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PROCEEDINGS

of the

National Safety Council

SEVENTH ANNUAL SAFETY CONGRESS

Held at the
HOTEL STATLER
St. Louis, Mo.
September 16, 17, 18, 19 and 20, 1918

UNIVERSAL SAFETY

INTRODUCTION

The ideal of the National Safety Council is to provide a complete interchange of Safety experience among its members. The Weekly Bulletins, Safe Practices Pamphlets, News Letters and other distributed information are a condensation of much of this experience, but the Annual Meeting of Members provides the opportunity to receive a comprehensive report, from leading representatives, of the progress made during the year. The contents of this volume will demonstrate the tenacity, faith and enthusiasm of the Safety Engineer in his lifesaving work, in spite of the pressure of war activities. Employers are receiving evidence of the frequency of accidents and the causes indicate that many of them can be prevented. The public conscience is becoming so sensitive to the truth that preventable accidents are regarded as almost akin to murder, and the time is fast approaching when accidents due to faulty engineering and unsafe practices will be eliminated.

Members will observe that the proceedings of the 1918 Congress have been published in one volume. The division of the 1917 proceedings into separate parts was not satisfactory. It has been necessary, however, to keep the present volume within reasonable size and the special report by the Director of the Rochester Public Safety Campaign, comprising 150 pages, has been printed separately. Copies may be secured from the Headquarters of the Council.

The attention of the members is particularly directed to the cumulative index, including the proceedings of all of the Annual Congresses from 1912 to 1918, as well as to the separate index for this volume. Copies of previous volumes may be secured at cost from the Headquarters of the Council.

The members of the Council are again reminded that the Information Bureau and Library at Headquarters is prepared to send promptly the information it has accumulated on any accident, health, or industrial relations problem. For five years this Bureau has endeavored to accumulate all available data relating to accident prevention and kindred topics, but many of our members do not take advantage of their privileges to the extent that would be beneficial to them.

NATIONAL SAFETY COUNCIL

IMPORTANT

This volume contains two indexes: the usual alphabetical index to the 1918 Proceedings (see page 1147), and also a CUMULATIVE INDEX to ALL Annual Congress Proceedings, from 1912 to 1918 inclusive (see page 1163). With the help of the cumulative index you will readily find authoritative information on practically every phase and detail of Accident Prevention and many allied subjects.

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National Safety Council

Annual Meeting of Members

St. Louis, Mo.

Sept. 16, 1918

PRESIDENT DAVID VAN SCHAACK, Presiding Officer

MONDAY MORNING SESSION

THE meeting was called to order by Mr. David Van Schaack, President of the National Safety Council, at 10:20 o'clock.

PRESIDENT VAN SCHAACK: The Seventh Annual Meeting of the National Safety Council will please come to order. Our deliberations will be opened with prayer by the Rev. Dr. Bunting:

INVOCATION

REV. DR. JOHN S. BUNTING (Episcopal Church of the Ascension, St. Louis, Mo.): Almighty and Everlasting God, whom truly to know is everlasting life, who hath sent Thy Son, Jesus Christ, to make us to know what is true and to obey what is good, we thank Thee that we are remembering today that Thou art a Saviour God and a God that saves, and we thank Thee, too, that we are able to remember that a world that hath been saved by Thee, O God, is a world that will be safe for man, and not until we realize the possession of the world by Thee, O God, will our knowledge of a saved and a safe world be secure. We ask Thee today to accept our thanks and praises that in the midst of the murk and the lowering cloud and the storm blast that beats across the face of life we are able to catch the light that never fails and never fades. We are able to hear a voice above the chaos and the tumult that never leads astray—a voice of reason, a voice of conscience. We thank Thee for the great minds and voices that echo this voice of Thine today, and we are more conscious than ever that it is never safe to do aught but that which is right, that it is never less than great to be simply true; that it is never

otherwise than glorious to be always honest and straight. We pray Thee to grant Thy blessing upon this Congress, which makes for safety and sanity, which makes for the security of human life and human relations; that makes more valuable the body that Thou hast made to be the vehicle of the soul. We thank Thee that Thou hast put into the minds of millions and tens of millions of our people to gather together and to think how they can better work out God's plan for taking care the better of God's life. We ask Thee to bless the President of the United States and the Congress, the Senate and the House of Representatives. We ask Thee, O God, to bless the Generals of our armies and the Commander-in-Chief of our armies. We ask Thee to bless the Captains of our ships and the Admirals of our navies, and we ask Thee especially to bless the men that handle the guns, at home and abroad, in the camp and upon the battlefield. We ask Thee to bless those who at this moment are charging up the fiercest hill in history, moving on to the most awful fortress. We ask Thee to bless those unflinching, undaunted faces that have behind them the beating heart of American blood. We ask Thee to give them joy and courage in their joy, and, above all, we ask Thee to bless the mothers that gave them to the race. They are the greatest of the great. We ask Thee that we may remember that while we are making safe our human life, we are doing it for Thy cause. And bless Thou the wounded and dying, bless those who have died and gone to their rest. We ask Thee to accept our thanksgiving for human life. Bless the officers of this meeting and its every proceeding, we beseech Thee in the person of our Lord, Jesus Christ. Amen.

PRESIDENT VAN SCHAACK: Mr. Morey, Chairman of the Arrangements Committee, will make an announcement.

ANNOUNCEMENT BY CHAIRMAN ARRANGEMENTS COMMITTEE

MR. ARTHUR T. MOREY (General Manager, Commonwealth Steel Company, St. Louis, Mo.): This is one of the happiest occasions of my life —the welcoming of the National Safety Council to St. Louis. It is good to see the familiar faces in the audience, men with whom we have been working these years to put Safety on the map. I just met Mr. Richards of the Northwestern, the daddy of safety on the railroads, and Mr. R. J. Young, the man who coined the phrase Safety First. He ought to have a statue. Not only do I welcome you, but the whole city of St. Louis welcomes you; official St. Louis, business and industrial St. Louis, educational St. Louis and social St. Louis—all welcome you with a complete and full and cordial and hospitable welcome. Yesterday, in the churches, the priests and ministers heralded the great safety idea and noted your coming. This week 120,000 children in the public and parochial schools take up the study of safety and its fundamental strength as a permanent part of their course of instruction. Workmen's meetings are to be held all over the city, in parks and recreation places, through the co-operation of the park department. The women, through their clubs, have cordially co-operated to get the safety idea into the home. When it was learned we were to have a safety

week all the men's clubs wanted some prominent national speaker from among our number to address their members; those clubs that did not have meetings this coming week arranged to have them. The police are co-operating. Just to give you a little instance of the spirit of love and co-operation and get-together that our safety movement embodies: Fourteen hundred policemen—almost every man on the force—was called together and taken in on this great idea. They were so pleased with the movement that they pledged it their full support—today you will see every one of them proudly wearing a big safety button. The same holds true with the fire department and the street department. At the head of our street department is Mr. Talbert, Chairman of our Public Safety Section, and he has turned himself and his department inside out to do his part in public safety in St. Louis. For your edification he will illustrate what has been done and what can be done for public safety on our streets. The Boy Scouts, the Junior Chamber of Commerce and the Senior Chamber of Commerce have all taken up the work and are backing it with all their strength. It is to become a permanent service in St. Louis, through the efforts of the Chamber of Commerce, with a permanent Secretary to direct and to follow up the work. The Secretary will co-operate with factory managers to make the workshops safe, and to give that cordial service and co-operation that makes Safety work of such practical value. The newspapers are co-operating and the public utilities and the automobile folks are giving their assistance. Charles Hardin, President of the St. Louis Local Council; Carl Smith, Secretary; C. W. Price, Field Secretary, and General Manager Cameron did much of the work in arranging for this convention and are entitled to the credit for the valuable lessons you will see demonstrated in St. Louis this week.

You have copies of our constructive program, also the little resume of events to be held this week—Safety Week. In addition you have a little pamphlet giving information about our city and program of entertainments. We want you to get all the profit and pleasure possible out of your visit to St. Louis. If we have overlooked anything tell us, and we will strive to remedy it. Speak to Mr. Cameron, Mr. Van Schaack, Mr. Price, Mr. Smith or to me and we will put all the forces into motion to see that you are made happy. We hope you will take full advantage of the entertainment features and that you will have a profitable and enjoyable time while in our city.

PRESIDENT VAN SCHAACK: It gives me great pleasure to introduce Mr. Jackson Johnson, one of St. Louis' most distinguished citizens and President of the Chamber of Commerce, who will extend a welcome to us on behalf of the city of St. Louis.

ADDRESS OF WELCOME

MR. JACKSON JOHNSON: Mayor Kiel has been unexpectedly called out of the city and it is my pleasant duty to speak for him and for the city of St. Louis in bidding you welcome. While I cannot do it in eloquent terms, as the Mayor would have done, I want to assure you that St.

Louis, St. Louis' business interests, the Chamber of Commerce, and all our people welcome you as our guests. We feel that this Congress represents one of the great humanitarian movements of the world. Whether we view the work of the Council from the standpoint of an altruist or whether we see it from the standpoint of business it appeals to every one that has given the matter the least degree of thought. The fact that the National Safety Council was organized only a few years ago and that it has gained such impetus, such momentum, is evidence that it has struck a popular chord in the hearts of mankind. The development of safety work speaks for itself. It is not necessary for me to go further in commending a movement that has developed as this one has. In this holocaust of the world's experience human life is apparently the cheapest thing we have, yet the winning of the war absolutely depends upon the conservation of human life. We have often been told that no nation could conduct a war without money. I believe that statement is untrue—manpower is the essential factor and will be the deciding influence in this war. With America the world is safe—we go in fresh with men who are the sole dependence of the world. Without America who could forecast the result? The American soldier will take the initiative and it will be America and England, America and France, and America and Italy—instead of our playing second fiddle we will play the first and that in a very few months. The force of American arms will be felt, will be the deciding factor. We at home owe a duty to the men at the front and no sacrifice we can make will cancel our obligation. The man who buys government bonds is making the best investment in the world and when he takes credit for it has little to stand on. I have often said and I truly believe that of all the investments offered to the world today the American bond is the best. If everything else fails our bonds will be good.

In closing I want to thank you again for coming to our city. I want to assure you that St. Louis welcomes you and that we hope your stay will be pleasant and your convention a complete success.

RESPONSE BY PRESIDENT

PRESIDENT VAN SCHAACK: It is always a very real pleasure, Mr. Johnson, to receive so cordial a welcome as that which you have given us, but the pleasure becomes especially keen when the welcome is extended on behalf of a city and a people who stand for the principles exemplified by St. Louis and her citizens. Lying midway between the geographical center of the country, in Kansas, and the center of population, in Indiana, St. Louis is in the very heart of America. The metropolis of the Mississippi Valley—a great producing area of the country—she is industrially a settled center both in production and distribution. We are glad to be thus in the heart of our country, because that heart beats steadily and forcefully for good. Material prosperity has not blinded St. Louis to those higher thoughts and acts which have so much greater meaning and value than the pursuit of money and what money brings. We are glad to be in a city with a soul as well as a brain; a city whose manu-

facturers are among the foremost in accident prevention; a city whose care for her citizens is shown by an exceptionally low rate of death from preventable causes; a city whose public schools, whose hospital service and whose library facilities are recognized models; a city which, in so many worthy respects, is reversing the tradition that a Missourian must be shown, and is setting an example to the rest of the country which may well be followed; a city which, if I may introduce a more personal word, has the good fortune to number among her sterling citizens that former President of our National Council—our good friend Arthur Morey—to whom we who are gathered here today are so deeply indebted for stimulating influence and for wise guidance.

Your welcome, Mr. Johnson, warm as it was, is not the only evidence that St. Louis is as glad to have us here as we are to be here. I wish I had satisfactory words at my command to express our full appreciation of the admirable preparations made for our Congress and for the reception and entertainment of those attending it by the officers and committees of the St. Louis Local Council and the Councils of her near neighbors, and especially for the splendid conception of a municipal safety week in which the people of St. Louis are co-operating so generally and so heartily. A municipal safety week, synchronizing with our Congress, is an original thought and I hope St. Louis is leading the way in this respect to a general custom. We accept very gratefully, Mr. Johnson, the welcome which you have extended to us—a welcome which we take to be not so much to us personally as to the cause which we represent, a cause that is worthy of all possible welcome. I thank you.

The Chair is informed that a quorum of the members of the National Safety Council is present, in person or by proxy. The Chair, therefore, will be glad to entertain a motion that we dispense with the calling of the roll.

(Motion made and seconded that the roll call be dispensed with. On being put to a vote it was unanimously carried.)

The Executive Committee at its meeting yesterday, named Messrs. W. N. Fitch, R. D. Young and W. P. Strickland as Inspectors of Election. The Chair will also appoint them as Tellers of this meeting.

It is now in order to have your President's address.

PRESIDENT'S ADDRESS

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

LADIES AND GENTLEMEN: Before undertaking to fulfil the duty which is incumbent upon me at this time, of rendering on behalf of your Directors, Executive Committeemen, and officers, an account of their care of your affairs during the past year, permit me to exercise my highly valued privilege of extending a most cordial greeting to you all—members, representatives of members and guests—gathered here to attend the Seventh Annual Meeting and Congress of the National Safety Council. There can be no

more convincing evidence of the real worth of the cause to which you have devoted yourselves, or of the truly democratic character of the institution which you have created in the service of this cause, than the strikingly large numbers in which each year you come together to dedicate yourselves anew to that cause's support and to determine how best its service may be advanced and enlarged.

I feel sure that you will appreciate my desire to say a few words in special welcome of certain of you—of our Canadian brothers who have come across a boundary line which in a sense, and a very real one, no longer exists, and of the women among you, here to attend the first special meetings of women held under the auspices of your Council at one of its congresses. The presence with us each year, in ever-growing numbers, of our Canadian members is an unmistakable sign of that universality of thought and action in service of a worthy cause which is being evidenced on a larger scale by the *entente cordiale* of peoples now actively engaged in winning the war—that war which it has been aptly said has ceased to be a war and has become a crusade for right, justice, and liberty.

Equally significant of that inevitable universality of thought and action in behalf of any cause that is really worth while is the increasingly keen interest in the National Safety Council's objects and activities which is being taken by the women of our country—the women to whom I know every man here, and elsewhere, will join me in paying heartfelt tribute for the notable part they are taking in support of that greatest of all present-day causes, that crusade for all that makes life worth living—the women who are willingly, nay gladly, speeding their husbands, their brothers, and their sons on that crusade, and then are turning, with a courage and determination which cannot be surpassed even on the field of battle, to their less conspicuous but equally essential fields of effort, to the replacement of the absent men in industry, and in every other vacant place, to the strict conservation of food, fuel, and other necessaries, and to those works of comfort and mercy which are so peculiarly and happily their own.

In rendering to you, on behalf of those to whom it has been entrusted, an account of their care of your affairs, I shall not attempt to go extensively into details, for these have been and will be placed before you in the reports of the General Manager and the several committees, but shall simply touch upon the salient features of what I trust you will consider some degree of accomplishment in the immediate past and upon the limitless possibilities of the future.

A PROGRESSIVE ORGANIZATION

I wish I could take the time, inasmuch as the Council is yet new to some of you, to review its history and achievements during the five years of its active existence, to describe its rapid growth in purposes and plans, as well as in membership and influence, from the time of its organization by a few men interested in safety, primarily to serve as a ready medium of exchange for their safety ideas and experiences, to the

present day, when the several and varied phases of its service are being placed at the disposal of the employers of at least seven million workmen, when it is co-operating with every other agency seeking to promote the betterment of society, when it has become recognized as a truly national force, and, through its offspring, the Local Councils, is fast becoming a local force in community after community, when the possibilities of its future, both in concrete and specific service and in range and power of influence for good, are beyond definition by anyone save a prophet.

It has been very gratifying to find at the close of our fiscal year that, despite the increase in dues and the all-absorbing effects of the world war, the Council has advanced steadily in membership and in material prosperity. There is something almost incongruous in the thought of material prosperity in connection with an organization devoted to such a cause, but unfortunately even a good work cannot be carried on without money, and the better the work the more need for money with which to forward it.

The increase in dues which went into effect last October, and which is responsible in large part for the present sound financial condition of the Council, was amply justified, in the judgment of your Directors and Executive Committee by the unavoidable high cost of what I take the liberty of terming right living—our particular right living—of the continuance and improvement of our then existing service and other activities, and of their proper extension in full keeping with our opportunities and privileges as a beneficent social force.

Our enlarged income has enabled us already to show some fulfilment of both these purposes and also to make plans looking to a greater measure of accomplishment. We must constantly bear in mind, however, that if we are to live up to our opportunities, we must continually increase our membership and coincidently our income. Such a working surplus as has now been accumulated is highly desirable—essential—for reasons which are obvious, but the only way we can properly maintain such a surplus is through unremitting activity to enlarge our income and thus care for new obligations.

It is perhaps needless to say that we should also keep ever in mind the necessity of holding to our traditional conservation both in planning new departures and in carefully observing budget provisions in the expenditure of funds for both new and old obligations. Your Finance Committee will probably be too modest to tell you how its budget, prepared a year ago, has been justified during the past year. It is only through the continued practice of the most rigid economy, however, that this has been possible, through persistent efforts to make one dollar do the work of two. I can heartily subscribe to the statement of one of your former Presidents, that a National Safety Council dollar was the hardest-worked dollar of which he had knowledge.

Notable among the results accruing from our improved financial condition, is the much-needed reorganization and expansion of our headquarters staff, now substantially in effect and fast approaching completion. Our work—our business, if I may term it such—while essentially

humanitarian in its nature, must be conducted on business principles if it is to be appealing, effective, and enduring, if it is not to be a house builded upon sand, and to carry it to a conclusion we must have at our headquarters and in the field a comprehensive and well-ordered organization, quickly responsive, hard-working and competently directed. The work has come to attain really vast proportions, wide in range, and minute in detail, and it demands as scientific a handling as can be given it.

REORGANIZATION OF HEADQUARTERS STAFF

The reorganization of our headquarters activities has already brought about some considerable degree of better service to our members, it has increasingly furthered the cause of accident prevention, and it will mean much more during the coming year—with a continuance of that hearty co-operation by our membership generally which is such a notable characteristic of the National Safety Council. This hearty co-operation is, to my mind, the great distinctive outstanding feature of our organization. It enters into the formulation and execution of every policy of the Council. It figures essentially in every phase of the Council's work, whether in the field or at headquarters. Every item of prepared information sent out, for instance, reflects the opinion and experience, so far as is obtainable, of the collective membership. A Safe Practices pamphlet, a bulletin, may originally be drafted by some individual on the Council's staff or in its membership, but in its final form it mirrors the composite knowledge and judgment of the many experts serving upon committees or otherwise called upon to review it.

On behalf of your Executive Committee and officers, I desire to take this opportunity of expressing our appreciation and gratitude to the literally hundreds of you who have served upon general and special committees, as Local Council officers and committeemen, as Sectional officers and committeemen, and as Directors. No matter how much credit you may give to our most efficient General Manager, Mr. Cameron, and his hard-working staff, including that truly great propagandist, Field Secretary Price, and the able head of our new Accident Prevention Department, Mr. Williams—and credit is most unmistakably due them all, for no more loyal and zealous staff ever served an organization—no matter how much importance you may attach to the guidance and counsel of your Executive Committeemen, it is you yourselves who have made the National Safety Council what it is and who will make it what it is to be.

CO-OPERATION FROM MANY SOURCES

Speaking of the Executive Committee, I am sure I voice your sentiments, as I most certainly do my own, in expressing to one and all of them the warmest appreciation of the inestimable value of their services to the Council and to the cause of safety. I have lived with them and worked with them, and I know it will never be my privilege to associate with a body of men characterized by more ardent enthusiasm, greater willingness to work (often at much sacrifice) and larger constructiveness of counsel—all without a single thought of self or selfish interest.

Nor has this co-operation been confined within the Council itself. It is a pleasure to make special acknowledgment here of the cordial relations which the council has enjoyed with the American Museum of Safety and the many Federal, State, municipal, and other agencies which are taking such keen interest in accident prevention and kindred phases of social work.

I think it may safely be said that during the past year the work of the Council has made progress in every direction. The weekly bulletin service has been not only continued but improved in quality. Effective use has been made of larger sized bulletins and of color combinations. Further improvements are nearing completion and will be in effect soon. Incidentally, I may say that 750 original bulletins were produced during the year, an average of more than two a day.

The development of Local Councils has proceeded apace. Not only have a number of new Locals been organized—we now have forty-seven in all—but hundreds of meetings have been held by the Locals and a distinct advance has been made in expanding their influence. The handbook "A Live Local Council" has been of much aid. The most significant development of the scope and activities of Local Councils has been the apparent success of the permanent secretary plan, put into effect January 1, for the first time. This project has worked out so well at Pittsburgh and St. Louis that plans are now afoot for establishing permanent secretaries at Cleveland, Buffalo, Detroit and other centers.

Just as the Local Council was the first development of the branch phase of organization in connection with a national association such as the National Safety Council, so is the permanent secretary plan unique, and it already gives promise of being of the greatest aid in solving some of the Council's leading problems, such as how to effect a closer personal contact between the Council and its members, how to intensify the Council's propaganda, and how to further the creation and development of community safety atmosphere, both industrial and public.

I think there can be no disputing the fact that a member of the National Safety Council receives more direct service, in proportion to the dues he pays, than does a member of any other organization at all similar in kind, but this service necessarily has been limited chiefly to printed matter and correspondence. We must continually seek for more practicable ways of getting into direct and close personal touch with our members.

The active Local Council, with its permanent secretary, is certainly one of these ways. This has been conclusively proven, I think, by the experience in Western Pennsylvania, where the permanent secretary plan was first put into effect. Through the employment of a permanent secretary, and with the hearty co-operation of the Pennsylvania Department of Labor and Industry and its Acting Commissioner, our old friend Lew Palmer, that Local Council has been able to organize plants, to hold meetings of existing safety engineers and to conduct a school for new ones, to hold meetings of superintendents and foremen, and also of workmen, and to carry the message of safety, through moving pictures, direct to the

workmen of the individual plant. Its meetings this year have been attended by an aggregate of nearly 110,000 men, and it is conservatively estimated that it has reached, directly and indirectly, half a million of workmen. Systematic instruction in safety has been put into the city and county schools throughout the entire district. The permanent secretary has personally visited every one of the district's 1,500 plants, whether affiliated with the National Safety Council or not.

COUNCIL ACTIVITIES

These activities mark a very real accomplishment, not only in direct personal service to the individual member, but in intensification of the national safety propaganda, and toward creation of a safety atmosphere throughout the entire community. They are a striking illustration of the kind of work that can be done in every community through close co-operation of the national body and its local members. It is just such intensive Local Council development that will put the safety idea where it ought to be, will make it a part of the life of each individual in each community.

Eight Safe Practices pamphlets have been distributed to the membership during the year, and twelve will be produced next year. Augmentation of the Council's engineering staff has enabled this work to be planned two years in advance. It is hoped to produce similar pamphlets very soon for all of the Sections; a start has been made, as one for the Paper and Pulp Section has been completed and distributed. I feel that a special word of thanks is due the 55 men serving on the Safe Practices Committee and the Committee of Review, of which that veteran in accident prevention, R. J. Young, is Chairman. These men are doing valuable and permanent constructive work for the entire membership of the Council.

Another, and an unique feature of last year's accomplishment, was the safety calendar, of which 150,000 copies were distributed. This calendar was apparently such a distinct contribution to the safety crusade that there will be a 1919 calendar—sample copies of which will be sent to members early enough for them to secure supplies for distribution to their workmen by the first of the new year. Three thousand special inquiries were received last year and answered through the Information Bureau and Accident Prevention Division of the Council.

While it is eminently fitting and a *sine qua non* of our continued existence as an organization that we render an ever-increasingly useful and satisfactory service direct to our members in helping them to cope with existing accident problems, it is well to look beyond present day conditions and endeavor to build for a better future. Of necessity, we have taken things as we found them, doing our best to overcome the difficulties presented. Safety measures as yet are largely of the nature of afterthoughts, and we must devote much of our attention to the remedying of the ills of today. If a place is dangerous, it must be protected. If machinery is built insufficiently safeguarded, guards must be applied. If a workman has careless habits, we must seek to overcome

them. But while we are doing these afterthought things, we can, and we should, keep actively in mind the fact that such conditions need not exist, that it is not necessary to build unsafe places and machinery, and that it is possible for the workman to avoid forming habits of carelessness.

It has seemed to your Executive Committee that efforts to overcome these conditions are reaching to the true fundamentals of accident prevention, and I think it may fairly be said that the promotion of activities along these lines has been one of the outstanding features of the Council's work during the past year.

SAFETY EDUCATIONAL COURSES

Steps have been taken looking to the introduction of safety educational courses in universities and technical schools. Conferences of representatives of such institutions have been held in both the East and West and committees appointed to further the work. A prospectus on the subject has been distributed to 500 universities and schools, and syllabi and Safe Practices leaflets are in course of preparation. While progress will necessarily be gradual, it is not too much to hope that the time will come, and in the not distant future, when not only will the students generally of these colleges and schools have a clear understanding of safety principles and practice, and recognize their great value, but those specializing in certain branches of engineering will be instructed in the features of safety applying specifically to their work in after life. The works managers of the future will be recruited largely from these men, as will those holding other supervisory and directing positions, and it will be of tremendous advantage to the cause of safety to have these men not only imbued with the safety idea, but familiar with and accustomed to its practical application.

In furthering education of the future workman into safety habits progress has also been made. We are co-operating with the Federal Board of Vocational Education, which will insist upon safety and hygiene educational work in every secondary trade school to which it gives "grants-in-aid" under the Federal Act appropriating $22,000,000 to assist the States in promoting vocational education. The Council is recommending the appointment of a Safety Engineer teacher for the promotion of this work in state secondary trade schools, and is undertaking to supply the vocational educational boards with the information necessary to work out the course of instruction.

The Council has had printed four school bulletins each month during the year (1,000 copies of each) and has distributed the majority of them through the school members, in public safety campaigns and to the many inquirers requesting help of this kind. We are meeting with steadily increasing success in introducing safety education into the public schools, and we hope to have safety courses made a part of the curriculum in the normal schools which train the future public school teachers.

All this educational work necessarily will be slow in showing full realization of results. It is looking beyond the present to the future, but to a future of the right kind, a future when both the workman and

his boss, of whatever degree, will instinctively believe in safety and act safely, because thinking safety has been inculcated in them in their youth, in the formative period before they had opportunity to acquire other habits of thought and action. In the last analysis that would be the millennium of industrial safety—a millennium well worth striving for, and by no means incapable of substantial realization.

On the material side of this basic phase of accident prevention, a subcommittee on safeguarding machinery at its source has studied the problem carefully and has made a beginning of the work of bringing the maker and the user of machinery to a common understanding of what safety features should be incorporated into such devices at the time of their manufacture, so that afterthought remedies will be unnecessary. Let me urge all here to respond promptly and fully to any requests made of you for information about how you have to safeguard machinery you purchase. It is only by convincing the makers of machinery that guards must subsequently be installed that they can be induced to include them, as well as other features of safe construction, as parts of the machinery when building.

THE ROCHESTER CAMPAIGN

Another, and in a way a kindred phase of educational work—perhaps the most notable project of the Council during the year—has been the public safety campaign in Rochester, New York, about which you will later hear in detail. It may well be said that the Council, in this Rochester campaign, has conducted a laboratory experiment in public safety, and, while the results are not fully evident, it has been demonstrated that the problem of public safety is fundamentally similar to that of industrial safety and just as open to practical solution. This Rochester campaign, which, by the way, is being continued by the people of Rochester, is bound to lead to similar organized public safety efforts in other cities and thereby eventually to a considerable further reduction in our national toll of accidents and to a wider appreciation of the safety idea—industrially as well as in a public sense. We are all interested in public safety as industrialists as well as citizens. A workman killed or injured on the street, in a public conveyance, or in his home, is just as much a loss to industry as one killed or injured in the plant in which he works, and a community atmosphere of safety thought has a distinct reflex action upon the industrial safety atmosphere. Without in any way belittling the efforts which have hitherto been made to promote public safety, I think it is no exaggeration to say that through the Rochester campaign public safety education and propaganda have been scientifically launched upon a permanent basis.

Other matters of much interest have been developed, or considered, during the past year which I should like to touch upon did time permit. For instance, your Executive Committee and Directors gave careful consideration to the so-called industrial relations problem, with a view to seeing whether, in their judgment, the Council could properly give its members a further meed of assistance in the matter of their relations with the human factor in industry. I cite this as an illustration of the

alertness of your Executive Committeemen and Directors toward seeing that the Council assume its full duties and responsibilities in assisting in the improvement of social and economic conditions in this country and in giving the utmost possible help to its members. It is only just that those to whom you delegate the conduct of your affairs should give full consideration to every matter which, by any chance, may enable the Council to render its members a better service or otherwise offer it proper opportunity to fulfil its every function as a social factor.

EVERY FUNCTION A SOCIAL FACTOR

"Its every function as a social factor." That certainly opens up a wide field for thought. It is comparatively easy to review the Council's past, replete with achievement as I feel justified in saying that it has been, but who can forecast its future? Already, in but a few years of existence, its range of activities has passed far beyond even the dreams of the most sanguine among its founders, yet its ultimate destiny seems as incapable as ever of anything like exact determination.

We know that today, with all its shortcomings, it is a real factor in the conservation of our country's greatest asset—the lives and health of its people. We know that in whatever it contributes to this conservation it is distinctly helping to win the war, the one object in comparison with which all others of the time fade into insignificance. We know that its propaganda, through the discipline of safety education, rules, and ordinances, is furthering that wholesome respect for law which is the one permanent basis of a government of the people, by the people and for the people. We know that by bringing employer and employe together, to deal with a matter in which neither can have any but a common interest, it is opening the way to keener appreciation by both of the principles of industrial and social justice and is helping to lay the foundations for an enduring industrial peace and for a better world in which to live.

But can, and should, we be satisfied with simply a continuation of our present efforts, with endeavoring at the same time to give our members a constantly improving and expanding service, and, through the educational propaganda in which I believe the Council is unique, and through cordial co-operation with every other active agency, to spread the gospel of safety far and wide with ever increasing forcefulness?

Not having the vision of the proverbial seer, we cannot tell. Our future lies in the lap of the gods, as I believe does that of most other human activities, to be determined by the workings of that national conscience which has been stirred into active being as a result of the great war. The whole structure of society, here as well as abroad, is being shaken to its very foundations by the conflict which is raging across the water; that conflict in which our sons and brothers—and our wives and sisters—are so nobly demonstrating to the world that this nation is as ready, and as able, to fight for an ideal today as when it successfully sought its independence.

The war is bound to change the trend of all human thought. A higher

conception of society is sure to prevail in the years to come, involving an entire rearrangement of social values, and necessitating the conduct of human affairs in the light of a new understanding of the relationship of man to man. May the vision be given us to see our full part, and the wisdom and courage to take it, in coping with changed conditions in the light of new standards.

THE FUTURE OF THE COUNCIL

In the meantime, let us rededicate ourselves to our cause as we now see it. While keeping an eye ever open to the possibility of larger usefulness through a broader range of activities, let us take heed that we do not follow strange gods, lest they prove to be false ones. Let us run no risk of alienating the support which has been so generously given us by rashly entering fields in which it is not yet clear that we belong. Let us lay emphasis upon concentration rather than diffusion, so that we run no risk of diminishing the force of our energy by scattering it too widely.

Let us pledge ourselves to greater effort in service of the cause that is so plainly in view. We have barely scratched the surface of the work immediately at our hand. From the experience of our past let us visualize the problems and duties of our future, that we may develop the ideas without which our ideals cannot be attained.

Let us be a militant organization. We can well be militant for a cause which at one and the same time is good business, good patriotism, and good morals. The history of every great and worthy movement is that it has had to be fought out as well as thought out. Let us push our propaganda for universal safety education with the utmost vigor, to the end that safety may be taught and practiced in every home and every school, as well as in every shop. Let us carry the banner of safety into every civic, as well as industrial, community.

Let us strive to establish, so far as we may be able, a personal contact with each of our members, as well as with each of our Sections and Locals, that contact which has a direct helpfulness so far beyond that of the written or the printed word—potent as they have proved to be. Let us fight for the membership—if necessary with the membership—for the money which will enable us to do these things.

Above all, let us steadily and increasingly continue the policy of co-operation, both internal and external, which has made possible the achievements of our past and without which we cannot hope for the full fruition of our future—that co-operation which must stand back of any movement based upon good morals, and which is so appropriate as well as so necessary to a movement which has as its ultimate object the widespread realization of the essential brotherhood of man.

PRESIDENT VAN SCHAACK: The next item on our program is the reading and disposal of the minutes of our last annual meeting. As the minutes have been printed a motion will be in order to dispense with their reading. (A motion was duly made and seconded that the minutes stand approved as printed. The motion was carried unanimously.)

PRESIDENT VAN SCHAACK: The next item is the report of your General Manager, Mr. W. H. Cameron.

REPORT OF GENERAL MANAGER AND TREASURER

GENERAL MANAGER CAMERON: My report is very brief. You have received a printed report, dated Aug. 1. Since that date the income of the Council has been $17,253.27. Our bank balance on Saturday was $5,548.26. My annual report also shows that we have invested $12,000 in Liberty Bonds. Adding our bank balance to our investments, at the present time we have $22,471.51.

The formal report is as follows:

FIFTH ANNUAL REPORT OF GENERAL MANAGER

Chicago, Ill., August 1, 1918.

1. Gain in membership for the fiscal year ending July 31, 1918, 306; present membership, 3,606, including 16,000 representatives and 6,000,000 employes; income, $117,000; surplus, $25,000; no debts.

BASIC WORK

2. The Council's function is to convey to the world's social system the true idea of the value of human life, and to teach the principle of its preservation through protective devices and safety education. An effort has been made to emphasize these aims during the year. Interest has been aroused in the educational phases of accident prevention and the universities and technical schools are preparing to teach safety to engineering students.

A six months' public safety campaign has been successfully conducted at Rochester, N. Y.; Fire and Accident Prevention Day was widely celebrated October 9; a start has been made in agitating for the safeguarding of machinery at its source; new safety films are being developed; foundations have been laid for teaching safety in public schools; magazine, newspaper and other publicity has been promoted. Other new activities are under advisement by the Executive Committee.

Governmental safety activities have been especially encouraging. The United States Emergency Fleet Corporation and the Navy Yards and Arsenals are now splendidly organized. Safety work in the United States has arrived.

