

MR. ARTHUR T. MOREY: Both memberships—memberships individually and as representatives of companies.

MRS. M. H. VARNUM: Would there be a separate financial burden on the women's section?

MR. ARTHUR T. MOREY: No! The individual membership is \$7.50 per year and the company memberships are based on the employer and the number of employees. I presume the officers would have to be members of companies who are members of the National Safety Council.

I might add that in other sections I spoke to they have got together in a group and formulated their organization, and have already adopted a form of by-laws and felt enough interest in it to present that to the Council for its approval, and to see to its programs.

MRS. M. H. VARNUM: I move that Mr. Morey's suggestion as to the method be adopted for preparing a permanent organization.

(The motion was seconded and carried unanimously.)

MR. A. T. MOREY: I think the thing to do is for those of you who are interested to call a meeting and go through the temporary form and proceed.

MRS. M. H. VARNUM: I move that the Chairman be empowered to call such a meeting and that she be temporary chairman of the meeting so called.

(This motion was seconded and carried unanimously.)

CHAIRMAN CORP: The chairman announces that there will be a meet-

ing this afternoon at five o'clock for the women who are interested in establishing a permanent section for women in the National Safety Council, and you will find the place of meeting by inquiring at the Registration Desk. Let me remind you, ladies, that our interest in this program will be shown first by our attendance this afternoon.

FRIDAY AFTERNOON SESSION

ORGANIZATION COMMITTEE MEETING

THE meeting convened at 5 P. M., Miss Tracy Copp presiding as Chairman.

CHAIRMAN COPP: As I understand it, our meeting this afternoon is perhaps more of a formality than anything else, that the real work is to be done after the officers are elected. May I just repeat what was said this morning by Mr. Morey that by taking the action which we expect to take today we make of this a permanent section. There goes with that the responsibility of providing the National Headquarters with material for bulletins. It is not necessarily a section for women only. It is a section for the interests of the employers of women.

Now what is your pleasure?

MISS NESTA C. EDWARDS: Madam Chairman, I would like to offer the following resolution:

RESOLUTION

"RESOLVED that this meeting here and now organize itself into the Women in Industry Section of the National Safety Council, and that the Chairman of this meeting, Miss Tracy Copp, appoint a committee of which she herself shall be Chairman to work out the details of the organization of the section, with the authority of said committee to adopt By-Laws for the section in conformity with the Constitution and By-Laws of the National Safety Council, and that those at this meeting be considered the initial members of the Section who shall be advised of the progress of the Section's organization and its duties and work to be accomplished, and that this meeting now proceed to the election of the necessary officers of the Women in Industry Section who shall be the officers for the first year under the Section's By-Laws."

I move the adoption of that resolution.

(The motion was seconded.)

CHAIRMAN COPP: It is moved and seconded that we consider this the establishment of a permanent section for women, that your Temporary Chairman for this afternoon be instructed to appoint a committee to draw up the Constitution and By-Laws that the people here present shall be considered the initial members of the Women in Industry Section. All those in favor of this resolution will say "aye"; opposed "no".

(The motion was adopted.)

ELECTION OF OFFICERS

MISS MILDRED M. HICKMAN: In recognition of the very splendid service which has been rendered us this year I should like to present the name of Miss Tracy Copp as Permanent Chairman.

(The motion was put and carried.)

CHAIRMAN COPP: We are now ready to receive nominations for Vice-Chairman.

(The name of Miss Nesta C. Edwards was placed in nomination, seconded, and carried.)

CHAIRMAN COPP: We will now proceed with the election of a Secretary.

MISS MAUD SWETT: I should like to nominate Miss Hickman of Cleveland.

(The motion to elect Miss Mildred M. Hickman of Cleveland as Secretary was carried.)

CHAIRMAN COPP: The duty of naming a committee to draw up the Constitution and By-Laws devolves upon your new Chairman. It is clear that the officers of the Section will be a part of that committee. I am wondering if I might just get from you informally a little expression of your feeling in this matter of selecting a committee. I had thought that perhaps we need five members on that Committee, and my first thought on it was that it might be well for us to ask a man to act with us on that Committee in drawing up the Constitution and By-Laws, and in preparing a program for next year. What do you think of it?

(The meeting collectively signified their concurrence in the suggestion.)

CHAIRMAN COPP: I am sure that you will have occasion to do something during the year as members of the Section. May I ask you then to keep me informed on the subject of the employment of women and all of the new things that are being published, and anything that can be presented to the official headquarters for publication in their very interesting bulletins.

MRS. HUMPHREY VARNUM: Do you want us to send you papers that have been presented publicly, papers that have been published, or do you want reports of the various movements that are going on in the different cities in regard to labor? Just what is your idea?

CHAIRMAN COPP: We should want all of those. I don't know that you are familiar with the publications of the National Safety Council. We shall be more familiar with them, but they are branching out into the subject of industrial relations and the employment of women. Their work is not now confined only to mechanical safeguards and the education of workmen. So that whatever we have that is good material should be sent to headquarters so that it can be summarized and given out officially through the Council to the members.

MRS. HUMPHREY VARNUM: Are you familiar with the bulletins that are sent out by Miss Tarbell from the Council of National Defense? I was Michigan Chairman of Publicity and we sent in newspaper clippings when they were vital to the subjects at hand even though they came

from small towns. We sent in articles from local magazines like the Michigan Manufacturer and Financial Record and other material of that sort. A great deal of it was used as the basis for formulating articles, but we don't want to swamp you with the wrong kind of material, and yet we would like to know just how much material you would like.

CHAIRMAN COPP: Miss Hunt and Miss Edwards are both here. They are very much more familiar with the mechanics of the office than I am. I imagine they would be glad to have all kinds of material from which to make extracts and make notes for publication. Am I right in that?

MISS HUNT: Yes.

MISS NESTA C. EDWARDS: The Library would like to have photographs or things that will be of value to the Women's Department. You may come across good blue prints and good drawings. I know they would be welcome.

CHARTER MEMBERS OF THE WOMEN IN INDUSTRY SECTION

The names, business connections and addresses of those present were as follows:

Miss E. Mae Haas, Employment Department, The National Cash Register Company, Dayton, Ohio.

Miss Anna M. Atherton, Supervisor of Women, The National Cash Register Company, Dayton, Ohio.

Miss Bernhard C. Riffel, Hyatt Bearings Division, General Motors Corporation, Harrison, N. J.

Mrs. Humphrey Varnum, Publicity and Advertising, Michigan State Telephone Company, Detroit, Michigan.

Miss Anna K. Koutecky, Women's Department, Morris & Co., Union Stock Yards, Chicago, Ill.

Miss Nesta C. Edwards, Consultant in Industrial Service, 168 North Michigan Avenue, Chicago, Ill.

Miss Naomi Neill, Supervisor Nurses, Aetna Life Insurance Company, Hartford, Conn.

Miss Maynard Downes, Robert A. Johnston Co., Milwaukee, Wis.

Mrs. S. M. Galaty, 508 North Humphrey Avenue, Oak Park, Ill.

Miss Mary Lapsley, R. N., Ohio Lamp Division of National Lamp Works of General Electric Company, Warren, Ohio.

Miss Clara L. Ruchti, R. N. Gisholt Machine Co., Madison, Wis.

Dr. Alice S. Cutler, The Printz-Biederman Co., Cleveland, Ohio.

Mrs. Flossa R. Washburn, The Printz-Biederman Co., Cleveland, Ohio.

Miss Stella Gonsior, National Safety Council, 168 North Michigan Avenue, Chicago, Ill.

Mrs. L. Luella Cox, Director Department of Women and Children, Industrial Board of Indiana, Indianapolis, Ind.

Miss Kathryne Hunt, Treasurer, National Safety Council, 168 North Michigan Avenue, Chicago, Ill.

Miss Mildred Middleton, Manager, Operators' Training Department, Michigan State Telephone Company, Detroit, Mich.

Miss Florence Swift Wright, National Organization for Public Health Nursing, 156 Fifth Avenue, New York City.

Dr. Marian A. Weightman, Willys-Overland Co., Toledo, Ohio.

Miss Harriet V. Condie, Employment Supervisor, Michigan State Telephone Company, 29 Madison Avenue, Detroit, Mich.

Miss Jeanie E. Hughes, John Schoonmaker & Son, Newburgh, N. Y.

Mrs. Lillian A. Brown, Glynn-Clarke Co., Cleveland, Ohio.

Mrs. Arthur T. Morey, 5565 Bartmer Avenue, St. Louis, Mo.

Mrs. C. A. Hamann, 2036 East 89th Street, Cleveland, Ohio.

Miss Muriel Mackay, Dominion Rubber System, Pt. Dalhousie, Ontario, Canada.

Miss Virginia H. Evans, Kimberly Clark Co., Neenah, Wis.

Miss Maud Swett, Assistant Secretary, Industrial Commission of Wisconsin, Madison, Wis.

Miss Mildred M. Hickman, National Acme Co. (Employment Manager), Cleveland, Ohio.

Miss NESTA C. EDWARDS: I move that these names be listed and that each one of us get a copy of that list.

(The motion was seconded, it was put to a vote, and carried.)

On motion the meeting adjourned.

Woodworking Section

October 3 and 4, 1919

J. E. RHODES, Chairman

Secretary-Treasurer, Southern Pine Association, New Orleans, La.

F. A. BARKER, Secretary

Resident Manager, Lumberman's and Manufacturers' Insurance Agency,
Milwaukee, Wis.

MEMBERS PRESENT:

David W. Teachout, Vice-President and Treasurer, The A. Teachout Co.,
331 Prospect Avenue, Cleveland, Ohio.

D. F. Hatch, Superintendent, The A. Teachout Co., 331 Prospect Avenue,
Cleveland, Ohio.

R. F. Milne, Lumbermen's Safety Association, 19 Castle Bldg., Ottawa,
Ontario, Canada.

F. G. Lovett, Inspector, Industrial Accident Prevention Association, 892
Excelsior Life Bldg., Toronto, Ont., Canada.

James H. Parks, General Accident Insurance Company.

Robert B. Howe, Safety Dept., Goodrich Rubber Co., Akron, Ohio.

L. B. Alsey, J. F. Hasty and Sons, Stave & Heading Mfg., Paragould, Ark.

Frank W. Schoof, Safety Equipment, Willard Storage Battery Company,
691 East 128th St., Cleveland, Ohio.

F. D. Ensminger, The Prest-O-Lite Company, Inc., Indianapolis, Ind.

W. H. Rohr, S. H. Smith Co., Publishers "Woodworker," Indianapolis, Ind.

C. H. Gram, Commissioner of Labor, Salem, Oregon.

C. W. Tellier, Eastman Kodak Company, 333 State Street, Rochester,
N. Y.

E. B. Jacques, Goodyear Tire and Rubber Company, Akron, Ohio.

Warren Hilleary, Royal Indemnity Company, 84 William Street, New
York.

W. F. Proper, W. F. Stewart Company, Automobile Bodies, Flint, Mich.

M. L. Henwood, Maryland Casualty Company, Baltimore, Md.

G. D. Bragdon, General Accident Corp., Philadelphia, Pa.

C. B. Allen, Mfrs. Liability Ins. Company, Jersey City, N. J.

Alfred Struck, President Alfred Struck Company, Louisville, Ky.

O. F. Behm, Standard Accident Company, Detroit, Mich.
 Wm. A. Marshall, Chairman, Oregon Ind. Accident Commission, Chairman, Safety Com. Pacific Logging Congress, Salem, Oregon.
 E. M. Hamlin, Mgr., Maine Mills, The American Thread Co., Milo, Maine.
 A. B. Cowfer, Safety Engineer, Ocean Insurance Company, 912 West 21st Street, Erie, Pa.
 Paul M. Bowen, Standard Accident Insurance Company, Detroit, Mich.
 R. H. Platts, Standard Accident Insurance Company, 906 Penobscot Bldg., Detroit, Mich.
 Holger Jensen, Maryland Casualty Company, Baltimore, Md.
 J. L. Naylor, Bureau of Labor, Manitoba, Parliament Bldg., Winnipeg.
 R. W. Patmore, East End Mfrs.' Association, Cleveland, Ohio.
 Charles N. Young, Acting Supt. Dept. of Sched. Rating & Inspection, National Workmen's Com. Serv. Bureau, 13 Park Row, New York, N. Y.
 John L. Bartlett, Safety Eng., Maryland Casualty Company, Baltimore, Md.
 Martin J. Flyzik, Olympia, Washington, Member of State Medical Board and State Safety Board.
 W. Graham Cole, Director of Safety and Industrial Relations, Southern Pine Association, New Orleans, La.

FRIDAY MORNING SESSION

THE meeting was called to order by the Chairman, at 9:30 A. M. CHAIRMAN RHODES: Although the Woodworking Section of the National Safety Council appears to be considered as one of the least important of this great organization, I am sure that with the active participation in this conference of those present, we can make the proceedings of this section not only interesting but extremely valuable to greet you, and to invite you to take part in this conference in a strictly informal way, in order that we may have the benefit of your suggestions and judgment concerning the questions which have been placed before us for discussion.

THREE BRANCHES OF LUMBER INDUSTRIES

The Woodworking Section really involves three different branches of the lumber producing and consuming industries. As I see it, we include first the manufacture of lumber; second, its distribution, and third, its consumption as represented by woodworking plants. Addresses from representatives of these three branches are scheduled to be delivered today and tomorrow.

Speaking for the lumber manufacturing industry, with which I am personally connected, I am pleased to say that there is an increasing interest on the part of employers in the work of eliminating causes for personal injuries. Our attention has been most forcibly called to the fact that the record of the lumber industry in the matter of accidents and fatalities is far from satisfactory. I am informed that on the basis of the number of injuries sustained by employees, the lumber industry stands third among

the great vocations in which men are engaged in this country, railroad-ing and mining leading the lumber industry. If this situation is true, and the lumber manufacturers during the coming year will make an effort to ascertain whether or not it is, I can assure you that they will make every effort to improve the record, but frank to say, personally I feel ashamed about it, and I know that many of our associates also entertain the same feelings.

SAFETY DEPARTMENT OF SOUTHERN PINE ASSOCIATION

The Southern Pine Association has inaugurated a Department of Safety First, for the express purpose of doing what it can to reduce the number of accidents sustained by employees in the woods and mills of the Southern states. Mechanical appliances, so far as they will protect life and limb in sawmills, have been perfected about as far as it seems possible at this time; hence, it would appear that little improvement can be made in that direction. The greatest number of accidents incident to the manufacture of lumber occur in logging operations, and I am informed that in this respect the operations of the Southern states show a better record than those of the far Western states, where logging is more largely done by machinery and where the timber handled is of a much larger and heavier character. At the session of this conference a year hence, we shall endeavor to present statistics which I feel certain will show a very gratifying decrease in the number of injuries sustained by employees in the Southern mills and woods, and I will not take your time by rehearsing the efforts which we are exerting to bring this about.

So far as the distribution of lumber is concerned, the number of injuries sustained by employees is undoubtedly very materially less than that in its manufacture, and I am pleased to note that a representative of the wholesalers and retail lumbermen will address us on this subject. The handling of lumber involves generally heavy manual labor, and it is hence impossible to entirely eliminate the physical hazard.

SEEK COÖPERATION OF MANUFACTURERS OF WOODWORKING MACHINERY

There are a vast number of industries throughout the country which produce articles made of wood. There are, of course, the manufacturers of sash and doors, boxes, and other exclusively wood products, but in addition there are a vast number of plants which have a woodworking department, such as manufactories of automobiles, batteries, and so forth. These operations involve the use of a large amount of woodworking machinery, upon which safeguards have generally been installed. The chief cause of accidents in woodworking plants is due to the fact that the employees do not use the safeguards which have been provided, and the management is frequently careless or indifferent. It is possible that the manufacturers of woodworking machinery can coöperate by incorporating these safety devices as an integral part of the machines, so that they cannot be removed. I think that some discussion upon this phase of the matter would be helpful, and to that end would suggest that the manufactur-

ers of woodworking machinery be invited to participate in future meetings of this section.

We are delighted to have with us representatives of our Northern friends, the Canadians, our worthy allies in the great war. We not only welcome their participation, but I feel that a resolution of thanks should be extended to them, expressing our appreciation of their interest in this great work.

By reason of the size of the lumber industry, as compared with many others represented in this Council, I feel that we should make an effort to make the sessions of this section at the next annual meeting among the most largely attended of all, and that steps should be taken at this time for the preparation of a program which will result in bringing out representatives of the lumber industry and affiliated branches, so that instead of being the smallest of the sections we may become one of the largest, if not in point of attendance at least in actual results achieved. In this connection, I wish to extend my thanks to Mr. Barker, Secretary of this section, for the keen interest which he has taken in the work during the past year. The success of work of this kind really depends more upon the Secretary than any other officer. I will appreciate it if you will consider this meeting in a strictly informal manner, so that our discussions may be of the most intimate and helpful sort.