WEEKLY BULLETIN SERVICE

3. The weekly bulletin service has been maintained without interruption and more than seven million copies were printed and distributed this year. Seven hundred and fifty original bulletins were prepared, including the Bulletin Board, Executive and Sectional series. The bulletins are apparently fulfilling their mission. The increased dues permitted this service; our increasing staff of engineers and editors are working out further improvements.

LOCAL COUNCILS

4. Forty-seven Local Councils are now actively pushing Safety work—a gain of fourteen locals during the year. The activities and responsibilities of State, District and City Locals are manifold, and require scientific business administration—salaried Secretaries are necessary to secure maximum results. Three of these Secretaries were appointed during the year. The Council hopes to have a staff of twenty salaried local Secretaries at work before the Eighth Safety Congress. A handbook entitled "A Live Local Council" has served to stimulate interest in Local Council business administration and a monthly News Letter for officers and committees has interchanged the activities of Locals.

ANNUAL CONGRESS PROCEEDINGS

5. The Sixth Annual Congress Proceedings necessitated a volume of 1,544 pages. The General and Sectional pamphlets were distributed to members. Many copies were sent to new members, educational institutions, etc.

SAFETY CALENDAR

6. One hundred and fifty thousand copies of the 1918 Safety Calendar were printed and distributed. The 1919 Safety Calendar is now in preparation. Many pamphlets, booklets, folders and educational leaflets were printed and distributed during the year.

SAFE PRACTICES PAMPHLETS

7. Eight Safe Practices pamphlets have been printed and distributed: "Freight Elevators," "Goggles," "Grinding Wheels," "Floors and Flooring," "Oiling Devices and Oilers," "Engine Guarding and Engine Stops," "Shafting, Couplings, Pulleys and Gearing," "Scaffolds." Three others are in the printer's hands. Twelve additional pamphlets will elaborate this service this year.

INFORMATION BUREAU AND LIBRARY

8. The Information Bureau and Library received over three thousand inquiries from members. Three Librarians are now employed in developing and cataloging the information received daily. Prompt answers were sent, often including books, pamphlets, blue prints, etc.

SAFETY FILMS, SLIDES, ETC.

9. Moving picture films, stereopticon slides, outlines of lectures, etc., have been furnished to safety engineers and lecturers to assist in promoting accident prevention work in the plants of our members.

10. The Universal Danger Emblem is increasing in popularity. Twelve special bulletins have emphasized its value and need. In time we hope to make it as well known as the Red Cross.

11. Thousands of copies of the "Sure Pop" book were sold this year.

12. The National Headquarters staff now comprises thirty-one per-

sons; activities have been subdivided and amplified in many directions. The coming year will witness a still further increase in personnel and even higher qualities of service.

13. The thanks and gratitude of the Executive Committee and Officers are tendered to every member of the Council for co-operation and persistency in promoting safety activities, and to every National, Sectional and Local Council Committeeman for unselfish services to the National Safety Council. W. H. CAMERON, General Manager.

PRESIDENT VAN SCHAACK: Mr. H. W. Forster, Chairman of the Finance committee will report for that committee.

REPORT OF FINANCE COMMITTEE

MR. H. W. FORSTER: The President has made a most excellent report for the Finance Committee; nevertheless, in order to have a clear statement in the record, I will read the brief report which your Finance Committee has prepared:

Mr. Chairman and Members of the National Safety Council: All who are connected with the management of the National Safety Council have before them clearly the fact that ours is an institution devoted to the splendidly humanitarian work of preventing accidents, and that the business and financial affairs of the Council are and should be subsidiary to the main purpose of our organization. So many altruistically conceived movements, however, have come to an untimely end because of the lack of application of wise business methods to their management, that your directors, executive committee, and officers have steadily had before them the necessity, if our work was to grow in size and in quality, of an income adequate to make possible the expression of your collective experience, ideas, and information, through a competent and adequate staff and their resultant publications.

The excellence of our cause, the businesslike attitude of our management, and the whole-hearted support of our members make possible what I hope will appear to you a most satisfactory report by your Finance Committee.

The Treasurer's report shows that the income of the Council for the fiscal year ending July 31st was $117,951.21, or 54 per cent increase over the previous year. This splendid showing has been largely due to your generous response to the call for an increase in the scale of dues, and it is interesting to note that, in spite of the interference of great war crisis with social work such as the Council maintains, the income from new memberships is equal to that received the previous fiscal year. There has been a net gain of 300 members, and the increase in dues has equalled the anticipation of your Executive and Finance Committees.

It has been apparent ever since the Council was organized that a substantial fund should be held in reserve as a working balance, and to meet the needs of extensions of service and to finance experiments such as the Rochester Public Safety Campaign. It has been the belief of your Committee that a surplus of approximately $25,000, or a sum equal to at least two months' fixed expenses would be sufficient surplus to

maintain and continue all the activities of the Council. A reserve of this amount has been acquired, although its accumulation did not begin until late in the spring. This reserve having been secured, your Executive and Finance Committees felt justified in authorizing the taking on of additional office space and the hiring of certain additional persons for headquarters' staff, to the end that the Council's service might be increased. The Council's headquarters has been reorganized by adding another division, thereby increasing the Engineering and Editorial service so that the basic promotion work of the Council might be pushed forward; increased help has been given the Sectional officers in developing the publications necessary to complete the objects for which the Sections were organized. This reorganization of headquarters' activities and the further additions to the staff that may be necessary will mean much larger accomplishments during the coming fiscal year, and the service to the members and to the cause of accident prevention as a whole will be considerably augmented.

As soon as the Council's bank balance grew to such proportions as to warrant the increased expenditure for the immediate needs of proposed activities, the Executive Committee approved your Finance Committee's recommendation to invest the larger portion of this surplus of the National Safety Council in the world's safest investment, Liberty Bonds, and $12,000 was so invested. An additional $5,000 investment was made in bonds of a safe, good yield, and high loan value character. The prospects of the Council are so bright and the work so pressing that there will be little occasion to consider further investments for the present, as the increased fixed expenses and service to members will require approximately all of our income.

I wish to direct your special attention to the fact that only 26 per cent of the total income last year was expended for salaries. A low salary ratio is definite evidence of efficiency in management, and I understand that no other national association has so excellent a record. I think I am right in saying for the Committee that this item of 26 per cent is in reality not overhead, because we are dependent upon the staff for the actual carrying out of the decisions of the members, Directors and Executive Committee; we believe the experience of the past five years has taught us that if the Council's publications are to be prepared by experts and based upon the plans of the various committees, and the many activities of the Council maintained, we must have a large, adequate, and competent headquarters' staff.

The policy of your Finance and Executive Committees has been to plan all of the expenditures of the Council's income upon a budget, prepared at the beginning of each year's activities following the Annual Congress. It is also a fixed policy of the Council that the Treasurer and other representatives shall be properly bonded; that the securities of the Council be kept in a safe deposit box in the name of the Council, access to which is only possible through two persons; that the accounts be maintained under the direction of accountants of recognized ability and integrity, and that an annual audit and certificate be secured from the company they represent. On the other hand, expenditures are based

upon the best business principles at our command. To give an illustration. I may say that during the year an efficiency expert who has spent his life in the printing trade, prepared specifications for the Council upon which to secure its bids for printing. The Council purchases large stocks of paper directly from the paper mills, and its records, correspondence, etc., are all managed according to modern business methods.

Before showing you several lantern slides, more clearly to visualize the financial history and experience of the Council, I desire to congratulate you upon the sound and businesslike financial condition in which the Council has been placed. The profitable Public Safety experiment at Rochester; the work of the Committee on Safety Education in Technical Schools and Universities, and other activities, will indicate to you what the Council can do when it has sufficient funds properly to carry on its work for the saving of human life and the making of the principles of accident prevention integral in our industries and in the life of our entire people.

H. W. Forster, Chairman,
A. T. Morey,
J. B. Douglas,
Finance Committee.

September 16, 1918.

NATIONAL SAFETY COUNCIL,

Continental and Commercial Bank Building, Chicago

Statement of Receipts and Disbursements for the Year Ended July 31st, 1918

RECEIPTS:

Membership Dues.			
Active	$109,418.55		
Associate	1,102.50		
	$110,521.05		
Less Refund of Dues	258.34	$110,262.71	
Sales of Pamphlets, Bulletins, Calendars and Miscellaneous Receipts		7,689.50	
Refund of Advance on account of Survey in connection with U. S. Employes' Compensation Commission.		500.00	
Loans: Amounts Borrowed from Banks and Officers for Current Expenses	$ 3,000.00		
Less Repaid	3,000.00		
Cash balance August 1, 1917:			
On Hand	$ 202.36		
In bank	1,279.47	$ 1,481.83	$119,934.04

DISBURSEMENTS:

Salaries of General Manager, Assistants and Office Staff		$ 31,304.25	
Office Printing, Stationery and Supplies		1,798.71	
Office Furniture and Equipment		1,908.60	
Postage		2,472.13	
Rent of General Offices		4,720.00	
Traveling Expense		3,310.45	
Telephone and Telegraph		747.00	
General Office Expense		1,557.14	
Library Expense		445.52	
Membership Solicitation Expense		2,786.94	
National Committee Work		265.43	
Shipping Room Expense		249.14	
Service Account, reprints of bulletins, slides, films, etc.		1,669.74	
Expenses of Various Local Councils		9,531.07	
"Safe Practices" Pamphlets		837.44	
Annual Congress Expense		5,808.78	
Weekly Bulletin Service		16,304.60	
Sectional Activity Expense (including printing Bulletins)		4,540.75	
Buttons and Danger Emblem		45.10	
Rochester Public Safety Campaign Expense		4,869.19	

INVESTMENTS:

U. S. Liberty Loan Bonds	$ 12,000.00		
Louisville Gas & Electric Co. $5,000 First Refunding, 5 year 7% Gold Bonds	4,923.33	16,923.33	
Loan to Western Pennsylvania Local National Safety Council		500.00	
Advances to Local Councils for Petty Cash Expenses		75.00	
Advances to Field Secretary		308.60	

CASH BALANCE JULY 31ST, 1918

Cash on Hand	$ 200.00		
Cash in Bank	6,755.13	6,955.13	$119,934.04

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.

(Signed) DELOITTE, PLENDER, GRIFFITHS & Co.,
Accountants and Auditors.

Chicago, August 9th, 1918.

(On motion the report of the committee was adopted.)

PRESIDENT VAN SCHAACK: Mr. Cameron, will you please report as Chairman of the Program Committee?

REPORT OF PROGRAM COMMITTEE

MR. W. H. CAMERON: The report of the Program Committee is the third and final edition of the program, copies of which you received when you registered. We ask you to please use that program in arranging for your meetings, and also to watch the bulletin boards for announcements. Delegates are requested to observe the time set for the several features of our program and to be prompt in attendance. We cannot carry out our elaborate program unless you get to the meetings on time. I hope you will co-operate to the very limit in our efforts to start each general and sectional meeting at the hour set for its convening.

I also desire to call your attention to the safety exhibit. The American Museum of Safety and the Council have joined in this work, and considerable thought and expense has been put into it. I think you will be pleased with our work.

(On motion the report was adopted.)

PRESIDENT VAN SCHAACK: I will ask Chairman H. H. Robertson to report for the Resolutions Committee.

REPORT OF RESOLUTIONS COMMITTEE

MR. H. H. ROBERTSON: Your committee wishes to offer the following resolution:

Whereas, It is the wish of this Congress to express its gratitude and full appreciation to:

Mr. Arthur T. Morey, Chairman of the Arrangements Committee of the Seventh National Safety Congress.

Mr. Clarence H. Howard,

Mayor Henry W. Kiel, of St. Louis,

Mayor Fred W. Mollman, of East St. Louis,

Mayor M. E. Kirkpatrick, of Granite City,

Mayor F. A. Garlsche, of Madison,

Mayor J. E. Lee, of Venice,

Mr. Jackson Johnston, President, Chamber of Commerce,

Mr. C. B. Hardin, President,

Mr. Carl Smith, Secretary.

The officers and executives of the Central Mississippi Valley Division, East St. Louis; the Local and Tri-City Safety Councils, the St. Louis Chambers of Commerce, the Church Federation of St. Louis, the Archbishop of St. Louis, the city officials, members of the police and fire departments, the Women's Council of National Defense, the Boy Scouts, the city and parochial schools, the Automobile Club of St. Louis, the Motion Picture Exhibitors' League, the local newspaper managers, the manufacturers and merchants, and other organizations and individuals who have so generously given their time, interest, co-operation and

material assistance in welcoming the National Safety Council to St. Louis, and in providing hospitality and accommodation for this Congress; therefore, be it

Resolved, That while we express to them our grateful acknowledgment for their manifold courtesies and considerate attention, this Congress recognizes that the welcome embodies much that is more than a mere courtesy, for it betokens an interest in what must always be among the noblest of human occupations, the averting and alleviation of the woes of our fellowmen and the creation of a spirit of fellowship and co-operation.

(The resolution adopted by a rising vote.)

MR. ROBERTSON: The committee offers the following:

Resolved, That the grateful appreciation of this Congress be offered to its President, Mr. David Van Schaack, for the constructive guidance, 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 material growth and made such substantial progress toward the goal for which it was organized.

SECRETARY CAMERON: What is your pleasure on this resolution?

MR. RALPH C. RICHARDS: I move its adoption by a rising vote.

A DELEGATE: I would like to offer an amendment: That the Secretary be requested to print for general distribution the remarkable and illuminating address of our President.

(The resolution as amended was unanimously adopted.)

MR. ROBERTSON: Your committee offers the following:

Resolved, That the hearty thanks of this Congress be unanimously extended to General Manager W. H. Cameron, to Field Secretary C. W. Price and to all the members 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.

(The resolution was unanimously adopted.)

PRESIDENT VAN SCHAACK: I will ask Chairman R. J. Young to report for the Safe Practices Committee.

REPORT OF SAFE PRACTICES COMMITTEE

MR. R. J. YOUNG: The Safe Practices Committee, in conjunction with the officers and headquarters staff, respectfully presents a detailed schedule of Safe Practices pamphlets issued, in course of preparation, and under consideration. The schedule covers a period of two years, and contemplates twenty-three pamphlets in the general series, and several sectional pamphlets.

Thirteen pamphlets have been issued to date. These have proven interesting and helpful to the membership, if commendatory letters and demands for additional copies are indicative of the general feeling of members. The schedule which follows assigns one pamphlet on a general subject to each month's distribution.

TENTATIVE LIST OF SUBJECTS FOR "SAFE PRACTICES" PAMPHLETS WITH DATES OF ISSUANCE

General Series

Nos. 1 to 13 have already been issued; Nos. 14 to 17 are in course of preparation; Nos. 18 to 40 are proposed. (Nos. 27, 35 and 40 really do not deal with "Safe Practices," but belong to the Health and Industrial Relations Divison. Nevertheless they are included in this list because it is felt that they should be sent to all members as a part of the general series.)

Date—		*Number and Subject*	
Oct.	9-16	1.	Ladders.
Feb.	18-18	1.	Ladders (revised).
Dec.	4-16	2.	Stairs and Stairways.
Jan.	1-17	3.	Boiler Rooms.
Feb.	26-17	4.	Crane Construction and Safe Practices.
May	28-17	5.	Belt Shifters and Belt Shippers.
July	16-17	6.	Knots, Bends, Hitches and Slings.
Sept.	3-17	7.	Belts and Belt Guards.
Dec.	3-17	8.	Shafting, Couplings, Pulleys, Gearing (Transmission Machinery).
Dec.	24-17	9.	Engine Guarding and Engine Stops.
Jan.	21-18	10.	Oiling Devices and Oilers.
Apr.	1-18	11.	Floors and Flooring.
May	14-18	12.	Scaffolds (for industrial plant use).
July	8-18	13.	Grinding Wheels.
Aug.	19-18	14.	Goggles.
Sept.	9-18	15.	Freight Elevators.
Oct.	18	16.	Safe Clothing.
Nov.	18	17.	Yards.
Dec.	18	18.	Power Presses.
Jan.	19	19.	Fire Causes and Prevention.
Feb.	19	20.	Trucks and Wheelbarrows.
Mar.	19	21.	Electrical Equipment in Industrial Plants.
Apr.	19	22.	Shop Lighting.
May	19	23.	Hoisting Apparatus, Other than E. O. T. Cranes (Chain and Air Hoists, Monorails, etc.).
June	19	24.	Fire Extinguishment (Including Private Fire Brigades).
July	19	25.	Acids and Caustics in Industrial Plants.
Aug.	19	26.	Saws (Including Metal Saws).
Sept.	19	27.	First Aid and Factory Hospitals.
Oct.	19	28.	Industrial Railroads.
Nov.	19	29.	Exits, Fire Alarms and Fire Drills.
Dec.	19	30.	Railings and Toeboards; Elevated Runways and Platforms.
Jan.	20	31.	Exhaust Systems for Grinding, Polishing, Pickling, Tanning, etc.
Feb.	20	32.	Excavating.

Mar.	20	33.	Machine Shops (excluding specific hazards already covered).
Apr.	20	34.	Use and Storage of Explosives in Industrial Plants.
May	20	35.	Ventilation (General).
June	20	36.	Conveyors—Chain, Belt, Bucket; also Gravity Chutes.
July	20	37.	Compressed Air Machinery and Tools; Other Gases Under Pressure.
Aug.	20	38.	Laundries.
Sept.	20	39.	Storerooms and Toolrooms.
Oct.	20	40.	Toilet Rooms and Lavatories; Drinking Water.

The Committee wishes to express its thanks and appreciation to the many members of the Council who have so generously given of their time and experience in making the Safe Practices pamphlets successful. The General Manager and his staff have given their best efforts in drafting, revising, illustrating and printing the leaflets; the Conference Committee of Fifty has rendered very valuable technical service in perfecting the drafts submitted by the Council's engineers, and scores of friends and well wishers have contributed freely in successfully launching and maintaining interest in the series.

The Committee wishes to congratulate the Council on the wholly unselfish spirit of its membership, recognizing that in just such service is the success of the Council assured. Trusting that during the coming year the Council will achieve an increase in membership and prosperity corresponding to that enjoyed during the last twelve months, Respectfully.

R. J. Young, Chairman,
E. B. Tolsted,
D. S. Beyer.

(On motion the report was adopted.)

President Van Schaack: The next business in order is the Report of the Committee on Uniform Industrial Accident Statistics. I will ask Dr. Hoffman to make the report.

REPORT OF COMMITTEE ON UNIFORM INDUSTRIAL ACCIDENT STATISTICS

Mr. Chairman and Members of the National Safety Council: In response to a resolution adopted by the National Safety Council at its annual meeting in 1917 a committee was appointed to investigate and report upon the whole subject of feasible uniformity and simplicity in industrial accident reporting, tabulation and analysis, chiefly with reference to the practical requirements of plant safety organizations and the required reduction of industrial accidents to the lowest attainable minimum. The committee has concerned itself chiefly with the collection of data, and a very considerable amount of extremely useful and suggestive information has been brought together through the hearty co-operation of plant superintendents and officials in charge of safety organizations throughout the country. The wide variation in methods followed, chiefly in connection with the recording and reporting of industrial accidents, suggested at the outset the con-

centration of interest upon the feasibility of a standard set of forms, arranged in the order of logical sequence, in conformity to the usual procedure as more or less determined by statutory requirements.

While the committee was specifically instructed to concern itself chiefly with the internal needs of plant safety organizations, it was not unmindful from the outset of the important fact that, as far as practicable, the order of procedure required to be followed in the making of official reports to industrial accident boards, or workmen's compensation commissions, or labor departments, etc., should govern in the adoption of fundamental principles, so as to avoid confusion, duplication and possibly seriously conflicting results.

A working basis for the deliberations of the committee was provided in the report of the Committee on Statistics and Compensation Insurance Cost of the International Association of Industrial Accident Boards and Commissions. This committee has rendered conspicuous services to the cause of practical statistics by its recommendations, based upon mature consideration and the essential requirements of both the state supervisory departments and the industries concerned. The standard tables proposed by this committee were designed to permit of their adaptation or modification to the varying administrative needs and financial resources of different jurisdictions, in view of the lamentable conflict of the laws on the subject of workmen's compensation systems in the different States. The committee of the National Safety Council, however, had to concern itself also not merely with the question of tabular presentation but also with the subject of forms and blanks suitable for the broader purposes of the safety organizations of industrial plants, both large and small, and rendering first-aid medical and surgical services of various kinds.

As a first requirement, in the order of procedure, the committee of the National Safety Council agreed upon the acceptance of the standard definitions adopted by the committee of the International Association of Industrial Accident Boards and Commissions, subject to such minor modifications as, in the light of subsequent deliberations, might be deemed necessary and advisable. The definitions are as follows:

STANDARD DEFINITIONS ADOPTED BY THE COMMITTEE OF THE INTERNATIONAL ASSOCIATION OF INDUSTRIAL ACCIDENT BOARDS AND COMMISSIONS

1. *Tabulatable Accidents, Diseases and Injuries*—All accidents, diseases and injuries arising out of the employment and resulting in death, permanent disability or in the loss of time other than the remainder of the day, shift, or turn on which the injury was incurred, should be classified as "tabulatable accidents, diseases and injuries" and a report of all such accidents, diseases and injuries to some State or national authority should be required.

2. In publishing the statistics of accidents, diseases and injuries, clear definitions of the terms used in the tables should be given either in the tables, in prefatory notes thereto, or in readily accessible text.

3. *Reportable accidents, diseases and injuries* should include all tabu-

latable accidents, diseases and injuries and all non-tabulatable accidents, diseases and injuries which require any medical expenditure.

4. *Compensable accidents, diseases and injuries*, as used in any report in accordance with the practice in the particular State, should be shown separately and clearly defined.

5. *Medical Service*—Information in regard to medical service expenditures should be given as fully as possible. If the statistics given cover only a part of the cases dealt with under the law, that fact should be made clear.

6. *Permanent Total Disability*—To this group should be assigned every accident, disease or injury which is designated by statute as permanent total disability or which permanently incapacitates the workman from performing any work continuously in any gainful occupation.

7. *Permanent Partial Disability*—To this group should be assigned every accident, disease or injury (less than permanent total disability) which results in the loss of any member of the body or part thereof, or in the permanent impairment of any function of the body.

8. *Accident Frequency Rates per* 1,000 *Full-Time Workers*—Accident frequency rates should be expressed in terms of the number of accidents per 1,000 full-time workers, *i. e.*, workers employed 300 days of ten hours each. The basis used for the average number of men should be the actual number of man-hours for the year; that is, the total working time for all employes of the establishment or the department for the year, reduced to the number of hours required for one man to do the same work. This should be taken from exact records if such records are in existence. If this exact information is not available in this form in the records, then an approximation should be computed by taking the number of men at work (or enrolled) on a certain day of each month in the year and the average of these numbers multiplied by the number of hours worked by the establishment for the year would be the number of man-hours measuring the exposure to risk for the year.

9. *Accident Rates per* $100,000 *of Audited Payroll Exposure*—Accident rates should also be computed on the basis of $100,000 of pay roll. This information should be published for all State funds and for the entire jurisdiction where practicable.

10. *Accident Severity Rates*—Accident severity should be expressed in terms of days lost, computed in accordance with the table and explanations appended hereto (Appendix C). Severity rates should be expressed in terms of days lost per 300-day worker.

11. In computing the duration of temporary disabilities, the day of the accident should be counted as the first day. (See Appendix C, Definition 10, *Monthly Review* of Bureau of Labor Statistics for October, 1917, p. 142.)

RELATIVE ACCIDENT FREQUENCY

Of the foregoing recommendations the most important, at the outset, is the precise determination of relative accident frequency, as to which the large majority of plants follow antiquated and usually more or less untrustworthy methods of statistical practice. The committee is of the

opinion that accident frequency rates, as suggested in the standard definitions, should invariably be "expressed in terms of the number of accidents per 1,000 full-time workers, *i. e.*, workers employed 300 days of ten hours each." This recommendation is in accordance with the practice followed for many years on the continent of Europe, and it is also in conformity to the recommendations of a joint committee of the Permanent International Committee on Social Insurance and the International Institute of Statistics.

It is clearly realized by the committee that the adoption of this method may require modifications in the methods of payroll accounting in the manner that for each and every person employed, and for each and every day of employment, the number of working hours must be accurately known. The most satisfactory practical solution of this suggestion is the adoption of a daily individual time record, such as has been inaugurated at Hog Island by the American International Shipbuilding Corporation, but even without this unusually exact procedure it should not be difficult, in most cases, to determine the number of hours of working time for any given plant and for any given period, but by preference at least on a monthly basis, as has been found entirely feasible and economical in the case of the Otis Elevator Company of Buffalo, N. Y.

The Otis Elevator Company, for illustration, during the year 1917, paid for 1,113,261 hours of labor, which, divided by 3,000, indicates a standard working force of 371 men working 300 days of ten hours each. During 1916 the same company paid for 1,441,567 hours of labor, which, divided by 3,000, gives a standard working force of 480 men. During 1917 the company had 58 tabulatable accidents of all kinds, equivalent to 15.63 per cent of the standard working force, or 156.3 per 1,000. During 1916 there were 169 tabulatable accidents, equivalent to 35.21 per cent or 352.1 per 1,000. Such a comparison is as near to being absolutely trustworthy as is ever likely to be attainable under whatever method of statistical technique that may be followed. The indicated accident reduction is as near to being a positive measure of progress in safety as any such measure can ever be; for no statistical data can ever meet all requirements and serve every purpose or completely indicate every phase of what, under given conditions, may be an extremely complex state of facts. The judgment based upon statistics must always be conservative and with a due regard to a knowledge of the individual facts presented, collected largely as a matter of convenience to meet the needs for a broad generalization. In other words, statistical conclusions are always relative and never absolute. All statistical conclusions are subject to this restriction, which is merely a frank admission of the inherent limitations of all statistical methods or any and every form of statistical analysis.

In view of the foregoing the committee is in entire agreement that, as far as practicable, all accident frequency rates should be on the basis of 1,000 full-time workers, theoretically represented by 3,000 hours of work, derived from actual payroll exposure. The committee, for the time being, refrains from giving final expression to its views on the much more involved question of accident severity rates. Qualified opinion is divided

as to the precise basis of computation, but in the main their views coincide with the conclusions of the committee of the international association.

UNIFORM CONFORMITY TO DEFINITION

The definition of a tabulatable accident, or industrial disease or injury, is in conformity to the judgment of the committee and defined by the words that "All accidents, diseases and injuries arising out of the employment and resulting in death, permanent disability or in the loss of time other than the remainder of the day, shift or turn on which the injury was incurred, should be classified as 'tabulatable accidents, diseases and injuries.'" Unless a uniform definition of a tabulatable accident is followed it is evident that no comparison can be trustworthy, whether interdepartmental, in the case of a given plant, or of one plant or industry with another. To avoid the erroneous use of statistics, therefore, it is suggested, aside from the adoption of and uniform conformity to this definition of a tabulatable accident, etc., as recommended by the committee of the international association, that every industrial accident report published by a given plant or industry should state in a footnote that the tabulation of accidents is in accordance with this standard definition. Thus, for illustration, in the case of the admirable record of accidents for the Otis Elevator Company, it is not possible to state without previous inquiry as to whether the accidents tabulated are in conformity to this limitation or whether there are included minor accidents not involving a loss of working time of more than the remainder of the day, shift or turn on which the accident occurred.

It is, no doubt, advisable to keep a record of each and every injury sustained during the course of an employment, even though not necessarily involving a loss of time. An eye injury, or a slight abrasion, may not involve at the time of occurrence more than a mere temporary indisposition and brief suspension of work, but if not brought to the attention of the foreman for whatever attention may be necessary and made a matter of record, such an injury may subsequently develop into one of serious consequences, and the time factor of occurrence, and the connecting circumstances of the injury itself might no longer be determinable, and prove, therefore, unavailable in the required ascertainment of the causative factors responsible therefor.

The committee, therefore, approves the recommendation of the committee of the international association, that a distinction should be made between reportable accidents and tabulatable accidents, and that the former "should include all tabulatable accidents, diseases and injuries, and all non-tabulatable accidents, diseases and injuries which require any medical expenditure," but would modify this recommendation to read "requiring any medical attendance"—the term "medical" in this sense being construed to include hospital first-aid and nursing service. The term "expenditure" might possibly be misconstrued as merely a matter of financial consideration. The question involved, of course, is not of a money expenditure, but of the medical service rendered and which would be proportionate to the nature and severity of the injury sustained. It is self-evi-

dent that these two classes of accidents require to be clearly differentiated. It is relatively immaterial as to what method is followed with reference to the reporting of minor injuries, but it is of the utmost importance that uniformity should be brought about in the tabulating of all serious industrial accidents and the committee, therefore, cannot too urgently recommend it to the membership of the National Safety Council that the definition of a tabulatable accident, in conformity to the standard definitions of the committee of the international association, should be universally and unconditionally adopted.

Paradoxical as it may seem, there is perhaps no more confusing factor in industrial accident statistics than the precise definition of death for statistical, and particularly, tabulatable purposes. The committee of the international association did not define a death—or, in other words, did not fix a time limit within which a death would have to occur to be recorded as such, instead of being returned under some other statistical definition, such as permanent total disability or permanent partial disability, etc. Practically every death in consequence of an industrial accident is preceded by a given, and widely varying, period of disability, which may range from less than an hour to many years. Cases are on record where deaths have occurred in consequent of specific injuries as long as ten years after the occurrence of the accident itself. This problem has been one of serious concern to the railways. The present rule is to return as fatal, for tabulating purposes, an accident in which the death takes place within twenty-four hours of the day on which the injury was sustained. The committee is of the opinion that since fatal accident rates are much more seriously impaired in comparative value by even minor errors in tabulation than non-fatal accidents, it is of the first importance that a definite rule of procedure be adopted and clearly indicated in the statistical analysis. The committee realizes, of course, that for workmen's compensation and other purposes the record of a serious accident can never be considered closed until death has actually occurred, but the problem of a comparative tabulation is a decidedly practical one. The reports are required to be made on a monthly, quarterly or at least annual basis. A correction of the statistics of former years, or of preceding periods, involves not only a considerable amount of time and labor, but needless confusion. It is, therefore, recommended by the committee that all accidents be considered as non-fatal in which death has not occurred within twenty-eight days of the day on which the injury was sustained. It is, of course, a comparatively easy matter to provide a supplementary record of such deaths as may come to the notice of the official in charge of the statistical tabulation, but it would seem a wrongful effort at theoretical accuracy to correct industrial accident records from time to time on the basis of supplementary information, chiefly as regards deaths, but also as regards permanent total disability. The definition, therefore, might be made to read that all industrial accidents are to be considered as non-fatal, irrespective of the degree of the injury sustained unless the accident terminated fatally within twenty-eight days of the day on which the injury was sustained.

SUMMARY OF RECOMMENDATIONS

The Committee on Uniform Industrial Accident Statistics of the National Safety Council regrets its inability to make final recommendations at the present time concerning all the numerous questions and problems to which it has given serious attention during the year. It is hoped, however, that the following recommendations will meet with the approval of the membership and prove feasible for universal adoption:

1. Every accident or injury, however trivial, should be immediately reported to the foreman, or some other responsible person, in charge of the specific duty of adequately protecting the safety and health of the employes during the time of their employment.

2. Every accident or injury, regardless of the degree of seriousness, should be made a matter of record on a printed form provided for the purpose, but limited to essential personal and related facts necessary for medical, legal and statistical purposes.

3. Since every accident or injury implies the possibility of, subsequently, serious complications, it is held to be most desirable that every such accident or injury, regardless of the degree of initial seriousness, should receive qualified first-aid nursing or hospital attention. The value of industrial accident statistics is in exact proportion to the accuracy of all statements made as matters of fact on the blanks subsequently used for purposes of tabulation and analysis.

4. Only such accidents or injuries should be tabulated for comparative or publicity purposes as involve a loss of working time for more than the remainder of the day, shift or turn on which the injury was incurred. A clear distinction requires to be made, therefore, between reportable accidents, as defined in the first section, and tabulatable accidents, as defined in the fourth.

5. The final record of every tabulatable accident or injury should include a statement of the precise time of occurrence and the exact duration of subsequent incapacity for work. The duration of such incapacity must not be confused with the duration of medical, surgical or other treatment.

6. Accidents or injuries causing permanent partial disability are such as "result in the loss of any member of the body or part thereof or in the permanent impairment of any function of the body" and causing less than permanent total disability as subsequently defined.

7. Accidents or injuries causing permanent total disability are agreed to be such as are "designated by statute as permanent total disability or which permanently incapacitate the workmen from performing any work continuously in any gainful occupation."

8. For statistical purposes, all accidents or injuries are to be considered non-fatal which do not terminate in the death of the injured employe within twenty-eight days of the date on which the injury was sustained. No subsequent correction of the original tabulation requires to be made of non-fatal injuries, as thus defined, which terminate fatally after more than twenty-eight days of the date on which the injury was sustained.

9. All non-fatal industrial accidents should be classified as to (*a*) permanent total disability, (*b*) permanent partial disability, (*c*) temporary total disability and (*d*) temporary partial disability.

10. All industrial accidents or injuries should be classified according to the duration of the time loss or incapacity for work, as (*a*) under seven days, (*b*) seven to thirteen days, (*c*) fourteen to twenty-seven days and (*d*) twenty-eight days and over.

11. All industrial accidents or injuries should be classified as to their causes and the nature of the injury sustained, in conformity to the recommendations of the Committee on Statistics and Compensation Insurance Cost of the International Association of Industrial Accident Boards and Commissions. (A copy of this report is obtainable, free of charge, from the United States Bureau of Labor Statistics, Washington, D. C.)

12. All industrial accident frequency rates should be expressed in terms of the number of accidents per 1,000 full-time workers, *i. e.*, workers employed 300 days of ten hours each. The basis for this calculation is the actual number of man-hours for the year, or for shorter periods of time, such as months, weeks or even days. The number of hours worked "should be taken from exact records, if such records are in existence. If this exact information is not available in this form, then an approximation should be computed by taking the number of men at work (or enrolled) on a certain day of each month in the year and the average of these numbers, multiplied by the number of hours worked by the establishment for the year, would be the number of man-hours measuring the exposure to risk for the year."

13. Industrial accident severity rates "should be expressed in terms of days lost," computed in accordance with a table and technical explanations published in the *Monthly Review* of the United States Bureau of Labor Statistics for October, 1917. Such severity rates are of a very high order of intrinsic usefulness and strongly recommended for practical purposes, at least in connection with the obviously less hazardous industries, which collectively, however, involve a very considerable loss of working time.

14. For the purpose of intensive departmental safety campaign purposes accident frequency rates should be used as a measure of comparative progress. An average accident frequency for the department should first be determined. Such an average should represent, if possible, not less than three years' previous experience. This standard should be represented by 100. Departures from the standard, or a rate above or below the normal, should be conspicuously displayed in the form of a simple graphic presentation, not complicated by more or less misleading comparative lines representing the accident frequency in other departments or industries. In other words, every department should rest its safety efforts upon its own present experience, compared with the past, irrespective of results or achievements in other departments of the same plant or other more or less dissimilar occupations or industries.

All of which is respectfully recommended to the membership of the National Safety Council. DR. F. L. HOFFMAN,

Chairman on Uniform Industrial Accident Statistics, National Safety Council; Third Vice President and Statistician, the Prudential Life Insurance Company of America, Newark, N. J.

St. Louis, Mo., Sept. 16, 1918.

(On motion the report was accepted.)

MR. RICHARDS: I did not hear reference made to accidents occurring to men comparatively new in the service. We ought to have reliable data on that question. Most of us realize a great proportion of our accidents are to men practically new in the service and our statistics ought to show that proportion or ratio. It would be very valuable to all of us.

PRESIDENT VAN SCHAACK: I have no doubt the committee will be very glad to give consideration to the suggestion.

I will ask Mr. A. W. Whitney to report for the Committee on Safety Education in Universities and Technical Schools.

REPORT OF COMMITTEE ON SAFETY EDUCATION IN UNIVERSITIES AND TECHNICAL SCHOOLS

Mr. Chairman and Member of the National Safety Council: Your Committee on the Teaching of Safety in Technical Schools and Universities has gone only far enough to realize that the field is most *important and promising*. Three conferences under the auspices of the committee have been held during the year; first, a conference of the Eastern Universities in New York City on March 2nd; second, a conference of the Western Universities in Chicago on March 20th; each of these resulted in the creation of a committee of the universities to cooperate with the committee of the National Safety Council; third, at the June meeting of the American Society of Mechanical Engineers at Worcester, at the request of our committee, a conference was had on the Introduction of Safety Education into the Engineering Curricula, at which papers were read by Mr. DeBlois of the duPont Company and by Professor Follows of the Carnegie Institute of Technology.

Your Committee prepared a pamphlet primarily for use at that time but also designed for general circulation among the universities, setting forth the need for the movement, containing data with regard to bibliography and exhibits, and suggestions with regard to arrangement of courses, also containing Mr. DeBlois' paper, also containing the names of a hundred men and women who have volunteered to deliver lectures on various aspects of safety as requested by the several universities. Copies of these pamphlets may be had from Mr. Cameron.

Under the direction of Mr. S. J. Williams, your committee is now preparing a Safe Practices pamphlet on the Guarding of University Shops and detailed syllabi of courses introducing the idea of safety as follows: first, two or three lectures as a part of an inspirational course for freshmen on problems of engineering; second, a course of lectures on safety as a part of efficiency in connection with a senior course in industrial management; third, courses on machine design, electric construction and installation and building construction.

These will be followed by syllabi in other fields such as mining, chemical engineering, etc.

Your committee is convinced that this work is as important, as fundamental, as well worth doing and as promising as anything the National Safety Council has undertaken. What we desire to do is to introduce

the idea of conservation and safety into the mind of the young engineer as a part of the concept of efficiency so that his whole future life may be governed by this controlling idea.

We have found a great latent interest among the universities; our correspondence is very large and shows clearly that the field is ready for cultivation.

There are serious difficulties at present, however. The work of the universities has been entirely changed to meet war conditions. We shall be able this year to get work started in a few universities, but most of our work will doubtless have to be in getting everything ready for a big drive at the end of the war. A. W. WHITNEY, CHAIRMAN.

(On motion the report was adopted.)

PRESIDENT VAN SCHAACK: I will ask Mrs. Joseph R. Wilson to report for the Committee on Safety Education in Public Schools.

REPORT OF COMMITTEE ON SAFETY EDUCATION IN THE PUBLIC SCHOOLS

Mr. Chairman and Members of the National Safety Council: During the past year the principal work of the committee has been devoted to laying foundations for teaching safety in schools, also along the lines of arousing interest in safety and accident prevention propaganda in selected groups of schools, urging the membership of the National Safety Council to further, where possible, through Local Councils, the safety cause of the public schools and to keep alive the gospel of the conservation of life and limb. To this end a news letter, suggested by the committee, was sent out by the General Manager to the membership. This letter aroused an earnest spirit of co-operation in various parts of the country, the responses showing a desire to further in a quick and practical manner the introduction of safety and accident prevention teaching in the public schools. The committee believes, with safety experts, that the objective of the whole safety movement must be through the child and the co-operation of the public schools, and in furtherance of such a campaign it is obvious that Local Safety Councils may aid materially by arousing interest in their own home centers and increasing and maintaining their community's faith in the cause. School and home safety bulletins, posters, etc., have been liberally distributed by the National Safety Council in experimental fields and with excellent results. Lectures, motion pictures, safety slides and illustrated talks have been employed to visualize to children and teachers the ways and means of preventing accidents common to the public.

The school board of Erie, Pa., renewed its first year's public school membership and the bulletins have been sent directly to the schools by the management, plus the regular bulletin service.

Brooklyn is still active in school safety work, also the schools of Pittsburgh, under the keen direction of the Western Pennsylvania Safety Council, with its accident prevention program.

FEDERAL INTEREST IN SCHOOL ACTIVITIES

The Federal Bureau of Education at Washington—a member of which serves on our committee—sent out through his department suggestions for safety education to boards of education and superintendents of schools, which doubtless were far reaching in awakening school authorities to the knowledge of how to conduct safety campaigns in schools and communities.

Through our committeeman, Mr. H. H. Wheaton, Director of the Federal Bureau of Immigrant Education, the Safety Council planned, earlier in the year, to distribute school safety bulletins and other literature to school faculties in all of the States, but owing to congestion in the Federal printing department and the high cost of labor the matter fell through. On Aug. 24 Mr. Wheaton left the Division of Immigrant Education to take up work with the Connecticut State Council of Defense at Hartford, Conn.

The Federal Bureau of Vocational Guidance at the present time, however, has plans whereby safety and hygiene will be taught in the secondary trade schools—that is, the Federal government will not give its "grants in aid" unless the State's programs for vocational guidance include safety and hygiene. There seems to be a certainty that this plan will materialize.

PUBLIC AND PRIVATE ENCOURAGEMENT

Mr. H. W. Clapp, a member of our committee and general superintendent of the Columbus Railway, Light and Power Company, is in a position to give vital impetus to the safety cause in the public schools of Columbus, through the medium of the school safety bulletins designed by the company with which he is associated. Bulletins have been provided for every school room, both public and parochial, for the past year, including elementary, intermediate and high school grades and, beginning Oct. 1, plans are under way to continue the service. These bulletins have been widely distributed by the National Safety Council to our several school safety experimental territories and to the membership. Several industrial schools are now using the Council's industrial safety bulletins. Oct. 9 is again to be observed throughout the country as Fire and Accident Prevention Day by all the public schools.

In Philadelphia, in the early part of 1918, Dr. John P. Garber, Superintendent of Schools, made application to the National Safety Council for school safety bulletins for 6,000 classrooms. Ascertaining later that no funds were forthcoming from his board for the purpose, Dr. Garber applied for a donation of bulletins from the Council and was supplied with nine complete sets of home and school safety bulletins for the nine district superintendents of the city, these officials promising that they should constitute a traveling exhibit, passing from school to school. Safety is a part of the public schools' curriculum of Philadelphia, but lack of funds is delaying a systematic presentation of the subject. The National Safety Council also presented the Philadelphia trades schools

with a complete set of industrial bulletins. These were very much appreciated.

The Philadelphia Rapid Transit Company has done excellent work along safety lines in the city public schools and the Philadelphia Electric and United Gas Improvement Companies are also reaching out to meet the needs of public school children. The Pennsylvania Railroad's safety department is active in its efforts to prevent trespass of children along its lines. The teachers whom I have interviewed are appreciative of the work done by the National Safety Council and these companies, but much as they have accomplished they have only scratched the surface—the number of accidents to school children can only be reduced by regular teaching of the subject of accident prevention in the classrooms. The superintendent of the Philadelphia public schools has promised the Chairman of your committee ample opportunity, during the coming year, to address teachers and normal school pupils on safety topics.

The Home and School League, now under new management (an organization made up of nearly sixty branches), has promised through its President to take an active part during the coming year in accident prevention work, and if possible to induce local associations to take out school memberships in the National Safety Council and present them to selected schools.

LESSONS FROM THE ROCHESTER CAMPAIGN

On March 1, 1918, the National Safety Council employed Mr. Julien H. Harvey to manage a public safety campaign at Rochester, N. Y., for six months. The experiment shows, we believe, that we must first arrange with school boards for a definite course of safety instruction before attempting to progress through other channels.

The Rochester campaign took in the high, elementary, grammar and kindergarten grades of the public schools, also including the parochial schools. The campaign was actively prosecuted and included lectures, motion pictures, safety slides, distribution of school bulletins, fire drills, as well as day-by-day instruction in the classrooms. The public display of safety posters in shop windows was a prominent feature in attracting children to study these subjects.

The Chairman of the Committee on Safety Instruction in the Public Schools spent the week of May 13 in Rochester and made addresses in twenty-two classrooms. The schools visited were alert to the topics of safety and accident prevention and the pupils were interested and, where permitted to do so, took an active part in the discussion. In several instances children who had met with accidents causing the loss of an eye, leg or arm, volunteered, for the good of their comrades, to show themselves to the assembly as an example of what carelessness may lead to.

The Rochester campaign revealed much that was interesting and showed the original methods teachers employed in broaching their subjects to pupils, everywhere was displayed enthusiasm and interest and all were anxious to make "Rochester First in Safety First." Great credit

is due Mr. Julien H. Harvey for the success of the campaign. Arrangements have been made for its continuation.

The committee is of the opinion that one of the principal obstacles in the way of regular safety instruction becoming a part of every public school's curriculum is lack of funds and suggests that some plan be devised whereby school and church associations and societies take out school memberships and donate them to selected schools until such time as safety and accident prevention instruction is included in the compulsory education schedule and takes its proper place upon the daily program of all schools, whether public or private.

SUGGESTED ACTIVITIES

The committee suggests that the time is now ripe for the Council's preparation of suitable textbooks for use in the public schools, to supplement the home and school safety bulletins, posters, "Sure Pop" and other available literature. Such textbooks must have all subjects correctly classified, be clear in contact with accident prevention topics, simple in language, wise in the use of statistics and figures of comparison and vital and interesting in presentation. Illustration must play a strong part, while crudities of action or expression, such as are common to the human being when surprised or shocked by real or near accidents, must be so modified or eliminated that the children will not acquire or actually be taught to use questionable or violent expletives.

The committee also recommends that the one-hour-a-week in school safety instruction be divided as follows: Fifteen minutes, public assembly with a safety lecturer, moving picture slides and posters, or an open discussion of a selected accident and its prevention. Fifteen minutes, class rehearsal of topic discussed at public assembly or written essays on same subject. Fifteen minutes, written lessons on selected safety bulletins displayed especially for the occasion. Fifteen minutes on home safety, taken from home safety bulletins, the children being encouraged to collect clippings from newspaper accounts of accidents to children and parents or relatives, in the home, street or place of employment. All work in classrooms to be recorded and marked for proficiency the same as other branches of study.

The committee also suggests community safety meetings once every three months, to be held at the schools in the evenings, to which parents and friends are invited and in which they are encouraged to participate. Reports to the General Manager from various parts of the country and letters to the committee reveal that many devoted safety men are at work endeavoring to solve the difficulties of the public school safety problems. Respectfully submitted,

MRS. JOSEPH WILSON, Chairman.
H. H. WHEATON,
Specialist in Immigration, Federal Bureau, Washington, D. C.
H. W. CLAPP,
General Superintendent, Columbus Railway, Light and Power Company.

St. Louis, Mo., Sept. 16, 1918.

(On motion the report was adopted.)

PRESIDENT VAN SCHAACK: I will ask Chairman C. M. Talbert to report for the Committee on Public Safety.

REPORT OF COMMITTEE ON PUBLIC SAFETY

MR. C. M. TALBERT: Owing to the lateness of the hour I desire to omit the formal report of the Committee on Public Safety work. I wish to invite all delegates interested in any phase of public safety work to attend the meetings of the Section and to assist in outlining our future campaign. Excellent work has been accomplished during the year. Through the financial support of the National Council we have established a system of public safety bulletins and while they are somewhat limited in number they have been sufficient to start the work. The Council also published a pamphlet on suggested methods for conducting public safety campaigns, copies of which will be distributed to those interested. The complete report of the Rochester campaign, a volume of 115 pages, contains in detail what has been done, the methods followed and results obtained. A limited number of copies are available and will be distributed to delegates attending the Sectional meetings. Features connected with public safety will be considered—we are anxious to bring them to the attention of other cities interested in public safety campaigns. We have something of interest for every delegate attending the convention and we desire to present to you some of our plans and to profit by your advice. We want to get your ideas and learn what has been done in your town.

It is somewhat difficult to arouse interest in public safety work. We are often forced to depend upon the initiative of the members of the Council both to start and maintain the work. Every delegate is interested in the prevention of public accidents and we hope to make our meetings the most interesting features of the convention. On the part of your committee and the officers of the Public Safety Section I wish to extend an invitation to attend and take part in our meetings.

(On motion the report was adopted.)

PRESIDENT VAN SCHAACK: The reports of officers of Local Councils will be presented in printed form in the proceedings of this Congress, so I will take the liberty of passing that order of business.

SECRETARY CAMERON: A large clock has been placed on the front of the hotel and on it the local committee will register the number of accidents happening each day this week—the record started yesterday. On the corresponding date of 1917 there were 55 accidents and 10 deaths in St. Louis. Yesterday there were only 25 accidents and 3 deaths. At 1 o'clock each day the registration will be noted.

PRESIDENT VAN SCHAACK: We will now hear the report of the Nominating Committee. Mr. C. B. Hardin, Chairman of the Committee, is one of the men to whom you are principally indebted for the splendid arrangements for this convention.

REPORT OF NOMINATING COMMITTEE

CHICAGO, August 19, 1918.

To the Members of the National Safety Council: As provided by Section 14 of Article III of the By-Laws of the National Safety Council, I present to you herewith the report of the Nominating Committee for the election of Directors whose terms of office expire Oct. 14, 1918. Your attention is called to the privilege of members of the Council, as specified in the same Section and Article referred to, viz., "not less than ten members may, in writing, make their nominations for successors to Directors whose term of office shall expire in that year, upon filing the same, in writing, with the Secretary of the Council at least thirty days prior to the date of the holding of the Annual Meeting."

W. H. CAMERON,
General Manager.

ST. LOUIS, July 13, 1918.

Mr. W. H. Cameron, General Manager, National Safety Council, Chicago, Ill.: Dear Sir—In accordance with your instructions we, the Nominating Committee, appointed by the President of the National Safety Council, with the approval of the Executive Committee, and as provided for by Section 8 of Article VI of the By-Laws of the Council, and as further provided by Section 9 of Article VI of the By-Laws, present herewith the report of nominations for successors to the Directors whose terms of office expire on October 14, 1918, and also to fill vacancies of four Directors, elected to serve until 1919, and one until 1920, who have since resigned from the Board of Directors.

The following list has been unanimously approved by the committee and is herewith submitted.

NOMINATED TO SUCCEED THOSE DIRECTORS WHOSE TERMS OF OFFICE EXPIRE OCT 14, 1918

Lieut.-Col. C. B. Connor, American Red Cross, Washington, D. C.

Marcus A. Dow, General Safety Agent, New York Central Lines, New York City.

Geo. T. Fonda, Superintendent, Bureau of Labor and Safety, Bethlehem Steel Company, Bethlehem, Pa.

H. W. Forster, General Manager, Independence Bureau, Philadelphia, Pa.

C. H. Hansen, Managing Director, Pennsylvania Mutual Liability Association, Huntington, Pa.

Van H. Manning, United States Bureau of Mines, Washington, D. C.

J. A. Robertson, Manager, Camera Works, Eastman Kodak Company, Rochester, N. Y.

A. H. Young, Manager, Industrial Relations, International Harvester Company, Chicago, Ill.

Robert J. Young, Manager, Department of Safety and Relief, Illinois Steel Company, Chicago, Ill.

C. W. Goodale, Chairman, Bureau of Safety, Anaconda Copper Mining Company, Butte, Mont.

I. V. Kepner, Safety Supervisor, Pennsylvania Salt Company, Philadelphia, Pa.

John J. Eagan, President American Cast Iron Pipe Company, Atlanta, Ga.

A. E. Davidson, President, Chesebro, Whitman Company, New York City.

J. W. Ensign, General Manager, American Car and Foundry Company, Huntington, W. Va.

Harry S. Moody, General Superintendent, Bausch & Lomb Company, Rochester, N. Y.

E. H. Fiesinger, Safety Engineer, Semet-Solvay Company, Syracuse, N. Y.

I. H. Colton, General Superintendent, Pacific Portland Cement Company, San Francisco, Cal.

Dr. L. A. Shoudy, Chief Surgeon, Bethlehem Steel Company, Bethlehem, Pa.

G. E. Williamson, Chief Engineer, Strathmore Paper Company, Mittineague, Mass.

C. M. Talbert, Superintendent, Department of Streets and Sewers, St. Louis, Mo.

T. G. Toomey, Wm. Filene's Sons Company, Boston, Mass.

C. B. Auel, Director of Standards, Processes and Materials, Westinghouse Electric and Manufacturing Company, Pittsburgh, Pa.

Carleton Macy, President, Queensborough Gas and Electric Company, Far Rockaway, N. Y.

R. M. Little, Director, American Museum of Safety, New York City.

George P. Hambrecht, Chairman, Industrial Commission of Wisconsin, Madison, Wis.

NOMINATED TO SUCCEED FOUR DIRECTORS ELECTED TO SERVE UNTIL ANNUAL MEETING, 1919

E. R. Curtin, President, The Lima Natural Gas Company, Lima, Ohio.

Miss Lillian Erskine, Investigator of Occupational Diseases, New Jersey Department of Labor, Trenton, N. J.

John T. Stone, President, Maryland Casualty Company, Baltimore, Md.

H. W. Belnap, Manager, Bureau of Safety, United States Railroad Administration, Washington, D. C.

NOMINATED TO SUCCEED ONE DIRECTOR ELECTED TO SERVE UNTIL ANNUAL MEETING, 1920

Dr. E. B. Rosa, United States Bureau of Standards, Washington, D. C.

Very respectfully yours,

E. S. Raymond, The Travelers Insurance Company, Dime Bank Building, Detroit, Mich.

Jas. F. Conner, The United Gas Improvement Company, Philadelphia, Pa.

John W. Higgins, Worcester Pressed Steel Company, Worcester, Mass.

T. W. Stingley, Bethlehem Steel Company, Sparrow's Point, Md.

C. B. HAMPTON, United Railways Company, St. Louis, Mo., Chairman, Nominating Committee.

(On motion the report was adopted.)

PRESIDENT VAN SCHAACK: No members' ticket having been nominated and as there has been nominated just enough men to take the place of those Directors whose terms are expiring this year and to fill other vacancies occurring in the Board, I suggest, in order to facilitate the transaction of our business, that it would be in order to instruct the Secretary to cast one ballot for the candidates named, for the terms for which they have been nominated.

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

PRESIDENT VAN SCHAACK: The inspectors of election, who are serving as tellers, will now report the result of the vote.

MR. W. N. FITCH: We report 1,359 votes cast in favor of and none against the gentlemen named.

PRESIDENT VAN SCHAACK: It gives me pleasure to announce that the gentlemen nominated have been unanimously elected to serve as Directors of the National Safety Council.

Our next item is the disposition of unfinished business. There being none, we will proceed to new business.

NEW BUSINESS

MR. RICHARDS: It is a great pleasure to all of us to meet again and to see so many familiar faces, and yet, when we look over this audience and remember the friends that were at our last Congress but are not with us today—some having given their lives on the battlefields of France—it is proper and, I believe, in order to offer a resolution expressing our grief and sympathy. I would like to submit the following resolution:

Whereas, Since our last Congress

HARRY A. BULLOCK and
ROBERT BRINTON HILL

honored members of the National Safety Council, have given their lives in order that the freedom and liberty established by the founders of this Republic shall be preserved for time everlasting: that our wives and mothers, our daughters and sweethearts shall be safe from outrage and cruelty; that children shall be protected from mutilation and that old and young shall not be deported and enslaved; that our property shall not be wantonly destroyed and that travel on the seas shall be safe and free to all the world: it is

Therefore, Fitting that the members of the National Safety Council, in Congress assembled, should express to the families of the members of the Council who have died for us and the great cause for which we are waging war, our sympathy in the irreparable loss that has come to them in the death of our fellow members, and our hope that the great God above us, who twenty centuries ago gave his only begotten Son to save the world from sin and iniquity, just as the fathers and mothers of

America, and the fathers and mothers of France, England, Italy and our other allies, are giving their sons, and sometimes an only son, so that all the world shall be free, may give them courage to bear their affliction; therefore, be it

Resolved, That we express to all the members of the Council who have joined the colors our undivided and collective thanks for the sacrifices they are making for our country and the hope that this terible war may soon result in a complete and overwhelming defeat of our enemies, who are also the enemies of justice, freedom, and truth, and we do each of us hereby renew the pledge of our lives, our property and our sacred honor to support them in fighting the battle for us: and be it further

Resolved, That these resolutions be spread upon the records of this Congress and a copy be sent to the families of those of our members who have given their lives to the cause.

(The resolution, after being amended to include the names of other members of the Council who have given their lives to the great cause, was unanimously adopted by a rising vote.)

There being no further business the meeting adjourned.

Our Duty to Others

Accident prevention is a great humanitarian problem in which each one of us has a part to play. By realizing the gravity of the problem and doing everything in our power to bring about changed conditions, an enormous amount of good can be accomplished. We should realize quite thoroughly our duties to others, for only in this way can the best results be obtained. In all should be that spirit of "live and let live." No man has the right, through careless or thoughtless action on his part, to jeopardize the life of another. In our actions as pedestrians, as drivers of vehicles, at work and in the home we should be constantly on the alert, not only in regard to our safety but also in regard to the safety of others. We should be so concerned with the future welfare of our children that we should leave no stone unturned to inculcate into their minds the necessity of careful habits. Our own good example should accomplish much in this direction.

General Session

St. Louis, Mo.

Sept. 16, 1918

PRESIDENT DAVID VAN SCHAACK, Presiding Officer

MONDAY AFTERNOON SESSION

THE meeting was called to order by Mr. David Van Schaack, President of the National Safety Council, at 2:30 o'clock.

PRESIDENT VAN SCHAACK: The meeting will please come to order. It is an established axiom that no matter how much success a man may have been able to achieve in life, the minute he reaches the point where he becomes satisfied his usefulness is ended. his influence gone. I think we may well consider ourselves in that position today. Notwithstanding the speakers of national reputation who will address you. we regret very much that other men prominent in the Nation's affairs could not accept our invitation to be here. For the purpose of making an explanation of the reasons why some of these men could not be present, and also because the program of this session is designed to excite the interest of executives as well as those more immediately concerned with safety matters, it seems to me very appropriate that I should ask a man who is known throughout the country, both as an executive and as a safety man, to preside over this meeting. It is unnecessary for me to introduce to a national meeting, let alone one held in the City of St. Louis, our good friend, Mr. Clarence H. Howard.

(Mr. Clarence H. Howard, President of the Commonwealth Steel Company, St. Louis, in the chair. At this point an original dramatic playlet, written and copyrighted [1918] by Mr. Oscar Dane of St. Louis, was presented. Permission to publish or produce the playlet, in part or whole, together with stage directions, may be procured from the National Safety Council.)

"THE GRIM REAPER."

(*Bell tolls*, GRIM REAPER appears in midst of audience, unannounced.)

REAPER: Welcome to our annual conclave. (*Bell.*)
Hear the constant tolling of our bell.
What pleasant thought its monody compels. (*Bell.*)

Hear the groaning of the bell,
Tolling the doom of the millions—
Aye, and will forever toll. (*Bell.*)
Ye have crowned me king.
Autocrat of all I survey.
My abject slaves . . . All
Blindly stumbling towards my dark abyss.
Your mothers, brothers, aye, you yourselves,
Soon must come to my realm.
Nor wealth, nor glory,
Can stay thy doom.
The flower-decked grave, the tearful eye,
But dimly veil my omnipotence. (*Bell.*)
(*Exultingly*) Ring out ye bells,
And let every stroke proclaim to the world
Its ignorance. (*Bell.*)
Ring out ye bells, and let every reverberation
Flaunt back to the boastful world
Its shame of tolerance. (*Bell.*)
And let your melodious dirge o'erthrow its chaotic
Jangling, false ambitions, delays,—
Aye, its sins. (*Reaper exits.*) (*Bell.*)

REAPER (*Enters with report*): Hold! A report I wish to render
From the blood-soaked fields of Europe:
We have gleaned nine million deaths
And many million serious injuries. (*Bell.*)
Is it not glorious? Now an important amendment.
The woman in industry. (*Pause.*)
No one discerns my sinister grasp, hovering over her,
To clutch at will, dragging her down to thralldom. (*Subdued laugh.*)
(*Bell.*)
Harken, to our never-ceasing paeans. (*Bell.*)
Welcome, thrice welcome, this year of 1918.
The past industrial harvest has indeed been a glorious one—
The toilers, the children, aye, the mothers of children.
Our New York conclave last year was naught in comparison.
There and then you boastfully recited the record of how
You had deprived me of my harvest;
There and then, flushed with pride, you made glowing
Speeches extolling what you had accomplished
Humiliated was I, but silent.
There and then you proclaimed the many toilers
Who had escaped my scythe;
The toilers whom you had armed to combat my prowess.
Chagrined was I, to be apparently so thwarted
By mere mortal men,
But this year, here and now, I COME INTO MY OWN.

Last year you confidently spoke of what you purposed to do,
And in the meantime, stealthily, I reaped the grand harvest
Of SIXTY THOUSAND DEATHS and ONE AND ONE-HALF MILLION ACCIDENTS
Think of it! Go on, lay your plans,
Still unheeding that "the best laid schemes of mice and men
Gang aft a-gley." (*Subdued laugh.*) (*Bell.*)
And now I must bid you adieu.
Next year will I come e'en with a greater report. Adieu.
All is most propitious,
Our subtle pitfalls are now well laid,
Naught can thwart me.
Mortal man is impotent,
His antique laws, decaying and weak.
And e'en the Great Jehovah on high is powerless,
And weeps for his children. (*Subdued laugh.*)
The world is doomed,
Who, who can stop me now?

SPIRIT: (*Appears*) I will.

REAPER: You, who are you?

SPIRIT: My name? At creation's dawn the simple herdsmen called me Brotherly Love,
Through the dark ages, the martyrs' blood e'en was shed that I might live, and smilingly with their last breath they whispered the hope of the oppressed, Christianity.
Here and now it matters little, my name.

REAPER: Words, words, empty words. Your name?

SPIRIT: I am the personification of Love, Truth and Justice!

REAPER: Disciple of evil, your name.

SPIRIT: (*Throws off mantle*) UNIVERSAL SAFETY! And with today's setting sun, we swear to baffle you, Grim Reaper.

REAPER: And with tomorrow's rising sun,
Ye are all one day nearer to your graves.
My dark chasm is built and paved with such good intentions.

SPIRIT: They were. But henceforth we shall *live* our belief.
THINK IT. BREATHE IT. TEACH IT. So that after us the good work will go on.

REAPER: You will surely FAIL.

SPIRIT: In the bright lexicon of UNIVERSAL SAFETY which 1918 has reserved for brilliant fulfillment, THERE IS NO SUCH WORD AS FAIL.

REAPER: Bombast—why, with these my ministers, my dupes, my helpers, will I ——

SPIRIT: These? What have they done for you, Grim Reaper?

REAPER: Not what they HAVE done, but what they have NOT done.

SPIRIT: The sins of omission.

REAPER: Aye, the sins of omission.

SPIRIT: Forty-five thousand of God's creatures—

REAPER: One and one-half million and forty-five thousand! I struck them down.

Now they wander aimlessly in my dark cavern.
The blooming bud, the full-bloom flower,
The sere and yellow,
I gather them all.

SPIRIT: Nay, we saved one and one-half million. These were not struck down. These were but accidents.

REAPER: Accidents! (*Laughs*) The blind! The maimed! The lost and crippled limb! The shattered nerve! The emaciated countenance! The palsied hand! The distorted mind! Living deaths. *I claim them all.*

What boots it whether a gear, a shaft, molten metal, a deadly wire, an open switch, mistakes,—
THEY ALL FILL GRAVES.
The tears of the widow and orphan attest my imperialism.

SPIRIT: Nay, new aid is pledged here.
And our hopes now blossom anew.

REAPER: Your aids will fail anew.
My true and tried destroyers are invincible—
CARELESSNESS, THOUGHTLESSNESS, RECKLESSNESS, IGNORANCE!

SPIRIT: And I have but one aid—UNIVERSAL SAFETY. And as the most acceptable service to God is doing good to man, I call on you, my helpers here and now, to place your left hand over your heart—so—and with hand uplifted—so—repeat after me:

"Our Father who art in heaven,
Vouchsafe and preserve us,
That we may promulgate to mankind
Thy message of universal safety;
That we may safeguard and protect
Our mothers, brothers, children,
From untimely death, accident, and disease.
Give us life and strength to preserve mankind,
Created in Thy image and likeness,
Unto all generations.
For ours is the happiness,
And Thine is the glory."

Nay, nay, keep thine hands uplifted. See, Death, defeated, sneaks away. Nay, hands still uplifted promise never to forget thy vow, keeping it like unto a frontlet between thine eyes. See, see, stalks away the Grim Reaper, dejected, baffled. Thus we vanquish untimely *death* and win the *victory*. Thus, you shall save the world.

And now march on to happiness and victory. (*Exit*)

ADDRESS BY CHAIRMAN

CHAIRMAN HOWARD: It is a distinct honor and pleasure to preside over a gathering of this kind—a national convention of men who have devoted their services to the cause of safety in industry. The work of the

National Safety Council can be measured by its efforts to make life safer and more worth living in our shops and mines and factories and as the work of the year is presented and the record of accomplishment is unfolded I am sure the value of the organization will take on added interest in the eyes of the people of this city and the entire country.

A few days ago I called my good friend Mr. Bush on the telephone and asked him to represent our city in welcoming the Seventh Annual Safety Congress to the City of St. Louis. Knowing he stands firmly for safety and human engineering and for all things that are beneficial to all men, I requested him, even at that late hour, to be present and help us open this session in a manner befitting the occasion. Mr. Bush replied that it would be a pleasant duty but added: "I hardly see how I can spare the time—I am crowded to the limit." I knew that before I asked him, but you know it is the men who are busiest that have to do these things. I have never called upon him to do a really important thing that he has not responded, and I knew I could rely upon him for this occasion. That is why he is so universally loved and respected—he stands for the best thought and effort in every movement to assist his fellow men; he is always ready and always on the job. He has proved it by coming here today in spite of his late invitation and his multiplicity of important duties. I have known him twenty-five years and never found him wanting—that is why we do not think of him as the "Hon. Mr. Bush" but just as "Ben Bush." When you can call a man by his first name you know he is a good fellow and that you can depend on him. I am very happy to have him here although he warned me "I will not have time to prepare a thing." I replied "Just one of your good old encouraging smiles is all that is necessary." He is leaving today for Chicago so I must cut my introduction short. I take the greatest pleasure in introducing Mr. Benjamin F. Bush.

ADDRESS OF WELCOME

Mr. B. F. Bush (Regional Director, United States Railroad Administration, St. Louis, Mo.): *Mr. Chairman, Ladies and Gentlemen:* It gives me peculiar pleasure to welcome to St. Louis—the commercial capital of the great Southwest—the 1918 convention of the National Safety Council. All good ideas are infectious, and the safety idea which, in 1914, had just become national, is now international. I do not refer simply to the fact that safety work has been organized in England and is today being organized in Japan. I am thinking of the statement—for which we have high authority—that this war is being fought to make the world safe for democracy. This is Safety First raised to its highest power. As a nation we have suddenly waked up to the fact that we cannot afford to have the international political machinery, by which the world is governed, unsafe for Belgium or Serbia, no matter how secure we may be ourselves. This simply means that the lords and rulers of this world have taken up the idea which you gentlemen first embodied in a working organization about a decade ago and are applying it on a world-wide

scale. As I understand the principles of the Safety First movement, it holds that there is no amount of reconstruction necessary to safeguard life and limb which is not warranted by the outcome, and the underlying idea beneath this war is worth its price, even though that price has to be measured in billions of money and millions of lives.

The immediate relation to the winning of the war of the safety movement, which, as embodied in your organization, has altered for the better the working conditions of 6,000,000 American employes, is too clear to require extended comment. Victory at bottom turns on manpower, for, given sufficient manpower, the necessary railroads, ships, food, fuel and munitions follow—Safety First is simply a matter of manpower conservation. The improved practice that cuts down the number of minor injuries in a great machine shop, and in so doing makes a saving of thousands of working hours in the course of a year, definitely helps toward winning the war. Casualties in the shop and casualties on the battlefield are one and the same in their relation to the available strength necessary to win the war. An improved saw guard may be as useful as an improved shrapnel helmet. Better methods of railway signaling have the same kind of value that better methods of trench construction have. It gives me pleasure, as a railroad man, to greet the representatives of a movement which has helped in safeguarding lives and property on the great railroads of this country. The organization of safety work by American railroads has been assisted in substantial ways by your co-operation and the results speak for themselves. One great western railroad—the Santa Fe—has a record of eighty-two consecutive days during the present year without the killing of a single employe, and the meaning of this is clearer if you bear in mind the fact that 90 per cent of the people injured on railroads are railroad men.

Important as are your aims, gentlemen, and valuable as is the work accomplished through the National Safety Council in the saving of life and the prevention of injury, it would be a very partial review of your work which stopped with the enumeration of these immediate and very obvious benefits. All large employers of labor and thousands of their employes as well realize that the sweep of your work goes far beyond this. Since only 30 per cent of accidents result from dangerous or faulty appliances, 70 per cent of the safety work must be done with and through the men themselves. It means the substitution of good methods for bad ones and to make this substitution there must be both an analysis of the essentials of good work and a correct moral attitude toward good work. The meaning of such an attitude, not only to American industry but to the whole structure of our social life, goes beyond analysis. Administered on a scale commensurate with its real meaning and importance, safety work means better personal relations between wageworkers and employers, better service rendered to society by industry. Perhaps it is not too much to hope that among the ultimate results of such work may be found a more antiseptic variety of politics and the elimination of waste and extravagance from the business methods of city, State and Nation.