(Chairman exhibited safety bulletins and forms as used by Southern Pine Association in their safety promotion work.)

SECRETARY'S REPORT

I am going to dispense with any unnecessary talk as regards the secretary's report with reference to our previous meetings, and devote my entire time to a direct appeal to you members present, for your full cooperation in increasing the membership of our Woodworking Section.

I was very much surprised to receive figures from the National Safety Council as regards the present membership of this Section, especially in view of the fact that lumbering, logging, and lumber-working represents more industries in the United States than any other prominent class of manufacturing, and frankly speaking we should have right from Ohio a greater number of members than are represented as a total for the United States, and if agreeable to the Chair, I wish to have each and every one of you register your name upon the booklet which I will pass around and by so doing I wish to consider it a partial pledge by each of you to secure at least one new member before our next Annual Safety Congress.

As we review the accidents occurring in the lumber and lumber-working industries, we cannot help but feel that a progressive accident-prevention campaign for these industries would eliminate a number of the so-called preventable accidents. My personal experience in the sawmill industry takes me back to a time when I remember frequent accidents by reasons of kick-backs on edgers, and speaking for the territory in which I am now interested, I am very glad to say that we have practically eliminated this class of accident, which has proven to be preventable and was usually fatal to the injured. Such was accomplished by applying sim-

ple and practical guards to the machine. Surely work of that character must interest any lumber manufacturer.

I can also go back a few years, and bring to my mind a vivid recollection of frequent finger and hand accidents on jointers, and today by the use of the round cylinder head instead of the square head in these machines, we have almost entirely eliminated any further loss of fingers or hands, and furthermore, the round cylinder head in the jointer has been found in addition to its wonderful safety feature, capable of doing the same and even more work than the square head can do.

Our every indication is that this Safety Congress is going to be the best one that we have as yet held for the woodworking section. As for next year, we are already planning to have prominent men of our industry deliver addresses, and I petition you all once again to cooperate fully in making our next Congress a successful one in membership as well as program.

Chairman Rhodes introduced Mr. David W. Teachout who delivered the following address:

SAFETY IN THE LUMBER AND MILLWORK INDUSTRY

DAVID W. TEACHOUT, VICE-PRESIDENT AND TREASURER, THE A. TEACHOUT COMPANY, CLEVELAND, OHIO

The work which the Council is doing in America we believe is of the greatest importance to the future of our people and the development of our Nation's life.

The Eighth Annual Safety Congress in Cleveland this week has been a source of great education to our own "local family" of almost one million people. This Congress has taught us to "be more careful to wait at the crossing, and not spend so much time waiting in the cemetery."

While it seems that we have many accidents to report in our daily papers, statistics indicate that we are a long way from heading the list of accidents in our large cities. Usually Cleveland aspires to be at the top but in this respect, in which you and I are vitally interested, we prefer to be at the bottom,—in other words have the fewest accidents possible in proportion to our population.

We feel indebted to this Congress in Cleveland and trust your stay in our midst has been both pleasant and profitable.

The subject assigned to me of safety in the lumber and millwork industry is one in which I have always been vitally interested. Perhaps this was first developed by my early experience in the manufacturing end of the lumber business at our North Carolina Mill. It was necessary to start with a very crude affair and practically no safety appliances. A few days after we started the mill I cautioned one of the few white laborers, one who was working with the log chain which came up into the mill to be careful with some gear wheels near the saw-carriage. Less than twenty-four hours after that time I saw this same man catch his arm in this very place and tear it off at the wrist. From that date I resolved that

whenever and wherever I could take some precautionary measure I would do so.

While in the South logging in the woods, slipping the logs down-stream by tide to the mill, ripping up the logs and then shipping the lumber north I came to know the conditions and the environments of the lumberman, in fact what is more vital. I came to *know workmen*. Never shall I cease to be grateful for this experience. I came to recognize the human side of men in the act of labor. "The humanizing of business is the beacon light of our country," as a prominent lumberman of the Central West has so well expressed it. Reasonable precaution in protecting life and limb is recognized today, not only as a duty under the law but is realized as a common-sense thing to do to save the corporation or partnership from great loss, and under some circumstances, financial ruin. And in addition there is the higher law. The Christian viewpoint is developing and there is the moral responsibility and duty which we must frankly face as we meet one another in industry as *associates*. Note that I do not say employer and employee.

Usually a man's word growing out of his own experience is more acceptable and I trust mine may be to the point in this message.

The first consideration in establishing a yard is the public hazard. From the standpoint of public safety all yards should be fenced in and the gates carefully closed at night. Lumber should be neatly piled and well stacked. This avoids boards and dimension falling over in case a truck strikes the corner of a pile. Every platform in a lumber shed should have a substantial rail. "An ounce of prevention is worth a pound of cure," as a maxim, applies in this line and especially around the planing mill. So far as I can learn we have never had any serious accident around any of the ten yards in which we are interested in the City of Cleveland. In the sash and door business we have had four deaths resulting from accidents over a period of forty-five years—two were sustained by falls in the elevator shaft, one from blood poisoning and one resulted from accident on one of our millwork machines. Danger signs and gates were present in the case of the former. Our experience, therefore, shows that an air of independence on the part of the workingman is usually at the bottom of these serious accidents.

Personally I believe that the conscience of corporate management is aroused to the peril of such accidents and that the majority of concerns are only too willing to accept suggestions for additional safety and install the apparatus at once, even at considerable cost or I might even say—no matter what the cost.

SAFETY SUGGESTIONS

Five concrete suggestions should be borne in mind.

1. Place "Danger" cards at every critical and dangerous place, and especially at elevator shafts. Have these in metal and nailed up so they cannot easily be torn down.

2. Where there are laboring men who do not understand English, have safety signs put up in their respective languages, and frequently call their attention to such notices.

3. Urge foreigners to study English so that in the time of emergency or accident our language as a medium may be readily understood.
4. Use guards on all machines. Do not allow the poor argument of "too much trouble" to stop improvements short of the most complete and up-to-date.
5. Watch safety of health in office and plant.

DISCUSSION

This paper was discussed by: Mr. D. F. Hatch, Supt. of the A. Teachout Company; Mr. M. L. Henwood, Maryland Casualty Company, Baltimore, Md.; Mr. C. H. Gram, Commissioner of Labor, Salem, Oregon; Mr. Wm. A. Marshall, Chairman, Oregon Ind. Accident Co., Salem, Oregon.

Chairman Rhodes thanked Mr. Teachout for his excellent paper and exhibit of safety appliances. One in particular attracted the attention of the section. It was a red flag with firm name and safety first on it, which is attached to the extreme extending part of a load of lumber while in transit on trucks. This was considered very effective in attracting attention of pedestrians when truck would be turning a corner and have the probability of extended lumber swinging into persons near by.

Program was continued by introduction of Mr. Holger Jensen, who delivered an address.

METHODS OF SECURING COÖPERATION OF WORKMEN IN USING SAFEGUARDS

HOLGER JENSEN. MANAGER, ENGINEERING AND RATING BUREAU, MARYLAND CASUALTY COMPANY, BALTIMORE, MD.

If it were within the power of those interested in Safety to look into the minds of men, it would, no doubt, still be impossible to lay down any specific method for obtaining the use of safeguards which would be satisfactory in all cases. However, it is not an impossibility to obtain the general use of safeguards by workmen, if sufficient consideration is given to eliminate the objections. These objections are generally due to faulty construction of the guard, which does not give the *maximum amount of safety*, or which *curtails the output*, and also due to the *state of mind of the workman* who is to use it. This last objection, however, so closely interlocks with the first two that it is, to use the late Andrew Carnegie's illustration, similar "to a three-legged stool." It is necessary to consider and deal with all three objections, in order to obtain the desired result.

The responsibility for obtaining the workmen's coöperation rests mainly with the employer in the providing of efficient guards. Guards should be substantially constructed and as near automatic in their action as possible, where adjusting is necessary, due to size and nature of material. Any operation possible with an unguarded machine should be possible with a guard, at least, the guard should not interfere with any necessary feature of the work during operation. When ordering a machine from a manufacturer, the buyer should insist upon it being constructed so as to give the maximum of safety in its operation. If this demand were a gen-

eral practice, more machines would be safeguarded by machine manufacturers. Where machines are sent out unguarded by the manufacturer, the proposition of guarding the machine is up to the buyer. The present practice of guarding the belts, shafts, and gears is more or less uniform, and by no means difficult, but when it comes to guarding the danger zone of operation, which, no doubt, produces more serious accidents in connection with the operation of woodworking machines than anything else and considering that the types of guards in use at present for guarding the danger zone of operation are in most cases very easily removed, these types of guards demand special and most careful consideration.

REPORT OF WISCONSIN INDUSTRIAL COMMISSION

The report of the Industrial Commission of Wisconsin as to Industrial Accidents in that State for the years 1915, 1916, and 1917 shows that 981 accidents were on circular saws, 64 on band saws, 150 on saws not classified: in all, 1,195 accidents on saws out of a total of 2,365 accidents on woodworking machines, or 50 per cent of the accidents occurred on saws. Attention is not called to these figures with the idea in view that the State of Wisconsin shows an especially bad record: on the contrary, the State Department of Wisconsin has been exceptionally active in the reduction of accidents on woodworking machines, but it is one of the few State Departments which has tabulated industrial accidents by industries. These figures would indicate that circular saws are the greatest producers of accidents of all woodworking machines. This is first due to the fact that saws, no doubt, comprise the largest percentage of any one kind of woodworking machine. It may, however, be interesting to note, that, for instance, of the 981 accidents on circular saws, 143 were permanent injuries, divided as follows: 4, deaths; 2, arm cut off at elbow; 3, loss of hand; 76, loss of one finger; 36, loss of two fingers; 13, loss of three fingers; 5, loss of four fingers; 1, loss of foot; 3, loss of eye; and 1, facial disfigurement. This shows the necessity of protection. In the majority of cases, it would, no doubt, be found that the accidents were due entirely to the lack of safeguards, but to say that all of these accidents were due to the fact that safeguards had not been provided would be folly. While the statistical data throws no light on this, it can reasonably be assumed that in a great many cases safeguards were provided, but were inadequate, or where a fairly good guard was provided, its use was dispensed with at the time of the accident, due to special work being done; repairs or adjustment having been made, which necessitated the removal of the guard and same not having been replaced. In some cases, a very good guard is removed, due to the operator's personal dislike to it, or to the fact that it prevents him from turning out the desired quantity of work.

CAREFUL MAN AND GUARD, BOTH ESSENTIAL

The necessity of safeguards on woodworking machines is obvious and is recognized by all employers. Argument is often presented that a careful workman eliminates the need of a safeguard. A careful workman is only obtained through training and education and is probably a more

superior condition in operating a dangerous machine without a guard than a careless man operating the same machine guarded, but the most careful man forgets at times. Experience has shown that both the careful man and the guard are essential. The two are inseparable and it is difficult to state which one stands first in preventing accidents. The guard should first be provided.

To discuss the construction and suggest standard safeguards for machines, such as jointers, circular saws, planers, shapers, etc., is not considered necessary, as most men engaged in the operation of woodworking machinery are familiar with guards which are on the market and which are looked upon more or less as standard guards. These, however, cannot always be accepted as a "cure-all", even for these common types of woodworking machines, but guards have to be designed with due consideration as to the class of work done and material used. This, of course, also applies to other types of woodworking machines for which there are no guards on the market. At a meeting recently held, at which the possibility of standardizing safeguards was discussed, it was brought out very strongly that it would be impracticable to do this at the present time, due to the great difference in design of machines and requirements demanded in guards and that the great bulk of machine guards used were designed and made in the individual plant or mill in which they were to be used. In such cases, the construction of the safeguard must have the most serious consideration of the man in charge. The guard must be of substantial construction and should be the best money can purchase.

THE WORKMAN SHOULD BE CONSULTED

The providing of such a guard is a big step towards getting the cooperation of the workman in using it, but in order to be sure of this attitude, the workman should not be looked upon in the same light as the machine on which the guard is to be placed. Human nature is very much alike, whether the man wears a white collar and tie and spends his time at a desk, or he wears overalls and puts in the day operating a machine. When a man has an opportunity to express his individuality and takes some part in the purchasing or creating of a new venture, he is sure to take a great deal of interest in making it a success. It has been proven time and time again that the cooperation of the workmen is vitally essential, if anything like the majority of preventable accidents is to be eliminated and the workmen, therefore, should be consulted in the purchasing, designing or installing of safeguards on machines which they operate.

The use of certain safety devices oftentimes means the learning anew of the operation of the machine. Human beings get into habits. They do not like to change their ways, especially when they become older. It appears to be human nature to oppose a change, unless good reason can be shown for making it. The employer, by his attitude, can show the workmen that he is interested in safety, is anxious to provide safe conditions, and that he further desires and appreciates the workmen's best opinion from their practical knowledge. It is true that many helpful suggestions are made by workmen in reference to safeguards, which, in

the form presented, are impracticable, but which need only the application by others more skilled and experienced to be used to good advantage. A great many safeguards in woodworking operations remain unused a number of times because the workmen feel that they are not practicable in the operation of their machines. The guard may give full protection, though interfering with the output, and the employer may be willing to suffer this loss, but the loyal workman resents any curtailing of output. No guard should be considered satisfactory unless it gives the maximum of safety and provides at least the same output obtained by the unguarded machine. Safeguards not interfering with operation increase production, due to the workmen's sense of security. A guard affording full protection, without interfering with the operation, is sure to appeal to the workman as being practicable and if he has had part in the designing or installation, it is certain to be used at its maximum of service. Unjust objection and criticism to a guard is generally made at the time of installing, so that later on when a change is made in the operator, the guard is accepted as a fixture.

RESPONSIBILITY

The placing of new or inexperienced persons on dangerous machines, needless to state, will produce accidents, even with machines which, in the hands of experienced workmen, would be satisfactory. This is where the foremen or superintendents should use discretion. They can also greatly aid in getting cooperation of the workmen from a safety standpoint, as well as from the point of production, in maintaining discipline. This can always be obtained if a sense of responsibility exists in the minds of the workmen. May it not justly be assumed that the secret in obtaining the use of safeguards can best be covered by one word. *Responsibility*—responsibility of the employer, his superintendent or foreman towards the safety of the workmen, and workmen's sense of responsibility towards their own safety, as well as the best interest of their employer? In former days when the employer and his small number of workmen worked shoulder to shoulder and knew each other personally and were concerned as to each other's best interests, they both realized fully their responsibility towards each other. With the plants and mills being increased in size, the employer and the workmen have naturally drifted apart. This is, no doubt, the cause for lack of cooperation shown in many places at the present time. This fact is being recognized in general and sincere efforts are being made to correct this unfortunate situation. In the large mills and plants the employer, on account of his duties, is unable to keep in close touch with the individual workmen. The superintendent and foreman become his substitute, and they must be considerate of the workmen under them. They should take an earnest and sympathetic interest in the welfare of each workman, but with it all, they should maintain a certain amount of dignity. The right type of foreman will find the workmen ready and willing to follow his instructions in spirit, as well as in action. This makes discipline easier and carries with it a

sense of responsibility in the minds of the workmen as to prevention of accidents, as well as responsibility towards production.

The answer to the question "How to Secure the Cooperation of Workmen in Using Safeguards" is A PRACTICAL AND EFFICIENT FOREMAN AND SAFEGUARD.

Mr. Jensen's paper was discussed by Mr. Cole of the Southern Pine Association, Mr. C. H. Gram, Commissioner of Labor, Salem, Oregon, and Mr. F. G. Lovett, Inspector, Industrial Accident Prevention Association, of Toronto, Ontario.

Mr. Jensen advises that he has a number of photographs of various woodworking guards, and that he will be pleased to give practically any of these to members making request. The Secretary has made a note to have Mr. Jensen contribute to a safety bulletin board for the next Safety Congress.

The subject of hazards in box manufacturing plants was assigned to Mr. C. R. Miller. Mr. Miller was not present and his paper was read by Chairman Rhodes.

SOME OF THE BOX MANUFACTURERS' PROBLEMS

C. R. MILLER, OPERATING MANAGER, RATHBORNE, HAIR, AND RIDGWAY,
CHICAGO

The future of the Safety movement in the Wooden Box Industry is, in a large sense, linked up with the problem of developing automatic and semi-automatic machinery. There is a great field for such development and an urgent necessity for it.