St. Louis is glad to have you as its guests. This community is in sympathy with the ideas that bring you here. Safety work is well organized in many of our plants and on the railroads of the Southwest—we have obtained results which we shall take pride in putting before you. There are a few plants still in condition to serve as horrible examples, but their number grows less and less. We trust that your work may be facilitated by the atmosphere of community sympathy. This town has done its share of pioneering in the realm of American business. The achievements of the Safety First movement on the scale which has characterized them would have been impossible without the facilities afforded by the American forms of organization of large corporations. The first chartered commercial corporation in the United States was organized here. The first system of schedule rating in the history of fire insurance—a safety measure of the first importance—was accomplished here, over an area including the spot where you are now meeting.

The freedom of the city is yours.

CHAIRMAN HOWARD: Let's give him a real good "thank you," boys, for his kindness in coming here and for his excellent address. (Applause.)

While a definite program has been arranged, with the consent of the gentlemen on the program, we will ask Judge Lindsey of Denver to tell us some of the things we'd like to hear—things that will stimulate us in our safety efforts. I know something of his work among men and boys and the good he is doing. This is my first opportunity of meeting him, but I feel that I have known him always. I know you will join with me in welcoming him and I take great pleasure in presenting a man you all know and love—Judge Lindsey.

ADDRESS BY HON. BEN B. LINDSEY

HON. BEN B. LINDSEY (Denver, Colo.): *Mr. Chairman, Ladies and Gentlemen*—I am just going through the country on a hop-skip-and-jump since I returned from France last month, speaking for the governmental activities that we sometimes call the spiritual and moral side of war—the War Camp Community Service—that is doing for the boys in the cities what the Y. M. C. A. is doing in the front lines and the camps, and the Y. W. C. A., Knights of Columbus, the Jewish Welfare, the American Library Association, and, last but not least, the great Salvation Army.

Right after the battle of Seichepray, in France, we came down the road from the heights of Beaumont and stopped in a little French village. Down in a cellar and away from the drizzle of the rain outside stood a group of doughboys around the Salvation ladies, as they call them, and between munchings of doughnuts they said: "We had to scrap with the Salvation ladies at the village back there because they wanted to stay until the end. They feed us up and they don't preach to us and when they do all of this for us how in h—— can a fellow keep from being good." (Applause and laughter.)

I cannot do more than hasten over the six months I have been in

Europe with those blessed boys. I landed with them in England, 20,000 strong, last January and left them at Chateau Thierry in July and there is so much to say that one hardly knows where to begin and where to end. It is only the courtesies of the moment that force me to start with my experiences in those dark days when Russia had gone to pieces and released 2,000,000 men, to be thrown against the British at the Somme—the one objective of the Germans, the channel ports—and then the peace that they looked for, that we would be forced to make. As Marshal Joffre said to me at his house, where we had the honor to go as his guests: "What will America do if they get the channel ports or Paris, either one of which may force us to an inconclusive peace?"

THE CALL TO AMERICA

Back of broken Soissons, that sweet little French town, that makes you almost weep to see all the havoc wrought there and all that has been done by the barbarism of the Huns—so much of it unnecessary to have ever been done: back of Soissons one evening with one of the French Generals, almost with the S. O. S. call on his lips, as I heard it everywhere in France: "When are the Americans coming?" I said: "But General, I believe we will have a million and a half at Christmas time, from what I have heard at general headquarters." He said: "Monsieur, 500,000 Americans here now, in the summer, are worth more than 10,000,000 at Christmas time. This is the dark hour—the crisis in the war. Civilization is in the balance. We know what you have done; we deeply appreciate it. We know the fighting spirit and quality of your men. It is that we need—fighting Americans."

I knew, because I had seen it with my own eyes, the preparations we had made, 1,000 miles of railroad lines—some of the best that has ever been built—along the lines of communication, that we might have the preparation necessary to hold our boys when they once got there, so that there would never be a retreat. But, Oh! how anxious they were. We went down through the Champagne country, along the Aisne. We saw on the roads thousands of Frenchmen marching to the Somme—everywhere going to the Somme—and into the town of Rheims we came, and Oh! what a graveyard it is. An old man in the cathedral pointed out the long streams of lead melted down from the beautiful windows by the fire set by the Germans. The Hun wouldn't even spare that, and, seeing what they were doing, set it all on fire, and the lead was melting into what he called the tears of France. And the big shells had fallen even that day—one came through the roof. The statue of Joan was outside and I had the great honor to help some of the soldiers take down the statue of Jeanne d'Arc, to be saved for civilization. (Applause.)

THE VISION THAT CAME TRUE

I had been to the village of Domremy, the home of Jeanne d'Arc, and in the little church there where she was baptized, and looked in the closet where she kept her little things: where the old women tell stories of her life. And they have still the vision of Jeanne d'Arc. "We saw

them coming through the clouds, we feel she must be hovering about. We saw the solid phalanx of marching men coming," they would say. "We knew, somehow, they would come to save France, and one beautiful morning, monsieur, in the sunlight of France, we heard the music in the road and singing down there on the hillside and around the bend there came the marching men, and the banner that preceded them was the Stars and Stripes." (Applause.)

Our boys marched all along those lines, the tramp, tramp of thousands of marching men, the Americans on to Lorraine, where I had been with the boys, to look down over the Boche trenches and see the smoke of the city of Metz. The old woman with the vision of Jeanne d'Arc said: "That was our vision come true and the spirit of Jeanne d'Arc was leading them on to save the world!" We have not forgotten what we owe to our allies. Victory would have been possible without them, but victory was made certain by America's coming to this war in the dark days of that early springtime. (Applause.)

We went to Verdun in the last days of May, to live there in the citadel. I have been with the boys in the front line trenches, in the machine gun pits and back to see the grand combat above between the French and German airplanes. It was a great privilege for a civilian to witness. Coming back with an old Colonel, he stopped at the cemetery, where, beneath a little grave was buried all his hopes. The Captain said: "It was his son—to me like a brother, monsieur: for three days and nights, on the slopes of Douaumont, under the rain of steel, we crawled, from shell crater to crater and never made but sixty feet, and how any living thing survived I do not know. He went West and I to the hospital." The Colonel lost all that was dear to him in the world, his only son, and he can never pass without shedding a tear for the boy that died for France. And I thought, after all, it was the spirit of all the fathers. Harry Lauder was just ahead of us on another part of the time. Harry Lauder was singing to the boys as he never sang before, though his heart was sad. Only the day before, Captain Jack Lauder, his son, was to be married in the castle he bought on the great estate in Scotland, he went down to death. Harry Lauder stumbled into the cemetery where that boy was buried and stood suddenly before his grave. He threw himself upon the ground and thrust his hands into the sod above that grave, as though he was taking it to his heart, and lifting his face to the sky he said: "Oh, God, if I could ask of You one thing, it would be to lift up my boy, that I might look into his face for one little minute and tell him how proud I am that he did what he did—that he died for his country—and how proud I am that I had such a son to give to my country." And, said my friend who witnessed it that was all. Harry sighed, and then down the line he went. I thought he could never sing again, but never, never have I heard Harry Lauder sing as he sang to the boys under the stars that night.

"THEY SHALL NOT PASS"

We had been through all the portals of the citadel of Verdun, to see, in

letters of fire, that slogan of France, *"They Shall Not Pass!"* and pass they never did. (Applause.) I saw the signs of it as I looked across the graves in that living hell between the bloody hillside of Douaumont and the shell-blasted hills where 100,000 Frenchmen lie buried in one grave, to attest their valor to the slogan that shall never die. Above their graves we saw the blood-red poppies growing in great red splotches. Six million marched up that Liberty road to Douaumont and Vaux, above Verdun, where the cause of humanity and civilization was saved.

Just after we came down the River Aisne and to Chateau Thierry it seemed the very earth opened for the sheeted flame that leaped to the skies as there came the rolling thunder down the line. It was the Boche at last. They had broken through between Soissons and Rheims. Of the 8,000 devoted Frenchmen we had seen there a few days before, and loved to know almost as friends, now 7,000 lay dead. Even the French soldiers, brave and valorous as they were, were ordered to retreat and we had to leave Chateau Thierry. One of the boys said afterward: "Judge, it seemed the world was coming to an end. Everything was going back to Paris." Germany was reaching the high tide of its hopes and was almost within sight of the beloved city. Even the men in the hospital had to get up and walk.

"THE YANKS ARE COMING"

The automobile we had been in a short time before was blown to pieces and we were footing it as best we could, stumbling time and time again and finally rolling into a ditch, when suddenly I heard, coming up that road, the strains of music—the sweetest that ever came to my ears—"The Yanks Are Coming, the Yanks Are Coming." (Applause.) I rose up to my full height, forgetting all the dangers that rolled above, to see the Americans, the 10,000 marines, that came to close up the gap and save the world. (Applause.)

A few days afterwards I saw one of the commanders that had been at the headquarters of General Duscheyne, when the fate of the world trembled in the balance, and he said: "I don't know whether there were 10,000 or 100,000 Americans at that time, but they saved Paris, they saved France, they saved the world—the Americans." (Applause.)

It made up for any mistakes we ever made for it was the turn of the balance in all this war. Germany had reached high tide, and now, held by the Americans in that hour, they were, as you know, shoved back and back and back. Those boys had held the lines until reinforcements came up. One of them said to me: "The Germans rode in on horseback; they were not able to bring up their artillery, they came so fast. One of our officers said: 'Boys, in case of doubt, there is only one thing for the marines to do and that is to go forward and give them hell.'" That is what they did. (Applause.)

THE SPIRIT OF FIGHTING MEN

I entered the hospital a few days afterwards, and there lay our broken boys, most of them, 50 per cent or 60 per cent of the casualties

were among the marines. Everywhere they were crowded into the cots. everywhere the surgeons were working overtime for days and nights. without sleep or rest, but Oh! how wonderful was the spirit of those boys. All those sacrifices without complaint. Miss Nation, one of our American nurses there said: "You must come to the Denver ward and see the baby of the regiment. The other night he thought he was 'going West' and he put his arms around my neck and said: 'I lied.' I said: 'What did you lie about?' 'I swore I was 18 when I was only 17.' I said 'Thank God for liars like that.'" (Applause.) I remembered a little boy in my own court, who swore he was 14, when he was only 13, to get a working certificate to go to work, and when I questioned him he said: "Judge, don't you think when a kid's mother dies she ought to have a gravestone? My mother died within the year and she was so poor that when I went out to find her grave the shingle that had marked the resting place was gone and the cemetery man helped me find her, and he said: 'You will lose your mother.' Mr. Green, the marble man, said it would cost $25 to put one up. I only had $5. He said I could pay it down and if the balance wasn't paid by a certain time they would take it away and I'd lose her. And the time passed so quickly I had to go to work to get the money. If you let me work another week it will all be paid and I will never stay out of school any more." I loved that boy because he lied. and I knew that was the reason he too was in France fighting for his country. (Applause.) I told that little marine that story and how proud I was of him. He had been in the band, for he was the bugler, and as the boys went forward the boy next to him was using his rifle and fell—"and," he said, "the next thing I knew I had that rifle in my hand and was shooting hell out of the Huns." (Applause.) He turned his pale face to the light of the day and over it flitted a smile, as though he appreciated the humor of his conclusion. "This here war ain't no musician's job. (Laughter.) It is a fighting man's job, and whether musicians or what they are they are fighting men."

We had lunch and the colored boys served it. They stood there grinning as a military train came up loaded with Algerian troops and one of them said: "Judge, they ain't like us at all; we all is Americans, but 'fore God them niggers ain't nothing but Africans." And we all in this great war are Americans and anything less than 100 per cent American is treason. (Applause.)

THE BOMBARDMENT OF PARIS

Now, my friends, in conclusion just let me say this: I have had something to do with children. That took me to England, where they were working on children's laws that I had the privilege of taking part in. But, just come with me, and I will only keep you a minute now, to the church of S——— where the Big Bertha shell struck on that day in Paris. Our friend who had been there said, "That hideous thing hit the roof and then came the shrieks of men, women and children. and presently I looked on the floor to find little Paul Du Prey pinned down under the wreckage with the blood gushing from his mouth. His mother

grabbed him in her arms and rushed to the little side altar and began to pray as few mothers ever pray, for she had given two boys to her country and this was the last. But it was no use. Presently he raised straight up and the fire came into his eyes and his voice was heard above the tumult and confusion. He threw his arms about his mother's neck and shouted 'Don't you cry, mama, I die for France!' and he fell cold in death, in his mother's arms. And, oh, monsieur, he was only one of the little boys and girls who died that day for France."

There is only one answer to all this hideous hell of the Hun and that is the everlasting defeat of Germany and a peace signed under the victorious banners of the Allies at Potsdam or Berlin. (Applause.)

THE NATIONAL GOVERNMENT INTERESTED IN SAFETY

CHAIRMAN HOWARD: We owe Judge Lindsey many, many thanks for his magnificent and inspiring address. We are delighted to have him with us, and very grateful for his coming. Mr. Morey wishes to make an announcement.

MR. ARTHUR T. MOREY: Official Washington is behind the safety movement and the Seventh Safety Congress, because it is helping to win the war by preventing accidents, by cutting down the terrible waste of preventable injuries. Secretary Redfield was in St. Louis recently and gave us a splendid talk on safety matters. His administration is behind the movement, because the spirit of it is the spirit of America—the spirit of winning the war. Mr. McAdoo is keenly interested, because of the conservation of manpower on the railroads. Secretary Lane is heart and soul behind the safety movement. I mention the interest of these gentlemen in our work because one or two of our friends thought we should not hold our Safety Congresses during war times. But when we explained that our efforts were directed toward stopping waste of manpower and helping to win the war they saw the movement in its true light. Secretary Lane was so interested that he wanted to attend the Congress. President Wilson wanted to come and he would be here if it could have been arranged. We arranged a big mass meeting for Secretary Lane but we have received word that he will be unable to be present. The mass-meeting arranged for tonight has been called off and in its place we will have a reception and dance, an opportunity to get together and become better acquainted.

CHAIRMAN HOWARD: We have letters of regrets from Secretaries Lane and McAdoo. Before proceeding with our program these letters will be read.

DEPARTMENT OF THE INTERIOR

Sept. 19, 1918.—National Safety Congress, Mr. Clarence H. Howard: Your motto, Safety First, has been adopted by the American Nation. The President put it into his famous saying that this war was to make the world safe for democracy. America cannot be safe so long as there is a power on earth that is organized to master mankind by force. We are fighting in France to make Germany and her allies know that conscience

must limit force; that the world is not to be ruled by the strongest man or the strongest nation; that Christian civilization means that strong arms must be held in restraint by noble hearts. When the Kaiser and junkers realize this we shall have won our victory, but they must prove to us that they realize it by more than words. The same principle must go into the business and social life of the world. In the new day that is coming we are to put a curb upon every exercise of arbitrary or unrestrained power. The manufacturer, the banker and the shopkeeper, the railroad, the farmer, the workingman and the politician all alike are to adopt a philosophy which this Nation is fighting for in this war, which is this: That no man can do as he pleases because he has the strength or the opportunity. Your work of making occupations safe and working places safe and highways safe is an expression of the right principle. We are to live together a long time on this continent and the sooner w adjust ourselves to each other the better, and the basis of adjustm fair play.

I hope that your convention will give its endorsement to our the Americanization of those of foreign birth upon our soil who understand America, and if you are in the mood to give a word c to the boys at the front you probably could make them glad by en our plan to make is possible for every soldier on his return to be an opportunity to make a farm for himself upon the unused lands country.

Safety First, as I interpret it, means "Make America safe for being just to all."

FRANKLIN K. L.

FROM SECRETARY McADOO.

WHITE SULPHUR SPRINGS, W. VA., Sept. 16, 1918. Mr. Clarence H. Howard: Please convey the following message to National Safety Council Congress: "Conservation of the lives and health of our people an imperative national necessity. To arouse leaders of all industries and to awaken all workers to this necessity is a work of vital importance. The old maxim, 'The safety of the people is the highest law,' has new importance in these days of human wastage. Never before have enlightened men so realized the world importance of safeguarding in a higher degree than before the broad interests of human beings and the right of all, even the humblest, to live in freedom and security, not only from oppression but also from injury resulting from controllable causes. Your organized influence and your vigorous work for the protection of the lives and the safety of economic workers has the complete endorsement of all far-seeing people. Today manpower means so much to the safety of the Nation that the conservation of the health and the promotion of safety, not only of the workers on our railroads but in all industries, stands as a patriotic duty as well as an economic necessity. Effective accident prevention work on all railroads under Federal control is, therefore, one of the most important activities of the United States Railroad Administration. Please be assured of my earnest interest and sympathy in the important work you are doing and of my best wishes for a fruitful outcome of your deliberations."

CHAIRMAN HOWARD: The next speaker is a good old friend and I am sure his paper will interest every one present. Introductory remarks are unnecessary, and I take pleasure in calling upon Mr. H. W. Forster, who will now address the Congress.

SAFETY AND WARFARE

H. W. FORSTER, GENERAL MANAGER, INDEPENDENCE, BUREAU, PHILADELPHIA, PA.

Mr. Chairman, Ladies and Gentlemen: Before America entered the great war we had learned of the stupendous internal changes brought about in the nations engaged in a modern war. We knew, when it was evident that we must throw our weight into the balance against the arch foe of democracy, that unprecedented changes were due to take place in American home life and industry. We foresaw and we have since seen the withdrawal of great numbers of able-bodied men—to date approximately three million—from industries which never needed them as now. Their places have had to be taken by inexperienced workers, and inexperienced workers are a serious accident liability. We have seen the entrance of women into new fields of endeavor, and we feared the accident and health menaces of new and of heavier work. We have seen new processes, whole new industries in fact, created, many of them of a chemical nature and accompanied by accident and industrial disease dangers of a serious character. We have seen industries speeded up to the point where past records of plant construction and of production seemed almost insignificant, and we knew what effect speed has on the accident totals. We have seen congestion on our lines of transportation as never before, and congestion and accident go hand in hand.

Is it any wonder, then, that men who love the safety cause frankly feared that executives working under great pressure would find it impossible to back the safety movement, as they must do if it is to be successful; that, with increasingly high labor turnover, new kinds of work and speed of production so definitely before them, the workers would lose interest in accident prevention; that plant organizations, faced with material and labor scarcities, would be unable effectively to look after upkeep and safeguarding which are essential if good accident prevention is to follow?

Is it any wonder that men who have given years of their lives to advancing the safety movement feared that the house they had so laboriously and so lovingly helped build might crumble under the shock of a world war—"that we might be too busy winning the war to bother with safety."

WAR INDUSTRIES HAVE MADE GOOD ACCIDENT RECORDS

Such were the fears. What has actually happened? The new and inherently hazardous industries have taken their toll of our workers. A nation cannot suddenly become a great producer of powder, high explosives, and shells without the loss of a considerable number of lives. But

by good operating practices and by the use of all available safeguards the life loss and the injuries have been held down to a very moderate total, when the number of workers concerned is taken into account, and the safety of these industries is steadily being increased.

In the old and normally hazardous industries it has been a common occurrence for accidents to increase, for a time at least, until extraordinary safety efforts could be made to meet the extraordinary conditions brought about by the war. But, generally speaking, accident prevention has stood the test of the war in splendid style. It has been a revelation to see how firm a hold accident prevention has taken in the past five years; how it is woven into the warp and woof of our industrial life; how, under stress and strain, it has not been allowed to fall by the wayside; how the prospect of new information and of renewed inspiration has drawn to this convention great numbers of busy representatives of extraordinarily busy organizations.

Let me develop for you, if you will, the status of safety under war conditions and of safety in warfare.

It has been cheering for us to observe that, with few exceptions, our industrial plants and transportation organizations have not let their safety work suffer appreciably since the outbreak of the war. They were furthering safety before the war because they knew it paid in every sense of the word, and, although they found it harder to maintain records and to create new ones than in the years prior to the war, they have kept up the good work.

More cheering than this is the fact that when these organizations were called upon to make the unprecedented expansions in plants and working forces, they held firmly to the principles of safety. They used the new buildings and equipment that were being made available as an opportunity to do things in accident prevention which the older plants had not made possible.

SAFETY IN NEW CONSTRUCTION

Even more cheering is the prominence which safety has achieved in the new war industries, where the need of speed has been such a factor that nothing could be allowed to delay the building program. These industries all have safety departments as a part of their operating forces, and most of them have had good accident prevention judgment applied to the plans of their plants. I know of a gigantic plant, now nearing completion in record time, on which over twenty thousand men were engaged in construction, where safety engineering principles were applied to the first pencil sketch of the first building, and in which every structural feature, every piece of equipment, and every operating practice came in for minute consideration from the point of view of safety. This plant, which will have over one million square feet under roof, bids fair to achieve that triple accident prevention ideal: Ample head room, ample clearances, and ready accessibility of all portions. This unusual attention to accident-prevention will not delay the completion of this great plant., because the safety engineers were given an opportunity to work with the designing engineers and were not, as is often the case, invited in after the plans

were made and the material ordered. The cost of securing the maximum of safety will be moderate, and what has been done will expedite production when the plant is completed as well as safeguard the workers.

Consider our shipbuilding industry. In this branch of national endeavor, where world records for speed of production are being made, systematic accident prevention is a part of the program. The first rough organization outline of the Hog Island shipyard—a project that for size and speed falls in the Panama Canal class—included a division of accident prevention as one of ten main divisions.

With the assistance of the National Safety Council, the United States government, since the outbreak of the war, has put effective accident prevention into its arsenals and navy yards.

The government-controlled railroads are more vigorously than ever before putting forward the cause of safety.

Ladies and gentlemen, a consideration of what old established industries, new war plants, and the government are doing in accident prevention at the present time, indicates clearly that American industry is not too busy winning the war to bother with safety.

SAFETY IN THE FIGHTING ARMY

We have seen that safety is a vital factor in our industrial life under war conditions.

The winning of the war requires two great armies: The fighting army and the industrial army.

Does safety have any place in the fighting branch of the service?

If war is viewed as a business then the parallel between accident prevention, as conducted by our most advanced industries and as practiced in our army is remarkable.

In the first place, the army subjects all entrants to a careful physical examination, in order that the seriously defective and the objectionable may be eliminated. So does modern industry.

The army places in positions where they can be useful those not up to the physical standard set for the fighting man. So industry places the sub-standard man where he can do useful duty and where he will not suffer harm.

TRAINING THE BACKBONE OF EFFICIENCY

Training is the backbone of military efficiency. Our military authorities through intensive training, are transforming ordinary men into extraordinary soldiers. Training is the backbone of industrial efficiency. Our progressive industries, through careful training, make extraordinarily efficient workers out of ordinary men and women.

The army throws effective and extensive safeguards around our soldiers as regards water, food, sanitation, communicable diseases, the use of alcohol. Modern industry does exactly the same thing.

Safety devices are as much a part of modern warfare as of modern industry. The gas mask is to the army what the respirator is to the gassy or dusty plant. The "tin hat" is to the soldier what the legging

is to the foundryman. The dugout is a safeguard quite as much as the shelter provided for the quarryman to safeguard him against blast.

Safe practices are as essential to the success and safety of the army as to the efficiency and safety of workers in industry. It has been found necessary in the army to work out the best, easiest, and safest method of doing things and to train the soldiers in safe practices, exactly as we are training our workers in the plants committed to effective accident prevention. The chance-taker in the army faces death needlessly, just as he does in the industrial plant.

The morale of an army, that belief in a cause, pride in an organization, and willingness to fight to the death if need be, finds a parallel in the *esprit de corps* which well-conducted industrial plants have created. Teamwork wins battles and teamwork produces unprecedented plant output.

A sense of responsibility on the part of the executive is essential in both the fighting and the industrial army. The general staff that plans battles to get the maximum results with the minimum of life jeopardy is analogous to the plant staff that plans to conduct new operations with the minimum of accident risk. The Captain's solicitous care of his men is the military form of the safety-imbued foreman's jealous care of his men.

EVERY OFFICER IN OUR ARMY IS A SAFETY ENGINEER

No enterprise can be conducted without accidents, no matter how extensive and effective the safeguarding measures may be. The risks run by the man who goes forth to battle for his country on the fields of Flanders exceeds that which his brother runs even in our most hazardous industries, but our army has the principles of safety so thoroughly in mind and has so vigorously and generously applied them that the business of fighting is by no means as dangerous as would appear to be the case at first glance. What is true of our army is also true of the other great armies, friend and foe alike. Would that safety ideas were as eagerly sought and as rapidly adopted in industry as in the army. In the army every officer is a safety engineer, every private a safety committee member in active standing.

Our army is not too busy winning the war to bother with safety. It would have no chance to be an important factor in the final victory, of which we are so certain, were it not committed vigorously to the application of safety principles as far as is consistent with the work in hand. A consideration of the importance that safety plays in our fighting army should be an inspiration to our industrial army in its accident prevention work.

Some executives, working under great pressure and feeling accident prevention to be a refinement that could well be put aside temporarily, have argued that with the world organized to slay and maim it was futile to devote time, energy, and money to accident prevention at home. Let us consider briefly also this rather plausible objection.

It has been approximately fifteen months since the first United States troops went overseas. Their numbers have now swelled to upwards of one

and one half million men—an inspiring total, one that already is a factor on the western front and a credit to American efficiency and enterprise. This army has seen a very considerable amount of active service, has successfully resisted a great drive on Paris, has fought in the open, denied the shelter of protecting trenches. The casualty figures to date are approximately ten thousand killed in battle and in accidents.

ACCIDENT TOLL IN AMERICA

Now, during these past fifteen months, while our army has lost *ten thousand* men, America has lost through accidents, here in the presumably safe home country, approximately seventy-five thousand men, women, and children—seven and one-half times as many. Furthermore, while the American expeditionary forces have had approximately *seventeen thousand* men more or less seriously wounded in these same fifteen months we have suffered here at home something like five hundred thousand serious accidents, many of which have crippled men and women for life.

Next year, with more men in France and with fighting throughout the year, our military losses will far exceed those to date, but our industrial, public, and home accidents will remain a large percentage of our military losses.

The lives lost and the injuries suffered by our soldiers and sailors are their contribution to the most splendid cause ever espoused by a nation. The lives lost and the injuries suffered at home, almost without exception, are offered up, not on the altar of patriotic sacrifice, but on the altar of ignorance and carelessness and criminal disregard of the sacredness of life. The sacrifices we are making on the seas and in Europe guarantee an era in which the sacredness of human life and liberty and justice will be recognized as never before; the accidents we are suffering at home add nothing to human advancement. The one is worthy of the finest traditions of the human race; the other is a blot on our intelligence and our Christianity.

I do not want to leave this subject of the parallel between accident prevention in the fighting army and in the industrial army without saying a word regarding the credit which commonly belongs and which, on an increasing scale, will belong to the industrial soldier. Modern war, based as it is on engineering and chemistry, requires that an unprecedented proportion of the available man and women power be placed in the industrial army. Service in the industrial army is largely devoid of glamour, of ability to see the direct results of effort, of the stimulus that comes from effective co-operation, but driving rivets into a hull is just as important as feeding a machine gun with bullets; building a gun carriage is as essential as firing the gun on the battle line; digging coal as vital as tunneling in No Man's land. Is not the farmer who raises food comparable to the man in the quartermaster's department who handles the food at home and abroad; is not the man who puts the engines into a ship, serving quite as well as the engineer officer who drives the ship across the ocean; is not the mechanic who assembles a locomotive as much a

patriot as he who runs it over the railroads of France and Belgium; is not the worker who is steadily on the job, putting his best efforts into his work, serving exactly in the same spirit as the soldier who does cheerfully and well the work required of him? And when it comes to facing death, I see no difference in the sacrificial spirit of the men who fight a fire that jeopardizes a plant making high explosives and those who sail the wintry seas, seeking to blast with those same explosives out of the deep the outlawed submarine.

Gradually the American workman is realizing the importance and the dignity of his position and gradually the public is losing the feeling that an able-bodied man not in uniform is of necessity failing to back up his country to the best of his ability. I am glad that there are being developed and that there will soon be put into effect methods of designating essential industrial services and of showing faithful performance of duty, to the end that proper recognition may be given our industrial soldiers and that increased stimulus may be put on production.

AMERICA'S PART IN WINNING THE WAR

Before we entered the war, one of the allied generals is reported to have said that the side which could put the last half-million men into the field would win the war. Now that a preponderance of man-power and of supplies has been brought about by our joining the allies, we are beginning to hear how great was the danger of Germany winning the war. What stupendous advantages to Germany in territory, in political domination, in indemnities, in sources of raw materials, and in manufacturing opportunities would have resulted from such a victory has been made clear to the American people.

Had Germany won, the victory would have been by a narrow margin of man-power and of industrial superiority, and I venture to state that the systematic accident prevention that our foe has practiced in the last quarter of a century would have won the war for him. There is little doubt that Germany at the beginning of the war had approximately a million more effective men and women for her army and her industries than she would have had had she pursued the same reckless, unchecked accident-producing course of our own nation.

The victory that was almost within the grasp of Germany—a victory which, to a considerable extent, would have been made possible because of her systematic accident prevention—shall never be hers. With increasing speed, efficiency, and consecration to a great cause our nation is throwing men and materials into the balance against the common foe of democracy. We are not going to furnish the last five hundred thousand men: we are going to furnish the three million or five million men that will prove to the world—forever, we hope—that might does not make right, but right might.

The war will be won by our side, but the war is not yet won. Every nerve must be strained by the members of our two great armies; the fighting army and the industrial army. Every man and woman must do his and her part. That part cannot be played by the citizen who is put out of the fight by accident.

Of all the great conservation movements upon which our nation has embarked to win the war, the conservation of life and limb is the greatest. Let us then, with renewed vigor and with renewed spirit of consecration, support the safety movement, for by so doing we will render a not inconsiderable aid to the greatest safety ideal yet conceived, an ideal toward which a large portion of the world is struggling—the making of the world safe for democracy.

CHAIRMAN HOWARD: The next speaker is one of our own townsmen. He has done a wonderful work here and he stands before us as an example of everything that is good. He is president of the Ad Club and it is my great pleasure to introduce our friend, Mr. John Ring, Jr.

NATIONALIZING THE SAFETY IDEA

MR. JOHN RING, JR., PRESIDENT, ADVERTISING CLUB OF ST. LOUIS

Mr. Chairman and Members of the National Safety Council: Pioneer work has been carried on in every phase of our Nation's growth. The great country of the West, that is now one of the largest factors in producing grain for the feeding of our allies, was not so many years ago a wild forest, which had to be cut and the land cultivated. The pioneers were the men who suffered the hardships and penalties for the work which was to follow. After a time home sites began to appear and the next link in the chain was the delivery of the United States mail by stage coach. Later came the railroads, bringing about a greater degree of closer communication. Following this the newspaper and magazine came, bringing the outside world to the rural districts. And now, in this day and age, the automobile is doing the latest chapter in the pioneer's work. The airplane may be the next step.

I think the nation's growth can, in a degree, parallel safety work in nationalizing the idea. You started out in your association with few members and scattered Local Councils. As your educational work goes along and the pioneers in the field extend their work, new Local Councils will be created, with a consequent greater national membership. I think this is the principle upon which the nationalizing of the safety idea is to be built. I am not going to argue anything from the premise of the value of the safety work. That would be wholly unnecessary to an audience of this kind.

You have today forty-seven Local Councils in as many cities, with a total membership of 3,600. If you could increase this to 150 Local Councils, with a membership of 10,000, over three times what you have today, it would give the scope of your work far greater impetus and, of course, the purpose for your existence would be increased many fold as a result of this enlargement. I feel that an educational plan must be worked out to lay the foundation for nationalizing your work. Assume, for argument's sake, that you will create a committee whose duty it will be to work with your Field Secretary to create Local Safety Councils in 100 additional cities. Assume also that they have prepared the proper plan of procedure by supplying a standardized set of by-laws and all other details that would go to create organizations of this kind, so that the

men taking on this work in each new city would have what I might call "ready-to-wear" service to undertake in these new communities. After 100 to 150 Councils of this kind were created you would be strong enough to carry on a national campaign to bring into your fold all of the business interests of America that should have a part in your program of saving manpower and to impress every man and woman in this Nation with a realization of what this movement means to them. In its great broad sense the safety idea applies to the American citizen at large as well as to the man in an industrial plant. Had there been publicity of Germany's war aims in the years previous to the war, of her military policies and the plans that the Kaiser and his world-dominators were laying, there would have been no war, or, if a war, a very short one, because other nations would, through publicity, have been made aware of the danger. A lack of publicity has cost many, many lives. I think this is so obvious that it does not need any argument.

PLANNING A NATIONAL CAMPAIGN

If the nations of this world today who are battling "over there" for their lives, for your existence and mine, had realized what Germany was about and known it, through publicity, they would have prepared and this war woulld never have gotten to its present stage.

Publicity of the purposes that your National Safety Council serves will bring into your organizations many manufacturers whose loss through the decrease of efficiency of their men could be materially lessened if the propaganda of the Safety Council, through national publicity, were to reach them in a clear, forceful and compelling way.

Now for a definite suggestion as to how this nationalizing can be carried out after the creation of Local Councils in 100 to 150 of the largest cities of the country. If this national campaign were carried on, without having the Local Councils, it would simply be as though the National Biscuit Company advertised their crackers throughout the nation and did not have dealers to market them in the various communities where they advertised. If the National Biscuit Company went into this city, for instance, using our local papers and did not have the goods on sale through jobbers and distributors it would simply be waste. The same thing applies to safety. If you went into a national campaign to advertise safety, you would have to have local organizations. Now, as to the funds to accomplish this—if 10,000 members were assessed say an average of $10 each, it would give you $100,000 to nationalize your safety work. There are probably men in this room who think this a large figure, and when I say $10 average, there are a great many corporations in your membership, and a great many outside of it, that could well afford to pay many times that amount. This $100,000 would give you a fund with which to nationalize the safety idea on a scale commensurate with the results you should obtain. Some men may doubt the possibility of accomplishing this nation-wide movement, yet the Associated Advertising Clubs have 150 clubs in their organization, 95 per cent of which are in this country. That is an organization of fourteen years' growth and today that organization is able to carry on anything it undertakes in a

national way as, for example, when they created committees in each local club to co-operate with the government in Liberty Loan, Red Cross, the Food and Fuel campaigns. By having the right type of men and organizations created to work to a given purpose from one end of the country to the other they can do these things, practically calling them into work over night. Your organization can do the same. There may be men who will not agree with these views so I am going to give you a few thoughts that may enable them to see the light, with the hope that they may then help in trying to nationalize the safety idea.