The Industry, as a whole, seems to have taken a great interest in the work of guarding plants for the protection of employees, and in the short space of five years has made wonderful progress in affording conveniences for the comfort of workers. It is a common thing, nowadays, to find in plants of almost any size, stations where hot coffee and sandwiches may be had at nominal prices; rest rooms very well fitted up and many like provisions for comfort.

But now I want to get to the subject that I consider most important.

We are sawing boards today about as we did twenty-five years ago. It is true that recently a new nail driving machine has been introduced for making up certain types of boxes, but the principle of all the machines for general work, now in use, has not changed in thirty years. About ten years ago, a new type of box, which has since come to be known as the —4—ONE WIREBOUND BOX, was introduced to the consuming public. This box is made very largely of Rotary Cut Veneer and even though nine or ten years have elapsed we have not yet a satisfactory sawing machine for ripping this veneer. I could extend the list to considerable length but think that these will be sufficient examples to convey my thought.

When we consider the modern automatic machine for working steel and iron products, such as plates, bolts, screws, tin cans, etc., our average machinery seems to be woefully ancient and inadequate. Then, too, our

chief competitor, the manufacturer of fibre containers has machinery that is well abreast of the times generally. A recent investigation showed me that in an average establishment for making fibre containers, twelve persons can produce as many containers in a given time as would require 65 to 70 persons in the average wooden box factory.

Perhaps some one is wondering where all this joins with the safety movement as most of us usually think of it. We all know that in the designing of machinery today, safe operation is one of the fundamental thoughts with the designer. Therefore, it is fair to assume that new machines will be well guarded. Those of us engaged in this section of the wood working industry must give more and more serious thought and study to this subject, if we are to hold our own and do our part in the great work of reconstruction.

Another great work for us, coming under the caption Safety is picking the right man for the job, and seeing to it that each person is instructed and learns to do his work with the least effort necessary. This is the only way to increase production and at the same time pay more wages for shorter hours.

Some of the great manufacturing institutions working in steel, iron, and metal are conducting training schools for workers, teaching them how to do their work with the least number of movements for each operation and at the same time are finding the misfits and placing them where they can be of the best service to both themselves and their employers.

I think our box factories are, in most instances, important enough to warrant some movement of this kind.

Discussion was entered into by most of the members with reference to box manufacturing hazards, and it was unanimously decided that this important subject should be gone into very carefully at the next sectional meeting. Mr. Miller's paper gave the members present a number of good pointers as to how to conduct safety work for this industry.

DISCUSSION

Chairman Rhodes announced that a general discussion was in order on any matters pertaining to papers read or safety in general for the lumber and lumber working industries. This discussion was entered into freely by all members present, and the exchange of ideas was very beneficial to all.

A very interesting discussion was on photographs of hazards and safety appliances and the following members very kindly consented to contribute in a reasonable way to any member present, or to the section for its next exhibit, photographs which they have and which they will take from time to time:

F. G. Lovett, Inspector, Industrial Accident Prevention Association, 802 Excelsior Life Bldg., Toronto, Ont., Canada.

R. F. Milne, Lumbermen's Safety Association, 19 Castle Bldg., Ottawa, Ont., Canada.

C. H. Gram, Commissioner of Labor, Salem, Ore.

Holger Jensen, Maryland Casualty Company, Baltimore, Md.

Mr. Cole of the Southern Pine Association brought up a very interesting subject relative to the standardizing of accident classification and the subject was referred to the secretary and Mr. Cole for a further investigation as to how insurance companies and states could be brought together for such standard classification.

Mr. R. W. Patmore, East End Mfrs. Association, suggested that this council should go on record with reference to the purchasing, only, of machines that had approved guards. The subject brought up some very interesting discussion and the chairman advised that he would take action by appointing a committee on resolutions to handle this matter.

Chairman Rhodes appointed the following committees, to report at the meeting on Saturday morning October 4.

Membership Committee:

Wm. A. Marshall, Chairman, Oregon Industrial Accident Commission, Salem, Oregon; D. W. Teachout, Vice-President and Treasurer, The A. Teachout Company, Cleveland, Ohio; W. D. Keefer, Safety Engineer, National Safety Council, Chicago, Ill.

Resolution Committee:

F. D. Ensminger, The Prest-O-Lite Co., Indianapolis, Ind.; R. W. Patmore, East End Mfrs. Ass'n., Cleveland, Ohio; M. L. Henwood, Maryland Casualty Co., Baltimore, Md.

Nominating Committee:

R. F. Milne, Lumbermen's Safety Association, Ottawa, Ontario, Canada; Holger Jensen, Maryland Casualty Co., Baltimore, Md.; Fred A. Barker, Resident Manager, Lumbermen's Mutual Casualty Co., Milwaukee, Wis.

Adjournment at 12:30 P. M.

SATURDAY MORNING SESSION

THE meeting called to order by the Chairman at 9:30 A. M. Chairman Rhodes announced that in the absence of Mr. Boyd, Secretary Barker would read his paper.

ACCIDENTS IN LOGGING OPERATIONS AND HOW THEY MAY BE REDUCED

JAMES BOYD, EDITOR OF THE "LUMBER TRADE JOURNAL," NEW ORLEANS

Logging operations procure the source of supply for the lumber manufacturing plants. Accidents happen, but in most instances they result in minor injuries. It is rare that many men suffer injury at one time, because as a rule they work in groups of two or three. Still, one operation reports 183 personal injury cases in 1918.

The best statistics on the subject have been prepared by Henry Burr, Vice-President of T. H. Mastin and Company, Kansas City. The experience of this organization over a series of years, which insures lumber

companies only against liability and workmen's compensation, is that 39 per cent of all accidents in lumber operations are in the logging department of which 21 per cent are in the woods and 18 per cent on the logging railroads. The cost of the accidents in the logging departments is 21 per cent of the cost of all the claims in the lumber industry and that in the railroad department is 20 per cent, or a total of 41 per cent of the entire cost of personal injury.

Mr. Burr has prepared the following figures showing causes of accidents in percentage to the total number of accidents reported:

	Per cent
Log cutting	45
Skidding by power	15
Loading by power	18
Skidding by animals	2
Loading by animals	3
Hauling by animals	8
Swamping	4
Unclassified	5

In the operation of the logging railroads the following causes contribute in the percentage shown:

	Per cent
Operation of cars	26
Maintenance of way	46
Unloading logs	8
Accidents in pond	5
Coupling cars	8
Boarding and alighting	4
Unclassified	3

Bulletins of the National Safety Council have done good work in lessening the number of accidents in operations where they have been used. A company began posting bulletins in 1916; that year it had 272 accidents; in 1917 the number was 225, and in 1918, 183.

Those companies which do not change men often have few accidents. Some of them avoid putting green men in places where there is a possibility or likelihood of an accident, using the new men in places where there is not a great deal to be done, and practically no risk, until they become sufficiently acquainted with the requirements of the work so they can throw around themselves the necessary precaution. Others employ only competent men, and require those in charge of operations to keep a careful watch over their men and see that they take no unnecessary risks.

The Choctaw Lumber Company, Broken Bow, Okla., maintains a Welfare Department under the direction of J. W. Clark. Part of the duties of this department relate to a reduction of accidents. Each employee is given a small book which gives directions for the prevention of accidents. Here are the instructions for The Woods Operations:

OPEN LETTER TO WOODS FOREMEN

1. Instruct every man who is new in your crew regarding his duties and point out to him where he may meet with danger. New men are more liable to accident.
2. The ax and the saw teeth are the cause of most minor injuries to logging men. Keep this idea before your men.
3. Falling trees with the cutters is the cause of most all deaths from accidents in the woods. Keep the men on the lookout.
4. Catching logs on the move injures men and may cause death if the cant hook should fail. Stop this practice; some one on POLLY the year 'round from this carelessness, two at the present.
5. Keep the safety idea before your men all the time and make a record for your crew.
6. Coöperation among the men in the woods, as the swampers and the teams, the saws and the haulers, and the men and the foremen, is of absolute importance; foreman see that this condition is maintained.
7. Men who refuse to use ordinary precaution among their fellow workmen will have to be replaced.
8. Keep the women and children in mind when you think of Safety First and it will be easier.

OPEN LETTER TO WORKMEN IN WOODS

1. We have a desire to see every man on his feet and making his own way in the world and wish to help you.
 2. Carelessness causes 90 per cent of the accidents of industry. Cut out your part of the carelessness and you have done your part.
 3. The ax, the saw, and the falling tree are the arch enemies of the woods department.
 4. Always strike with the ax aimed out and from the body and there can be no injury with the ax.
 5. Don't treat the Safety idea lightly; it may save your life and keep your children from being orphans.
 6. A crippled man is not a man; he is only part of a man. Be a whole man.
 7. Industry needs every man of us. Let's work together that all may be happy.
 8. We have SAFETY FIRST rules now and I am asking every one of you to coöperate with each other and with the foremen to make your department free from injury. We should all be better for the rule.
- Mr. Clark publishes a monthly paper as part of his work. Following is the "SAFETY FIRST DEPARTMENT" from a recent issue:

SAFETY FIRST

The accident record for the month is very good. One hand badly hurt in the Bismarck planer mill, due to "carelessness and awkwardness," as the injured man puts it. It might have been a wrist as well as the two

leaders in the hand. Be on the lookout at all times and stay away from danger.

The new floor in the machine shop is a much needed improvement and will aid in preventing accident. Uneven floors are dangerous.

W. L. Douglas was hit by a falling limb at Broken Bow camp. This is a type of injury that can't well be avoided at times. Eternal vigilance will help.

One man injured at each camp by ax cuts. These appear too frequently. The foremen should point out this danger and then the men should quit chopping toward the feet; chop out from the body and you can't cut your foot. It will take more time to do this, but it will save you a foot, perhaps.

The cleanest place on the job is the car shed of the Bismarck car repair men. These men could keep a house neat and orderly.

A health pamphlet and a safety first pamphlet will be sent to each working hand this week. Read these and then take them home and keep them. I have done several weeks of hard work in preparing them and I know the material they contain is authoritative. We mean to send much of this to your home and ask you to keep it and try to get good from it.

The one remedy that is a certain preventative of all accidents is carefulness.

Mr. William A. Marshall, Chairman, Oregon Ind. Accident Commission, discussed Mr. Boyd's paper and read from an article which he had prepared to be delivered before the Pacific Logging Congress.

ACCIDENT SEVERITY IN LOGGING OPERATIONS

WILLIAM A. MARSHALL, CHAIRMAN, COMMITTEE ON ACCIDENT PREVENTION,
PACIFIC LOGGING CONGRESS, SALEM, OREGON

If statistics are to be of greater value in connection with accident prevention work in logging operations, the information should show, not only the number of accidents occurring in the various occupations or divisions of the work, but also the average severity resulting. The fact that there has been a reduction in the number of accidents during a given period is not conclusive evidence of a real reduction in the total injury to the workmen or in the total of compensation benefits paid to injured workmen.

A study was made for the Pacific Logging Congress of logging accidents in Oregon for the year ending June 30, 1919, and I am taking the liberty of presenting two of the condensed tables and some of the conclusions drawn from them. The principal purpose of this study was to show the causes resulting, not in the greatest number of accidents, but which represented the greater total loss to the injured workmen in temporary and permanent disabilities and in fatalities.

In comparing the relative hazards of the various occupations, or the severity of injury resulting from the different causes of accidents, the total amounts paid in compensation are often unreliable, particularly in

Woodworking Section

1433

Logging accidents in the State of Oregon, for the year July 1, 1918, to June 30, 1919—By occupations

Occupations	Fatal	Per- manent Total	Per- manent Partial	Temp- orary Total	Total Cases	Per Cent	Days Lost	Per Cent	Compen- sation	Per Cent
(1) Fallers, buckers, scuffers, sawyers, rivers, timbers and the buckers	18	-	30	426	474	85.90	141,684	24.20	\$ 82,402.48	24.70
(2) Snappers, rigging, slingers, chasers, hook- ladders, choker setters and whistlemen	16	4	35	435	499	28.78	166,601	28.57	104,156.18	27.43
(3) Loaders and deckers	5	-	10	132	147	3.04	49,211	8.44	37,213.14	9.80
(4) Donkey engineers and firemen and pump- men	5	1	18	108	132	7.22	50,092	8.59	34,370.02	9.05
(5) Wood bucks, wood splitters and drag saw operators	4	1	7	69	81	4.43	36,460	6.35	12,950.18	3.41
(6) Teamsters and truck drivers	...	-	5	117	122	6.67	7,112	1.22	10,018.19	2.64
(7) Riggers, drivers, and boommen	3	-	-	9	12	6.66	18,125	3.11	16,186.58	4.25
(8) Superintendents and foremen	1	-	1	18	20	1.04	6,449	1.11	7,782.06	2.06
(9) Saw filers and blacksmiths	...	-	-	14	14	.77	238	.04	497.85	.13
(10) Commissary employees and stewards	...	-	-	19	19	1.04	358	.06	634.01	.17
(11) Miscellaneous (logging)	1	-	4	62	67	3.66	10,798	1.86	15,010.10	3.95
(12) Logging railroad conductors	...	-	1	6	7	.39	1,057	.18	1,006.65	.26
(13) Logging railroad brakemen	2	-	8	49	59	3.23	27,208	4.67	17,939.59	4.72
(14) Logging railroad engineers	3	-	1	14	18	.98	18,570	3.18	7,714.96	2.03
(15) Logging railroad firemen	...	-	2	15	17	.93	4,693	.30	2,697.09	.71
(16) Logging railroad maintenance and con- struction	4	-	13	134	151	8.26	44,501	7.64	29,283.03	7.70
Total	62	6	135	1,627	1,830	100.00	583,216	100.00	\$379,752.11	100.00

the logging industry, where a considerable number of fatal cases leave no dependents. For these reasons an additional basis of comparison has been inserted in these tables and such disability is measured and the result converted into a common denominator of "days lost". In temporary injuries the actual days lost from employment are counted, while the injuries resulting fatally or in permanent disability are arbitrarily weighted in terms of potential work-days lost according to a table of weights adopted by the International Association of Compensation Boards and Commissions.

A study was made of the causes of accidents by occupations or occupational groups. The following is a summary of the original table:

The value of the study was enhanced by the fact that in the more important respects the conclusions were in harmony with tabulations of previous experience. Some of the deductions made are as follows:

Fallers, Buckers, Sealers, Swampers, Rivers, Peelers and Tie Hackers: Falls of trees and limbs caused but 18 per cent of all accidents and 66 per cent of all fatal cases in this group. This one cause, however, was responsible for 55 per cent of the total severity. Rolling logs caused 17 per cent of the total injury. On the other hand, the use of hand tools (saws, axes, wedges, and sledges) accounted for 43 per cent of all accidents in this group, but was responsible for but 11 per cent of total severity. These three causes represent 83 per cent of total severity to workers in these occupations. Machinery caused less than 2 per cent of accidents in this group.

Snipers, Rigging Slingers, Chasers, Hocktenders, Choker Setters, and Whistlemen: Two hazards again appear as factors in this group, falling trees and limbs causing 21 per cent and rolling logs 9 per cent of severity. Trees felled or objects set in motion by moving logs being pulled in caused 9 per cent of accidents and 21 per cent of severity, while the breaking of or pulling loose of lines or hooks caused 10 per cent of all accidents in this group and 15 per cent of severity. One-half of all fatal cases in the group resulted from the last two causes. Workmen being caught by lines or struck by logs going in caused 21 per cent of accidents and 30 per cent of total severity. These five causes account for 96 per cent of total severity resulting from injuries in this group.

Loaders and Deckers: The two outstanding hazards in this group were rolling logs, causing 46 per cent of severity, and workmen being caught by logs while being handled by machinery, the severity in the latter cause being 21 per cent of the total.

Donkey Engineers and Firemen and Pumpmen: While over one-third of accidents in this group are caused by contact with the donkey engines and their parts, the injuries resulting from the operation of hauling in the logs represent greater total severity.

Wood Bucks, Wood Splitters, and Drag Saw Operators: Here, again, hauling in of logs causes over one-third of total severity, notwithstanding the fact that over 50 per cent of accidents are from use of hand tools.

Rafters, Drivers, and Boommen: Drownings are responsible for 99.3 per cent of total severity to group.

Woodworking Section

1435

Summary of Cause

Causes	Fatal		Permanent		Permanent		Temporary		Total Cases		Per Cent		Days Lost		Per Cent		Compensation		Per Cent	
	Fatal	Permanent	Permanent	Partial	Temporary	Total Cases	Per Cent	Days Lost	Per Cent	Compensation	Per Cent	Days Lost	Per Cent	Compensation	Per Cent					
I-Machinery	16	2	46		325	389	21.26	155,738	28.42	\$ 94,004.25	24.75									
II-Steam pressure apparatus.....					1	1	.05	32	.01	73.80	.02									
III-Vehicles	10		12		140	162	8.85	83,671	14.35	57,453.00	15.13									
IV-Explosives, electricity, fires and hot substances					27	31	1.69	17,539	1.97	8,340.76	2.20									
V-Falls of Persons.....	2		2		253	262	14.32	19,899	33.70	18,205.92	4.79									
VI-Stepping on, striking against or falling on sharp objects.....		1	5		100	106	5.79	11,493	1.38	14,752.50	3.89									
VII-Falling or rolling objects.....	25	3	18		181	227	12.40	196,532	4.37	123,048.54	32.40									
VIII-Handling objects.....			10		211	221	12.08	8,076	.51	11,086.84	2.92									
IX-Hand tools.....			29		356	385	21.04	26,503	8.87	23,451.82	6.13									
X-Animals			2		14	16	.88	2,964	3.01	2,542.12	.67									
XI-Miscellaneous	8		3		19	30	1.64	51,719	3.41	26,778.56	7.05									
Total	62	6	135		1,627	1,830	100.00	583,216	100.00	\$379,752.11	100.00									

Logging Railroad Conductors, Brakemen, Engineers, and Firemen: Brakemen suffered 58 per cent of total accidents to trainmen, with resulting severity 53 per cent. Operation of hand brakes, falls from trains, and runaway trains are the principal hazards to train employees.

Logging Railroad Maintenance and Construction: The two principal hazards to employees in this group are operation of trains and blasting.

In the following summary of the cause table, using the material irrespective of occupation, a number of important deductions are to be found. Using "days lost" as the basis of comparison, it will be noted that accidents caused by machinery, logging trains and falling or rolling objects caused the greatest severity. On the other hand, the use of hand tools and the handling of objects caused one-third of all accidents but only 6 per cent of severity and only 7 per cent of total compensation cost.

In consideration of the very interesting points raised in both Mr. Boyd's and Mr. Marshall's papers, a motion was made by Secretary Barker to the effect that each of these papers be prepared in pamphlet form and distributed to all loggers in the United States. Mr. Barker's motion was seconded and unanimously carried.

Chairman Rhodes announced that the printing and distribution of these pamphlets would be placed before the Executive Committee of the National Safety Council, and should they deem it too expensive for them to undertake, that he as Secretary of the Southern Pine Association would have his organization prepare these pamphlets and see to the distribution of them.

Members present suggested that Mr. Marshall and Mr. Gram be delegated at next year's Congress to deal with the subject of logging on the Pacific Coast and further suggested that representatives from the South and North be selected, and the very interesting matter of logging accidents be thoroughly gone into. The Chairman and Secretary promised to take this matter up with the Executive Committee and see that representation in these localities was on the program for next year.

Chairman Rhodes expressed his pleasure to the Canadian members who had come from their great distance to attend this Congress, and requested a rising vote of appreciation by all members present. This was unanimously endorsed with enthusiasm.

Response in behalf of the Canadian members was delivered by Mr. Lovett, Inspector, Industrial Accident Prevention Association.

Chairman Rhodes expressed his regrets that Honorable T. J. Duffy, Chairman of the Ohio State Industrial Commission, Columbus, Ohio, was not present to deliver the address assigned to him on the subject of "Does It Pay to Employ Safety Engineers in the Woodworking Industry."

Mr. Frank Hawkins, Secretary, Lumbermen's Safety Association, Ottawa, Canada, was unable to attend the meeting and his paper was read by Secretary Barker.

APPLICATION OF WORKMEN'S COMPENSATION ACT IN
CANADIAN SAWMILL AND LOGGING OPERATIONSFRANK HAWKINS, SECRETARY, LUMBERMEN'S SAFETY ASSOCIATION,
OTTAWA, CANADA

It is no longer necessary to apologize for safety work nor to explain what safety work means. It not only counts for the amelioration of suffering—the humanitarian bond of sympathy between the injured and those in a position to help—it counts for increased efficiency in the workshop or mill, and increased efficiency means increased production of better goods for less money, which in the last analysis means a larger opportunity to compete in the world's markets, in other words that "Safety is a paying proposition."

I think every one will concede this to be the case.

The question, therefore, resolves itself merely into one of method: that is, of law and its administration.

When Mr. Price invited me to address you he suggested the subject.

"Accident Prevention in Canadian Woodworking Plants."

In Canada we have our Provincial Workmen's Compensation laws just as you have here in the United States. The Association with which I am connected is the Lumbermen's Safety Association of Ontario. I therefore speak only from the point of view of that Province, and of our particular group, Class 1, which embraces lumbering, sawmills, manufacture of veneer, excelsior and cooperage stock, lumber yards in connection with mills, creosoting of timber, and kiln drying of lumber.

A further explanation is due to you in that our group does not take in Woodworking factories. We have 34 classes or groups of industries operating under the Workmen's Compensation Act of Ontario.

It is reasonable to believe that a comparison of laws and their administration adopted by various states and provinces may be of practical value. This is my apology then for referring only to the Ontario Workmen's Compensation Act and to Class 1 thereunder, in the hope that other papers presented at this Conference may, by inviting comparison and discussion lead to betterment in law and administration.

WORKMEN'S COMPENSATION ACT OF ONTARIO

The Workmen's Compensation Act of Ontario came into effect the first of January, 1915, and at that time could only be regarded as legislation of the most advanced type. It completely abolished common law rights in so far as damage suits for accidents are concerned; it vested arbitrary powers in a commission appointed by the provincial government from whose ruling there is absolutely no appeal. It exempted railways from the operation of the act under schedule one, putting them in a separate class, together with Dominion Telephone, Telegraph and Express companies, Municipalities, etc. The whole cost of awards made by the Commission is payable out of the group funds contributed by each industry. The industries also pay a large proportion of the expenses of administra-

tion. Whether or not this whole subject of compensating the injured is a matter for Federal rather than State or Provincial Legislation is a subject which might easily be considered in the near future.

It is to be conceded that where the bread winner is incapacitated through accident some form of compensation is due not only for the injured himself but in order to relieve suffering and want on the part of his wife and children or other dependents. From the point of view of the workmen, legislation of this character is much to be desired because under the old law he had to prove negligence on the part of his employer, otherwise he had no right to recover damages. If through negligence he contributed to the accident or if he were injured through the negligence of a fellow employee, or had he assumed the risk of the employment he was barred.

Under the old law if the employer and employee did not agree upon a settlement the remedy was an action in court. This meant long delay, annoyance, and great expense to one, or both of the parties, and, with the technicality and complication that prevailed, much uncertainty as to the result. The ordinary workman or his dependent widow shrank from such a proceeding or feared the danger of an appeal, or perhaps had not the money with which to proceed. Upon the other hand employers often suffered from vexatious litigation by irresponsible claimants. Under the new law, with its simple provisions and methods of procedure, settlements are made expeditiously and without expense to either party, and payments go direct to the person entitled.

On the other hand the employer was forced to defend all suits, with the possibility of a Court judgment that might mean practically ruination and the consequent ill-will of both employer and employee. The employer is now relieved from all anxiety on this score as he can neither sue nor be sued for damages.

Representations made by the Lumbermen's Safety Association with regard to the Safety Associations being recognized by the Board as representing the respective groups of employers have been acknowledged, and favorably considered.

The Association has also urged the necessity that an appeal to some judicial tribunal should be had on certain general principles. We do not seek to appeal to such tribunal on the matter of awards made by the Board. This suggestion, however, is opposed by the Board as they are not prepared to recommend legislation of this character.

RECENT AMENDMENTS

A recent amendment to the Act includes clerical employees, and on and after January 1, 1920, their salaries will be assessed just in the same way that the workmen are included. In similar fashion an employer or partner, or executive officer of any company, or a member of his family, if employed by the company, may be covered in precisely the same way as the workman by including a reasonable amount as salary in the pay roll, and so notifying the Board.

Another recent amendment increases pensions for widows and children. On April 24, 1919, a widow's pension was increased from \$20.00 to \$30.00,

with an increase from \$5.00 to \$7.00 for a child, the maximum for all dependents being from \$40.00 to \$60.00 per month.

We have persistently urged against the building up of large reserves to provide for deferred liabilities and the Board has abandoned their former position in this regard. In other words, the Current Cost plan is now practically adopted by the Board. When it is considered that under the Act the Board may assess upon all industries or any one industry for any amount, and as often as the Board may deem fit, the necessity of building up large reserves is not apparent.

Merit rating also is a settled policy of the Board. A workman cannot contract himself out of the operations of the Act.

Medical Aid must be provided for as long as is necessary and an employer is prohibited from collecting any sum from any employee in any way toward medical aid; nor can any doctor collect anything from the workman for services covered by the Act. The employer must also furnish the necessary transportation for an injured employee to the doctor, the hospital, or the man's home. The cost of Medical Aid has added practically 15 per cent to the amount of the assessments.

The gross revenue for the year (all classes) in schedule 1

amounted to.....	\$4,319,439.98
Expenditures	3,474,769.09

Leaving a provisional balance of.....	\$ 844,670.89
---------------------------------------	---------------

The various classes may appoint Inspectors to examine and report on industries within their group, and persistent failure to carry out the betterments suggested by the Inspector renders that industry liable to pay individually the whole amount of any damages awarded, at the discretion of the Board.

Last winter our Inspector visited a number of camps and in addition to ordinary safety work his inspection covered hygienic and sanitary conditions, also first aid to the injured. It is proposed to extend this feature during the coming winter.

In the year 1918, owing no doubt to inexperienced labor, the number of accidents in Class 1, increased to 1,160 as against 975 in 1917. But the number of permanent disability cases was reduced in 1918 by seven and of deaths by four as compared with 1917; leaving 1,069 temporary disability cases in 1918 as against 873 in 1917. The year 1918 was the first full year where medical aid was in operation, there being 212 that received medical aid only—i. e., there was no compensation paid—so that it was impossible to compare this with only part of 1917, when there were only 63 cases in which medical aid only was given.

The average rate (over all industries) per \$100 of Pay Roll for the first year's operations in 1915 was \$1.64 subsequently adjusted to \$1.27; for 1916 the average rate was \$1.09; for 1917, 98 cents which is expected to be still further reduced for 1918. The rates charged for lumbering operations are per \$100 of Pay Roll.

Sawmills	\$1.60
Logging or lumbering.....	1.20

It is claimed by the Board that a full measure of compensation has been provided and every reasonable effort has been made to avoid imposition.

Where work is sub-let the principal is responsible for reporting to the Board and is to see that all assessments are paid, and all returns made to the Board.

In this condensed fashion I have endeavored to carry out Mr. Price's suggestion to give you some idea of the operation and also some of the results obtained in the application of the Workmen's Compensation in the Province of Ontario, Canada.

While industries do not agree with the commissioners on all points it is only simple justice to say that the Board has administered the Act in a fair and impartial manner.

LABOR—CAPITAL—PUBLIC SERVICE .

We are finding out that the safe-guarding of machinery, printing of bulletins, the holding of safety conferences, and indemnifying the injured is not the sum total of safety work. However estimable and just these things may be we must henceforth take a larger view of the human being. Our intercourse with one another now must be on the basis of "Man to Man." The old order has passed away or is rapidly passing. No longer may the arbitrary and overbearing manner of the capitalistic employer or the equally intolerant attitude of the labor agitator be able to hoodwink and deceive. An intelligent and fearless public opinion must enforce the rights of both capital and labor—it will supply the necessary ingredients whereby the wheels of progress may be efficiently lubricated and the great public service be uninterruptedly maintained. This is a great triumph: Labor—Capital—Public Service; and we must fully appreciate that what injures or affects one injures or affects all. We shall learn presently that a closed factory is a public loss, and the employer who interferes with public service by closing his factory must open it again at the public demand; and similarly the human factor must be brought to realize that the threat, "We will get 'ours'—or quit work"—will have to be replaced by something that will keep the workman at his bench, while at the same time giving him a contented mind and a fat pay envelope.

We must cultivate a community spirit between employer and employee—a spirit founded upon the rock of mutual confidence and esteem—every one must feel that the new order of things means justice and the square deal. This, I conceive to be a work for which the National Safety Council is eminently manned and equipped to perform.

Explanations were given by the Canadian members with reference to the Government's working principles of the Compensation Law.

Mr. J. A. Dickinson of the Bureau of Associated Mechanical Engineers of Washington, D. C., was in the room and was called upon by the chairman to speak with reference to the standardization of accident classification. Mr. Dickinson delivered a very interesting discourse as to the Government's plan for this work, and it is hoped that universal methods may be applied for the standardizing of the various elements which enter into

accident prevention work. Mr. Dickinson suggested that steps had already been taken with the manufacturers of woodworking machines with reference to their standardizing guards for their machines, but so far very little had been accomplished.

Mr. Cole of the Southern Pine Association made a suggestion that our section should endeavor to secure uniform classification of accidents. This apparently met with the approval of the members, and the chairman appointed Mr. Cole and Mr. Barker as a committee of two, to investigate and report as regards the manner in which this work is now handled by insurance companies and state departments.

Chairman asked for the report of the committee on resolutions. This report was delivered by the chairman, Mr. F. D. Ensminger, of the Prest-O-Lite Company, Indianapolis, Indiana as follows:

REPORT OF RESOLUTIONS COMMITTEE

We, the members of the Woodworking Section, of the National Safety Council, in Eighth Annual Congress assembled, having given considerable thought and discussion to the Woodworking machines now being used in the industry, are of the opinion

First, that these machines are not built with safety devices sufficient to protect the operator from serious injury.

Second, that because of this serious defect, it is hard to attract employees to operate these machines.

Be it resolved, therefore, that purchasers of woodworking machines specify that such safety devices be attached to and sold with the machine that will give adequate protection to the operator.

And be it resolved that the National Safety Council call to the attention of the manufacturers of woodworking machinery this resolution.

And be it further resolved that the Secretary of this Section be instructed to forward these resolutions together with a list of Woodworking machine manufacturers to the headquarters of the National Safety Council.

Signed—F. D. Ensminger, Chairman
R. W. Patmore
M. L. Henwood

Mr. Gram, Commissioner of Labor, Salem, Oregon, made a motion that a copy of the above resolutions be sent to the association of Woodworking Machinery Manufacturers by the National Safety Council. This was seconded, and unanimously voted to be so carried.

REPORT OF COMMITTEE OF MEMBERSHIP

Mr. Marshall, Chairman, recommends that each member should forward to the Council a list of prospective members. This action is to be taken by the Council and the Membership Committee to be advised of the progress.

Mr. Gram suggested that the National Council send its field representatives to Washington and hold meetings in the various territories which

he feels positive would be an incentive for increasing membership in that territory. General Manager, Mr. Price is to be notified of this request.

REPORT OF NOMINATING COMMITTEE

In view of the very excellent manner in which the present officers have served their particular position, we the nominating committee recommend the reelection of Mr. Rhodes as Chairman, and Mr. Barker, as Secretary for the coming year.

Signed—R. F. Milne, Chairman
Holger Jensen
F. A. Barker

Chairman Rhodes and Secretary Barker expressed their appreciation of reelection and assured the members present that the next year's council will be bigger and better than ever before, it being particularly proposed to have in addition to papers by interesting speakers, picture exhibits of safety appliances and bulletins, and also motion pictures and stereopticon slides.

It is hoped that the membership will be very materially increased, and that the woodworking section will grow to a proportion that will place it in the eyes of the safety world as second to none.

Mr. Marshall mentioned California's accident prevention department's logging film as being of special interest, and suggested that this section endeavor to have the film at its next Congress for review, by the attending members. This will be acted upon as per his request.

Mr. Flysik from the State of Washington gave a very interesting address as to the new move in that state with reference to safety conditions.

Adjournment 12:30 P. M.