ADVERTISING AND PUBLICITY

Employ a paid Secretary in each city, if at all possible to do so. In larger communities at least, do this by all means. We know you cannot get men to volunteer their services and put in the amount of time necessary. They cannot do it and insure you successful results. For that reason, therefore, it is absolutely essential, in a movement of this kind, to have a paid Secretary in cities where you have sufficient members to justify it.

Deal with an advertising agency of standing and reputation, one that has produced results for others in national advertising. If you go into magazines and newspapers throughout the Nation, after organizing Local Councils, let your plans be prepared by men experienced in the national advertising field. You would not go to a plumber for a suit of clothes, therefore, you should not go to an advertising concern without a record behind it. Let them discuss your problems and outline to you what they think is best. Right here I might say, don't confuse publicity with advertising. I dare say there are a great many people in this room who do not make a distinction. Publicity is the news of a newspaper. You can't pay for it—you can't buy it. Advertising is the space that you pay for and which you fill with your own message. This morning's papers had an account of your national meeting here. It was a news item—that is publicity. Beside it was an advertisement of Uneeda Biscuits, that is advertising; they bought a certain amount of space and filled it with their own message. Advertising is the space that you pay for and which you fill with your own copy, and in your own language. A good publicity agent is essential in your national advertising campaign and the publicity and advertising should work together. There will be many things arise in connection with your advertising that are good publicity stories and you will need a publicity agent to "put those things over to the public." Don't expect miracles in your national advertising. Your educational work can be carried on and should be carried on and your advertising will work with it. People don't graduate from school in six months and your national advertising will not produce a 100 per cent public following in six months. You cannot nationalize anything without public favor, and the quickest way to get public favor is through paid advertising. Great public service corporations are using advertising today that a few years ago would have scoffed at the idea. They are buying the space and telling their complete message to the public in that way.

TELL THE STORY BY MEANS OF ILLUSTRATIONS

National clipping service on news pertinent to safety work should be conducted. Where evils are mentioned that should be corrected by local legislation or an enforcement of local laws, the national headquarters should have your local committees follow up such cases. Your publicity agent should provide pictures for the pictorial section of daily papers—a medium now possible to get into with the right kind of material. The pictorial page idea, I think, was started by Mr. Curtis, owner of the *Saturday Evening Post* and two daily papers in Philadelphia. The idea has gone the Nation over and it offers great opportunity for acquainting the people with what they now should know. A good publicity agent can see that safety propaganda reaches the public through the pictorial section of the daily papers.

The session you are opening today is your most important annual meeting. I believe this. I think that every delegate ought to be saturated with that thought. In Europe the most necessary thing, and yet the thing least valued, is a man, because the whole purpose over there is to kill men. This makes the burden of your work greater than under normal conditions. Your purpose is to save men. I think there is a great need for safety ideas in every community. The government is advocating conservation in many, many ways, and certainly the most vital of all is the conservation of manpower. I think when the reconstruction period comes —and we can all look forward to it, it is coming one of these days— it will be vital that the men of this country be at their best. The industries should be at their best, and how better can you insure this than by having safety devices and the safety idea made known nationally? "Over there" liberty has been bought by the sacrifice of men: over here the lives of men are being saved by protecting them for great national needs. There is no greater work that your organization could undertake than to have Local Councils created in these many cities I speak of, after which carry out a national advertising plan. It is useless to go into what this plan might constitute. You want to reach the man who employs labor, you want to reach both the laborer, and the employer, but this is not the time to go into a discussion of what are the best mediums to use. An advertising agency can give you all these facts.

I hope the safety idea grows nationally and I want to thank you for the opportunity given me of placing these thoughts before you. I hope they may prove of some practical value.

CHAIRMAN HOWARD: We always hold the best to the last. Major Darlington has had a good deal of difficulty in getting here, being very busy in the service of the government. He was formerly with the American Iron and Steel Institute and I am sure he has something you all want to hear.

THE ECONOMIC VALUE OF HEALTH OF INDUSTRIAL EMPLOYES

DR. THOMAS DARLINGTON, AMERICAN IRON AND STEEL INSTITUTE, NEW YORK CITY

Mr. Chairman and Members of the National Safety Council: When I look over this magnificent audience, all interested in but one thing—the welfare of their fellow-human beings—I feel like exclaiming with Shakespeare's Miranda:

* * * O, wonder!
How many goodly creatures are there here!
How beauteous mankind is! O brave new world.
That has such people in't!

It is a wonderful thing to be here and to have an audience of this kind and I am very grateful to those who have invited me here, for while it is always a privilege to talk to one's fellow human beings, it is a great privilege to have an opportunity to talk to an audience of this kind. There is one thing, that has impressed me since I have been among you, and I rather like the quality. Perhaps it is best illustrated with a little story: You know, how on Fifth avenue, in New York, the automobiles go up one side and down the other, one following another. There was a great big limousine ahead and a little machine right behind. At Thirty-seventh street the policeman pulled the semaphore—"STOP!" The big machine stopped, the little machine crashed into the back of it. They are not allowed to make immediate arrest, so the policeman pulled out a summons and started to fill it in. "What is your name?" he asked. "Casey." "What is the first name?" "Patrick." "American citizen?" "Yes, sir." "Born in this country?" "No sir." "Where were you born?" "Ireland." "What part of Ireland were you born in?" "Limerick." "Are you one of the Casey's of Limerick? Now you hold your machine right here, don't move from this spot 'til I go up and see what that big mutt meant by backing down into ye's."

SAFETY WORK ONLY BEGUN

You have impressed me as clannish; and I must confess that I like it. But we haven't time to tell stories. I have so much that I would like to say to you, that I want to show to you. You know that the job that you have is important—one of the most important in the world—to meet certain conditions in the future, but I don't believe today you realize fully what you stand for, or realize what is coming in the future. We have only just commenced to scratch the ground in safety. We have hardly begun it. Prevention of accidents has gone a long ways, but that is a small thing compared to what you can do and the part that, in my opinion, you are to play in the future.

My subject is the economy of the whole thing. It is easy to figure it in some lines. Take the question of the prevention of accidents, you can put it in dollars and cents in those states where you have a compensation law. You know what it is worth if a man's finger is cut off, or

his leg, the length of time he is away and what you have to pay for it. You can put it into dollars and cents—that is so far as the industry is concerned. We have gone a long way in the care of the man in industry. When I first entered this work in 1910, as a consultant for the United States Steel Company, after having been on the board of health in New York, in some places 50 per cent of the injuries in industry became septic wounds and men were off for a long time. Fifty per cent—500 out of a thousand. Today, go to the Youngstown Sheet and Tube, the Carnegie, the Cambria (that is the Midvale now), you find it is only one out of a thousand, or one-tenth of 1 per cent, and if you go to Bethlehem, where the clinics are under the control of one of your officers, Dr. Shoudy, you will find that it is almost infinitesimal: in four years, out of thousands of accidents, he has only had two cases. A perfectly wonderful record. And you can put that into dollars and cents. But how little all that is compared with what can be done along other lines which you scarcely realize.

I want to begin my address with an axiom: Efficiency depends on health. One man may say it one way and another in another way. Some say that efficiency depends upon a man's psychology. Yes, but what does his psychology depend upon? Doesn't it depend upon the flow of blood to the brain? If your liver is out of order you see things with a green and yellow hue, like the color of bile. Your attitude in life depends largely upon your health. The man who is in perfect health gets up on a sunshiny day and feels it is good to live—he wants to work; but the man who has been sick and is anemic does not. Can we put that into dollars and cents? Yes. But it is not so easy.

I want to repeat the axiom: Efficiency depends on health. Let us keep that before us all the time. Upon what does health depend? *First*, upon what a person can do for himself. The man in industry, what can he do for himself? His health depends largely on the care he takes of his body—this wonderful, beautiful human machine. *Second*, on the care taken of him by those who control the industry for his time is not his own. In the army the man is controlled in his habits by his officers, but in an industry, no. And the *third* proposition is what can be done by cities, by states, and by the national government in the making and enforcing of laws. Of that we will not talk today, but I want to touch upon some of the other things. How does good health make dollars in industry? *First*, it lessens fatigue. A great many books have been written on fatigue, especially by socialists, who would make us believe it is a curse to work. That we will consider a few minutes later. The question is how can we avoid getting tired? A man who is not tired can get out twice the product of the man who is tired. What makes us tired? Is it work? Not necessarily. To understand the question of fatigue you have to know something about the human body, and I will take a moment to explain a few things in physiology. We have a complicated body, but at the same time it is very simple. We are chemical engines. I bring up my arm (illustrating by raising arm). What have I done? This muscle has contracted and it pulled the arm up. How did it do it? I used up certain energy. The muscle contains energy. Mind you, all

energy comes from something—something is used up. In the body there is a constant breaking-down process and building-up process—in medicine we call those things metabolism. Every cell of the body and every portion of the body is in motion all the time.

A LIVING ORGANISM

When any part of the body stops motion it is dead. It is in constant motion. What was this energy we used? It was "$C_6 H_{12} O_6$." What is that? Sugar. Our muscles contain sugar. What happens to it? I make that motion. All right, what has become of the sugar? It becomes $2(C_3 H_6 O_3)$. What is that? Lactic acid. Each atom of sugar in the muscle splits up into two atoms of lactic acid. This again splits up and it finally becomes H_2O and CO_2. These pass out through the kidneys and the skin and the breath.

Let us consider the production of energy under a boiler, the simplest case. We say we want to get up heat. We put coal under the boiler. Does not the amount of steam you are going to get up depend on the character of coal first of all? Suppose the coal is full of slate, you do not get up very much steam; but suppose you have Pocahontas coal, it is all right, provided you have the draft. If it does not have the draft it does not burn. And when you have it all burning you have to pull out the ashes. That is the human body. We work on the food we eat. It is burned by the oxygen that is carried by the red material in the blood, and we get the ashes and waste which come in the muscles and body. We have first the food which you eat. Does the workman always eat the right kind of food? Is the luncheon that he brings something that is going to put sugar in his muscles? I opened 250 buckets at the Carnegie steel mills to see what kind of food they contained. One man had a whole head of cabbage. How much energy did it contain? If you do not eat the right kind of food and the food does not digest you get tired. That is the first thing about fatigue. Does the food assimilate? Is it digestible? Has it germs from the teeth in it, so that it ferments? Has it been properly masticated? Has it already fermented, as sour bread in the bucket or sour coffee? A healthy man has, we will say, 5,000,000 blood count under the microscope, and plenty of oxygen is carried to the tissues to burn the food. But some people have only 2,000,000 or 3,000,000 blood count, because they have been sick or because they have had tonsilitis or cold in the head, or from sleeping in badly ventilated rooms, or living in unhygienic surroundings, or have lacked movement of the bowels. These things make him have poor blood and he doesn't carry sufficient oxygen to the tissues and he is tired often after the first hour of work.

WASTES OF THE BODY MAKE PEOPLE TIRED

Don't tell me that fatigue comes simply from work. If a person has not the food, and the oxygen to burn it then they cannot work. Another thing: If they do not get rid of toxins from the muscles and the waste products from the bowels they are fatigued from that cause also. There is nothing in welfare work that cannot be put into dollars and cents.

I said that once before the Iron and Steel Institute and one of the men said to me: "How can you put a movement of the bowels into dollars and cents?" It is the easiest thing in the world. What is it worth? If there is fermentation in the intestinal tract, due to bacteria, poisons are made and absorbed into the system. We call it autointoxication. If indol is absorbed into the body, let me show you what happens. We have a little stand, like this, and here is a long arm coming over to make a record and here is a short arm. (Illustrating on black board.) We take the muscle out of the back of a frog's leg, it is called the gastrocnemius. We put the muscle in here and when we stimulate it electrically with an interrupted current it contracts intermittently. We will take one muscle and inject a little salt and water into it and we will take the record of that muscle and this is what we find: That we will get these marks (illustrating on blackboard by drawing a number of perpendicular lines). That is the record. Now we take the other muscle and put in place of it the least little bit of indol from the bowels, found with most everybody. Indol is often absorbed when a person does not have the proper movement. What happens? Here is the record that we get (illustrating on board by drawing a fewer number of perpendicular lines than in the previous illustration). It cuts off in a little more than one-third of the time. That is the lifting power. Now, then, a man goes to work, who, because he has not had the proper facilities, or did not have the time to have a proper movement, what happens? This man, we will say, has a wage of $3.30; but the man who didn't have a movement of his bowels is worth $1.20. That is exactly what he is worth, and that is all he lifts and does in a day. That is one of the most difficult things there is to put into dollars and cents. I want to keep that one thing before you. Remember this: That the waste of the body makes people tired. I know of nothing that makes people so tired as to retain the waste in the body. When you hear someone talking—these I. W. W.'s, as I heard them in New York (I ran on a ticket down there once and got beaten, it was one of those off years when the Fusion party would get it). I remember hearing a man talking in the campaign on the East Side: "Oh, my friends, the time is coming when we are going to have a three-hour day." Think of it! What in the name of conscience would he do with the other twenty-one hours? Why? Because he believed that work was a curse and that everybody got tired from work and that work was a thing that created fatigue. Not a bit of it. If you have not the proper food and do not get your proper rest—and the lack of sleep makes people tired—if you do not carry out all the things that we know are good for the body, you are tired and fatigued. Monotony helps to make you tired. That is another thing we must take up some day.

What can be done by men for themselves? These are things that you have to teach: The regulation of his meals, the amount, character and mastication of them; the amount and character of drink, hours of rest and sleep, ventilation of rooms, personal cleanliness, clean bodies and clothes, washing of hands before meals. Washing of hands before meals —how important is that in industry? Does every one have a chance to wash his hands before meals? Oliver Wendell Holmes discovered the washing of hands in America. Of course, Germany claimed it, for

Shemmelweis. Up to that time nobody ever thought of washing their hands, except Pilot—and that was symbolic.

PERSONAL CLEANLINESS IS IMPERATIVE

Oliver Wendell Holmes said that when his students went from dissection to cases of confinement and did not wash their hands the women frequently died. The Philadelphia physicians said he was all wrong, that it was a disease created by God and he must not run up against the Almighty. As for Semmelweis the Germans ridiculed him so much that he did go crazy. Later on Lord Lister started what was known as the Lister method, and in 1877, when I was first in college, Lord Lister talked of the washing of hands. How do we know it is true? I had the privilege, when I was commissioner of health in New York, of arresting a woman who had been a cook in a number of families (the papers called her "Typhoid Mary") and in every home she had lived in there had been a case of typhoid. They found she carried typhoid in the movement from her bowels. Why did she give it? Because she never washed her hands. Two parts of the body are often very, very dirty, the hands and the mouth. Remember this, 90 per cent of all contagious diseases go in above the chin. Hands carry disease. Has the workman a chance when he eats a sandwich that some housekeeper at home has put up, and probably hasn't washed her hands, and the sandwich is half fermented, and he sticks it in his mouth with his own dirty hands? Do you wonder he gets contagious diseases? I don't.

CARE OF THE TEETH

What else? Daily washing of feet, proper shoes, amount and kind of clothing. That is something we have to come to as men. The women have reached it. They are way ahead of us and the reason is the women have gotten rid of heavy flannel underwear. We cannot say, with the poet: "Her feet, beneath her petticoat, like little mice steal in and out" because she doesn't wear any. It is a good thing and if we could get rid of stiff collars that stop the flow of blood from the brain, and heavy clothes, we would be a great deal better off. And so would the workmen. Sometimes accidents are caused by workmen wearing too many clothes. How about the brushing of the teeth? Do all the workmen brush their teeth seven times a day? If they don't you are losing money.

At least thirty of the most serious diseases in the whole body originate from the teeth. Nearly all cases of rheumatism, if they don't come from the teeth, they come from the tonsils, but most of them come from the teeth. If you have an abscess at the root of a tooth you have what is known as haematogenous infection. One of the first things that I did on the board of health was to appoint a pneumonia commission and we found at the New York University that 70 per cent of the students had germs in their mouths. We went to my own neighborhood—children, the butcher, the baker, everybody—and I had them examined. They all had the germs of pneumonia in their mouths. Some people had as many

as forty-eight kinds of germs in their mouths—not single germs but forty-eight different kinds. You will often find diphtheria germs in the mouths of children in the public schools, and the only reason they do not get it is because they are not in condition to take it. We know that valvular heart disease comes largely because the teeth are not taken care of.

Take into consideration that it is the food that gives man his energy. Maybe the food he puts in his mouth is sterilized. We are very careful with children and old people, when they are sick, to boil the water and sterilize the milk, and then we put it into the mouth with forty-eight different kinds of germs—we put them into the milk again. The workman eats his sandwich and it ferments and it does not get into his muscles. He does not have the necessary energy and he does have lots of spoiled work. If you compare the early output of the day with between 11 and 12 and 4 to 6 o'clock you will find you are getting very little work during these periods. If I was running a plant the first thing I would do would be to put in marble water closets. However, there was a man that tried that and the Italians went in there to eat their luncheons. The second thing I would do would be to give a toothbrush to every man that was working for me and I would try to get him to use it before every meal and after every meal, because I know he would be getting out a great deal more work and be more efficient.

THE CULTIVATION OF CHEERFULNESS

Regularity of habits we have talked about and the cultivation of cheerfulness. That, perhaps, is almost more important than anything else—the cultivation of cheerfulness. There is something we have learned of late years, given to us by Cannon and by Crile. Over the top of the kidneys is a little gland known as the adrenal. (Illustrating on blackboard.) Up here in the neck is another gland known as the thyroid. We have other glands apparently with no ducts to them. They regulate the body, the same as a governor on an engine. As the steam in the engine presses on the governor and as the governor comes up it cuts off the steam, so these ductless glands regulate the bodies. The adrenal contracts the arteries. If we get too much of it it is a deadly poison. In anger, grief, sorrow or a grouch these glands secrete too much, they poison the body and create arterio-sclerosis. With laughter and joy, other glands begin to work. If a man eats the sandwich I spoke of that is badly put up and he lacks gastric juice, because of the grouch, it goes down in his bowels and creates poison and that poison is absorbed—that gives him more grouch.

Above everything else we must teach happiness. We must teach that, like the Creator of all things, our greatest happiness in this world must be in our daily work, in the things which we, like the Creator, ourselves create. Keep that in mind if you want to live long. If you want to live to an old age you must find happiness in your daily work and you must work, too.

I spoke of that three-hour day. The Scripture says: "In the sweat of thy face shalt thou eat bread." Remember the man in the Scrip-

ture who said: "Let us eat, drink and be merry" and that night his soul was required of him—he died. Why? He ate too much and gave up exercise. The rich man today does differently. He builds a golf course and works harder than ever—just to keep alive. I know that some of the audience here agree with me—it is an awful waste of time to play golf—life is too short. Remember that longevity depends largely on work.

INDUSTRIAL ACTIVITIES

What can be done in industry? I want to give you a list of some of the things that you can do. You have begun with the prevention of accidents and their care. How about the rest of the things which are worth just as much money: Prevention of accidents, drinking water supplies, washing facilities, laundries, lockers, toilet arrangements, drainage and sewage disposal, disposition of garbage and rubbish, care of stables and animals, heating work places in winter, cooling work places in summer, ventilation, overcrowding, dust, gases and fumes, periods of rest in working hours, education, relief funds, compensation, lighting, first aid, hospitals, trained nurses and social workers, physical examination of employes, lunch buckets and lunch rooms, commissaries (bread, meat), milk supplies, flies, mosquitoes and vermin, clean mills and yards, housing, gardens, rest and recreation (other than in working hours), transportation, insurance, pensions and saving and investing.

IMPORTANCE OF PURE DRINKING WATER

Remember you cannot do any of these things unless you can justify them to the employer in dollars and cents. I am going to give you a single illustration of the justification of such work. We will take the simplest one—drinking water. Water is a part of the body—over sixty-six per cent. It is a food in one sense, but it does not make energy. You can easily tell how much it means if you go without it a day—the body will not work. What is the next thing? I spoke of these secretions of the body. These secretions depend largely upon the amount of fluid that you take. Fluids prevent friction. When we breathe, when we move our muscles, in everything that we do, there is friction and it is prevented if there is plenty of fluid. Perhaps the most important of all the functions of water is to keep the temperature of the body normal. The temperature of everybody in this room is about 98½ degrees, unless they are sick. It is in St. Louis, the whole United States, the Esquimaux, down at Panama, at the equator, Europe, Asia, Africa, all peoples have the same temperature. How do we keep it? Through water. Suppose that you have not enough water in the system what happens? The temperature of the body goes up. If you get a temperature of 107 degrees, which can readily come from the amount of heat in one single meal, you are liable to die.

Years ago I was taught that in the Black Hole of Calcutta the people died from poisons that emanated from the breath. Nothing of the kind. We spit out germs when we talk, some people more than others, but

still the emanation from the breath, the carbon dioxide, is necessary for our existence and our living. What happened in that place where they were all crowded into one hot room? It was a humid climate and they struggled to get out and they created heat in the body, because the sugar and fats not only create energy but they also create heat. And the people manufactured heat in their bodies that they could not get rid of. The temperature went up and they died from fever and from heat. Water keeps down that heat and allows people to work. It tends to prevent sunstroke and heat stroke.

The digestion of food is of the utmost importance, because our very life depends upon the food that we assimilate. How do we assimilate it? We absorb it like blotting paper, because it is in solution, and if you do not drink water with your meals you do not assimilate your food properly. Many have a fool notion that you must not drink water with your meals. If you do not drink water with your meals you do not get proper solution of food. Water, then, means increased production, and a lot of it. That is the way to put it to the manufacturer. He has stockholders to account to. No matter how he may feel he cannot spend the money of his corporation for philanthropy, he must justify his expenditures. So also you can justify shower baths and cleanliness and so also many other things. I was asked to go to a plant where they said to me: "Our men are on edge—they used to be all right. We do not know what is the matter with them." I found they were on edge—most of them had beautiful houses and gardens and there were lots of new babies in town. But these babies had bad milk and they cried all night and the men were kept awake. The company bought a herd of cows and distributed certified milk at cost. The babies stopped crying and everybody was happy. All these things can be put into dollars and cents. But I have talked long enough though I could talk for hours along the lines of things that should be done in industry. There is another side to the matter. I have talked exclusively of the money side, but we have another obligation. There are many who talk about the brotherhood of man, many care nothing about it—it is only a catch word to them. Cain's answer was, "Am I my brother's keeper?" But another answer has come down through the centuries: "Thou shalt love thy neighbor as thyself." The first commandment is to love God but the second relates to the love of neighbor. When I was on the board of health we had 187 laws, all founded on one old law. The man that loves his neighbor will not spit on the sidewalk; the man that loves his neighbor will not allow soot to go out of his chimney and get on his neighbor's clothes, he will not permit his child, with a contagious disease, to give it to countless others. He will not break any of the laws because of the love he bears his fellowman. These things are the things that we should do, not because we can justify them in money, but because of our love for our fellow human beings. And when that time comes we will have no I. W. W., no Bolsheviki, for there will be no place for them. I have unlimited hope for the future, and an abiding faith in our people. It may not be given to our eyes to see the end from our beginning. We are not looking for the millenium, only for a brighter, nobler and a

happier civilization. I feel like one described so beautifully in the lines of Tennyson—like one

> Who, rowing hard against the stream,
> Saw distant gates of Eden gleam,
> And did not dream it was a dream.

CHAIRMAN HOWARD: Gentlemen, we want to try an experiment. It is not always possible in industry to get enough speakers so we are trying out a phonographic record. We want your ideas on it. This record is by Mr. Marcus A. Dow, of the New York Central Lines. (The phonographic record was run.)

We have some wonderful moving pictures here, loaned by the United States Steel Corporation, and I know you will be glad to see them. Before they are shown, however, I want to thank Dr. Darlington for his splendid talk. He is doing a splendid work down in the camp and it required a great effort on his part to attend our Congress.

(The moving picture film entitled "Why," was shown, after which the meeting adjourned.)

TUESDAY MORNING SESSION

CHARLES R. HOOK, CHAIRMAN

CHAIRMAN HOOK: Before we start our regular program, we will hear a phonograph record entitled "Why Safety First?" by Mr. A. W. Whitney, General Manager of the Workmen's Compensation Bureau of New York. There are not enough speakers, properly trained, who have time to go around the country giving proper safety talks, so the National Safety Council wants you to help decide whether or not this is good propaganda. Will it get the message across? (The record was given.)

CHAIRMAN HOOK: We will discuss the matter of phonographic records at the end of the meeting. I hope you will be prepared to express an opinion at that time.

The real function of a Chairman is to preside and not to talk. Interested as I am in safety, I cannot refrain from saying a few words on the subject.

SELLING SAFETY

The Program Committee has assigned to me a short talk on "The Real Problem of the Safety Engineer." At several meetings in the past I have expressed myself very decidedly on this subject, and what I say will probably be a repetition, but as I see it, as I believe it, the real problem of the safety engineer is the selling of safety to those who employ as well as those who are employed—the job of showing to the manager as well as to the workingman the value of the safety program. That is absolutely essential, if we are going to have a successful safety campaign in an industrial establishment. That comes first—the impressing upon all their absolutely selfish interests in the proposition. It is essential to prove to the management that it is a "dollars and cents" proposition—that it means more money in the treasury; to the workman it means more money in his pocket and increased health and happiness. To do that the safety engineer must have confidence in his ability to put the idea across—he must believe in the thing that he is doing. He must be a sales engineer, and, as I see it, that is his field.

I have in mind a plant that thinks it is exceptionally well organized along safety lines. They get out the most beautiful reports that I ever saw—a great, big sheet every month, with all the accidents tabulated; burns and falling timbers and monkey wrenches—everything under

the sun. Beautiful statistics. The records are regularly put on the superintendents' desks and permitted to lie there until the next sheet comes out and covers the previous month's report. Statistics are excellent, if used properly, but somebody must understand them and give the plant the message that is indicated, so that those who receive the reports will take a real interest in them—you can't get real interest by simply sending out statistical reports week after week and month after month with no personal contact. The man who has charge of the reports and who is responsible for their compilation is probably the safety sales engineer, as I prefer to call him. It is his job to awaken an interest and an appreciation of the value of the reports in the minds of the superintendent, the foremen and the general manager, and until he does that the reports are worse than worthless—they have cost a lot of money and the company is getting nothing out of them.

Some fellows go about the work of making up statistics, putting up posters around the plants and doing things in the same old humdrum way day after day. They do not realize just what is behind the whole thing. They remind me very much of a man our director of education told about when explaining the coming winter's educational program to our superintendents and foremen. He said that the president of one of the great railroad systems sent out word that he was going to give a gold medal to the man who had been in continuous service the longest period. So the divisional superintendents, branch officers and others started to comb their files and to look for this man. Finally he was found at Indianapolis, and in due form was notified that he had been in the company's service for the longest period and that the president was going to give him a gold medal. He was told to get spruced up; that a pass would be given him and he was to go to New York, meet the president and get his medal. So he got a new suit and they gave him a pass and some expense money and sent him to New York, the division superintendent going with him. The president was delighted to meet him, grasped his hand, congratulated him and presented him with the medal. The president said to him, "Let me see: You have been in service for thirty-five years?" "Yes, sir. I have been in service thirty-five years and I have never lost a day." "Where have you been working?" "At Indianapolis, the same place and the same job for thirty-five years and never lost a day." "That is fine: that is wonderful! I am proud of you and the system is fortunate to have such a man in its employ. What do you do?" "Why, when a train comes in I take a hammer and go along one side and hit each wheel as I come to it: then I go down the other side of the train and hit each wheel on that side." "Why do you do that?" "D—— if I know."

PUT THE WORK ACROSS

A lot of men go about all classes of work in that spirit. They do it in the same old way: they put up posters or get out statistics—they are performing a job, but they don't seem to know why they are doing it. They will have to learn why: that is what they have got to put across with the fellow who is apt to be hurt and the fellow who will have to

pay if an accident occurs. There must be confidence: you must have belief in the thing you are doing and confidence in your ability to put the job across. There is need for vision and imagination and enthusiasm and sticktoitiveness—all the things that go to make for real success in any line. When the safety engineer, dragging through the plant, day after day, goes up to a foreman and says, "You had an awful bad record last month; did you know it?" you can imagine how much enthusiasm he is going to get out of that foreman and how much pep he is going to get into him. If he can't put Pep (with a capital "P") into his work he might as well quit, because he is wasting his time. You can't sell an idea with that kind of work. The real problem of the safety engineer is to sell the value of the thing he has to both management and workmen.

The policy of the company must be right. I assume that the management is broad-minded enough and wise enough to see the value of a safety program if properly carried out in its plant, because if the policy of the company is adverse there is no use trying. Granting the policy of the company is in accord with the safety movement, the road is open to the safety sales engineer to do his work and to sell his idea. He must understand the psychology of the workmen. I have used that expression a great many times, but it is the one thing, to me, that spells success or failure for the safety engineer. If you don't know how to appeal to the workingmen of your plant—if you don't know how to present things to them so that you will make their brain cells work in your direction—then you had better stop working with them and work on yourself until you get the idea: until you know how to approach them, how to get to them. Sometimes it is from the rear, sometimes from the front, sometimes from left or right flank, but you have to use all the agencies at your command in order to interest them in the things you are interested in, that you are trying to put across. Not one of us knows so blooming much about safety that we, by ourselves, can put any small part of a big program across. it takes the combined effort of all of us. But someone has to have the vision: it has to come from some central point, then hand it on down the line: every last mother's son in the plant has to be a part of our program *and feel his part* before we will get any place, and to do that I say again it is absolutely necessary for the safety engineer to understand the psychology of the worker as well as the psychology of those who employ him.

The real problem of the safety engineer is to sell safety to the organization. This will be brought out in the papers on our program. It is a very great privilege and a pleasure for me to publicly express my appreciation of the work of a man who has been a wonderful help to me personally and to my company. Many times we receive credit for things which have been accomplished through the efforts of those who are keeping us in our jobs, and if safety has gotten across, to any appreciable extent, in the plants of the American Rolling Mill Company, it is very largely due to the loyal, determined and enthusiastic efforts of the general manager of our sales division of the safety department, Mr. Frank E. Morris, whom I now have the pleasure of presenting to you.

HOW TO ORGANIZE FOR SAFETY

F. E. Morris, Safety Engineer, American Rolling Mill Company, Middletown, Ohio

Mr. Chairman and Members of the National Safety Council: This is presumed to be a session for junior safety engineers, and the speaker has been asked to talk on "How to Organize for Safety," but I see before me many senior safety engineers. This proves one thing—that there is always something to learn, and the progessive safety man is always trying to do so. New discoveries in our calling are being made daily, and like the progressive lawyer, preacher or doctor, we have to study hard to keep up with the parade. We of this profession—and it is a profession—argue and preach safety, but what is safety? Who are those whom we call the careless ones? Let's see if we agree on what we are talking about

Safety is the antidote for carelessness, and carelessness is lack of forethought Coming down the street a little while ago I saw a messenger boy dart out from behind a car and directly into the path of a fast auto. That boy was just as careless as he was when he used to swallow buttons and safety pins. When I reached the corner I noticed an intelligent looking man buy a paper, glance at the head lines on the front page; then he opened it up to the sport page, to see whether the Browns or the Cardinals won yesterday. He proceeded across the busy street—buried in his paper and paying no attention to the traffic officer's warning. That careless man will soon be buried in something besides his newspaper; he is right now on his way to the emergency hospital, but he does not realize it, because he won't stop to think. He may not get there today, nor next week, but he is on his way. He has not learned a thing about safety since he was a messenger boy.

Knowing better does not make much difference. We are each more or less thoughtless or careless. Why do we still take foolish chances? Really there is no great mystery about it. It is because the habit of carelessness is in our blood: it is a great human frailty, and if you will tell me why intelligent men get hurt, even when bent on pleasure, I will tell you why the workers in our mills and factories get hurt while they are busy making a living.

FUNDAMENTALS OF SAFETY

How are you going to line up yourself and your workers so as best to fight this lifelong evil habit that infests every one of us? What are the A-B-Cs of a safety organization? Before I get through we may reach some of the Ps and Qs, and the Rs, but first we shall review briefly the fundamentals.

Assuming that you are a newcomer in the ranks of the safety engineers, just how are you going about it to start the ball a-rolling? What is the first step? The first step, Mr. Safety Man, is to organize yourself. You wouldn't go for medical advice to a doctor who was himself sickly, nor would you sit in church and listen to a man whom you knew to be a

hypocrite. By the same token, if we would be a success as safety engineers we must first search ourselves and cleanse our systems of all evidences of that foolish habit that we are going to attempt to eradicate from among our workers. Isn't it the truth, now, that we all, like sheep, have gone astray? Heaven preserve us from the man who poses as one who is absolutely free from the sin of carelessness, for as a model he is obnoxious. Here is an illustration:

One Sabbath morning a certain preacher was thundering away at his parishioners and when he was in the midst of a beautiful flight of oratory one of the dear old ladies arose from her pew down near the front and said:

"Brother Brown, I have not sinned for over twenty years, and I have not thought an evil thought for over eighteen years, and Oh, Glory! I feel that if I had just one more feather in my wings I'd fly away to heaven."

The pastor prayed fervently, under his breath: "Oh, Lord, stick in the other feather and let her go."

Granted that none of us is an example of safety-purity, we must nevertheless live the part. We cannot pass one of our foremen on the road on Sunday afternoon at the rate of fifty-five miles per hour and expect to hold a successful safety meeting in his department on Monday. To sell this idea—the biggest idea in the industrial world today—to sell this idea we must believe it ourselves, and we must show that we believe in it by living it every day and every hour of every day as we move among our fellows. You wouldn't eat in a restaurant if you knew that the proprietor went out to get his meals; if the food isn't good enough for him it certainly is not up to your standard. While you are training yourself to thus live and act safely you will find that this world-old habit is not to be dropped off like an old coat; you will learn that you have no armchair job ahead of you.