Respectfully submitted,

F. A. Barker, Secretary.

INDEX

- A. B. C. session. 287-313.
- Abbott, F. R. "Platforms, walkways, stairs, ladders, and floors in cement mills." 429-432.
- Accident, definition of preventable. 510.
- Accident causes. see classification of causes of accidents.
- Accident prevention:
- "Electric railway hazards—causes, effects, and remedies" (McDougall). 557-562.
 - "Nationalizing and standardizing" (Reid). 550-553.
 - "Accident prevention in a malleable iron foundry" (Church). 720-725.
- Accident reports. see Report forms.
- Accident severity in logging operations" (Marshall). 1432-1436.
- Accidents:
- Cost. 983-984. 1061-1082. 1243-1249. 1364.
 - Investigation of. 761. 776-777.
 - "Practical demonstration of investigating accidents" (Weeks). 766-776.
 - Reduction methods. 541.
- Accidents—Statistics:
- Chemical industry. 465.
 - Decrease due to education. 661-662.
 - Frequency and severity rates. 128. 135. 460. 493-494. 521. 1432-1436.
 - In "Accident prevention in a malleable iron foundry" (Church). 724.
 - In "The Construction—the real safety of punch press work" (Kaems). 316-317.
 - Lost time. 461. 530.
 - Preventable. 849.
 - "Public accidents and their cost" (Crum). 1061-1082.
 - Results of safety work in St. Louis. 1056-1057.
 - "Safety before and after the war" (Schneider). 563-570.
 - Standardization. 851-854.
 - See also specific subjects, sub-head Accident statistics.
- "Accidents in logging operations and how they may be reduced" (Floyd). 1429-1432.
- Adams, H. B.:
Chairman. Electric railway section. 533-574.
Remarks on safety work in schools. 151.
- Agent. Safety:
Maintaining interest in safety work. 1275-1276.
"Should safety agents be clothed with authority to require correction of dangerous practices?" (Mitchell). 1299-1300.
"To what extent should supervising forces be held responsible for the safety of men under their direct supervision?" (Clark). 1301-1302.
- "Value and necessity of safety agents" (Dow). 1217-1223.
Value of. 1223-1236.
- "Aims and purpose of the safety section of the United States railroad administration" (Duffy). 1207-1214.
- Aisles. Width of: Cotton mill; 1344. 1348-1349. 1350.
- Ambrine:
Use for burns. 372. 697. 700-701.
See also Burns.
- American steel and wire company safety committees. 300.
- Americanization:
"Immigrant's part (Rieg). 107-113.
In "Experiences of Wm. Demuth & Co. in industrial democracy" (Feuerbach). 59.
"Principles and methods of the Americanization movement" (Burns). 97-106.
"What the industries can do for Americanization" (Waller). 113-116.
- Americanization meeting of general session: Minutes of meeting. 97-126.
- Anderson, Mary. "The Women's bureau." 1339-1391.
- Aniline and benzol products. Care of workmen employed in manufacture of. 436-448.
- Annual meeting of members. see Business session.
- "Application of workmen's compensation act in Canadian sawmill and logging operations" (Hawkins). 1437-1440.
- "Are employers' contributions advisable?" (Discussion). 581-587.
- Arsenide poisoning. 440-441.
- Automobiles:
Accident statistics. 1077.
See also Grade crossings.
- Automotive section:
Minutes of meeting. 315-362.
Nominating committee report. 362.
- Bach, E. E. "Labor turnover and its relation to mine accidents." 847-850.
- "Bad teeth and fatigue" (Price). 642-649.
- Banquet. 183-197.
- Barelay, L. W. "What Boy Scouts can do for safety." 1010-1016.
- Belknap, H. W. Resolutions of respect for. 1215-1217.
- Belts for linemen. 1125.
- Benefit associations. see Employees' benefit associations.
- "Benefits to ex-employees" (Chandler). 593-594.
- Benzol and aniline products. Care of workmen employed in manufacture of. 436-448.
- "Best form of management" (Redfern). 575-577.

- Bethlehem steel company safety committee, 391-392.
- Beyer, D. S., Chairman, Textile section, 1341-1379.
- Beyer, Mrs. D. S., "Safety last," 191.
- Bins, Safeguarding:
In "Hazards in cement stockhouses, packing and shipping departments" (Frame), 393-397.
Signals, Electric, 400.
See also Cement industry.
- Black Hawk mine fire, 877-878.
- Blanchard, Roy, Dr., Invocation, 7.
- Blank, E. F., "Employment and safety," 339-341.
- Blasting, 408-417.
- Bliss, A. E., "Inspection of plants of gas companies," 1102-1107.
- Blood poisoning, see Infection.
- Bonsib, R. S., "Results of safety work in shipbuilding and how they were obtained," 516-519.
- Bonus systems in safety work, 921-923, 1367.
- Boston Safety Council report, 267.
- Boy Scouts of America:
Relation to safety, 1016-1017.
Selection of delegates to National congress, 1087-1088.
"What Boy Scouts can do for safety" (Barclay), 1010-1016.
- Boyd, James, "Accidents in logging operations and how they may be reduced," 1429-1432.
- Brown, A. C., Toastmaster, Banquet, 184-186.
- Building construction, see Construction.
- Bulletin boards:
Importance and use, 310-311.
In "Poster talk on safety" (Kroes), 996-997.
"Methods of promoting safety education in a plant" (Rasmussen), 293-296.
- Bulletins:
Discussion of public utilities section, 1091-1093.
Gruesome, 286, 998-999.
Objections to, in construction work, 508-509.
Reasons for discarding, 999-1000.
Safety posters made by children, 178.
Use of cartoons, 286.
Use of photographs, 387-388.
- Burdick, A. L., "Training and up-grading of women factory workers," 1403-1405.
- Bureau of mines (U. S.) training in mine rescue work, 855-857.
- Burns, A. T., "Principles and methods of the Americanization movement," 97-108.
- Burns:
Accident statistics, 1073.
In "Accident prevention in a mal-leable iron foundry" (Church), 721-722.
Packing houses, 951.
"Sulphate and sulphite hazards" (Riis), 966-973.
Treatment of, 367-372, 699-703.
"Treatment of" (Clark), 693-698.
Burns caused by electricity, see Electricity, Injuries from.
- Burton, H. J., "Working safely on live high tension lines," 1122-1128.
- Business session, 7-38.
- Buttons, Safety committee, 759-760.
- Cambria steel company safety committee, 299.
- Carbon monoxide gas poisoning, 472-476, 869-871.
- Cadders, 1355-1356.
- Carelessness:
Real cause in accidents, 987-988.
"Unsafe practices in paper mills—their cost in money and men" (Matthieson), 980-985.
- Carnegie steel company safety committee, 302-303.
- Carrel-Dakin treatment: For infected wounds, 705, 706, 715.
- Carrow, T. H., Chairman, Accident causes and remedies committee, 1179-1203.
- "Safety committee suggestions and recommendations; how they should be treated and disposed of," 1251-1263.
- Cars, Hand, see Motor and hand cars.
- Cars, Motor, see Motor and hand cars.
- Cartoons in bulletins, 286.
- Case, P. S., "Experience of a small city in local council work," 218-222.
- Causes of accidents, see Classification of causes of accidents.
- Cement industry:
"Hazards in cement stockhouses, packing and shipping departments" (Frame), 393-398.
Chafing of skin, 398-400.
"Educating cement plant employees in safety" (Josse), 350-356.
"Physical examination, first aid and care of the injured at cement plants" (Coleman), 362-368.
"Platforms, walkways, stairs, ladders, and floors in cement mills" (Abbott), 429-433.
"Safety factors in the use of explosives in cement rock quarrying" (Snelling), 405-418.
Sanitation in, 377-378.
"Sanitation in cement plants" (McKay), 373-376.
- Cement section meeting, 363-433.
- Central Mississippi Valley division report, 267-274.
- Chains:
Chains, cables, and slings, 515, 740-742.
In "Suggestions outlining functions of safety committee" (Kessler), 735.
- Chandler, W. L., "Benefits to ex-employees," 593-594.
- Chaney, L. W., "Is industrial death necessary?" 128-132.
- Chapman, F. E., "Selling the new employee," 596-600.
- Chemical fire extinguishers, 889, 890-891.
- Chemical industries:
"Controlling factors in gas mask design," (Lewis), 466-478.
"Dangers in the dyestuff industry," 458-463.
"Lead poisoning and its prevention" (Tolman), 448-453.
"Some accident experience in the dye industry" (Massey), 478-484.
"Study of factory sanitation in foreign dye works" (Hamilton), 426-448.
"Sulphate and sulphite hazards" (Riis), 966-973.

- Chemical section:
 Minutes of meeting, 435-481.
 Nominating committee report, 466.
 Chicago, Burlington, and Quincy railroad employees' benefit association, 575-581.
 Chicago Local Council, report, 274-275.
 Chubbains, 634.
 Children, Safety work with:
 "Teaching safety in public schools" (Payne), 165-172.
 See also Schools, Safety work in.
 Church, H. L., "Accident prevention in a malleable iron foundry," 720-725.
 Chutes:
 "Compilation of chute types for loading ore into tram cars in metal mines" (Mitke), 894-901.
 In metal mines, 901-914.
 Cincinnati local council: Educational plan (McClain), 181-182, 260-265.
 "Cincinnati local plan" (McClain), 260-265.
 Clark, J. C., "To what extent should supervising forces be held responsible for the safety of men under their direct supervision?" 1301-1302.
 Clark, Dr. W. I., "Treatment of burns," 593-608.
 Classification of causes of accidents:
 Electric railways, 572-573.
 "Is industrial death necessary?" (Chaney), 128-132.
 Cleveland schools safety demonstration, 172-176.
 Clothing for workmen in cement industry, 384-385.
 Coffin, H. P., Remarks on safety work in the schools of Portland, Ore., 151-152.
 Colcord, Dr. A. W., Discussion of "Treatment of Burns" (Clark), 699-700.
 Coleman, C. E., "Physical examination, first aid and care of the injured at cement plants," 363-365.
 Collective bargaining:
 In "Labor management and collective bargaining" (Leiserson), 82-85.
 "Employees' representation from the standpoint of organized labor" (Woll), 71-75.
 See also Employees' representation.
 Committees, Safety:
 Gas plant, 1112.
 In "Is accident prevention in construction a source of profit or a hobby?" (Hurlbutt), 495-497.
 In "New ways to put safety across in a steel plant" (Heyne), 759-760.
 In "Safety education in the textile industry" (Ide), 1362-1363.
 In "Unsafe practices in paper mills—their cost in money and men" (Matthieson), 982-983.
 "Methods of selecting committees and maintaining interest in safety" (Scott), 1270-1276.
 Organization and management, 1000.
 Packing houses, 956.
 Paper mill committee work, 991-994.
 Railroad, 1335-1336.
 Recommendations of, 383-389.
 "Safety committee suggestions and recommendations: how they should be treated and disposed of" (Carrow), 1251-1263.
 "Suggestions outlining functions of safety committee" (Kessler), 733-735.
 Training of, 312.
 "Workmen's inspection committees" (Oartel), 297-303.
 Community interest in health activities, 567-678.
 Company magazines, see Magazines, Employees.
 "Compilation of chute types for loading ore into tram cars in metal mines" (Mitke), 894-901.
 Cone, L. C., "Dangers in the dyestuff industry," 458-463.
 Connor, J. F., "Preventing accidents in gas plants," 1096-1098.
 "Consider the crane" (Rausch), 743-753.
 Construction:
 Accident statistics, 493-494.
 "Coöperating on safety" (Dresser), 522-527.
 Crane operation, 753-754.
 Group organization for safety, 500-501.
 In "Some accident experience in the dye industry" (Massey), 475-480.
 Inspection, 501-502.
 Minor accidents, 498-501.
 "Protecting the public against accidents on new buildings" (Talbert), 502-505.
 "Safety in steel erection" (Gibbs), 509-514.
 Construction section:
 By-laws committee report, 488-489.
 Minutes of meeting, 455-531.
 Nominating committee report, 527-528.
 "Controlling factors in gas mask design" (Lewis), 466-478.
 "Coöperating on safety" (Dresser), 522-527.
 Coöperation:
 "And industrial progress" (McCormick), 40-50.
 "Experiences of Wm. Demuth & Co. in industrial democracy" (Feuerbach), 50-63.
 "Methods of securing coöperation of workmen in using safeguards" (Jensen), 1423-1427.
 "Teamwork in safety" (Speyer), 186-190.
 "Coöperation and industrial progress" (McCormick), 40-50.
 "Coöperation of officers and employees in safety work on railroads" (Meyers), 1237-1239.
 "Coördination of industrial and community health activities" (Ford), 667-678.
 "Coördination of safety between transportation and equipment departments" (Jeffries), 539-540.
 Copp, Tracey, Chairman, Women in industry section, 1371-1416.
 Cost of accidents, see Accidents—Cost.
 Costigane, A. P., Chairman, Paper and pulp section, 957-1001.
 Cotton mills:
 "Plant and machinery layout as affecting the accident hazard in textile mills" (Moller), 1342-1350.
 "Standard guards in textile mills" (Owen), 1351-1361.
 "Council—past and future" (Richards), 193-197.

- Cranes:
 Boom derrick hazards. 506.
 Chains, cables, and slings. 515, 740-742.
 "Consider the crane" (Rausch). 743-753.
 Operation of. 757-758.
 Transfer of castings. 740.
 Warning signs. 514.
 Crile, Dr. G. W.. "What the war has taught us in surgery." 703-715.
 Crum, F. S.. Leader of discussion on statistical data relative to employees' benefit associations. 588-593.
 "Public accidents and their cost." 1061-1082.
 Dakin solution. 268-269.
 Dakin solution, see also Carrel-Dakin treatment.
 Danger signs, see Signs.
 "Dangers in the dyestuff industry" (Cone). 458-463.
 Dead ends for protection of miners. 892-893.
 DeBlois, L. A.:
 Experience of Delaware local council. 223-225.
 "Supervision as a factor in accident prevention." 132-137.
 Delaware local council: Experience (DeBlois). 223-225.
 Demuth plan of employees' representation: "Experiences of Wm. Demuth & Co. in industrial democracy" (Feuerbach). 50-62.
 Dental work: "Bad teeth and fatigue" (Price). 642-648.
 Dermatitis, see Skin diseases.
 "Desirability for standardizing mine rescue training and plan for standardization" (Parker). 854-857.
 Detonators. 409-411, 415-416.
 Detroit Safety Council report. 275-276.
 Dickson, G. W.. "How to use danger signs in a paper mill." 362-365.
 "Die construction—the real safety of punch press work" (Kaems). 316-327.
 Dies, see Power presses.
 Dimethyl sulphate. 439-440.
 Dinitrobenzene hazards. 437-438.
 Diseases, Occupational:
 "Coordination of industrial and community health activities" (Ford). 667-678.
 "Industrial dermatoses, their sources, types, and control" (Pusey). 622-642.
 "Industrial health hazards" (Laufer). 614-631.
 "Lead poisoning and its prevention" (Tolman). 448-458.
 "Study of factory sanitation in foreign dye works" (Hamilton). 436-448.
 See also Health supervision of employees. Physical examination of employees.
 Dispensaries, see Hospitals and dispensaries.
 Dow, M. A.. "Value and necessity of safety agents." 1217-1224.
 Downes, Maynard. "Supervision of women industrial workers." 1326-1401.
 Draeger apparatus. 858-860.
 Drawing frames. 1356-1357.
 Dresser, F. J. C.. "Cooperating on safety." 522-527.
 Dust collectors, see Ventilation and exhaust systems.
 Dwight, A. S.. "Importance of safety measures to the miner." 911-918.
 Dye industry, Hazards of:
 "Study of factory sanitation in foreign dye works" (Hamilton). 436-448.
 "Dangers in the dyestuff industry" (Cone). 458-466.
 "Some accident experience in the dye industry" (Massey). 478-484.
 Dynamite, see Blasting, Explosives.
 Easley, J. W.. "Effective means of focusing the responsibility for the prevention of accidents upon foremen." 1115-1117.
 East Chicago Safety Council report. 276.
 East St. Louis Safety Council report. 277.
 Edsall, Dr. D. L.. "Industrial clinics in general hospitals." 655-660.
 "Educating cement plant employees in safety" (Josse). 380-386.
 Education, Safety:
 "The Cincinnati local plan" (McClain). 260-265.
 "Place of safety in education" (Little). 157-165.
 "Teaching safety in public schools" (Payne). 165-172.
 See also Schools, Safety work in.
 Education committee report (Whitney). 30-32.
 Education of miners: Vocational school of Phelps-Dodge corporation. 842.
 Education of the public: In "Principles and methods of the Americanization movement" (Burns). 102.
 Education of workmen:
 In "Preventing accidents in gas plants" (Connor). 1097-1098.
 In "Some accident experience in the dye industry" (Massey). 482-484.
 Methods. 526-527, 660-667, 736-737, 921.
 "Our method of safety education" (Shaw). 336-339.
 "Spasmodic safety efforts and the harmful results" (Webber). 1154-1159.
 Value of spasmodic safety efforts. 1159-1164.
 See also New employees.
 Educational section:
 Charter members. 153-155.
 Minutes of meeting. 156-182.
 Outline of plan and purpose (Whitney). 141-142.
 Value of (Payne). 142-144.
 "Effective means of focusing the responsibility for the prevention of accidents upon foreman" (Easley). 1115-1117.
 "Effective means of using rescue apparatus in the fighting of mine fires" (Ryan). 871-877.
 Elam, F. H.. Chairman, Employees' benefit association section. 575-600.
 "Electric railway hazards—causes, effects, and remedies" (McDougall). 557-562.
 Electric railway section:
 Minutes of meeting. 523-574.
 Nominating committee report. 530.
 Electric railways:

- Accident statistics, 562, 566-570, 1077.
 Standardization, 550-553.
 Drinking water, 373-374.
 Drowning—Accident statistics, 1074.
 Drummond, A. B., Chairman, Meat packers' section, 953-956.
 Duffy, A. F., "Aims and purposes of the safety section of the United States railroad administration," 1207-1214.
 Du Pont de Nemours Company's construction safety work, 490-497.
 Dust: "Lead poisoning and its prevention" (Tolman), 443-458.
 "Why does not every electric railway have a safety organization?" (Proctor), 545-547.
 Women employees, 566.
 Electric shock, see Electricity, Injuries from.
 "Electrical equipment, its installation and guarding" (Kahle), 330-335.
 Electricity:
 Accident prevention in electrical property, 1149-1153.
 Accident statistics, 1080.
 "Electrical equipment, its installation and guarding" (Kahle), 330-335.
 Static, in dye industry, 464.
 Tagging, barriers, markings, and practices of operators" (Wagner), 1134-1148.
 "Working safely on live high tension lines" (Burton), 1122-1128.
 Electricity, Injuries from:
 Fallen wires, 1128, 1130-1131.
 Treatment by prone pressure method of resuscitation, 386-388.
 "Elevator hazards affecting the general public" (Webster), 1017-1020.
 Elevators:
 Freight, 954.
 Hazards in gas plants, 1099-1101.
 Safety devices and measures, 1020-1022.
 Employees' benefit association section:
 Minutes of meeting, 575-600.
 Statistics committee report, 587-588.
 Employees' benefit associations:
 "Are employers' contributions advisable?" (Discussion), 581-587.
 "Benefits to ex-employees" (Chandler), 593-594.
 "Best form of management" (Redfern), 575-577.
 Relation to accident prevention, 1120-1121.
 "Selling the new employee" (Chapman), 596-600.
 Statistical data, 588-593.
 Women, 1394.
 Employees' meetings, see Meetings of employees.
 Employees' publication—Round table discussion, 601-611.
 Employees' representation:
 "Coöperation and industrial progress" (McCormick), 40-50.
 "Experiences of Wm. Demuth & Co. in industrial democracy" (Feuerbach), 50-63.
 "From the standpoint of organized labor" (Woll), 71-75.
 "Labor management and collective bargaining" (Leiserson), 76-85.
 "Practical aspects of employees' representation" (Tolsted), 63-70.
 See also Collective bargaining.
 Employees' representation meeting of general session: Minutes of meeting, 39-96.
 Employment:
 Discussion of problems, 341-345.
 "Employment and safety" (Blank), 339-341.
 In "Labor management and collective bargaining" (Leiserson), 76-85.
 In "Supervision of women industrial workers" (Downes), 1329-1401.
 "Employment and safety" (Blank), 339-341.
 Enameling ovens, 332.
 Engineering section, Report of the Special committee on formation of, 36-37.
 Erie Safety Council report, 277.
 "Essentials and non-essentials, and cost of conducting a safety week campaign" (Smith), 1040-1045.
 "Essentials of a safety organization" (Hayward), 287-290.
 Evans, Dr. W. A., "Health education in industry," 660-667.
 Remarks on safety education, 145-146.
 Exhaust systems, see Ventilation and exhaust systems.
 "Experience at Nitro" (Williams), 356-362.
 "Experience of a large city in local council work," 204-215.
 "Experience of a small city in local council work" (Case), 218-222.
 "Experiences of Wm. Demuth & Co. in industrial democracy" (Feuerbach), 50-63.
 Explosions:
 Accident statistics, 417-418.
 Cement rock quarry accidents, 119-429.
 Disk of chipping hog, 969.
 Dyestuffs, 461-463.
 Gas, 1099.
 In sulphate mills, 972-973.
 Explosives:
 "Experience at Nitro" (Williams), 356-362.
 "Safety factors in the use of explosives in cement rock quarrying" (Snelling), 405-418.
 See also Blasting.
 Eye protection:
 In cement plants, 369.
 In foundries, 730-731.
 "Testing of goggles for protection against radiant energy" (Oakes), 782-789.
 See also Goggles.
 Falls (people)—Accident statistics, 1075.
 Fatigue:
 "Bad teeth and fatigue" (Price), 642-649.
 Definition and description, 624, 629.
 Fay, A. H., "Mine accidents: English speaking vs. non-English speaking employees," 807-821.
 Feiss, R. A., Chairman, Americanization meeting of general session, 97-126.
 Fellmer, M. L.:
 "Foreman"—the determining factor, 291-293.
 Remarks on Americanization, 122.
 Feuerbach, F. L., "Experiences of Wm. Demuth & Co. in industrial democracy," 50-63.

- Flesinger, E. H., Chairman. Chemical section. 436-484.
- Fire prevention:
- "Effective means of using rescue apparatus in the fighting of mine fires" (Ryan), 871-877.
 - "In anthracite coal mines and necessary equipment for fighting mine fires" (Price), 885-888.
 - In mines. 380-385, 888-892.
 - In "What Boy Scouts can do for safety" (Barclay), 1011-1014.
 - "Fire prevention in anthracite coal mines and necessary equipment for fighting mine fires" (Price), 885-888.
- Fireproof clothing. 384-385.
- First aid:
- Cement industry. 386-391.
 - "Desirability for standardizing mine rescue training and plan for standardization" (Parker), 854-857.
 - "Effective means of using rescue apparatus in the fighting of mine fires" (Ryan), 871-877.
 - In "Accident prevention in a malleable iron foundry" (Church), 722-724.
 - "Physical examination, first aid and care of the injured in cement plants" (Coleman), 363-368.
 - First aid contests—List of medals. 951.
 - Fisher, Dr. J. C., "Malingering—involving the problem of getting the sick or injured employee back to work." 681-693.
 - Flat foot. 631.
- Floors:
- In "Some accident experience in the dye industry" (Massey), 478-479.
 - Packing houses. 955-956.
 - Textile mills. 1350.
 - See also Housekeeping, Shop.
- Foot protection in foundries. 726.
- Ford, Dr. C. E., "Coordination of industrial and community health activities." 667-673.
- Ford motor company's method of safety education (Shaw). 326-329.
- Foreign languages. Signs in. 963.
- Foreign workmen:
- "Immigrant's part" (Rieg), 107-112.
 - "Mine accidents: English speaking vs. non-English speaking employees" (Fay), 807-821.
 - "Principles and methods of the Americanization movement" (Burns), 97-106.
 - Relation of inability to speak the English language to accidents. 849-851.
 - See also Americanization.
- "Foreman—the determining factor" (Kellmer), 231-235.
- Foremen and sub-foremen:
- Duties of. 309-310.
 - Education. 240-250.
 - "Effective means of focusing the responsibility for the prevention of accidents upon foremen" (Easley), 1115-1117.
 - In "Experience of a large city in local council work" (Smith), 210-211.
 - "How to conduct a school for safety supervisors and foremen" (Stanion), 232-240.
 - "How to make safety meetings interesting" (Shattuck), 988-991.
 - In "Die construction—the real safety of punch press work" (Kaems), 324-325.
 - In "Importance of proper inspection of tools used in shops and by maintenance of way gangs" (LaFountaine), 1307-1308.
 - Inspection of tools. 1308-1309, 1311.
 - Meetings. 495-496.
 - Responsibility for accidents. 956.
 - Responsibility for prevention of accidents. 1117-1120.
 - Rulebooks in woods operations. 1451.
 - Supervision as a factor in accident prevention" (DeBlois), 132-137.
- Formation of engineering section. Report of special committee, 36-37.
- Foundries:
- "Accident prevention in a malleable iron foundry" (Church), 720-725.
 - "Personal element in a safety program for the foundry" (Gartland), 726-733.
 - "Suggestions outlining functions of safety committee" (Kessler), 733-736.
- Fout, G. E., Remarks on Americanization. 116-118.
- Frame, R., "Hazards in cement stock-houses, packing and shipping departments." 393-398.
- "Fundamental principles of safeguarding" (Williams), 303-308.
- "Future of the woman industrial worker" (Tarbell), 1406-1410.
- Gartland, M. F., "Personal element in a safety program for the foundry." 726-733.
- Gas industry:
- Hazards. 1108-1114.
 - "Inspection of plants of gas companies" (Bliss), 1102-1107.
 - "Preventing accidents in gas plants" (Connor), 1096-1098.
- Gas poisoning—Accident statistics. 1074.
- Gears—Safeguarding. 305-306.
- General Manager's report—N. S. C. (Price), 20-26.
- General round-table meeting. 127-140.
- General sessions. 39-132.
- Gibbs, E. A., "Safety in steel erection." 509-514.
- Gidley, W. W., "Management and training of men." 826-832.
- Gloves, Rubber, 1124, 1131, 1132-1134.
- Goggles:
- Persuading employees to wear. 520.
 - "Testing of goggles for protection against radiant energy" (Oakes), 782-789.
 - Use in packing houses of cement plants. 401-403.
 - See also Eye protection.
- Golter, 631.
- Geldie, J. H., "Standardization of guards (experience of the automotive group)." 346-351.
- Grade crossings:
- General discussion. 1282-1289.
 - "Prevention of accidents at highway crossings" (Reynolds), 1277-1282.
- Signs and signals. 1286-1239.
- Guards for machinery, see Safeguarding.
- Hall, R. D., Remarks on Americanization. 118-120.
- Hamilton, Alice, "A study of factory sanitation in foreign dye works." 436-448.
- "Hand and motor car accidents" (Walsh), 1320-1324.

- Handling materials:
 In "Hazards in cement stockhouses, packing and shipping departments" (Frame), 397-398.
 In "Safety factors in the use of explosives in cement rock quarrying" (Snelling), 405-406.
 In "Sulphate and sulphite hazards" (Riis), 967-968.
- Hanrahan, Mary, Explanation of Cleveland schools safety demonstration, 172-176.
- Hawkins, Frank, "Application of workmen's compensation act in Canadian sawmill and logging operations," 1437-1440.
- Hayward, C. B., "Essentials of a safety organization," 287-290.
- "Hazards in cement stockhouses, packing and shipping departments" (Frame), 393-398.
- "Health education in industry" (Evans), 660-667.
- Health service section:
 Industrial dermatoses committee (Discussion), 679-681.
 Minutes of meeting, 613-716.
 Nominating committee report, 678-679.
- Health supervision of employees:
 "Coordination of industrial and community health activities" (Ford), 667-678.
 Cost of health supervision in industry, 675-676.
 "Health education in industry" (Evans), 660-667.
 In "Supervision of women industrial workers" (Downes), 1397-1398.
 "Industrial clinics in general hospitals" (Edsall), 655-660.
 "Industrial dermatoses, their sources, types, and control" (Pusey), 632-642.
 "Industrial health hazards" (Lauffer), 614-631.
 "Malingering—Involving the problem of getting the sick or injured employee back to work" (Fisher), 681-693.
 See also Physical examination of employees.
- Heyne, H. P., "New ways to put safety across in a steel plant," 758-762.
- Home safety, 1014-1016.
- Hooks, 735.
- Hospitals and dispensaries: "Industrial clinics in general hospitals" (Edsall), 655-660.
- Hours of labor—Women, 1384.
- House organs, see Magazines, Employees.
- Housekeeping, Shop: "Platforms, walkways, stairs, ladders, and floors in cement mills" (Abbott), 429-433.
- "How to conduct a school for safety supervisors and foremen" (Stanion), 223-240.
- "How to employ women successfully in industrial occupations" (Knoepfel), 1378-1389.
- "How to make safety meetings interesting" (Shattuck), 988-991.
- "How to obtain news items for a plant publication" (Wilson), 610-611.
- "How to use danger signs in a paper mill" (Dickson), 962-965.
- Human element in safety work:
 Discussion, 547-549.
 "Personal element in a safety program for the foundry" (Gartland), 726-733.
 "Human factor in the safe operation and maintenance of rolling stock" (Phillips), 535-538.
 "Humanizing a steel plant" (Stremmel), 792-797.
- Hurlbutt, F. L., "Is accident prevention in construction a source of profit or a hobby?," 490-497.
- Hygiene: "Coordination of industrial and community health activities" (Ford), 667-678.
 See also Health supervision of employees.
- Hypothyroidism, See Goiter.
- Ide, W. S., "Safety education in the textile industry," 1361-1365.
- Illumination:
 Cranes, 755-756.
 See also Lighting.
- "Immigrant's part" (Rieg), 107-113.
- "Importance of proper inspection of tools used in shops and by maintenance of way gangs" (LaFontaine), 1305-1308.
- "Importance of safety measures to the miner" (Dwight), 914-918.
- "Importance to the contractor of preventing minor accidents" (Rutherford), 498-501.
- "Industrial clinics in general hospitals" (Edsall), 655-660.
- "Industrial dermatoses, their sources, types, and control" (Pusey), 632-642.
- "Industrial health hazards" (Lauffer), 614-631.
- Industrial hygiene, see Health supervision of employees.
- "Industrial relations in the mining industry" (Willis), 832-841.
- Infection:
 "Industrial dermatoses, their sources, types, and control" (Pusey), 632-642.
 "What the war has taught us in surgery" (Crile), 702-715.
 See also Burns, Carrel-Dakin treatment.
- Injured workmen, see Workmen, Injured.
- Inspection, Safety:
 Gas plant, 1113-1114.
 "Importance of proper inspection of tools used in shops and by maintenance of way gangs" (LaFontaine), 1305-1308.
 Tools used in shops and maintenance of way gangs, 1308-1318.
- "Inspection of plants of gas companies" (Bliss), 1102-1107.
- Instruction of workmen, see Education of workmen.
- Insurance, Industrial:
 In "Experiences of Wm. Demuth & Co. in industrial democracy" (Feuerbach), 60.
 See also Employees' benefit associations.
- Interest in safety work, How to maintain, 1272-1276.
- Internal development committee report (Robertson), 27-28.
- International Harvester Company employees' benefit association, 536-600.