WORKING "WITH" OR "FOR" YOUR EMPLOYER

Now, assuming that you have brought yourself to that stage where you can sincerely talk safety to your closest friend without having him tell you that it is "bullsheviki" and at the same time reaching for his gas mask, what is the next step? The next step is to make sure that the boss is sold on this proposition. Of course, incidentally, you should know just why your superior decided to have a safety department, why it was made a company policy, because the reason will determine in a measure your course of action, for you will work differently for a boss who hired you because the law demands a safety man in his plant, from what you would if he had employed you because he wanted to see fewer of his men hurt. In the one case you work *for* him, and in the other you work *with* him; it is better to have him converted to the idea for the sake of his fellow humans, but you need worry little about that so long as he is sold.

However, you must make sure that he is sold, and he must be sold to such a degree that he will not withhold necessary expenditures, nor pressure if you should find need for higher authority, for that sometimes happens in the earlier stages. While the boss is busy spending thousands

of dollars on advertising his product and other thousands on developing his output and still other thousands on the machines that do the producing. do not let him forget that you are taking care of his most expensive machinery—his workers.

That is the second step—the man behind must be *sold* on the proposition. and let me say to you, Mr. Safety Man, if you are not convinced that the man higher up is sold, go home and sell him the idea. You know him and you know what selling argument will most appeal to him. If you can't sell him resign; get out of the safety business and give some other salesman a chance at your boss. The profession of safety engineer is the proudest business that you and I could be in today, and before I get through I will tell you why I think so. Furthermore, my friends, the prevention of accidents, the saving of human lives and limbs, is too sacred a business to allow for trifling; be honest with yourself, don't sit at your desk with the smug satisfaction of a salary and a title, but for the sake of your workers and for your own sake. if you can't win the conviction of the boss because you have not got conviction in your own heart, then I say get out of the safety business.

My first job with the American Rolling Mill Company was to sell the idea to Mr. Hook, who was then our vice-president, and in charge of our "personal relations" department. I soon found out that I was in much the same position as the wet goods salesman from Milwaukee who tried to do business in St. Louis—there was a plenty of it here already.

GIVING AND SELLING

You ask me, "What do you mean by 'selling' safety?" To me it looks like a selling proposition all the way through. Don't you know that you can't give anything away? You *give* $10.00 to the Red Cross? You do not—you buy ease of conscience. You give $25.00 to the K. C. or the Y. M. C. A.? You do not—you owe them more than that. You can't give anyone anything. Ten years ago this month I was enjoying my honeymoon and you can believe me when I say that for the last ten years I've been paying for the silver spoons and the cut glass that the kind friends and neighbors *gave* to us on that happy occasion.

You can't give safety away, nor can you wish it on any one; nor can you hand it to anybody tied up with a green ribbon. Your workers have got to buy it and pay for it. and you must be the salesman. But more of that later, that is not among the A-B-Cs; that comes along about G, H and F.

All right, now where are we? You yourself are lined up and we've got the boss lined up. He has decided that he will get behind this thing and help you push it. There are a few things that your boss has attempted in his business career that he did not get away with—but that was in his earlier days, when he was on his way up; now he *knows how*, and if really and sincerely, 'way down in his heart, he believes in this thing—in other words if you have made a sure-enough sale—you can wager your last jitney that he will lend you all of the moral suasion and give you all of the money that will be necessary to make the safety compaign go *big*. The

boss *can* do it, but don't forget that he has other things on his mind as well, and that while this safety business looks big to you it may not look so big to him, at first, and you must not fume and fret if it does not go along at your pace.

I recall that one spring when I was on the farm I was given a mismated team of horses with which to plow the lower "forty." There was "Old Bill," older in fact than I was, and "Patsy," a beautiful prancing animal just broken to harness, and the day we started that job Patsy was for finishing before sundown and he pawed and he plunged and soon covered himself with a dripping sweat. Old Bill, however, did not get excited, but just plugged along in good horse-sense fashion, and until the younger horse learned that it did not pay to fume and fret, but that the wisest way was to pull steadily with his older and wiser teammate, the best that we could do was to make a sorry mess of that job. So I say, do not be impetuous, do not try to make a world's record the first month.

Your zeal is quite likely to lead you into deep water and for that reason the man at the top should give the safety department a committee of executives—say of three men—to act as a sort of court of appeal on safety policies. For instance, the safety engineer might think it advisable to put up numerous signs in foreign languages; he learns that some one else is using them, so why not stick up a few? When he seeks the advice of his Central Safety Committee he finds that, in view of the fact that there is a school right in the plant for teaching the good old American language, the company policy will be to have no foreign languages used in the plant. Mill men don't believe in signs, anyway. You will find that a committee of this sort is a valuable aid, it's a good stabilizer, a good safety valve that will keep you from blowing up and doing a lot of damage.

SELLING SAFETY TO SUPERINTENDENTS

In addition to giving you such help as I have just outlined, the vice-president or the general manager, as the case may be, should start you off right with a meeting with his organization. He calls in his aids, the department heads, and says: "Gentlemen, the safety engineer has sold me a dose of Safety First and I find, after taking it for several days, that it is great stuff: I commend it to you. He is going to tell you what it will do for you and if you find that it is good, as you will, I want you to help him pass it on to your foremen." Then you proceed to sell the superintendents.

That is my idea of how the boss should put safety on the map; you must keep it on the map. Know these men higher up intimately, be keen enough to discern any laxity on their part, for if they let their sympathy lag in the slightest, their disinterest will be felt all down the line. After this get-together meeting each division head has his foreman's meeting, where you go through the same program, and so on down till you reach the ultimate consumer. If you have trouble in putting the sale across in any particular instance you might casually mention that this is endorsed by the president of your company—try the same psychology that the house-to-house agent works on friend wife when he tells her that Mrs. Smith,

living in the brownstone front up the street, bought one (how the ladies do fall for that). If that is not selling argument enough, request the general manager to remind that superintendent that this safety business is a company policy and that it would be well for him to line up; in other words, bring a little pressure to bear.

At this stage you have merely launched your campaign. On the Fourth of July last we were thrilled through and through at the news that a hundred ships were launched on that day and we pictured Old Glory soon floating over Potsdam. But don't forget that much is to be done after the boat is in the water. The carrying on of this campaign is left largely, almost entirely, to you—it is your business to engineer the movement so as to get the best of results.

Now as to some of the personal qualifications necessary to your success as a safety engineer: You must have enthusiasm, you must have knowledge—knowledge of safety, knowledge of men, and knowledge of what your workers need. What is the greatest asset of the safety engineer? It is the lever that Archimedes had in mind when he said: "Give me a lever that is long enough and I'll move the world"—it is *enthusiasm*. Enthusiasm is the force behind your knowledge and if there is one qualification that should be born with the safety engineer it is the capacity for intelligent enthusiasm. With enthusiasm you can remove mountains and with enthusiasm no obstacle can stand in the path of success for your safety campaign.

THE ACQUIREMENT OF KNOWLEDGE

What about knowledge. You know that young men and young women go to college in search of knowledge. During those four years when they are working so hard—to separate dad from his hard-earned shekels—the biggest fact that they learn is this, mind you, the biggest fact they learn in all of that time is this: That, in the future, whatever information they may need is printed in a book somewhere. Much printers' ink has been spilled on this subject of "How to Organize for Safety" and it would be fatuous for me to con over what has been scattered broadcast by our National Safety Council and what is, therefore, common property with you and me. But I will tell you this, when I looked over this material to find what *not* to talk about in this paper I said to myself: "My kingdom for just one brand new idea." Let me urge you as fellow members of the national organization to write to our headquarters for information and suggestions that will apply to your particular case.

Now as to knowledge of your workers. No two men are exactly alike and you must be able to discern the difference. You must be keen not to offend any of your workers by action, words or appearance. You must dress the part and look the part. Go out among your boys and get dirty, salve your pride—if you carry any such excess baggage—with a little black oil: get smeared up a bit, don't be supercilious. Let your workers respect your good advice and not the white collar, the creased trousers and the shiny shoes which men are so apt to recognize as the symbols of authority. Go out and tie up with the oiler, spend the day with him

and learn what a charmed life he leads. Climb up on top of the boilers, go down under the soaking pits; don't be a stranger to any of your workers or to any nook or cranny of your plant. Incidentally, you will find work that needs to be done, for that day has gone by when we could offer as an excuse: "If he had not gone where he had no business to go he would not have been injured."

So I say, do not sit at your desk and send a peremptory message out into the plant to have Bill Jenkins come in to see you for a heart-to-heart talk, for Bill will leave his heart with his job. Go out to Bill on the job and have a face-to-face talk with him there.

Human nature has not changed much since Old Adam carelessly took a chance and bit into a quince. Don't you know that the most interesting part of your work is your contact with men as humans? And only in proportion as you study *men*, and come to learn *men*, will you be successful in getting them to abandon care-*less* and to adopt care-*ful*. That *sounds simple*, doesn't it? It is just as simple as it sounds, for after all the worker himself decides that he will thereafter try to work safely, doesn't he? The man higher up cannot *make* him do so, nor can the safety engineer *order* him to do so—you merely lead him up to the point where he says for himself: "I shall hereafter try to be a *safe* man." Gentlemen, your success in leading your men up to this point will depend on just how well you know Old Human Nature.

In this connection I ought to introduce a fellow whom I have on my staff; he's a wonderful plugger and he gets results. Mind you, he will gladly work for you as well if you but let him. This friend of mine is "Old Cy." I used to be chummy with a mythical character whom I called Old George Luck and when things were breaking bad I used to say that Old George had deserted me, but as safety men we know that there is nothing in this luck superstition, and I have supplanted Old George with Old Cy. Can you guess his last name? *Kology!* Old Cy Kology can do you a world of good.

What do I mean by psychology in safety work? Let me give you an instance: We had a worker who I knew was inimical to the safety business and I tried various subterfuges to get under this man's skin, but with no success, till one day I happened along just as he was biting off a chew from a plug about this long. "Good mawnin', Jim, what kinda chawin' y' carr'in' this mawnin'?" You see, Jim is a Kentuckian from the hill counties; technically they are called "briars" and "briar" talk is the only foreign language that we condone in our plants. Well, Jim handed me his plug—you know the meanest man in the world would not refuse you a chew of tobacco. I bit off a generous chew and then I complimented him on his excellent selection of the best chewing tobacco made. As a matter of fact, I am no "common-sewer" of chewing. I know as much about it as a pig does about the war, but right then and there I spoke the password that admitted me into Jim's lodge, for he figured that I must be a decent sort of a cuss after all. Would you believe it, he has been one of my best safety assistants ever since? That's what I mean when I say "Put Old Cy on your staff."

DUTIES OF COMMITTEES

In your work in the different departments, of course, you will see to it that the foreman has his shop committee. I won't dwell on this subject but let me briefly say this: It won't take more than a year or so to rotate this honor to include every man in the department and then you must be ready to spring some new wrinkle to keep up their safety interest. The longer this scheme of shop committees is worked the harder it will be to get results, so don't put too much dependence on it—but it is fine for a starter.

The safety man will arrange for exchange visits for his shop committees between departments and you will get some very practical and thorough investigations, for they invariably try to hang something on the other fellow. For an entire plant investigation take the best three men from your shop committees and call them a works committee. Of course, you will have their picture taken for the plant magazine—it won't make them angry and it's fine safety advertising. Now don't let the three kinds of committees cloud up the proposition—let's see what we have: We have, first, the central safety committee, your safety advisors; then the foreman has his shop committee in each department, and last the works committee that goes around each month and gives the whole plant the once over *for you*. Each one of these committees has its proper sphere and if you make use of them they will help you a great deal.

Up to this point I have been talking not about your work with the workers, but about the men whom you will get to work with you. I have not specifically mentioned the foreman, for there is a speaker to follow me on this program who will tell us all about the importance of the foreman in safety work.

ACCIDENT REPORTS

Let us consider your daily routine work: It is necessary that you get prompt first-hand information regarding the time, place and character of all of your accidents, whether minor or serious. At the American Rolling Mill Company we do not ask the foreman to fill out a report of any kind when a man is hurt. We have about 1,500 accident cases every month among about 5,000 men and you can imagine that it would take considerable valuable time to have the foreman write up 1,500 reports. I don't think that foremen's reports are of much value, and besides you will find that a worker won't be so ready to go to the hospital with a minor cut or bruise if he feels that his foreman may get peeved because he will be obliged to write out a report. Some concerns have a form on which the foreman states that a safety rule was violated; we can't do that either, because we have no published rules except the one that I hold in my hand. On the back of this little identification disk you will find the following rule: "Before going to work ask the foreman for safety instructions." We have no rule book, for it seems to me that that one rule, in a plant where the foremen have the safety of their men at heart, is rule enough. On some of these forms is a line for "Discipline recommended." Put on

the soft pedal when you talk of discipline. Don't make safety enemies by making your careless ones wear dunce caps.

To get this daily information of accidents that have occurred, it is the practice in our plant, and in many others, I believe, to have the medical department make out the accident reports in triplicate—one copy of which goes to the safety department. My first job every morning is to go over the reports from our four different hospitals for the preceding twenty-four hours. We study each and every one of these to see if there is a possibility of preventing the minor hurts, for we agree with Mr. Ralph Richards that if we can prevent men from getting hurt in the little ways the big accidents will take care of themselves.

If the causes given on the report are not evidently correct we get right out on the job and probe the affair to the bottom. Some men are so ashamed of their carelessness that they will prevaricate, thinking they will get by, and then again the nurses may not be quite familiar with the mill operation on which the man was injured and their reports may be somewhat garbled. Something like the little girl whose mother had injured her spine. One day she overheard the doctor talking about cauterizing and when a kindly disposed neighbor inquired of little Helen how her mamma was she replied: "Oh, she is not so well today; you see, last night she caught her eyes on her backbone."

So we investigate the causes of all of our accidents and if the case is a serious one we even try to find out where the man was the night before. Does he drink? Is everything all right at home? Every other thing is sought that might have a bearing on the cause. You investigate an accident with the foreman and his shop committee and they take the action necessary. You and your friend Cy lead them to conclude just what your broader safety experience shows you to be best and be assured that they will see that their judgment is carried out. If the shop committee says: "Let's do so and so!" isn't that much better than your posting a rule that the men in this department must do so and so?

DON'T MIX CONFLICTING DEPARTMENTS

We love to have freedom of action. We haven't yet been educated to fully recognize freedom in just authority and for that reason, Mr. Safety Man, let me say that it is well to segregate your safety and police departments. You cannot sell the safety idea if your workers suspect that you are backed up by a star and a club. The policeman is like the fat man—nobody loves him. When you were on the farm—you know about 80 per cent of us used to live on farms—when you were on the farm you will recall that one day the old bay mare got sick and dad pried her mouth open while the hired man threw a wad of medicine 'way down her throat and she had to swallow it or else choke. Well, gentlemen, you cannot administer safety that way. Don't be mixed up with the police officers in your plant; the most lovable cop in the world is secretly called a "snitch" and you cannot afford to mix with him.

Once in awhile in your investigations you will find that a man has re-

ceived an injury outside of the plant and that he will claim that he got it on the job like the colored man who hurried by one morning with his face all wrapped up. Later the clock-house man stopped his brother and said: "Look here, Watson, what's the matter with your brother; did he get hurt?" "Hurt, no sah, boss; he ain't done got hurt; he's been a sayin' for a couple of weeks that he was a goin' to beat up his wife and last night she done overheered him."

The investigation of accidents that have happened is one of your most important daily duties, but what is the best preventive? To my mind nothing gets results like shop meetings. Tip the foreman off that at such and such a time you are going to shut down a certain room and be sure to advise the boss to stay away—the reason that more men do not go to church is because when they were lads their dads dragged them to church—let the men come to your meeting of their own volition and then give them a message straight from the shoulder. You go into a factory room and climb up on a shear table and call the fellows together. Tell them that you are going to talk to them while they are resting on company time; you will not need to announce your subject for they all know you and they know that you are working for them. Name their foreman's committee, remind them what that committee is for, throw in a good story or two, and don't fail to draw a moral from some accident that has recently happened. Make some poor fellow's misfortune their good fortune, for that is the only good you can get out of an accident. Such meetings are time well invested for the company; you win converts right and left, for this is the best kind of safety advertising.

ADVERTISING SAFETY

How else are you going to advertise? I call it advertising, for safety education is just that—you advertise the benefits that accrue from safe habits. Well, how do other people advertise their wares? Are they content to post bulletins on a stock bulletin board? Not by a jugful. But before I talk about bulletins I want to tell you a story: A preacher announced, near the end of his sermon, that after the services he would like to meet his board down in the front pews. After the benediction had been said the deacons and the elders wended their way to the front seats and among them was a bright looking young fellow—I think that perhaps he might have been a safety engineer. The preacher looked inquiringly at him and said: "Ahem, I don't believe I know you; are you a member of my official family?" The young man replied, "No, sir; I am not a member of your official family, but you asked all of the board to meet you here after church and if any one was more bored than I was I'd like to see him."

KEEP YOUR BULLETIN BOARD ALIVE

That's a good thing to remember, I believe, in posting our bulletins on stock boards. Let's not bore any one. When you open your paper every morning there is a certain ad on a certain page, on a certain part of that page, and you pay no attention to it. Why? Because that ad has been

there for years and you know that that advertiser is a dead one; he's not up-to-date, else he would change his ads about; he would word them differently, he would catch you unawares. Let's be up-to-date advertisers. Vary the kind of matter you place on your bulletin boards, vary the boards themselves. Don't fool yourself into believing that the workers are going to come to them to see what you have put there—they steer shy of them as a rule. Did you ever see a natural picture of men reading a safety bulletin board? They are all as stiff and formal as this one because it is hard to catch men in the act and much less would they be willing to have their picture taken in the act. It is much like you and your Bible—there are good things in it, but would you want any of your fellow men to walk in and catch you reading it? But the Gideons 'll get you, if y' don't watch out!

Don't be satisfied to cover up a board with National Safety Council bulletins—no one but the most morbid will be attracted thereby; rather have one good picture in the centre and by putting it alone you add to its importance and the single lesson has a chance of sticking. A clipping from a newspaper describing an accident in some other plant will attract more attention than a regular bulletin, for men's curiosity is thereby aroused and men will fight to satisfy their curiosity, not to mention the ladies.

There are many workers who will pass by the most artful of bulletins. We try to reach these know-it-alls by small traveling boards we call our "daily." These are hung in inconspicuous places about the plant and they are changed every day. We've actually seen men reading these on the sly, men who wouldn't be caught near a larger board. You are selling a good thing—advertise it in any way that you can.

MAKE YOUR STATISTICS WORK FOR YOU

Just a word as to your statistics. Of course, you want to show the progress that you are bound to make and it would be a fine thing if we had an official standard for computing our figures so that each might know how much better he is doing than the other fellow, but the most important thing that concerns you is to so compile your figures that they will help you in your work. To that end I know of nothing better than the monthly summary that is sent out to the different departments. In the summary print the names of the foremen in whose gangs the accidents occurred. It is surprising how the foremen will strive to keep their names off of that report. It is well to have also a comparison with the months just preceding so that each department and the general management may see at a glance just how the safety idea is taking hold in the plant. Personally, I don't care a fig whether a man gets hurt on the head or on the hand; such figures seem to me to be non-essential, the big idea is that the man got hurt.

If you have a physical examination department you are fortunate indeed, for the doctors will not only reduce the liability of accidents by not placing a man on the job for which he is not physically fitted, but you can often solve the mystery of an accident by having the men concerned re-examined, for it often develops that a man's eyes or his hearing has

become deficient since the last examination. However, the most frequent cause of these apparent mysteries is what caused the sudden and lamentable demise of a man of color, Luther Simpson by name. The following day this conversation was overheard between two of his erstwhile friends: "Did you-all know, Jackson, what dem dere doctahs found out when they cut into that man's haid to see why he died; do you-all know what dey found?" "No; I jes' know that he got killed in the mill; what did dey find?" "Well, suh, dey found out that that thair culled fella's brain hadn't nevah been used!"

You may wonder what success we are having with the ideas in vogue that I have outlined. Are they just theory or will they work out in practice? With your permission I will put on the screen a graph which shows what progress is being made in our plants, where the conditions that I have described obtain. We use the United States Bureau of Labor definition for lost time accident and you will notice that we are now having about thirty "lost time" cases per month among about 5,000 workers, and while we feel that we are using successful methods—for you must remember that the hazards in an iron and steel industry are above the average—we are by no means content: we are striving hopefully toward the ideal situation when industry and the industrial worker shall have been made safe.

THE PROUDEST OF BUSINESSES

I said at the beginning of my talk that we safety engineers are in the proudest of businesses. The doctors and the preachers are doing a wonderful lot of good, but how much better it is to keep a man from getting hurt than it is to fix him up after he is hurt! While the preachers are saving souls and looking after the spiritual welfare we safety engineers will keep on saving lives and looking after the physical welfare of our workers. Like us, the preachers are striving to attain an ideal and though they have been at their job for a couple of thousand years and are still a long way from their goal, that does not discourage us a bit. Human engineering is one of the ideals of modern business. We are not in this profession for the purpose of saving compensation costs—that is merely incidental. Jesus Christ drove the money changers out of the temple, but he erected no bank of discount for himself. If mere money making is to be the only test of fitness then John D. Rockefeller is greater than Mohammed, Confucius, and the founder of Christianity and greater than all of the other seers in whose phrases and faiths the world has lived for over two thousand years.

Our captains of modern business have learned not only that the milk of human kindness is sweet, but also that modern business thrives on it. Human engineering is still an uncharted continent and the man higher up is willing to outfit us and back us up that we may explore that wonderful country whose wealth has hardly been touched. Your methods may be different from my methods—you are exploring and I am exploring, to the end that we may find new ideas to add to the fund of safety information, that we may add also to the sum total of human happiness.

We shall "carry on" and let us carry on in such a manner that some day it may be said of us as Froude said of the Elizabethan explorers, Drake, Frobisher and Hawkins and men of that stamp: "As their enterprise was grand and lofty, so for the most part was the manner in which they bore themselves, worthy of it."

(Mr. Morris used a number of slides to illustrate points in his paper.)

DISCUSSION

MR. CARROW: I have attended a great many safety meetings and I have listened to a great many speakers, but I feel it a duty to say that Mr. Morris' talk is the most complete exposition of the safety problem I have ever heard. He seems to comprehend his subject from a practical as well as a psychological standpoint. I suggest, as a token of our appreciation, that we manifest our thanks by rising. (The suggestion was adopted.)

CHAIRMAN HOOK: I want to call your attention once more to the last slide shown. The significance of that slide is that since 1916 the number of men employed has been going up (illustrating) until it has now reached over 5,000 at our Middletown plants. The number of lost-time with the largest number of men we have ever employed, we had the smallest number of lost-time accidents in the history of the company—by a lost-time accident we mean a man who loses more than the remainder of the turn, shift or day on which he was hurt. Mr. Morris says he is not intensely proud of the record—he says we haven't scratched the surface—and because he feels that way about it I am sure great things are in store for us in the future.

We will now have the pleasure of listening to a paper by Mr. J. J. Heelan.

MODERN METHODS OF SAFEGUARDING

J. J. HEELAN, SUPERINTENDENT, BUREAU OF INSPECTION AND ACCIDENT PREVENTION, AETNA LIFE INSURANCE, HARTFORD, CONN.

Mr. Chairman and Members of the National Safety Council: When we talk about "Modern Methods of Safeguarding" we are reminded of the present conditions in industry as a result of the war, and recognize the necessity of doing more at this particular time to prevent accidents than we might feel obligated to do under normal conditions. A large number of trained and alert workmen have been taken out of industry and in their places we have men farther advanced in years, whose senses of sight and hearing are not as keen as those of the younger men. His unfamiliarity with the hazards of his new occupation, as well as the high speed at which plants are operating today, are also important factors, all of which require that the human mind should only be depended upon to prevent an accident when it is difficult to remove a dangerous condition

Let us also remember the large number of women who have so patriotically taken up work which heretofore has been considered a laborious and accidents has been going down (illustrating). In the month of August, through the means of safeguarding.

somewhat dangerous occupation, even for a man. Negligence in providing a guard that would have prevented an accident to one who has volunteered to "do her bit" in a field of work in which she is physically incapable of continuing for any great length of time is an offense for which no just excuse can be rendered.

Statements are sometimes made as to the value of safeguarding in the prevention of accidents, and it is claimed by some persons that safeguards prevent but a very small percent of industrial accidents. If the statement is based on the frequency of accidents, with no regard to the loss sustained, such statement as a general one may be considered quite true, but if we recognize the severity of these accidents it is not only wrong; but has a harmful effect upon the promotion of accident prevention work.

The frequent serious injuries resulting from accidents occurring several years ago, when there was very little safeguarding being done, are an experience which many of us cannot easily forget. A workman usually receives more than just a mere scratch when he gets caught in a piece of machinery, falls from a high place, or is struck by a bursting emery wheel. It is apparent that conditions prevailing at that time are lost sight of by those who I believe unintentionally belittle the value of safeguards. If one will review the present accident record of a modern and progressive plant, how different it will appear from the record of a plant of the old type, when serious accidents were happening with more or less frequency, and caused by exposed gears, protruding set screws, open pits and similar dangerous conditions.

PROBLEM CONFRONTING THE SAFETY ENGINEER

An employe cannot be expected to be interested in safety work if the employer is indifferent to guarding a condition which is obviously dangerous. The problem confronting the safety engineer, when beginning his duties, is to decide where safeguards are needed. He will probably find three classes of hazards to deal with: Those common to all industries, hazards of the class of industry to which the plant belongs, and the peculiar hazards of the plant with which he is connected.

When we mention the certain general hazards to be found in practically all industries we have in mind shafting, gears, belts and pulleys, stairways, elevators, pits, engines, boilers, ladders, floors and similar equipment. The hazards of the class of industry may be burns from hot metal or acids injuries from handling material, eye accidents from chipping and grinding, methods of feeding certain machines, gases, dust, electric current, and many other things too numerous to mention. The class of accidents attributable to the particular plant may be caused from class of help, abnormal labor turnover, congested conditions, crude system of operation, breakdowns due to age of premises and equipment, forcing production beyond capacity for which it was originally constructed, or exposure to alterations during the enlargement of the plant.

In dealing with the general hazards it is quite important to determine which should receive first attention, and I wish to state that it does not always follow that the greatest hazard exists at the place where there

is an exposure to the greatest number of workmen. Many serious accidents have occurred in places where no one is supposed to go, for the simple reason that the conditions are familiar to no one and the workman is injured before he has time to discover the danger.

The safety engineer should be guided by the question: "Can a person be injured at this place?" He should proceed with the installation of guards for all places where he has knowledge that danger exists, and as rapidly as time and money will permit, with due regard for the least possible interruption with the operation of the business. Certain standards must be followed in the construction of guards and it is advisable for the safety engineer to give this matter very careful consideration.

The laws of many states and provinces not only require certain guarding in manufacturing plants, but many of them specify requirements which these guards must meet in order to comply with such laws. Insurance companies have a set of standards for safeguarding which the employer can follow if he desires to have the advantage of a schedule rate for his risk, and the National Safety Council issues *Safe Practices* pamphlets to guide one in this work. These standards are similar in many respects, and a careful review of each should enable the safety engineer to determine without much difficulty, the height and type of guard to provide in the different places. I have not mentioned the kind of material to use in the construction of guards for the reason that while we generally agree that angle iron, sheet metal, perforated metal and wire cloth of small mesh are the most desirable, metal is not very plentiful in sawmill districts and I have seen some very effective and neat guards made of wood.

While it is essential to comply with the various laws it is also of value to recognize the standards of the insurance companies, which not only fulfill the requirements of the laws, but in many instances cover a wider range of guarding. There is also an opportunity afforded for applying the rating schedule for purpose of measurement of the risk, which can be used as a basis of comparison for determining the results of the safety work in the plant. To meet the hazards associated with the class of industry to which the plant belongs valuable assistance can be obtained from the plant safety organization, but it will be found necessary to seek information from others in the same class of business who have had similar problems to handle. I know of no better way of obtaining this valuable help than through the medium of the National Safety Council.

MECHANICAL SAFEGUARDING

In eliminating or reducing the hazards of the particular plant, it may be difficult to accomplish satisfactory results. Much will depend upon the ability of the safety engineer to convince the employer that, with certain changes in the operation of the business, not only will greater safety be secured but better efficiency obtained. If some method of operation is hazardous and the safety engineer has knowledge of a better method which reduces or eliminates this hazard, it is his duty to bring this safer method to the attention of the employer and urge its adoption.

One of the most difficult problems to handle in safety work is the prevention of accidents caused by feeding and operating machines doing a variety of work. Material must be fed to the machine and the operator is obliged to put his hands into the danger zone while doing this work. A guard can often be devised, for individual operations, which will permit the material to be placed in or fed through the machine and at the same time protect the operator's hands from injury at the point of operation, but I have yet to find a satisfactory guard with a very wide range of application for overcoming this hazard. One of the best methods of overcoming the danger to workmen engaged in such occupations is to provide a mechanical or automatic feed device on the machine. In the development and attachment of these appliances to a machine the safety engineer should endeavor to bring out any inventive ability which may exist amongst the workmen. He should also recognize the value of making suggestions along these lines, so as to encourage others to apply their knowledge and experience in the solution of the various problems with which he is confronted.

As safety organizations are so essential to successful results with guarding I want to say something in this regard, on account of experience which I have had through the opportunity afforded by my duty of visiting numerous plants. I found very little had been accomplished in quite a few establishments, because the man in charge of the safety work was dealing with the problem of generalities and had no well-defined plan of action. It is not only uninteresting but usually unsatisfactory to proceed in this manner. Plan your work and work your plant, remembering that a safety organization must generally be not only built up but kept alive.

I have been in woodworking plants where the bulletin boards contained bulletins illustrating accidents in mines and in machine shops, where they had posted bulletins descriptive of accidents in the paper industry. I have seen instances where both foremen and workmen would have meetings and discuss recommendations for safeguarding machinery and entirely ignore eye accidents, infections, and numerous other injuries constantly occurring in the plant. They would just go through the formality of carrying out a plan of organization without a sincere effort to accomplish something.

The accident record of the plant must show continuous improvement or interest in safety work is lost. Progress in the reduction of accidents not only makes it easier to have guards installed but encourages the use of them. Providing guards and giving no thought to the accidents caused by methods of operation, or carrying on safety organization work without consideration of the needs for safeguards, will produce about the same results as the amateur gardener gets who pays no attention to the weeds.

In conclusion, I wish to remind the young safety engineer that a safety department in industry is not an experiment of the employer or a piece of philanthropy, but a most important part of the business. The working organization which it has taken so long and such untiring energy to build up must be maintained if the firm expects to meet with growing success. Accidents are a burden to industry; they reduce production,

increase the cost of operation and are a discreditable mark against the plant in which they happen. There can be no sense of justice in people who tolerate an enterprise which causes suffering and privation to humanity, which wastes the man power of a nation—its greatest asset—and who remain indifferent to a remedy that is available. A field of most laudable endeavor is open to the young safety engineer and the need for performing a noble piece of work in the interest of his fellow man, as well as in fulfillment of duty to his country, was never more urgent than at the present time.

CHAIRMAN HOOK: After the next paper, "Does the Attitude of the Foreman Determine the Success of the Safety Engineer?" by Mr. W. E. Worth, we will have a general discussion.

DOES THE ATTITUDE OF THE FOREMAN DETERMINE THE SUCCESS OF THE SAFETY ENGINEER?

W. E. WORTH, GENERAL SUPERINTENDENT, CHICAGO TUNNEL COMPANY.

Mr. Chairman and Members of the National Safety Council: The question "Does the attitude of the foreman determine the success of the safety engineer" sounds easy and as a matter of fact can readily be answered in the affirmative or negative. In either instance, however, considerable explanation is necessary. To get the attitude of different types of foremen let us assume that you have been asked to take charge of the accident prevention work of an average sized plant, where various types of foremen are employed.

Before accepting you should make a survey of the situation and determine certain facts such as (1) that you will have the backing of the management, (2) the personnel of the organization, (3) the relation of the different departments. You should also obtain an organization chart for your guidance in dealing with department heads and generally familiarize yourself with the methods of operation. Then before attempting to do any definite constructive work carefully analyze the accident record and make a rapid but careful survey of the physical condition of the plant from the standpoint of accident hazard. Now let's get back to the foreman. There has been much discussion as to the advisability of a safety committee organization, but if you decide to have one, something like the following should be the procedure: The foremen and workmen should receive first attention and be organized into committees. These committees should be entirely independent of each other. The reason for separate committees of foremen and workmen is that the foreman, as a leader of the men, should be the safety engineer's deputy, and as such should co-operate in enforcing all rules and seeing that safeguards are used at all times. The workman is the best source of suggestion for safeguarding the plant.

FOUNDATION FOR A SAFETY CAMPAIGN

After organizing these committees you should say to the foremen that you need their co-operation; that their attitude will be apparent in the

way they conduct their departments and that certain points will be carefully observed, namely:

1.—*Neatness of Department*—The men cannot be expected to keep "their house in order" if their leader is inclined otherwise. A department which is not kept in order is an indication of the type of foreman. He is reflected in his men and in the work they turn out. The labor turnover in such a department will naturally be high because a first class man, be he laborer or mechanic, will not be satisfied under such conditions.

2. *Instruction of Workmen*—The foreman should see proper instructions are given to his men and that they understand the instructions. If a foreign language is spoken by some of the men, instructions in their language should be given by one of their own nationality. (Right here I want to say that communication by use of their native tongue with men who do not understand our language should be only a temporary expedient. They must learn our language as well as our ways and we should give them means to enable them to do so.) The foreman should determine by test if instructions are thoroughly understood. If results are not satisfactory repeat and further explain the rules. He must not lose his temper. It may lose a good man, which means his work over again, breaking in a new man. If he has not time to instruct the new man himself he should delegate some one competent to do so.

3. *Inspection of Machinery*—A competent foreman will, through force of habit, inspect the machinery in his department as he makes his rounds. If a new foreman has not the habit it is well for him to cultivate it. It means a great deal to the company, both from a safety and production point of view. As he makes his rounds the safeguards should be looked over to see they are in good order as well as being used.

4. *Example*—Example is an important factor with a successful foreman. If he by his attitude shows the workmen that he believes in safety, in other words, "practices what he preaches," they will also believe.

5. *Discipline*—Workmen should be disciplined if they fail to obey instructions. While discipline in the old days meant one week to thirty days off duty or dismissal, today it should mean a "heart to heart" talk between foreman and workman, with a statement of the failure made against the workman's record. If he is right he will not repeat. If he does, determine whether he is competent for the place he is filling. Discharge should be the very last resort.

The foremen by this time will know and understand your attitude and if these five points are followed up you will find them a fine working basis for your campaign.

I am assuming that you have the absolute backing of the management in your work; that in your capacity as safety engineer you are considered as important a factor in the plant operation as a division chief; that you are in fact the personal representative of the chief operating officer. As his representative it is expected that you will have consulted with him and obtained his approval of your plans.

As soon as possible you should begin holding weekly meetings of foremen to discuss progress and compare results. It would be somewhat un-

usual if in a large organization all foremen and department heads responded promptly to what to them is a new departure. You must expect, if not positive opposition at least only passive interest on the part of some foremen. At your weekly meetings you will begin to see the attitude of the foremen and you will probably classify them in this order: Progressive, Passive, Obstructive.

TYPES OF FOREMEN

The first type of foreman is immediately interested in any new movement giving thought to the working out of the problem represented, and applying himself to the work in a manner which insures the interest of his men and assures the success of the scheme whatever it may be. He can be depended upon by the safety engineer to give able advice in handling the problems which arise and enthusiastic assistance in enlisting the support of the workmen. Such foremen should be the men around whom a safety organization is built. With them as your deputies you are started right.

Having determined the foremen who are interested, you would of course continue to keep them so, but of necessity devote your strong efforts to winning to your viewpoint and support the men who are not interested or who for certain reasons oppose you consistently. The passive foreman needs your close attention. He does not have to be opposed to your work to interfere with its being successfully carried on. He must be one hundred percent for you and your work if success is to be assured. Why? Because if he always fails to exemplify the principles of safety to his men you are just as badly off as if he were against you. If a foreman is known not to be with you and his men want to be with you the task is easier than when a foreman is apparently with you, but fails by his acts to set proper example to his men.

A foreman cannot post instructions as to safe methods of operation and then himself violate them. If he posts a "Stop, Look and Listen!" sign and then fails to do so, you cannot expect Mr. Workman to do any different. Just a few weeks ago one of our men, who had charge of a certain part of our safety work, came to me just as he was leaving on a vacation and said: "You know I have always told you anything I thought you should know. I hurt my knee several days ago, but I did not go to the doctor. You know how busy I have been. Feel my knee." After I felt the lump on his knee what I said would not look well in print. This man failed to do what he was supposed to be seeing the other men did. I could not, regardless of my warm feeling for him, let him continue to supervise this work. It would be only a matter of a few days before the men knew of his injury and failure to report same. He had set a bad example. I was afraid to take a chance. If allowed to remain in charge the men might take the same chance he did, with probably more serious results to themselves.

FOREMEN MUST SHOW THE WAY

The foreman must show the way. He is the leader of his department. If he sets a bad example how can you expect the men to be different.

Such a foreman is the man you have got to convert. The foremen who are against you—fortunately, they are becoming rare—I believe soon can be won if you handle them diplomatically. In my experience, covering over twenty years. I have found this kind a peculiar type. To a new man, no matter what form of propaganda he may be connected with, this type of foreman seems a hopeless task. You begin to wonder why the management keeps him on the payroll and you are liable to say things you will regret later. He needs special observation—you must discover his hobbies. He may be an expert along lines which are peculiarly valuable to the company—determine his valuable points, familiarize yourself with them and make your approach by showing your interest in his work. Do not overlook this important point. If you are not interested in the other fellow, you cannot expect him to be interested in you. Your work, in your opinion, may be the most important factor in the operation of the plant. The foreman probably has the same idea of his work. It becomes, therefore, a matter of reciprocity. You should not consider your work properly organized until every foreman in your plant has been convinced that safety of operation is just as important as any other detail of his work. The modern foreman knows this to be true.

The foreman of the future will be taught the truth of this by his experience and observation. In your work the foreman of the future must be considered, he who is now a workman, or possibly an apprentice. The present day foreman, of course, is your immediate problem, as his influence is far reaching and more potent than yours; you must have him with you. Should you find that he cannot be convinced or that he deliberately opposes you in the working out of the various problems confronting you, he must have your close attention.

DUTIES OF COMMITTEES

Let us assume that you are unable to win to your view one or more of the foremen. Knowing you are right and having the backing of the management you should proceed to organize the department without the assistance of the foreman. Carefully prepare your plans for organizing the department. The following is suggested:

1. Very close supervision of each operation in the department by the safety engineer.
2. Rush work of completely safeguarding machinery in the department—giving it preference over other departments where foremen are progressive or passive.
3. Extra efforts toward safety education of workmen in the department.
4. Put into effect as fast as possible every safety suggestion which is practicable.
5. Authorize workmen's safety committee to make periodical inspections.
6. Request the chairman of the workmen's committee to act as your deputy instead of the foreman.
7. Prepare comparative statements of costs of accidents for the management.

SAFETY ENGINEER MUST KNOW EXACT CONDITION

Your efforts are now naturally directed to winning to your viewpoint the department or departments which are not with you. It is not possible to lay down a line of action for you without knowing the exact conditions you are trying to correct, but you can be governed by those conditions when preparing to offset the attitude of the foreman. By close supervision of each operation in the department the safety engineer soon will determine the hazards which exist and can apply himself to the designing of safeguards. It is important, under the circumstances, to install mechanical safeguards as fast as their need is determined and they can be constructed. The safeguards should immediately reduce the accident hazard materially. This reduction of hazard will be apparent to the workmen and will greatly assist in getting their attention to your educational campaign, carried on with bulletins and other means with which you are no doubt familiar. This will bring suggestions for further safeguarding of machinery and unsafe places as well as suggestions for improved methods of operation and elimination of unsafe practices. If the workmen's safety committee makes periodical inspections you will in this way have three checks against unsafe machinery and practices—your own, workmen's suggestions and the workmen's committee. In addition to these you have the added interest of the chairman of the workmen's committee to spur on to greater effort every man in the department. By crowning all these efforts with comparative statements of injuries and cost of accidents you usually can show the management that the disinterested foreman is an expensive proposition; too expensive to remain in his employ. There are, in some companies, departments where the margin between profit and loss is so small that two or three serious accidents will result in the department operating at a loss. An analysis of such accidents, together with a statement of cost, will soon bring results. You will either convert your foreman or there will be a new one.

To be classed as competent, a foreman must be up to standard in all things pertaining to his work, not expert in a few. He must be convinced that:

> His responsibility does not cease when production is maintained, and that he is responsible for the safety of his men.
>
> He should realize that his future promotion, his personal efficiency, the maintenance of his working force, the morale of his force, maintaining production and his personal and his family's happiness depend in a great measure on the men under him feeling safe while at their work; and
>
> That a series of serious injuries can soon disorganize a department and affect the entire plant for days.

Workmen do not always become positive forces in accident prevention work, but a foreman should always be an asset. If he is not, the accident hazard among his men is likely to be high, too high for your comfort.

In this movement as in every other effort that affects the workers and depends for success on their co-operation, the foremen must be taught

the value of their work and take a leading part. Constant attention to the work, enthusiasm, and an honest desire to prevent accidents on the part of the foreman is necessary. They must constantly remind the men of its importance and keep them interested.

While the attitude of the foreman, in a great measure, determines the success of the safety engineer and while the foreman's hearty co-operation is important and greatly to be desired, yet if the safety engineer has the co-operation of the workmen it will offset in a great measure the foreman's attitude and he can be successful even if all the foremen are against him.

DISCUSSION

CHAIRMAN HOOK: One of the big values of a Safety Congress, to my mind, is the discussion of the problems or ideas presented. As the paper is read some particular point is raised about which we want more information and if the meeting adjourns without clearing up that particular point we lose the real value of the meeting. Several things occurred to me as the speakers were presenting their papers this morning—among others the questions of labor turnover and accident rates.

Our turnover, like every other plant, I assume, has increased during the past eighteen months. This is particularly true among colored common laborers, yet the number of lost-time accidents has decreased. That would refute the argument that as turnover increases accidents necessarily increase. A lot of men have been hiding bad practice in their plants and putting up a large labor turnover as a shield, although I do not think they are justified in doing so.

Another point: I think it is extremely important and very necessary to let the rank and file of the men in your plant know that you get their records from the safety department; that you look them over; that you know the foreman and superintendents who are interested; that whenever you have an opportunity to compliment a particularly safe workman, you take advantage of that opportunity to drive the lesson home. Back up your safety organization with the information that the big boss is behind your safety engineer—that he is familiar with what is going on and he knows who are the safe men and who are the careless men. Not very long ago Mr. Morris told me one of our men was taking a lot of interest in safety work, although he had not previously been interested. I made it my business to bump into that fellow and let him know that Frank Morris had told me all about him. I said: "You are giving Mr. Morris a great deal of encouragement and I am much pleased to learn of your good work. It is to your own interest, of course, but every fellow doesn't realize its value, as you do." I wanted him to know that Frank got that message to me and that his efforts were appreciated.

VALUE OF ATTENDING SAFETY CONGRESS

Impress your executive with the necessity of coming to the Congress of the National Safety Council each year. We are pretty busy these days—some of us are spending most of our time in Washington. I was

quite sick a few days ago, the doctor said it was foolish for me to travel and my wife tried to persuade me to stay home, but there is something in the air—you feel better when you get down here. I am feeling better already and I will go home with lots of enthusiasm and a greater belief in the thing we are trying to put across because of attending the Congress. I can give Mr. Lewis, Mr. Morris and the other men in charge of the plant more help and encouragement and I will feel a greater responsibility as a result of my coming here. Keep after your general superintendent and general manager and induce them to attend the National Safety Congress each year and they will acquire some of this enthusiasm—this medicine that is so good for all of us, it will do wonders in helping the program in your plant. We will be only too pleased to help you with your management if you are unable to impress them with the necessity of attending the Congress. Have Mr. Cameron ask members of the Executive Committee to write personal letters to your general officers. We will all help, it is our duty.

I am interested in anything that is directly connected with the winning of the war; if I didn't think that your efforts and my efforts along this line would help I wouldn't be here today.

STATUS OF SAFETY COMMITTEEMEN

Mr. Walter Greenwood (Carnegie Steel Company, Youngstown, Ohio): Gentlemen, as a junior in safety engineering, I came here for information, not to elaborate on what has been said better than I can say it. A few things have been said this morning that I do not quite agree with, and I am seeking information on those points. We have talked about committee work and I am not fully clear as to the status of safety committeemen. Does a committeeman have authority to tell a man what he shall do or shall not do or does he communicate his information or instruction through the superintendent of the department or the foreman in charge? On whose time does the committee meet? Does it meet during working hours? Do committeemen leave their work long enough to give intelligent discussion to safety matters?

I know of one plant where most matters pertaining to safety subjects or to accidents are discussed at the weekly foremen's meetings.

It has been said that we cannot standardize safeguarding, but is it not true that standardization can be utilized by engineers when drawing specifications for machinery?

It has been said that rule books are not read and that instructions given by the foreman are more important. Whose fault is it if the book of rules is not read and why does not the foreman take some means to ascertain if the rules are read and understood? A preference has been expressed for verbal instruction, but I believe a printed book of rules is more comprehensive than the spoken language as the men have an opportunity of reviewing rules they do not understand. I have measured different nationalities in whose hands books of rules were placed and have reached the conclusion that only the most illiterate did not read the rules. The men who did not study the rule books suffered the highest percentage of accidents.

WORK OF EDUCATIONAL DEPARTMENT

CHAIRMAN HOOK: I think the function of a committee should be advisory. You cannot take executive power away from the men you hold responsible for the operation of your plant, but your committee can plan and advise and if the plan is approved by those who have the power to do so it can be adopted as a part of the policy of the plant. Once adopted it is up to those who are responsible to the management to see that it is executed.

Safety committeemen cannot be invested with executive authority —some one person has got to be responsible. I might illustrate by a reference to our department of education: We have, in connection with our personal relations department, a director of education and an educational committee. The chairman is the general superintendent of the plant and the other members are the apprentice instructor, the superintendent of the forge and foundry division (one of our early enthusiasts), the superintendent of the annealing department (at one time a principal of one of our city schools), Mr. Lewis, director of safety and labor, and Mr. Cowgill, assistant to Mr. Lewis. The director of education is not classed as a member, but sits with them. The function of the committee is to study the needs of the plant and determine what educational facilities should be offered to raise the standard of our employes. If the director of education should have one idea—and his might be that of the educator—he might not have the practical view of the men operating the plant. Suppose he has a plan and presents it to the educational committee for approval. If the educational committee does not approve it, and fails to convince the director that his plan is wrong, the director can send in a minority report. Then the responsibility is mine to decide which of the two, if either, is adopted. Once a plan is adopted it is up to the director of education and his staff to execute it. That is the way we handle it.

Before we started the fall term for our apprenticeship, night and Americanization classes, the educational committee and director of education formulated a complete program, clearly illustrating the work. I approved it and turned it over to the education department for execution. The director of education alone could not have worked out such a practical plan, I am sure. The advice the man on the job is able to give in committee work and in helping to formulate plans, subject to executive approval, is of great value.

MR. EVANS (Briar Hill Steel Company, Youngstown, Ohio): I have in mind the plant where the safety plan is based on the suggestion sent out by the National Safety Council—where the important group is the central safety committee—a workable plan. But unless the central committee has authority to carry out its recommendations the time spent in its meetings is not worth while. To refer every suggestion to one central power takes too much time and accidents may happen in the interval—the central committee must have authority to carry out its suggestions or the plan is useless.

MR. WORTH: Isn't it assumed that the National Safety Council's plan of

organization is simply a generally suggested one? It is my understanding that the central safety committee is a final authority to pass upon and carry out the suggestions made by the workmen's and foremen's committees. The central committee should consist of the executive heads of the departments, with a chairman, and should be the final authority on safety suggestions.

MR. GREENWOOD: The plan I am most familiar with—one that has been adopted by a great many corporations—is for the general committee to put their propositions up to the manager for approval and every order is passed down through the central head. The discussion leads me to believe that some of our members are under the belief that the safety committeemen have authority. I have never been under that impression myself, but I should like to know which is the better system.

DIFFICULTY IN ENFORCING SAFE PRACTICES

MR. I. L. LOCKNEY (New York Shipbuilding Corporation, Camden, N. J.): The hull department committeeman the other day asked me if they had authority to go to a man and speak with any force behind them. I have had some authority in state work and it has been my experience that you catch more flies with molasses than with vinegar. I told the committeeman that the yard policeman had been instructed by the chief to stop unsafe practice but had met rebuke from the workmen. He was clothed with authority—had a uniform and a badge—and if he could not get co-operation through his authority it would be hard for a committeeman to do so. I advised the committeemen to carry out all they could of the golden rule and the brother's keeper theory and let the rest go; that in time they would be able to get more co-operation in that way than by the exercise of authority.

About the first thing a man in a riveting gang learns—instead of riveting—is to be a tough nut; he wants to be hard, and with such characters as that the exercise of authority will only make things worse.

MR. CHARLES T. BANKS (Safety Supervisor, Michigan Mutual Liability Company, Detroit, Mich.): The presumption is that members of a safety committee are selected for their tact and knowledge of the business. I do not know of any safety committee having been authorized to enforce rules—their functions are exercised by talking in a tactful and proper manner to other workmen about unsafe practice; when they have gone that far they have about reached their limit. I think it is proper for the safety committee member who notices the violation of a rule to take that matter up with the chairman of his committee. In the institution with which I have been connected for several years we have found a mild system of indirect discipline very effective. The best way to describe it is to explain exactly what a safety committeeman would do if he discovered a workman, we will say, grinding without goggles. He is authorized to say to him: "John, don't you know you ought to wear goggles?" If John says "Yes" and puts them on, that settles the matter, but if John does not do so the committeeman has the authority to say "The superintendent (or general foreman, as the case may be) has asked me

to send to his office all men who refuse to wear goggles. I wish you would go over with me right now." Then he goes to the foreman (or superintendent) and says: "This man was grinding without goggles. I spoke to him but he does not think goggles are necessary." He leaves John with the superintendent, who goes about the matter something like this: "John, I thought you were the last man in the plant who would do anything of that sort. You are a good workman in every other respect and I am very much surprised to find you breaking the rules; in fact, I am so much surprised that I am not going to do anything about it at all. I don't believe you will do anything of that sort again, so we will drop it."

PATIENCE AND GOOD HUMOR WILL WIN

If John is caught a second time the superintendent says: "John, this is the second time. What do you think we had better do about it? What would you do if you were in my place? John usually answers: "I don't think I would do anything. I am going to wear my goggles after this. I don't think you will have any more complaint about it." "All right. I am going to take your word for it. Go back to work." If John comes back the third time—you will be surprised the small number of third times you will have—the superintendent says: "John, this is the third time. What do you think I ought to do about it now?" The superintendent never loses his temper. He puts it up to John. John says: "I don't know." "We ought to do something, hadn't we?" "Yes, I suppose so." "Well, what do you think we had better do?" "Well, I don't know. It is up to you." "I am going to drop it, even for the third time. The fourth time, John, you needn't come in to see me at all: see the timekeeper: he will take care of the fourth case." Out of some 30,000 employes we have had very few men up the fourth time.

Mr. F. N. Wells (Packard Motor Car Company, Detroit, Mich.): I am a junior member and just getting where I would like to do all these things, but I feel that I need a little help. I should like to ask about the plan Mr. Morris is working in his plant—the size of the safety department, the men employed for safety work exclusively. I find it very hard to do everything that is required and give the proper attention with the help I have. Our plant has about 12,000 on the rolls at the present time and we are divided into 300 departments. We have a central safety committee of all the executives, including the doctor, the director of welfare and the director of employment—a total of seventeen members—the safety engineer acting as secretary. He is directly under the superintendent of construction and maintenance.

The work Mr. Morris outlined seems to require so much daily attention that I believe it would require more than one assistant to the safety engineer.

PROPER SIZE OF SAFETY ORGANIZATION

Mr. Earl B. Morgan (Employment Manager, Curtis Publishing Company, Boston, Mass.): That is the eternal conflict between the man who has to put the job over and the powers that be. It is a sales proposition

pure and simple—you might say it is "reverse English" on the sales proposition. I have worked nine hours to sell my boss to one hour to do the job—until such time as I sold him or got out. If you can't sell the man after working at a ratio of nine to one you might as well look for another field.

The more men you can get to help you in safety work, the better. I do not believe there is a limit. I do not mean you should have them right in your department, but my study of the subject would suggest that a fair average of immediate workers under the safety engineer, in the average industrial plant nowadays, would be about fifty man-hours per week per thousand employes. This was put up to me a year ago when I was with the Norton Company. We had four plants and they thought I was getting topheavy on accident prevention, so I showed the number of man-hours we were putting into them directly—not the volunteer effort, because that you must have—I mean the clerical work and the man who is reporting to you and making inspections all day long, the specific duty of accident prevention. I sent out a questionnaire to Browne & Sharp and others of that type in the machine tool line; to the mining and the crushing companies, and to the steel industry. I found they all gibed pretty close, where they had clerical work on statistics, plus claim settlements, to do. Keep in mind that we had the inspection and supervision of mechanical safeguarding and claim settlement—compensation claims and getting the injured men back to work as soon as possible. Even after the accident has happened the safety engineer cuts down the period of disability if he can get the man back in some place on a semi-wage earning basis. We had a case where a man lost his left arm in a crushing roll, but in seven weeks that man was making 10 cents more per hour than he was the day of the injury. We designed a hook which fitted onto the stub of his arm and put him on an elevator. The hook fitted onto the tiller and that man was working on the elevator, formerly he was a laborer. The rate was raised at that time because the elevator was on a time basis and we picked it out as a place where the man, by efficient methods, could increase his productive power—and he did it. He was a foreigner, having seven children. I cite this case to show you the safety engineer doesn't have to quit his activity even after the accident happens. But it depends on the organization as to how many men you must have to make it a success.

HELPING THE NEW MAN

MR. MORRIS: As I understand it, the question is, how many men does it take to carry through a program of the sort I outlined. A visitor at our plant asked the same question: "How many safety assistants do you have?" I answered: "Two hundred and seven." "Two hundred and seven?" "Yes, we have 207 safety foremen," I said. "I mean, how many men do you have in the office," he asked. That was another proposition. In our office we have a foreman of the sanitary operators—supervision of sanitation is assigned to the safety department as we consider it a part of our safety program. We have an assistant safety engineer,

an A-1 salesman, and also a clerk who does statistical work and answers letters. He has done a lot of correspondence work in regard to the Metal Section bulletins which the National Safety Council is getting out. The main work of the safety man is not inspecting, but investigating. The safety engineer is not an inspector but an investigator—I like the distinction between the two words. We pay particular attention to the lost time accidents—they average about thirty a month. A fellow can make a pretty good investigation of a serious accident in one day, because our inspectors do not go through the plant to see if a guard is here or a guard is there—it is the foreman's job to keep guards in place.

The shop committee is appointed by the foreman. The safety engineer gets after the foreman about the first of the month, and he picks out three live wires for his safety assistants, because it is his job to prevent accidents in his department. To those men we give departmental safety committee buttons; the buttons are their property, an emblem of service, but not badges of authority. When a new man comes into the shop a safety committeeman does not have authority to say: "You will have to do so and so." He says: "Look here, brother; I am one of the safety men in this department. I see you are new and I want to tell you how we do things here." Committeemen are merely safety advisors.

CHAIRMAN HOOK: Psychology plays a very essential part in our work. When a new man comes into a shop and the foreman, the superintendent or someone in authority talks safety to him he often gets the idea of "Well, hell; that is to the company's interest—they are interested because they have got money at stake," but if one of the men working on a lathe, similar to the one he is working on, is a member of the shop committee and he goes up to the new workman and says: "Brother, I want to tell you about this; I am a member of the safety committee. This is what we have found," etc., and "this is what you ought to do for your own protection," he thinks: "Well, there *is* something to this safety work I have been hearing about. This man thinks it is good enough for him, so it is good enough for me" That is the psychological effect.

General Round Table Discussion

St. Louis, Mo.

Sept. 17, 1918

PHIL STREMMEL, Chairman
General Superintendent, Granite City Steel Works, Granite City, Ill.

CHAIRMAN STREMMEL: I have not as yet heard our national hymn sung since the opening of this Congress. I think it would be very fitting for all to stand and sing "My Country, 'Tis of Thee."

This is a round table meeting, a meeting in which you are each invited to take part. We ought to know who we are and where we are from, so I would suggest that you turn to the left and shake hands with the man next to you and tell him your name and what company you represent. He will tell you his name and where he is from, and the company he represents. Then turn to the right and repeat the introduction. Thank you.

I was deeply impressed by the speeches this forenoon. Safety First is a movement in the interest of the other fellow and I am glad we are to discuss such a subject. Sam Walter Foss is the author of the following beautiful words:

"There are hermit souls that live withdrawn,
In the place of their self-content;
There are souls, like stars, that dwell apart,
In a fellowless firmament;
There are pioneer souls that blaze their paths
Where highways never ran—
But let me live by the side of the road
And be a friend of man.

"Let me live in a house by the side of the road,
Where the race of men go by—
The men who are good and the men who are bad,
As good and as bad as I.
I would not sit in the scorner's seat,
Or hurl the cynic's ban—

Let me live in a house by the side of the road.
And be a friend to man.

* * *

"Let me live in my house by the side of the road.
Where the race of men go by—
They are good, they are bad, they are weak, they are strong,
Wise, foolish—so am I.
Then why should I sit in the scorner's seat,
Or hurl the cynic's ban?
Let me live in my house by the side of the road,
And be a friend to man."

HOW TO SELL SAFETY TO THE BIG BOSS

"How to Sell Safety to the Big Boss." That is a very important subject. I am going to ask General Manager Cameron to start the discussion.

MR. W. H. CAMERON (General Manager, National Safety Council): This request is a surprise, but I will do the best I can. I presume it depends a good deal upon the personal qualities of the safety engineer as to whether he sells any proposition to the boss. In my own experience with safety work, in 1910, I had to sell the idea to everyone in the company. I had to sell the president of the company, the vice president, the comptroller, the purchasing agent, and everyone else in the company. I discovered that the president and other officers had to be "shown"—my job was to visualize to them what life preservation meant in their business. I have been saying for years that if we can get this proposition before the eyes of our general managers, so that they will "see it", they will do the things we want them to do. If we can only get the "attention" of folks we can get into their minds the facts we know to be true. If I could only take their ears into my hands and make them "pay attention", and their eyes and make them "see" I am sure I could sell the safety idea to them.

I believe you must get hold of the ears of your president and general manager to make them see these things. How can you make them see this safety proposition? That depends upon your personality, your persistence, your courage and the methods you follow. Permit me to illustrate these truths by several references to my own safety work: I think I was one of the first safety men in the country to take pictures of killed and injured men and I used them to visualize to the president and other officers of the company the folly of accidents—I tried to demonstrate to them that accidents could be prevented. Many of you know that the presidents of our large corporations do not visit their factories frequently. They do not know, intimately, the causes of accidents and proof must be brought to them of these facts—what the causes of accidents are, the cost of the accidents, and the remedies for their prevention. I maintained a constant circulation of these pictures and stories among all of the major and minor officers of the company.

I remember my first industrial accidental death experience. I could not get much attention for it. I went to the home of the dead boy and his

mother gave me his picture and the family story. The father of the boy had been working for this particular industry thirteen years; the boy was the oldest in the family and was helping to pay the mortgage on the home For some months previously I had made efforts to have the trolley wire that caused his death properly safeguarded, but the work was allowed to drag. I said to the president: "You are going to sign a check this week for $3,500 to pay for the death of this boy," showing him the picture, "and for $1,600 you could have had the electrical wires safeguarded." He was convinced, as he never had been before, of the economy and humanitarian values of safety work.

It is the duty of the safety engineer to get close and stay close to the general manager of his company if he expects to have his ideas and plans put into effect. He must be constantly, persistently and everlastingly on the job, demonstrating what the safety movement means. The officers of our industries are busy men and it is the duty of the safety engineer to sit alongside of the boss and sell him this thing every minute. The measure of his success will depend upon his ability as a salesman.

CHAIRMAN STREMMEL: Mr. Cameron has given us the right idea and its method of presentation to the "big boss." We are indeed fortunate, this afternoon, to have a man in this room who is a "big boss" in one of our plants. He has had the safety idea sold to him. Mr. Charles R. Hook will be the next speaker.

A RETURN ON CAPITAL INVESTMENT

MR. CHARLES R. HOOK (American Rolling Mill Company): It was an easy matter to sell safety to me because I came up through the plant. My experiences as foreman, assistant superintendent and superintendent showed how necessary was the solving of this problem if we were to cut down industrial accidents and safeguard the lives of our workmen. If you want to sell safety to the "big boss" you have to get it down as near as possible to a dollars and cents basis. I do not care what kind of a management you have, you must realize that your management is responsible to your stockholders. An industry, a business, has been started with one idea, and one idea only, or it would not have been started, and that is to make money. Unless you have something which will help bring a bigger return on the invested capital you are not going to get very much of an audience from the "big boss."

I know this is an absolute fact and those of us who are responsible for general management have that problem before us continually. Where you have "big bosses," the board of directors, and when you have a program which is part of a bigger program, which has cost your company $15,000 or $20,000 a month, your board of directors wants to see tonnage results from that expenditure or they will consider that you are carrying on what is generally called welfare work.

The safety program is no welfare program in our plant; we never use the word "welfare"—we do not like it and we do not believe in it. No self-respecting man wants to be welfared. If you have the kind of men in your plant you ought to have and you want to have they will not stand for what is generally termed "welfare work." All these things, we believe,

are a part of the general program of mutual interest and if we are spending $15,000 or $20,000 a month for safety and general health and sanitation programs we believe that we are getting a corresponding return for the expenditure. It is easy enough to visualize this whole thing. Where you have workmen's compensation you know what an arm or a leg is going to cost you, but a lot of our managers fail to realize that the efficiency in their machine shop or in their steel plant or in their rolling mill or in their paper mill or whatnot has been very largely decreased and continually held at a very low standard because of psychological effects.

SAFETY WORK PAYS BIG DIVIDENDS

You and I know that when we are feeling good we have lots of pep in our bodies, we put pep into our work, and unless we get happiness out of our work we cannot accomplish efficient results. All the things that contribute to our happiness naturally increase our general efficiency and it is the increase in the average efficiency of all the workers that brings dollars into the treasury. I know, if you give it proper study, that you can prove it to the "big boss"—you can sit down and make a real analysis and you can prove to him that the money you are spending each month is returning more than what your company has put into the work. That is the basis on which to sell it to the "big boss." In turn you can show the workman that he has a very selfish interest in the safety program, because he is going to increase his earning power through his increased efficiency and the chances which he will have thereby of getting a better job and more money. I am sure you can put the subject on a dollars and cents basis and that is the way to sell it to the "big boss."

MR. FELLMER (Markham Company of St. Louis): It is my business to sell the safety idea to the management. I do it every day and it is the dollars and cents idea that gets the thing across. My plant, working about 700 men, asked for a very material increase in their liability insurance premium on the basis of their experience. It was quite a problem, but the rate was secured and at the same time we got real co-operation in accident prevention out of that plant. I dropped all other work and began an analysis of the proposition as it presented itself. When I got through with my analysis I had a graphic chart that showed that the plant had suffered 1,616 accidents in twelve months with a corps of 700 men. It further showed that about one-third of these accidents called for the payment of compensation. The accidents were then sub-classified by causes and into different departments and into different classes—sprains and strains, burns and eye accidents and so on—and how much was lost in dollars and cents; also how many hours.

When the drawing was finished I had it blue-printed. I took it to the president of the company and in exactly five minutes I sold him the idea. Safety is on the map as far as that company is concerned and is there to stay. One very interesting thing developed which assisted in the selling: That the injured workmen had lost $17,000 in wages. When I went to the president I said: "I would like to call your special attention to the fact that your men lost $17,000 in wages through accidents. It is very unfortunate and I know you do not like to see it, but what does that spell to

you and what does it spell to the company? In the archives of the company, probably in the comptroller's office, there is a sheet showing exactly how the cost of your product is made up—the cost of raw material, cost of auxiliary material, overhead, maintenance and everything else, also labor. If you will take this $17,000 and your labor item per ton of product and make just one little equation, you will find, Mr. President, what it costs you to have your men injured." No further argument was necessary. Safety was on the map. That is how I sold the idea to the "big boss."

SELL TO YOURSELF FIRST

MR. J. M. EATON: In my judgment very few of the so-called "big bosses" are sold the safety idea on a basis of dollars and cents. I should dislike to feel, in this day and age, that that was a fact. Most business concerns, of course, figure up what accidents cost, but in the aggregate the sum is relatively small as compared to their volume of business, income and so on. The dollars and cents total of what accidents cost is wasted every day in other directions in any big organization.

The "big boss" is sold not in the plant but outside of the plant. His mother first started to sell him the idea of safety, if he is any kind of man at all, and most men at the heads of big businesses are pretty broad-gauge fellows. He is not the type of man that looks with favor upon any plant condition which is such as to injure the operatives in that plant. I have sold safety to two or three big men—I think I have sold it to a couple of the biggest men in this country—and I did not do it on a dollars and cents basis. General managers and the presidents of companies do not want people to get hurt—they would like to keep people from getting hurt no matter what it cost. I know in my experience where the prevention of accidents has cost a good deal more per year than the accidents themselves formerly cost.

The impression should not go forth from this meeting that accident prevention is a dollars and cents proposition. The "big boss" sometimes is only half sold because he has had to sell to himself—the man who thought he was selling the idea had not first sold it to himself. A number of the safety engineers we meet are enthusiastic about safety half their time, the other half of the time they fool away on some sideshow.

If we would get well settled in our minds that the first fellow we have to sell is ourselves—that we have to believe in safety twenty-four hours a day; we must view it from every possible angle; we must measure it up to every other activity in the shop; that we must be in touch not only with our own department and the superior who is immediately over us, but with every department head and every activity of the company from employe to the paymaster. Then we will begin to get somewhere upon this proposition.

The two or three companies I have been fortunate enough to do something with in connection with safety have not always had happy experiences on accidents. In two very unhappy experiences the effort to cut down accidents did not originate with me or with a safety engineer who was working under my direction—they originated in the throne room.

They did not originate there because some fellow went in with a blue print or balance sheet and showed that 2,000 accidents in the preceding six months cost $50,000. It originated in the mind of the man at the head of the business because he did not like to see the ambulance come up to the door and take people away. Do not get it into your heads the idea we are working on is solely a business proposition. Of course, it costs money. Accidents prevented save money, but it also costs money to prevent them and your balance sheet may be pretty even at the end of the year. After everything is said and done it is the humanitarian proposition from the top down which influences the "big boss."

BE FULLY PREPARED TO MEET ALL QUESTIONS

MR. L. B. BACON (Upson Nut Company, Cleveland, Ohio): I want to sell a man safety: he is of the old school and has theories about it. I must go to him full of confidence. What does that mean? It means that I have to analyze the situation and that I must understand it thoroughly, so that when he asks me: "Do the men want it?" I can answer him that they do and tell him why. When he asks me: "How did you first think of it; what first brought it to your attention?" I must be able to answer with confidence. If we do not have that confidence we are not going to put it over. I have practiced law for twenty-three years and it has been my object to prepare my case before the date it goes before the court and jury. If I do not prepare my case so that I can anticipate what my opponent is going to do I will fail. No matter how much enthusiasm we have, if we do not analyze, if we cannot answer questions so that the employer will understand what we mean, unless we are convincing, we are going to fail.

MR. WALTER GREENWOOD (Carnegie Company, Youngstown, Ohio): I disagree with those who think this proposition is not a commercial one. Speaking directly to the subject "How to Sell Safety to the Big Boss?" I feel it is a process of evolution. You have to commence with a small beginning and sell him a small quantity first. My first article in stock is confidence. Examine the situation carefully, you know what is wanted, and tell it to the "big boss." If you succeed in persuading him to comply with your request you have made the first step in the process of evolution. My next dose of medicine is honesty. If I have presented matters to him that afterward show that I was right and that the matters should have been proposed, and that has been done repeatedly, his confidence in my ability and integrity increases step by step. In that way I sell him some more of the goods.

Those two points I consider the most important of all the measures that can be pursued to sell the goods to the "big boss." My next attempt is to sell him persistently. We have put it up to the "big boss" more than once—propositions that we think should be carried out, but he has disagreed with us, has failed to take them up. If, however, we are persistent in presenting the proposition and have new evidence to present, and keep on presenting it, that, I find, is another good method of selling the goods.