- Iron and steel industry:
 "Accident prevention in a malleable iron foundry" (Church), 720-725.
 "Consider the crane" (Rausch), 743-753.
 Frequency and severity rates, 128.
 "Humanizing a steel plant" (Streimel), 792-797.
 "New ways to put safety across in a steel plant" (Heyne), 753-762.
- Iron mining, see Mines and mining—Metal.
- "Is accident prevention in construction a source of profit or a hobby?" (Hurlbutt), 190-197.
 "Is industrial death necessary?" (Chauncy), 128-132.
- Jacobsen, H. G., Chairman, Cement section meeting, 363-433.
- Jeffries, G. K., "Coordination of safety between transportation and equipment departments," 539-540.
- Jensen, Holger, "Methods of securing cooperation of workmen in using safeguards," 1423-1427.
- Johnston, Robert A., Company's supervision of women workers, 1396-1401.
- Jones, M. J., "What can employees' publications do to promote industrial good will?" 605-607.
- Josse, J. C., "Educating cement plant employees in safety," 380-386.
- Kaems, L., "Die construction—the real safety of punch-press work," 316-327.
- Kable, L. C., "Electrical equipment, its installation and guarding," 230-235.
- Kessler, E. W., "Suggestions outlining functions of safety committee," 733-736.
- Knives—Packing houses, 954.
- Knoepfel, C. E., "How to employ women successfully in industrial occupations," 1378-1389.
- Kroes, Al., "Poster talk on safety," 995-998.
- "Labor management and collective bargaining," (Leiserson), 76-85.
- Labor turnover, see Turnover, Labor.
- "Labor turnover and its relation to mine accidents" (Bach), 847-850.
- Ladders: In construction work, 497-498, 507.
- LaFontaine, G. L., "Importance of proper inspection of tools used in shops and by maintenance of way gangs," 1305-1308.
- Lauffer, Dr. C. A., Chairman, Health service section, 613-716.
 "Industrial health hazards," 614-631.
- Layout, Machinery: "Plant and machinery layout as affecting the accident hazard in textile mills" (Moller), 1342-1350.
- Layout, Plant: "Plant and machinery layout as affecting the accident hazard in textile mills" (Moller), 1342-1350.
- "Lead poisoning and its prevention" (Tolman), 448-458.
- Lee, W. G., "Organized labor's interest in safety work," 1241-1244.
- Lehigh Portland Cement Company health organization, 363-368.
- Lehigh Portland Cement Company locker rooms (Reininger), 378-379.
- Lehigh Valley Safety Council report, 278.
- Leiserson, W. M., "Labor management and collective bargaining," 76-85.
- Lewis, W. K., "Controlling factors in gas mask design," 466-478.
- Lighting: In "Plant and machinery layouts as affecting the accident hazard in textile mills" (Moller), 1343-1344.
 See also Illumination—Cranes.
- Linemen:
 Safety in live high tension line work, 1128-1133.
 "Working safely on live high tension lines" (Burton), 1122-1123.
- Little, R. M., "Place of safety in education," 157-165.
- Local councils:
 "Experience of a large city in local council work" (Smith), 204-215.
 "Experience of a small city in local council work" (Case), 218-222.
 Finances, 251-259.
 Officers' session, 199-246.
 Paid secretary (Discussion), 221-229.
 Reports, 267-284.
 Lockers and locker rooms, 374-375, 378-379.
- Logging:
 "Accidents in logging operations and how they may be reduced" (Boyd), 1429-1432.
 "Accident severity in logging operations" (Marshall), 1432-1436.
 "Application of workmen's compensation act in Canadian logging and sawmill operations" (Hawkins), 1437-1440.
- Lunch rooms:
 Johnston, Robert A., Company, 1398.
 Westinghouse Electric Company, 1394.
- Lynch, J. J., Chairman, Automotive section meeting, 215-262.
- Machinery—Accident statistics, 1076.
- McClain, G. H.:
 Cincinnati local council educational plan, 181-182.
 "The Cincinnati local plan," 260-265.
- McCormick, Cyrus, Jr., "Cooperation and industrial progress," 40-50.
- McDougall, R. E., "Electric railway hazards—causes, effects, and remedies," 557-562.
- McKay, B. L., "Sanitation in cement plants," 373-376.
- Magazines, Employees':
 Distribution, 603-605.
 "How to obtain news items for a plant publication" (Wilson), 610-611.
 In "Results of safety work in shipbuilding and how they were obtained" (Donsih), 517-518.
 "What benefits should a corporation expect to derive from an employees' publication?" (Matthieson), 604-605.
 "What can employees' publications do to promote industrial good will?" (Jones), 605-607.
 "What kind of material is needed to make the plant periodical a success?" (Saylor), 607-610.
- "Malingering—Involving the problem of getting the sick or injured employee back to work" (Fisher), 681-693.

- "Management and training of men" (Gidley), 826-822.
- Marie Conde, see Beyer, Mrs. D. S.
- Marquette Cement Manufacturing Company health organization, 363-368.
- Marshall, W. A., "Accident severity in logging operations," 1432-1436.
- Masks:
 "Controlling factors in gas mask design" (Lewis), 466-478.
 Discussion, 470-477.
 Paper and pulp industry, 974.
 See also Respirators.
- Massey, A. H., "Some accident experiences in the dye industry," 478-484.
- Maternity insurance, 1378.
- Matthieson, H. H.:
 "Unsafe practices in paper mills—their cost in money and men," 980-985.
 "What benefits should a corporation expect to derive from an employees' publication?", 601-605.
- Meat packers' section: Minutes of meeting, 953-956.
- Medical supervision, see Health supervision of employees. Physical examination of employees.
- Meetings of employees:
 "How to make safety meetings interesting" (Shattuck), 988-991.
 Size and results, 541-542.
 Type and time, 542-543.
- Meetings of foremen, see Foremen and sub-foremen.
- Members, Annual meeting, see Business session.
- Membership campaign, 38.
- Membership committee reports of sections, see name of Section, sub-heads. Membership committee report.
- Metal mining, see Mines and Mining—Metal.
- Metals section:
 Minutes of meeting, 717-802.
 Nominating committee report, 791.
 Secretary's report, 718-719.
 "Methods of promoting safety education in a plant" (Rasmussen), 293-296.
 "Methods of securing cooperation of workmen in using safeguards" (Jensen), 1423-1427.
 "Methods of selecting committees and maintaining interest in safety" (Scott), 1270-1276.
- Meyers, Fred, "Coöperation of officers and employees in safety work on railroads," 1237-1239.
- Miller, C. R., "Some of the box manufacturers' problems," 1427-1428.
- "Mine accidents: English speaking vs. non-English speaking employees" (Fay), 807-821.
- Mine car, Standard gauge, 900-901.
- Mines and mining:
 Accident statistics, 811-820, 842-859, 950, 1075-1076.
 "Desirability for standardizing mine rescue training and plan for standardization" (Parker), 854-857.
 "Effective means of using rescue apparatus in the fighting of mine fires" (Ryan), 871-877.
 "Fire prevention in anthracite coal mines and necessary equipment for fighting mine fires" (Price), 885-888.
 First-aid contests, 951.
 "Industrial relations in the mining industry" (Willis), 832-841.
 "Labor turnover and its relation to mine accidents" (Bach), 847-850.
 "Mine accidents: English speaking vs. non-English speaking employees" (Fay), 807-821.
 Rescue apparatus and inspection, 862-868.
 Rescue training, 860-862.
- Mines and mining—Metal:
 Accident statistics, 950.
 Chutes, 901-914.
 Comparison of safety records in large and small companies, 919-921, 924-925.
 "Compilation of chute types for loading ore into tram cars in metal mines" (Mitke), 894-901.
 "Importance of safety measures to the miner" (Dwight), 914-918.
- Mining Section:
 Discussion of permanent secretary, 938-946.
 Membership and publicity committee report, 806.
 Minutes of meeting, 803-951.
 "Need for a definite technical service in the mining section of the National Safety Council" (Tillson), 926-935.
 Organization of local councils, 926-943.
- Mitchell, F. W., "Should safety agents be clothed with authority to require correction of dangerous practices?", 1299-1300.
- Mitke, C. A., "Compilation of chute types for loading ore into tram cars in metal mines," 894-901.
- Moller, Kenneth, "Plant and machinery layout as affecting the accident hazard in textile mills," 1342-1350.
- Morey, Arthur, Resolutions committee report, 32-33.
- Morley, R. A., Experiences of Ontario safety league, 215-218.
- Motor and hand cars:
 Discussion, 1324-1334.
 "Hand and motor car accidents" (Walsh), 1320-1324.
- Moving pictures in safety work, 543, 544-545.
- Music in industry, 1291-1292.
- National Aniline and Chemical Company report of frequency and severity rates, 460-461.
- National railroad accident prevention drive, 1289-1299.
- National Safety Council: "The Council—past and future" (Richards), 193-197.
 "Nationalizing and standardizing accident prevention" (Reid), 550-553.
 "Need for a definite technical service in the mining section of the National Safety Council" (Tillson), 926-935.
- New employees:
 In "Accident prevention in a malleable iron foundry" (Church), 722-723.
 In "Employment and safety" (Blank), 340-343.
 "New ways to put safety across in a steel plant" (Heyne), 758-762.

- Niagara frontier local council: "The experience of a small city in local council work" (Case), 218-222.
- Nominating committees: Report of N. S. C., 34-35.
For reports of section nominating committees, see name of Section, sub-head Nominating committee.
- Non-English speaking foreigners, see Foreign workmen.
- Northeastern Ohio Safety Council report, 278-280.
- Nurseries, 1351.
- Nurses:
Kimberly-Clark Company first-aid nursing department, 1377.
"Responsibilities and opportunities of the industrial nurse" (Wright), 1372-1376.
- Oakes, C. E., "Testing of goggles for protection against radiant energy," 782-789.
- Oartel, J. A.:
Chairman, Metals section, 717-802.
"Workmen's inspection committees," 297-302.
Officers of sections, see name of Section, sub-head Nominating committee report.
- Omaha Safety Council report, 280.
- Ontario safety league: Experiences (Morley), 215-218.
- Organization, Safety:
Construction work of Du Pont de Nemours Company, 490-497.
"Coördination of safety between transportation and equipment departments" (Jeffries), 539-540.
"Educating cement plant employees in safety" (Josse), 380-386.
Electric railway, 543-544.
"Essentials of a safety organization" (Hayward), 287-290.
"Experience at Nitro" (Williams), 357-358.
In "Coöperating on safety" (Dresser), 525-527.
In electric railways, 554-555.
"Methods of selecting committees and maintaining interest in safety" (Scott), 1270-1276.
"New ways to put safety across in a steel plant" (Heyne), 758-762.
S. Slater and Sons, Inc. (Textiles), 1361-1363.
"Why does not every electric railway have?" (Proctor), 545-547.
"Organized labor's interest in safety work" (Lee), 1241-1244.
"Our method of safety education" (Shaw), 236-239.
- Owen, H. A., "Standard guards for textile machinery," 1351-1361.
- Oxy-acetylene welding and cutting: Practical demonstration of welding and cutting (Schleicher), 797-802.
- Packing houses: Discussion of hazards, 954-956.
- Paige, C. E., Chairman, Public Utilities section, 1089-1165.
- Paper and pulp industry:
Discussion of safe practices pamphlet, 975-979.
How to use danger signs in a paper mill (Dickson), 962-965.
"Sulphate and sulphite hazards" (Riss), 966-975.
- "Unsafe practices in paper mills—their cost in money and men" (Matthieson), 980-985.
- Paper and pulp section:
Bulletin committee report, 979.
Discussion of safe practices pamphlet, 975-979.
Minutes of meeting, 957-1001.
Program committee report, 960-961.
Safe practices committee report, 961-962.
- Parker, D. J., "Desirability for standardizing mine rescue training and plan for standardization," 854-857.
- Parresine treatment for burns, 363-370.
- Pay envelopes, 1103.
- Payne, E. G.:
"Teaching safety in public schools," 165-172.
Value of the Educational section, 142-144.
- Personal element in a safety program for the foundry" (Gartland), 726-733.
- Philadelphia Junior Safety Council, 571.
- Philadelphia Safety Council report, 280-281.
- Phillips, F. R., "Human factor in the safe operation and maintenance of rolling stock," 535-538.
- Photographs, Use of, 387, 388, 517.
- "Physical examination, first aid and care of the injured at cement plants (Coleman), 363-365.
- Physical examination of employees: As related to benefit associations, 578-579.
Discussion, 370-372, 625-627, 676-678.
"Employment and safety" (Blank), 339-341.
Federalized plan, 618-619, 624, 627-628.
Mine rescue work, 868-871, 879.
"Scope of the physical examination in industry" (Selby), 649-653.
See also Health supervision of employees.
- Physicians, Requirements of industrial, 671-672.
- Picker machine, 1351-1355.
- "Place of safety in education" (Little), 157-165.
- "Plant and machinery layout as affecting the accident hazard in textile mills" (Moller), 1242-1250.
- "Platforms, walkways, stairs, ladders, and floors in cement mills (Abbott), 429-433.
- "Poster talk on safety" (Kroes), 995-998.
- Powder, Manufacture of, 361-362.
- Power presses:
"Die construction—the real safety of punch-press work" (Kaems), 316-327.
Safeguarding, 307-308, 328-330.
"Practical aspects of employees' representation" (Tolsted), 63-70.
"Practical demonstration of investigating accidents" (Weeks), 766-770.
- Prayer opening the Eighth Annual meeting of the N. S. C., 7.
- Presses, see Power presses.
- Preventable accidents defined, 510.
- "Preventing accidents in gas plants" (Connor), 1096-1098.

- "Prevention of accidents at highway crossings" (Reynolds), 1277-1282.
- Price, C. W.:
 Chairman, Local council officers' session, 199-266.
 Chairman, Safety education organization meeting of general session, 141-155.
 General Manager's report, 20-26.
 Treasurer's report, 25-26.
- Price, M. W.: "Fire prevention in anthracite coal mines and necessary equipment for fighting mine fires," 885-888.
- Price, Dr. W. A.: "Bad teeth and fatigue," 642-649.
- "Principles and methods of the Americanization movement" (Burns), 97-106.
- Prizes: In steel plant, 611, 763-766.
 See also Bonus systems in safety work.
- Process vessels, see Reaction vessels.
- Proctor, C. E.: "Why does not every electric railway have a safety organization?" 545-547.
- Profit sharing plan of Wm. Demuth and Company, 57-59.
- Program committee reports of Sections, see name of Section, subhead. Program committee report.
- Prone pressure method of artificial respiration, see Resuscitation.
- "Proper personnel of a public safety committee" (Quigley), 1023-1027.
- "Protecting the public against accidents on new buildings" (Talbert), 502-505.
- Psychology in safety work, 761-762.
- Public, Education of the, see Education of the public.
- "Public accidents and their cost" (Crum), 1061-1082.
- Public cooperation committee report, 27-28.
- Public Safety:
 Accident report forms, 1027-1029.
 "Elevator hazards affecting the general public" (Webster), 1017-1020.
 "Essentials and non-essentials, and cost of conducting a safety week campaign" (Smith), 1040-1045.
 In "Experience of a large city in local council work" (Smith), 213-214.
 "Proper personnel of a public safety committee" (Quigley), 1023-1027.
 "Protecting the public against accidents on new buildings" (Talbert), 502-505.
 "Public accidents and their cost" (Crum), 1061-1082.
 "What Boy Scouts can do for safety" (Barclay), 1010-1016.
- Public safety section:
 Minutes of meeting, 1003-1035.
 Publicity committee report, 1029, 1030.
 Resolution committee report, 1039.
 Statistical committee report, 1004-1007.
- Public utilities companies:
 "Inspection of plants of gas companies" (Bliss), 1102-1107.
 "Preventing accidents in gas plants" (Connor), 1096-1098.
 "Tagging, barriers, markings, and practices of operators" (Wagner), 1134-1148.
 "Working safely on live high tension lines" (Burton), 1122-1128.
- Public utilities section:
 Membership committee report, 1093-1094.
 Minutes of meeting, 1089-1165.
 Program committee report, 1094.
 Safe practices committee report, 1094-1095.
 Secretary's report, 1090-1091.
 Pulp mills, see Paper and pulp industry.
- Punch presses, see Power presses.
- Pusey, W. A.: "Industrial dermatoses, their sources, types, and control," 632-642.
- Quarries: "Safety factors in the use of explosives in cement rock quarrying" (Snelling), 405-418.
- Quigley, J. M.: "Proper personnel of a public safety committee," 1023-1027.
- Railroad trespassing, see Trespassing on railroads.
- Railroads:
 Accident statistics, 1076, 1180, 1201, 1248, 1249, 1252, 1321.
 Accidents, 1304-1305.
 "Aims and purposes of the safety section of the United States railroad administration" (Duffy), 1207-1214.
 "Cooperation of officers and employees in safety work on railroads" (Meyers), 1237-1239.
 "Methods of selecting committees and maintaining interest in Safety" (Scott), 1270-1276.
 No-accident campaigns, 1289-1299.
 "Organized labor's interest in safety work" (Lee), 1241-1244.
 "Prevention of accidents at highway crossings" (Reynolds), 1277-1282.
 "Safety committee suggestions and recommendations: how they should be treated and disposed of" (Carrow), 1251-1263.
 Safety work, 1282-1299, 1335-1336.
 Time inspection, 1336, 1338-1339.
 "Value and necessity of safety agents" (Dow), 1217-1223.
 Value of safety agents, 1223-1236.
- Rasmussen, W. R.: "Methods of promoting safety education in a plant," 293-296.
- Rausch, C. C.: "Consider the crane," 743-753.
- Reaction vessels, Protection against excessive or abnormal pressure, 480-482.
- Redfern, J. N.: "Best form of management," 575-577.
- Reduction of accidents, Methods for, see Education of workmen.
- Reid, Harry: "Nationalizing and standardizing accident prevention," 550-553.
- Relief systems, see Valves, Safety.
- Reninger, H. A.: Report on locker rooms of Lehigh Portland Cement Company, 378-379.
- Report forms:
 Accident report forms (Crum), 1027-1029.
 Employees' benefit associations, 588-593.
 Highway vehicular accidents, 1005-1006.
- Resolutions committee report (Morey), 32-33.
- Respirators:

- "Desirability for standardizing mine rescue training and plan for standardization" (Parker), 854-857.
 Distance covered by two-hour mine rescue breathing apparatus, 880-882.
 Effect of temperature on breathing apparatus, 883-884.
 "Effective means of using rescue apparatus in the fighting of mine fires" (Ryan), 871-877.
 See also Masks.
 "Responsibilities and opportunities of the industrial nurse" (Wright), 1372-1376.
 Responsibility for accidents:
 "Effective means of focusing the responsibility for the prevention of accidents upon foremen" (Easley), 1115-1117.
 Foremen, 1117-1120.
 "Supervision as a factor in accident prevention" (De Blois), 132-137.
 "To what extent should supervising forces be held responsible for the safety of men under their direct supervision?" (Clark), 1301-1302.
 "Results of safety work in shipbuilding and how they were obtained (Bonsib), 516-519.
 Resuscitation:
 Prone pressure method adopted by N. S. C., 613.
 Prone pressure method illustrated, 176-177.
 Prone pressure method used, 386-388.
 Reynolds, H. H., "Prevention of accidents at highway crossings," 1277-1282.
 Rhodes, J. E., Chairman, Woodworking section, 1417-1442.
 Richards, R. C.,
 Chairman, Steam railroad section, 1171-1340.
 "Council—past and future," 193-197.
 Remarks on Educational section, 144-145.
 Rieg, Hans, "Immigrant's part," 107-113.
 Riis, Erling, "Sulphate and sulphite hazards," 966-973.
 Robertson, H. H., Internal development committee report, 27-28.
 Rochester public safety campaign, 562.
 Roesch, E. J., Remarks on Americanization, 120-122.
 Ropes: Resistance to muriatic acid, 528-529.
 Rosseland, F. M.,
 Chairman, Safety bulletin luncheon, 285-286.
 Discussion of Public utilities bulletins, 1091-1093.
 Rubber manufacture, Safety in, 1167-1170.
 Rubber section, 1167-1170.
 Rules, Safety:
 Formulating, 843-844.
 In construction work, 511, 513-514.
 Rule books, 308-309.
 Standard railroad rules, 1264-1265.
 Woods operations, 1431.
 Rutherford, G. A., "Importance to the contractor of preventing minor accidents," 498-501.
 Ryan, T., "Effective means of using rescue apparatus in the fighting of mine fires," 871-877.
 Safeguarding:
 "Die construction—the real safety of punch-press work" (Kacms), 316-327.
 "Electrical equipment, its installation and guarding" (Kahle), 330-335.
 "Fundamental principles of safeguarding" (Williams), 503-508.
 "Standardization of guards (Experience of the automotive group)" (Goldie), 346-351.
 Safeguarding standards, see Standards, Safeguarding.
 Safety agent, see Agent, Safety.
 "Safety before and after the war" (Schneider), 563-570.
 Safety bulletin luncheon, 285-286.
 "Safety committee suggestions and recommendations: how they should be treated and disposed of" (Carraw), 1251-1263.
 Safety committees, see Committees, Safety.
 Safety education, see Education, Safety.
 "Safety education in the textile industry" (Ida), 1561-1565.
 Safety education organization meeting of general session, 111-112.
 "Safety factors in the use of explosives in cement rock quarrying" (Snelling), 495-498.
 "Safety in steel erection" (Graham), 509-514.
 "Safety in the lumber and millwork industry" (Teachout), 1411-1422.
 "Safety last" (Neyer, Mrs. D. S.), 147.
 Safety, Public, see Public Safety.
 Safety signs, see Signs.
 St. Louis local council:
 "Experience of a large city in local council work" (Smith), 541-545.
 "St. Louis plan of public safety" (Talbert), 1045-1057.
 Sanitation:
 "Study of factory sanitation in factory dye works" (Hamilton), 426-448.
 See also specific subjects, sub-head Sanitation.
 "Sanitation in cement plants" (McKay), 373-376.
 Sawmills:
 "Application of workmen's compensation act in Canadian sawmill and logging operations" (Hawkins), 1437, 1440.
 Saws:
 Accident statistics, 1124.
 Circular, 306-307.
 "Practical demonstration of investigating accidents" (Weeks), 766-776.
 Saylor, A. C., "What kind of material is needed to make the plant periodical a success?" 607-610.
 Schaefer method of artificial resuscitation, see Resuscitation.
 Schleicher, J., Practical demonstration of welding and cutting, 797-802.
 Schneider, E. F., "Safety before and after the war," 563-570.
 Schools, Safety work in:
 "Cincinnati local plan" (McClain), 260-265.
 Demonstration by Cleveland school children, 172-176.
 Philadelphia Junior Safety Council, 571.
 Portland, Oregon, 1009-1010.
 Remarks on (Adams), 151.

- Remarks on schools of Portland, Oregon, 151-152.
 St. Louis, 1007-1009.
 "Teaching safety in public schools" (Payne), 165-172.
 Work of Frisco railroad at Fort Smith, 1303-1304.
 See also Children, Safety work with, Education, Safety.
 Schubmehl, F. E., "The subnormal worker," 629-630.
 "Scope of the physical examination in industry" (Selby), 649-655.
 Scott, Robert, "Methods of selecting committees and maintaining interest in safety," 1270-1276.
 Screw conveyors:
 Hazards, 403-404.
 In "Hazards in cement stockhouses, packing and shipping departments," 396-397.
 Seattle Safety Council report, 281-282.
 Secretary's report, Sectional, see name of Section, sub-head Secretary's report.
 Selby, Dr. C. D., "Scope of the physical examination in industry," 649-655.
 "Selling the new employee" (Chapman), 596-600.
 Service to Members committee report (Sinn), 28-30.
 Shattuck, S. F., "How to make safety meetings interesting," 988-991.
 Shaw, R. A., "Abstract of paper on our method of safety education," 336-339.
 Shipbuilding:
 "Results of safety work in and how they were obtained" (Bonsib), 516-519.
 Shock, Electric, see Electricity, Injuries from.
 Shoes for workmen—Foundry, 725-726.
 "Should safety agents be clothed with authority to require correction of dangerous practices?" (Mitchell), 1299-1300.
 Signals, grade crossings, see grade crossings—signs and signals.
 Signs:
 Grade crossings, 1286-1289.
 "How to use danger signs in a paper mill" (Dickson), 962-965.
 Metal recommended, 966.
 Tagging, barriers, markings, and practices of operators" (Wagner), 1134-1148.
 Sinn, F. H., Service to Members committee report, 28-30.
 Skin diseases:
 Dermatitis, 465.
 In dye works, 437-439, 444.
 "Industrial dermatoses, their sources, types, and control" (Pusey), 632-642.
 Skin grafting, 700-701, 703, 714-715.
 Smith, C. L., "Essentials and non-essentials, and cost of conducting a safety week campaign," 1040-1045.
 Smith, C. L., "Experience of a large city in local council work," 204-215.
 Smoking, 877, 891.
 Snelling, W. O., "Safety factors in the use of explosives in cement rock quarrying," 405-413.
 "Some accident experience in the dye industry" (Massey), 478-484.
 "Some of the box manufacturers' problems" (Miller), 1427-1428.
 "Spasmodic safety efforts and the harmful results" (Webber), 1154-1159.
 Speyer, James, "Teamwork in safety," 186-190.
 Sports—Accident statistics, 1070-1071.
 Stairs and stairways—Cement mills, 431.
 "Standard guards for textile machinery" (Owen), 1351-1361.
 "Standardization of guards (Experience of the automotive group)" (Goldie), 346-351.
 Standards, Safeguarding:
 "Fundamental principles of Safeguarding" (Williams), 303-308.
 "Standardization of guards (Experience of the automotive group)" (Goldie), 346-351.
 Stanion, Thomas:
 Chairman, General round-table meeting, 127-140.
 "How to conduct a school for safety supervisors and foremen," 233-240.
 Statistics, see Accidents—Statistics; also specific subjects, sub-heads.
 Accident statistics.
 Steam railroad section:
 Accident causes and remedies committee report, 1179-1203.
 Delegates attending session, 1171-1177.
 Election of officers, 1265-1269.
 Membership committee report, 1205-1207.
 Minutes of meeting, 1171-1340.
 Publicity committee report, 1204.
 Storage of explosives, 406-408.
 Street cars, see Electric railways.
 Street traffic, see Traffic.
 Stremmel, Philip:
 Chairman, A. B. C session, 287-313.
 "Humanizing a steel plant," 792-797.
 "Study of factory sanitation in foreign dye works" (Hamilton), 436-448.
 Sub-foremen, see Foremen and sub-foremen.
 "Subnormal worker" (Schubmehl), 629-630.
 "Suggestions outlining functions of safety committee" (Kessler), 732-736.
 "Sulphate and sulphite hazards" (Riis), 966-973.
 "Supervision as a factor in accident prevention" (De Blois), 132-137.
 Supervision, Health, see Health supervision of employees.
 "Supervision of women industrial workers" (Downes), 1396-1401.
 Supervisors, Safety:
 Education, 240-250.
 "How to conduct a school for safety supervisors and foremen" (Stanion), 233-240.
 Surgeons, Industrial:
 "What the war has taught us in surgery" (Crile), 707-715.
 "Tagging, barriers, markings, and practices of operators" (Wagner), 1124-1148.
 Talbert, C. M.:
 Chairman, Public safety section, 1003-1088.
 "Protecting the public against accidents on new buildings," 502-565.

- Public cooperation committee report, 27-28.
 "St. Louis plan of public safety," 1045-1057.
 Tarbell, I. M., "Future of the woman industrial worker," 1406-1410.
 "Teaching safety in public schools" (Payne), 165-172.
 Teachout, P. W., "Safety in the lumber and millwork industry," 1421-1423.
 "Teamwork in safety" (Speyer), 186-189.
 Teeth:
 "Bad teeth and fatigue" (Price), 612-619.
 Tener, S. W., Chairman, Banquet, 183-184.
 "Testing of goggles for protection against radiant energy" (Oakes), 782-789.
 Textile industry:
 Accident statistics, 1341-1342, 1365.
 "Plant and machinery layout as affecting the accident hazard in textile mills" (Moller), 1342-1350.
 "Safety education in" (Ide), 1361-1365.
 "Standard guards for textile machinery" (Owen), 1351-1361.
 Textile section:
 Minutes of meeting, 1341-1370.
 Nominating committee report, 1366.
 Thaw house, 407-408, 426-429.
 Tillson, B. F.:
 Chairman, Mining section, 503-551.
 "Need for a definite technical service in the mining section of the National Safety Council," 926-935.
 Time inspection, see Railroads, Time inspection.
 Tissot gas masks, 472-475.
 "To what extent should supervising forces be held responsible for the safety of men under their direct supervision?" 1301-1302.
 Tolman, C. P., "Lead poisoning and its prevention," 448-458.
 Tolsted, E. B., "Practical aspects of employees' representation," 63-70.
 Tools:
 "Importance of proper inspection of tools used in shops and by maintenance of way gangs" (La Fontaine), 1305-1308.
 Inspection, 1308-1318.
 Traffic:
 Discussion of national traffic code, 1020-1029.
 In "Electrical railway hazards—causes, effects, and remedies" (McDougall), 560-562.
 Traffic—Signs, 1038-1039.
 "Training and upgrading of women factory workers" (Burdick), 1403-1405.
 Treasurer's report (Price, General Manager), 25-26.
 "Treatment of burns" (Clark), 693-698.
 Trespassing on railroads:
 Accident statistics, 1200-1201.
 Tuberculosis, 624, 628-629.
 Tunnels, see Housekeeping, Shop.
 Turnover, Labor:
 "Labor turnover and its relation to mine accidents" (Bach), 847-850.
 United States railroad administration:
 "Aims and purposes of the safety section of the United States railroad administration" (Duffy), 1207-1214.
 "Unsafe practices in paper mills—their cost in money and men" (Matthieson), 980-985.
 "Value and necessity of safety agents" (Dow), 1217-1223.
 Valves, Safety:
 On pressure vessels, 481-482.
 Van Schaack, David:
 President's address, 11-20.
 Presiding officer, Business session, 7-38.
 Reply to Address of welcome, 9-10.
 Venereal diseases, 844, 870, 879.
 Ventilation and exhaust systems—Dye works, 441-445, 450-456.
 Vermillion, Mr., Remarks on Americanization, 124.
 Vocational training, 842.
 Wagner, W. C., "Tagging, barriers, markings, and practices of operators", 1134-1145.
 Walte, Floyd, Address of welcome, 8-9.
 Walks, see Housekeeping, Shop.
 Waller, H. T., "What the industries can do for Americanization", 113-116.
 Walsh, J. L., "Hand and motor car accidents", 1320-1324.
 War in relation to safety: "Safety before and after the war" (Schneldorfer), 563-570.
 Warner, E. A., Chairman, Roundtable session—Employees' publication, 601-611.
 Water, drinking, see Drinking water.
 Waterbury Safety Council report, 282-283.
 Webber, H. M., "Spasmodic safety efforts and the harmful results", 1154-1159.
 Webster, Dana, "Elevator hazards affecting the general public", 1017-1020.
 Weeks, H. J., "Practical demonstration of investigating accidents", 766-776.
 Welcome, Address of (Walter), 8-9.
 Welding, see Oxy-acetylene welding and cutting.
 Welfare work:
 Foreign dye works, 445-447.
 "How to employ women successfully in industrial occupations" (Knoepfel), 1378-1389.
 In "Experiences of Wm. Demuth & Co. in industrial democracy" (Feuerbach), 61.
 "Industrial relations in the mining industry" (Villis), 832-841.
 "Responsibilities and opportunities of the industrial nurse" (Wright), 1372-1376.
 "What benefits should a corporation expect to derive from an employees' publication?" (Matthieson), 601-605.
 "What Boy Scouts can do for safety" (Barclay), 1010-1016.
 "What can employees' publications do to promote industrial good will" (Jones), 605-607.
 "What kind of material is needed to make the plant periodical a success?" (Sayler), 607-610.
 "What the industries can do for Americanization" (Waller), 113-116.

- "What the war has taught us in surgery" (Crile), 703-715.
- Whitney, A. W.:
 Chairman, Educational section meeting, 156-182.
 Education committee report, 30-32.
 Outline of plan and purpose of the Education section, 141-142.
- "Why does not every electric railway have a safety organization?" (Proctor), 545-547.
- Wiles, Mr., Remarks on Americanization, 122-123.
- Williams, S. J., "The fundamental principles of safeguarding", 303-308.
- Williams, W. E., "Experience at Nitro", 356-362.
- Willis, C. F., "Industrial relations in the mining industry", 332-341.
- Wilson, C. H., "How to obtain news items for a plant publication", 610-611.
- Woodtke, L. D., Chairman, Construction section, 485-531.
- Women—Employment, see Specific industry with subdivision Women employees.
- Women in industry:
 "Future of the woman industrial worker" (Tarbell), 1406-1410.
 "How to employ women successfully in industrial occupations" (Knoepfel), 1373-1389.
 In mine offices, 846.
 "Supervision of women industrial workers" (Downes), 1396-1401.
- "Training and upgrading of women factory workers" (Burdick), 1403-1405.
- "Women's bureau" (Anderson), 1339-1391.
- Women in industry section:
 Charter members, 1415-1416.
 Minutes of meeting, 1371-1416.
 Organization and election, 1413-1415.
- "Women's bureau" (Anderson), 1339-1391.
- Woll, Matthew, "Employees' representation from the standpoint of organized labor", 71-75.
- Woodworking industries:
 Accident statistics, 1424.
- "Methods of securing cooperation of workmen in using safeguards" (Jensen), 1423-1427.
- "Safety in the lumber and mill-work industry" (Teachout), 1421-1423.
- "Some of the box manufacturers' problems" (Miller), 1427-1428.
- Woodworking section:
 Members present, 1416-1417.
 Membership committee report, 1441-1442.
 Minutes of meeting, 1417-1442.
 Nominating committee report, 1442.
 Resolutions committee report, 1441.
- Worcester County Safety Council report, 283-284.
- "Working safely on live high tension lines" (Burton), 1122-1128.
- Workmen, Education of, see Education of workmen.
- Workmen, Foreign, see Foreign workmen.
- Workmen, Injured:
 "Malingering—involving the problem of getting the sick or injured employee back to work" (Fisher), 681-693.
 "Physical examination, first aid and care of the injured at cement plants" (Coleman), 363-368.
- Workmen's compensation:
 "Application of workmen's compensation act in Canadian sawmill and logging operations" (Hawkins), 1437-1440.
 "Malingering—involving the problem of getting the sick or injured employee back to work" (Fisher), 681-693.
- "Workmen's inspection committees" (Oartel), 297-303.
- Works committees, see Employees' representation.
- Wounds, Treatment of: "What the war has taught us in surgery" (Oartel), 297-303.
- Wright, F. S., "The responsibilities and opportunities of the industrial nurse", 1372-1376.
- Young, A. H., Chairman, Employees' representation meeting of general session, 39-96.