The big boss is very busy, like the rest of us—his mother's teachings

do not always sink as deeply as they should—he is liable to forget. It is not a part of his mother's teachings to consider cost in preventing accidents. It is a fact that any proposition that is put up to the "big boss," and he may be ever so good and ever so tight behind you, and ever so willing, but the first question that will naturally come up is: "What will it cost?" I glory in saying that I have a boss back of me that does not stop at cost if you show him that what you ask for is needed. I can point to a recommendation where $10,000 was expended in a renewal. Part would have been compulsory and incident to the renewal, but the additional cost was a considerable sum. The earnings were 50 per cent of the investment and the reduction was seven parts out of nine. That is, it removed seven employes where nine were formerly used and the hazard of those two remaining employes, as measured by a hazard scale, was reduced from fifteen to one.

KEEP THE MOVEMENT WITHIN DEFINITE BOUNDS

Mr. R. M. Hemming (Superintendent of Transportation, Fort Wayne and Northern Indiana Traction Company): I have been connected with electric railways since 1911. A peculiar condition seems to have crept into safety work and into the electric railway industry. The sooner we find a remedy for the feeling that seems to exist in some quarters, the better it will be for all of us.

Since I have been quite actively engaged in the safety problem I have had occasion to communicate with a number of electric railway properties and it is surprising to learn their attitude toward Safety First organizations. I will not mention any of the names of the electric properties I have in mind, because it would not be fair: I have said to a number of them: "Why don't you organize a safety proposition on your property?" "Well, I will tell you, we have looked into it and we have been told that it is not a very good thing—that it develops into a knockers' meeting. They want to correct all of the human failures with mechanical appliances." True enough, some of these organizations have developed into knockers' meetings, but if the man at the top of the ladder is not diplomatic enough to handle such conditions, he either has the wrong kind of an organization or isn't big enough for the job.

On the Fort Wayne and Northern Indiana Traction Company they formerly had a safety organization which was somewhat unwieldy and for that and other reasons it was disbanded. When I came on this property, April 1, I organized in the transportation department a safety body and gave everyone to understand that it was for the sole purpose of sweeping the trash from in front of his own door and not to criticise the track, car equipment and everything else.

Gentlemen, when you get the idea that we are practically the same as other industries, we are going to make the safety movement what it ought to be.

For instance, let us take a plant—we will assume that it has several departments. The men in department "A" have nothing to do with those of "B" but they must, by necessity, pass through department "B" and they find unsafe conditions. The foreman in "A" has nothing to do with

the foreman in department "B" or the machines behind those walls. The foreman in department "A" reports unsafe conditions to the safety engineer on the property, who is the man to designate the scope of safety work and see that safety orders are obeyed. He investigates the complaint and the foreman in department "B" has branded the foreman in department "A" as a knocker. Interference with proper duties is the thing that must be stamped out and someone must be big enough to fill the job and put it over.

It seems to me that this is a very important phase of safety work, especially from the electric railway standpoint. *Knocking* must stop and *constructive safety* work be pushed harder than ever.

SHOW EMPLOYER THE MAGNITUDE OF ACCIDENTS

R. J. HOAG: My work is that of a safety engineer. I spent four years as statistician for the Industrial Insurance Department of the State of Michigan and had many talks with employers on statistics. I never had a conception of what industrial accidents were until I sat down in the department and went over them and tabulated them in the form of statistics; it was then I got a conception of what they were and it is that thing you have got to do for busy men. I don't care whether you have to appeal to the "big boss" through dollars and cents or through the number of injuries or the days lost or what it is; the thing you have to do is to show him the magnitude of your accidents and that is all. He is busy with cost accounting or the different administration propositions of his plant and he has not time to investigate the number of accidents, but the very moment you show him an analysis he will grasp the situation. I had to make my appeal from the dollars and cents standpoint, so I tabulated the statistics of seventeen plants and showed the employers the amount of money they had paid into the State Industrial Insurance Department—it required 80 per cent for cash payments for accidents. In other words it represented $20,000.

I want to establish a record, so that the first six months of this year, under a safety engineer, will cut the $20,000 so that the figures, being presented to these employers, will signify that we are making progress. It is very important to do that. You have to show them the nature of the injuries and in order to keep their interest in the work you must show the employers you are doing this and that thing. The employe is the hardest proposition to keep interested. The employes say that you want to tell them what to do; they say they are running their own jobs and you have to be diplomatic and persistent if you are to secure their co-operation.

MR. EARL B. MORGAN (Curtis Publishing Company, Philadelphia): The principles of advertising in a big way apply almost directly to this proposition. First, what is your market? I see by the program that the market is the "big boss."

Let us forget the "big boss" for a moment and look at this market in the sense of indirect sale. Let us sell the "big boss" by selling the man under him and let it come up to the "big boss" that way. Then, what we do not accomplish that way, let us sell direct—let us go and sit in the "big boss'" office all day long or until we sell him.

I think we can draw another lesson from the advertising game, in the sense of creating a consciousness in the plant—a plant consciousness. To make matters clearer, just assume that you go into a store for an alarm clock. I dare say that ten years ago you would not know what to say if the salesman asked: "What kind of an alarm clock do you want?" No, you would just say: "I want an alarm clock." Today if you want an alarm clock and the salesman asked you that question, you would probably tell him a special make—in other words you are alarm clock conscious. Let us go into a store to buy a pocket knife. If the salesman asks you what kind of a knife you want, you don't know—in other words, you are not pocket knife conscious. We can so saturate the plant consciousness idea with the safety idea that every man is safety conscious and that consciousness of its very self will sell the "big boss."

Then you have to keep your market sold; that is another principle of salesmanship—you have to stick with it long enough to dominate. I think these principles, taken from the other field, will perhaps be useful.

MR. MATTHIESON: I think there are three ways to sell safety to the "big boss," the "little boss" or any other person. *First*, of course, it has the commercial side, the money side, the money we can save: that naturally will be of interest. In my mind there is another side, the humanitarian side. It is a good argument and one I have often put up. There is no "big boss", director, president or anybody else, I believe, but what has some touch of humanitarianism in his heart. In other words, there is no man so hard-hearted but has a soft spot somewhere. You must touch that point. My third point is through patriotism. If you can show that by putting over the propaganda of safety that you are going to save a good man or two men or a thousand men to help win the war the employer will sit up and take notice.

NOT ALL "BIG BOSSES" ARE ALIKE

MR. CHARLES T. BANKS: So far everybody seems to think the "big bosses" are all alike. Not all of them are humanitarians or philanthropists. Most of my work has been in connection with railroad companies—you have got to show them—and I never had occasion to sell the safety idea but once. The president unconsciously remarked one day in my presence that he could borrow money for 5 per cent a year and if I could show him where he could make 7 per cent he would do so and make money. There was not much trouble in showing that we could make 7 per cent.

It is usually a question of figures until the humanitarian standpoint is brought out clear enough so that it can be seen. It is sometimes a long road, particularly when you are stretched out all over the country. I think both Mr. Eaton and Mr. Lang are right—one man is arguing the case from one standpoint and the other from the other; it depends entirely on the attitude of the big boss, his environment and what he is permitted to do. Sometimes the "big boss" has a "bigger boss."

MR. WILLIAM E. WORTH (General Superintendent, Chicago Tunnel Company): I have tried to sell the "big boss" a big proposition. I hope you

will pardon the personal manner in which I speak, but I feel I must do so in order to make myself clear. At the time I sold safety to our company I was general superintendent, and so far as 85 per cent of the men on the pay roll were concerned I was the "big boss"—but I had a "big boss" also. Do not be discouraged if you do not sell the idea to him in a hurry, it took me four years to do it—I sold it to the men before I sold it to my boss. Going back some nine years, I attempted to interest the company in the proposition for the simple reason that I was interested. If the men were as much distressed over the accidents we were having as I was I knew the state of disorganization in our plant must be terrific. So I attempted to sell the idea to the "big boss."

I had an experience which, in view of the position taken by some of the other speakers, probably will sustain both sides of the question. I looked at it from a purely humanitarian standpoint, but sold it to the boss on a dollars and cents basis, in this way: Our premiums for insurance, as a result of our accidents, went up so far that I finally compiled some statistics on the basis of my knowledge of insurance company methods of settlement prior to the compensation laws and I arrived very closely at what they had spent. I went to the president of the company and told him what I thought could be done. I told him: "If you will allow me to organize the plant and spend some money to organize it safely, I will save you money and instead of paying it to the insurance companies I will guarantee you that we can handle it ourselves." He said: "I don't believe you can do it and make it worth while." I said: "I believe I can. I will split my salary and take one-half my salary and one-half of what I save on the insurance premiums by carrying it ourselves if you will let me spend some money on a safety organization." He said: "Worth, if you think you can make more money by splitting your salary and taking half of what you save it is sold." That is how I sold the safety idea to our company.

SPECIAL TRAINING FOR SAFETY ENGINEERS

Mr. Morris: It is something of a paradox for me to try to tell you how to sell safety to the "big boss" because I had that job—I was told I did—but when I came to try it out I found that the boss was already sold.

In order to sell to the boss you have to sell to yourself. The plant which I had the privilege to represent did not send a salesman out on the road without giving him a thorough preliminary training. He has to go through the mill and spend three years in a course of sprouts before he is allowed to go out on the road to present his proposition. A great many of us have been chosen as safety engineers for this or that reason, but it seems to me very important that the safety engineer must make absolutely sure that he is sold on this proposition.

You have something to sell and you are looking for a market; as has been said, the boss is the market. How do you know that is so; how do you know the boss is interested in safety? You are sure of it because you are working for him; you are the safety engineer—he is interested for one reason or another. We may not know what motive impels him to employ

you as a safety engineer—it might be that he wanted to have a safety department because it was popular; someone else had one and rather than be behind the times he decided to have one; it might be that compensation laws compelled him to secure a safety man in the plant. We do not know what decided him to secure a safety engineer, but he is the prospect. We know that.

Do not try to sell him until you are sold. Suppose you attempt to convince the boss that safety is a paying proposition and you are not sure that you can get away with it: then you have to plug along with that feeling and without the confidence that you have him backing you up. How are you going to sell a superintendent if you have not sold the boss? If the superintendent does not feel that the boss is behind the proposition you will have a difficult time: how are you going to sell the foreman if you have not sold the superintendent? It is most important that the boss be sold on this proposition.

You are not sure that you have sold the boss, so you flicker along for six months or so and do the best you can, but you make progress in spite of the fact that you do not feel that the boss is behind you. Whether the boss was moved by humanitarian principles or whether he is one of these voracious devils that are looking after all the nickels he can get, he does spend money for safety work: you can show him, in six months or a year at the best, that you are making progress and that it pays.

In 1917 we showed, on our final clip for the year, that we had saved (over the preceding year) the time of one workman working every day for ten years. If the boss had not been sold that would have been a very appealing proposition to him.

You might think that the boss was not sold, but you must not forget that he has lots of other big things on his mind and while safety looks awfully big to you it does not look so big to him. You have to be patient and go at his pace. Judge Gary says that safety work pays and I am sure there is not a business man in the country that will controvert his statement. You can always find someone bigger than your boss who is willing to tell him that it pays in practically all lines of utility. When you go to the boss have something so definite to lay before him that he will be convinced that it is a paying proposition.

Mr. James: I am happy to say my company did not have to buy the Safety First idea—they started the work several years before the National Safety Council was organized and they have driven hard ever since. About a year ago our honorable President asked our help in scattering the seeds of safety through our district. We undertook the work and for fifty miles we presented the work of the National Safety Council. With three exceptions every employer we approached agreed to join the movement—the three referred to said they would have to take the matter up with their partners. They were not heartless, they did not fully understand the work they were asked to undertake. If every employer could only know what safety work has done for our country and for our men we would have little difficulty in securing his active co-operation.

"HE IS MY BROTHER"

CHAIRMAN STREMMEL: In the North End of the city there is a public school and during the school year each morning a boy of 12 could be seen carrying a boy about 9 years of age on his back to school. He carried the lad from school at lunch time, then again to school and back again after the school closed. One day a gentleman who had noticed this boy week after week carrying the lad back and forth on his shoulders asked: "Young man, do you ever get tired carrying that boy back and forth?" The young fellow, with a smile on his face, straightened up and said: "No, sir; he is my brother." Safety engineers are selling the safety idea to the manager; they are not only presenting it from a dollars and cents standpoint, but from real responsibility for the welfare of their brothers. This has much to do in selling the safety idea to the big boss.

MR. J. CLAUDE SMITH (Inland Steel Company, Indiana Harbor, Ind.): I sold the safety idea to the "big boss" of our company before I got my job; that was practically the way I got it. At that time I was assistant safety engineer for the Illinois Steel Company at their Gary works and the compensation laws, I believe, caused a great many companies to go into the matter of installing safety devices and handling their own insurance. In my opinion compensation laws have had a great deal to do with selling safety to the "big boss." Insurance companies, too, because of the manner in which they sometimes handled their claims, probably influenced the employer in favor of the safety idea. We handle our own insurance and, although we employ several thousand men, we have had but one case in court from our steel mills and one from our ore mills.

It is not only a case of selling safety to the boss in the first place, it is a case of selling it to him right along after you get started. How are you going to do it? Advertising has a great deal to do with it. We advertise it all the time—we consider that advertising is just as necessary in selling safety, not only to the "big boss" but to the "little boss" and to the men, as it is in selling any other article. We continually keep it before the men—at the plant and in town, any place I go, they call me "Safety Smith," probably they do not know my first name. I am a walking advertisement. That may not be true in every plant but it is true with us.

We have a big sign at the entrance of our plant and we sell safety just as the packers and others put up big signs to sell their goods. We print a monthly *Safety Bulletin* in which we sell safety to our men, to our "big boss" and to all the other bosses because we make that *Bulletin* appeal to the "big boss" from the humanitarian standpoint, from the efficiency standpoint and from every other standpoint through which safety enters into the business.

COMPARING GOOD RECORDS WITH BAD

We compile a tabulated account of our accidents—not complicated, very simple—and we show each superintendent every month exactly where and how accidents occurred, compared with the pervious year.

That helps to sell safety because it shows him how to prevent accidents in his department. We have found this service very valuable in getting results. We encourage men to look for dangerous places, dangerous practices and other conditions which may cause accidents—we are educating our men, we believe we are selling them something which helps to prevent accidents. We have given out nearly 6,000 safety service medals; we have given out twenty-three jeweled gold watches, cuff buttons and many other prizes monthly.

A copy of every letter we write to a superintendent and of every report we make for every department goes to the "big boss" every month and I know from what I have been told by different superintendents that he takes them up with the various heads of departments at times when I am not there. It is a good idea to show the "big boss" just what you are doing. Some bosses might not want to read all that stuff, we write a good many letters every day, but our "big boss" seems to like it, he reads everything we send in.

At the present time we are carrying on a campaign to sell safety not only to the "big boss" but to all the other bosses as well through a lecture system. We are holding ten-minute lectures every day, sometimes we have an audience of 125. Our talks are not confined to safety matters, we try to show the men that they are just as important in winning this war as are the soldiers who are across the water; that in getting out the steel that is needed for our boys to fight with they are serving our country just as much as if they were "over there." That helps to sell the "big boss" and helps to make him realize we are trying to boost his end of it. Then we go further, we say that if a man is off on account of an accident he is not helping to win the war, he is not helping to produce the steel needed, and in that way we drive the lesson home.

One of our departments had a comparatively bad record. The first half of the year they had an average, according to our method of computing accidents, of nineteen men off every day. In the last six weeks, since I started this campaign, they averaged only one man off a day. This movement is a success and it shows the help of the superintendent in that department. We sold safety to the superintendent and to a thousand men under him.

Mr. Edward: (American Smelting and Refining Company): We had no difficulty in selling safety to the company that I represent. They may have been a little slow at the start but the results achieved thoroughly convinced them that it is a very good thing. During the months of June and July three of our plants were entirely free from disabling accidents of any kind. A fourth plant had no accidents during July. A man in the safety appliance business asked the question the other day: "Were accidents increasing, due to the abnormal labor situation?" I answered: "No; just the reverse. Our plants, the first six months of this year, compared with the same period of last year, made a reduction in accidents of over 30 per cent; comparing the last six months of last year and the first six months of this year, we had a reduction of 28 per cent." Eleven of our plants ran with the rate of from 18 to 80 per thousand men 300 hours per annum and we had one plant that had a rate of over 200. That,

in the smelting business particularly, I think, speaks very well for safety work.

SELLING THE SAFETY IDEA TO THE "BIG BOSS"

CHAIRMAN STREMMEL: In the few minutes we have left I think it would be helpful, if Mr. Hook will agree, to have a safety engineer give a public demonstration of "How to Sell the Safety Idea to the 'Big Boss.'" Mr. Hook is one of the "big bosses" in one of our plants and a demonstration of how to sell Mr. Hook the safety idea should be interesting and valuable. Mr. Bacon, will you volunteer to sell the safety idea to Mr. Hook?

MR. BACON: Mr. Hook, the men are asking for guards on the saw in the blooming mill. It throws sparks twenty feet and three men have been seriously burned. We have discussed the matter before and each time the word came back that we cannot provide guards which will protect the men because of the peculiar location of the saw. I have thought out a plan and I have taken it up with the superintendents in the yard and in the blooming mill. I have also talked with three of the men at the shears: they are thirty feet away but they are afraid of the sparks: we have to have four men on the shears and they must keep their minds on their work. The guard I am suggesting will cost us, perhaps, $2,000, but what is $2,000 when you consider that one of the sparks may destroy a man's earning capacity for five months to say nothing about his pain and suffering. That is the situation as we have talked it over. I have come prepared to answer any questions you desire to ask, then I will tell you what I think is the best thing to do.

MR. HOOK: Obviously, there is no argument. The guards must go on.

MR. BACON: All right: if you will write to the operating engineer we will start work tomorrow morning.

MR. HOOK: You are the safety engineer, aren't you?

MR. BACON: I am for the moment, yes.

MR. HOOK: In principle I have agreed and I think it perfectly proper that the saw should be guarded. Have you agreed with the superintendent of the department as to the type of guard that is to be used; are you sure that the guard that you are going to put on will accomplish your purpose?

MR. BACON: If it does not do it perfectly it will accomplish the result in a big way. We have the blueprints all made, but I have not brought them to you because you do not need to pay any attention to those details; you simply hold me responsible for keeping the shop in as workable a condition as it can be made for the safety of the men. If that particular guard or guards which I have in mind do not fulfill this I shall see that they are perfected.

THE QUESTION OF COST

MR. HOOK: If the superintendent of the department and yourself are agreed as to the device and type of guard that is to be used and the con-

ditions you report are as you state them, there is no argument; it is all understood.

MR. BACON: I came to you today to ask if you were convinced that it should be done at once, because I do not want any more hazards. I have told you that three men have been seriously burned and that I would like a written order for this to be done at once.

MR. HOOK: No, that would be obviously wrong. You should go to the general superintendent on a proposition of that kind—the general superintendent has authority to order such safeguards. All that is necessary to take up with me is this: How much is it going to cost?

MR. BACON: It will cost at least $2,000, perhaps $2,500.

MR. HOOK: It is the policy of the company and part of the by-laws of the corporation that any expenditure contemplating $1,000 or more must go through the executive committee. I will have to ask you to transmit your recommendation in regular form. It will be properly approved by me and I will forward it to the general manager for his approval.

MR. BACON: I presume you recall that when you hired me and I came into the plant that you told me there was one thing you wanted to eliminate, namely, red tape—particularly in anything relating to safety.

MR. HOOK: Red tape as far as is possible, sir, to keep within the bounds of the policies laid down. How long have you been operating this saw?

MR. BACON: A year and three months.

MR. HOOK: Have you had any fatal accidents?

MR. BACON: No: but two of the accidents which have occurred were worse than fatal.

MR. HOOK: In what way?

MR. BACON: Because of the burns they were worse than fatal, when you stop to think from the humanitarian standpoint. As to the cost; there is no question between us on that point. That was understood when I came here.

MR. HOOK: You say the saw has been in operation about a year and a half?

MR. BACON: Yes.

MR. HOOK: You come a year and a half after the saw was placed in operation and put this proposition before me? I would like to know what you and the general superintendent and the superintendent of that department have been thinking to permit a thing of that kind to go on all this time without bringing it to me.

MR. BACON: Do you remember that on the 17th of February, at my suggestion and request, you went with me to examine that saw?

MR. HOOK: No, I do not: I would not have gone out there on the 17th of February and permitted it to go on this long..

MR. BACON: I made a memoranda of the visit and of my interview with you and sent a copy of it to you.

MR. HOOK: How long ago was that?

MR. BACON: The 17th of February. This is the 17th of September.

MR. HOOK: You should have followed it up.

MR. BACON: Do you recall how many times I have talked to you about this?

MR. HOOK: Where is the memoranda?

MR. BACON: Let us get the men in—that this red tape business can be finished—let us get them in right now and have the order go through its routine within the next hour or so. Can't that be done?

MR. HOOK: No, it cannot; there is no reason why it should. If you have permitted a condition all this time you will have to permit it to take its regular course in accordance with the policy of the company. I have no authority to pass on an expenditure of that kind off hand. I am responsible for the moneys of the company that are expended in the plant. There has been plenty of time for the recommendation to have gone through the regular channels. Mr. Bacon, there is no use in carrying the argument any further. If you presented it to me on the 17th of February and permitted it to go on, even if I did not give it attention, if you permitted it to go on to the 17th of September evidently you did not consider it of sufficient importance to keep right after it until you got it through. If the condition was as bad as you say it was and is and you could not convince your management that the expenditure should have been made before that time, why, you are losing time in the plant.

A QUESTION OF RESPONSIBILITY

MR. BACON: I told you, I admit, and I was dilatory in following up my recommendation. A man was injured day before yesterday and I feel responsible for his accident, but for any man that is injured between now and the time the guard is put on the responsibility is thrown onto my superior's shoulders.

MR. HOOK: Just a minute; I want to reply to Mr. Bacon. I would not have Mr. Bacon give you a wrong impression of my attitude on this proposition for anything in the world. There is no one in the United States today who realizes, I think, more clearly than I do that the great corporations of the United States are actuated by the very highest ideals and humanitarian principles. But you have put down here for discussion "How to Sell Safety to the 'Big Boss'"—you would not have it on the program if the "big boss" had been sold. If the "big boss" was looking at it entirely from a humanitarian standpoint he would be selling the thing to you and you would not have to sell it to him. I would dislike to think that all of us had to be appealed to by the dollars and cents standpoint, but I am trying to present to you this fact: There are many men that cannot see humanitarianism in anything unless it is presented in dollars. If you have a proposition that you can present in a dollars and cents way you do not have to appeal to humanitarianism; you make it go upon the business proposition and we are all in business—when you can present it as a business proposition, as you men can when you have the facts that you have at your command. As I said before if the boss had been sold from a humanitarian standpoint you would not have had to go to him with the proposition.

PROMOTION OF COMMUNITY INTEREST

CHAIRMAN STREMMEL: I am sure we have all profited by the discussion of the subject. We will now take up our next subject, "The Promotion of Community Interest in Safety as an Industrial Asset."

MR. WM. H. CAMERON: Our Field Secretaries, who are going from locality to locality and getting hundreds of members every year, say that our industries are not doing as much as they might to interest the other factors of the community; they have in mind the public school, the library, the home, the public utility companies and others. We believe we have something of value and interest to present in the report of the public safety campaign in Rochester. The National Safety Council, during this last year, has taken a decisive step in a movement which we hope will compel attention and influence public safety activities in every section of our country.

We have a splendid field for work in the schools. Our program is always welcome and the possibilities of accomplishment unlimited. The work has a two-fold purpose: *First*, we instruct the children in practical application of safety principles in their work and play and, *second*, through the children we reach the parents. So, you see, the introduction of our safety program into the schools has an enormous influence in awakening safety impulses in the minds of the workers in the shops and factories. Last year one of the most popular activities of the Council was the publication and issuance of hundreds of thousands of safety calendars. The calendar was a constant reminder of the need of safety thinking and its presence in the home for 365 days brought home to parents and children the vital necessity of our campaign.

The safety movement has grown to a point where we must not only go out and work the plant, we must reach outside; we must get everyone interested—when we succeed in that we will be ready for new problems in industry. After you have preached safety several years you feel the need of a vitalizing factor to maintain the interest of employes. Why not attempt this through the school board? Why not attempt this work in co-operation with your street railway company, your public utility companies and your Chamber of Commerce; why not promote meetings among churches, clubs and so on? The great Safety First campaign in the city of St. Louis is getting everyone interested in the subject and is not only benefiting the community as a whole but is doing the very work you are employed to do in industry. Our Council has for a long time urged the importance of arousing every person in the community to a realization of the values of safety educational efforts.

MOVING PICTURES AND LECTURES

MR. J. CLAUDE SMITH: We interest our community in Safety First by means of moving pictures and lectures. Special films and talks are used to interest children. We also send safety bulletins to the schools—they are found useful in class work and are used in the first section in teaching English to the men—when the men are learning English we teach

them the elements of safety rules. We advertise this service when holding meetings of workmen in the plant. We have also had men appear before the Commercial Club and give lectures on safety. Through these mediums we have built up a strong interest in safety work in our community. Another factor in our work is the taking of *Safety Bulletins* home by our employes—we find the *Bulletins* are read and discussed by the whole family.

CHAIRMAN STREMMEL: The National Safety Council is asking one outstanding question: "How can we get Safety First into our public schools?" I understand that Mr. Smith, the newly elected secretary of the St. Louis Chamber of Commerce, has interested our Board of Education in Safety First work. One principal will devote his time to a study of safety and through him the work will reach the public schools. Next year, at our Harris Teachers' College, every principal of our public schools will be required to take a course in Safety First and thereby fit himself to instruct teachers and scholars in the principles of the work.

MR. R. J. HOAG (Tacoma, Wash.): The city of Tacoma has been doing very effective work in that line. A safety engineer gives lectures in the schools and safety squads are organized among the children in each individual school. During the year the traction company gives a picnic to the safety squads—this helps to maintain interest. Essays on safety subjects are prepared by the school children and prizes are given for exceptionally good work. One prize is a loving cup which must be won a certain number of times to become the property of the school. School activities are supervised by the school safety engineer and reviewed by the city commissioners. The work has been very successful.

NECESSITY FOR PROPER LAWS

MR. WALTER GREENWOOD (Carnegie Steel Company, Youngstown, Ohio): The question is one of education and is closely allied to engineering and legislative problems. We can do certain things, but there are other things we cannot do, with effect, in preventing accidents in the home or in public places. We can teach the child to swim and in that way eliminate many of the accidents that occur from drowning. We can teach the child not to play with matches or with fire and thus eliminate another common cause of accidents. Accidents which occur in public places, however—such as those occasioned by automobiles and street cars—are more difficult to approach.

Proper legislation and proper enforcement of law will materially assist in securing reductions in street accidents. We hear statements concerning reductions in street car and automobile accidents in some municipalities but I know of no place where this has been accomplished without the enforcement of good law. I visited a city last week where the daily papers contained no accounts of automobile or street car accidents and, because of my interest in accident prevention, I made an effort to learn their method of handling safety work. I found they had

written into their code the very best laws that could be thought of and when a point was found to be lacking they went to the Legislature and had it incorporated into the code. This city had a very efficient administration and the municipal officers administered the laws honestly and impartially. As a result street cars and automobile accidents were reduced 75 per cent. Street railway officials were vigilant in enforcing safety measures and automobilists were required to exercise every precaution.

SAFETY FOR CHILDREN

DR. ROBERTS (Belleville, Ill.): I have an opportunity to speak on safety subjects before the junior high school and the grammar schools in Belleville. The high school has a local of the Safety Scouts and they are very active in promoting public safety. Belleville is a city of 5,000 inhabitants but the work of accident prevention has been so well administered that not one accident has occurred to a child during the last year. Legislation has been attempted to keep children out of the streets and thus prevent street car and automobile accidents, but it will not work out and never has worked out in the history of the world. The only relief is thorough education—the teaching of the child to be careful. This must be done in the schoolroom and in the home.

MR. C. W. PRICE (Field Secretary, National Safety Council): During the past two years I have visited many of the larger cities, and this is what I have found: Not more than one plant in ten is doing what you safety engineers would call efficient, organized, educational safety work. They were building guards in compliance with the requirements of state inspectors and the insurance companies, but they had no conception of what it meant to inculcate the safety spirit into the organization—really to grip the proposition as they would grip anything else which saved waste.

This is the situation after eleven years of the safety movement. Eleven years ago the Steel Corporation made a demonstration on such a broad scale that it ought to have convinced any intelligent employer. Why has our progress been so slow? And what must we do to speed up? Until the present time the development of the safety movement has been largely in individual plants. To be sure, in many of these plants marvelous results have been achieved.

I believe this is the solution, and this marks the next great development of the safety movement: We must incorporate the safety idea into the community life so that every man, woman and child will come to know about it and respect it, just as they respect the Red Cross, the pure milk movement, or anything else which is indispensable to preserve the community life. I meet managers of plants every few days and they tell me that when we introduce safety into our schools, and provide for the systematic instruction of every child, we shall then begin to get down to the root of the problem. Through the children the parents will be reached and there will begin to develop a real community interest. When this is done the interest will be directly served and more effectively than in any other way.

CHAIRMAN STREMMEL: I would like to substantiate what Mr. Price has just said. My little girl—8 years old—came home last week with an announcement calling attention to the fact that this was to be Safety First week. At the bottom of the slip was a request for the parent's signature and the statement that on the return of the notice, properly signed, the child would receive a ticket to an entertainment to be given on one of our public playgrounds. Tonight my wife is taking our little girl to see the Safety First pictures.

SELLING SAFETY IDEA TO BOARD OF EDUCATION

MR. MORRIS: It is a question of selling the safety idea to the board of education. When you put it up to the board you generally find they do not know what you are talking about. I have made several safety talks to school children and found them much interested in the subject. It is often necessary to use homely illustrations and you have to talk their language, of course, but I have always received a great welcome. I am immensely interested in school work because I have three live representatives there and I want to see the work actively pushed because of the indirect benefit it would bring to me. I think the secret of effective public safety work is to get hold of the school children and arouse their interest in the prevention of accidents.

When the wife says good-by to the workman in the morning. I often think she is using—unconsciously, perhaps—a contraction of "God be with you!" and is wishing that her husband will be taken care of that day. I know of no better way to get safety into the homes than through the schools.

MR. R. J. HOAG: I believe school authorities are going to push safety more vigorously in the schools in the future than they have in the past. Last Friday "The Story of Little Mary Brown" was read to the school children of Tacoma. It brought the tears to their eyes and made a deep impression. Every minister and every priest in our city delivered a sermon on "Safety" last Sunday.

MR. H. H. ROBERTSON: The spirit of Mary Brown goes marching on The National Safety Council should take great encouragement and strength from an announcement made a few moments ago by the city authorities: One year yesterday there were ten deaths by accident in St. Louis; yesterday, the records show no deaths.

THE FIRE HAZARD

MR. HENDERSON: I believe it would be opportune to call the attention of the delegates present to the necessity of using their best endeavors to reduce fire hazards. Fires in our homes were more frequent than in any other buildings. The record for one year shows 4,700 fires in this city and 1,300 occurred in residences. The government is doing its utmost to conserve property and food and every one of us can assist in reducing fire hazards if we will use common sense methods and care. Last year property loss from this cause totaled $2,700,000. I

want to leave this thought with you, that when you return to your home towns ask that the education campaign in the public schools include not only the Safety First message but a chapter or two on fire prevention.

MR. JOHNSON (United States Smelting Company, Midvale, Utah): The first work of the safety engineer is to clean up his plant and that process usually consists in removing a multitude of sins. If you investigate you will find the cause of many fires to be the throwing of a cigarette into a scrap pile or into a bunch of dirty paper or waste, perhaps resulting in the destruction of the building. The safety engineer's first thought is to clean the plant thoroughly. When this is accomplished hazards from fire as well as from accidents are greatly reduced.

After the usual announcements the meeting adjourned.

Organize Safety just as you organize production; give it a dignified place as an indispensable part of an efficient shop organization. Do this and you will succeed; go at it half-heartedly and you will fail.

Local Council Meeting of Officers and Committeemen

St. Louis, Mo.

Sept. 17, 1918

C. W. PRICE, Chairman
Field Secretary, National Safety Council

TUESDAY MORNING SESSION

CHAIRMAN PRICE: During the past two years I have visited most of the large industrial centers, such as Pittsburgh, Boston, New York and St. Louis, and I have been surprised to learn from our Local Council officers, insurance men and state inspectors that not more than one plant in ten was doing what we safety engineers would call thorough-going, efficient, organized educational safety work—and this after eleven years of the safety movement. Eleven years ago the Steel Corporation made a demonstration which should have convinced any manager of what it is possible to accomplish in accident prevention and the value of safety from the standpoint of efficiency. Splendid as have been the achievements in hundreds of industries, we must confess that the Safety movement is not progressing as rapidly as we would wish, especially in these times of war stress, when the cry from Europe and from our great President is for more men.

As I see it, the development of the safety movement thus far has consisted largely of the organization of safety in individual plants. The service of the National Safety Council has been largely confined to individual member companies. This was necessarily so, and it was this service which made it possible to finance the Council's activities.

I am not criticising the Council, the Council has done the best it could, but I am asking the question: "What can we now do, looking toward the future, to increase the usefulness of the Council and to further the safety movement in this country?" I believe the next big step in the Council's work is to incorporate the safety idea into community life. What do I mean by that? I mean just what has been done by the Red Cross in the last two years; I mean what has been done by the pure milk, anti-tuberculosis and other movements whch have had to do with the preservation

of human life. I mean that the safety idea must be so incorporated into community life that every man, woman and child will first know about; *second*, respect safety; *third*, act safety. In other words, to accept it just as they do other things that conserve life—as an everyday part of their thought and care.

IT CAN BE DONE

In the session today you are to hear a number of valuable experiences, which I believe will reveal to you what can be done in reaching all the people in a great industrial center. I am hearing expressions from managers of industrial plants nearly every day which reveal the growing interest in communty safety. Over and over again managers have said to me: "Price, when you get into the schools and begin to teach safety to the children, you will get down to the roots of the accident problem and do more to serve the managers and to reach the industries than anything which has ever been done."

I am going to start my work this year with a new motto, one I have received while in St. Louis—"IT CAN BE DONE." When you leave this room, after hearing the stories of our members of the work they have accomplished, I believe you will be convinced, as I have been, that *it can be done*.

If our boys over in France are willing to give their lives, their all, if necessary, what man of us in the National Safety Council should not be willing to go home from this Congress and put his shoulder to the wheel to help the Local Council in his own community to reach every man, woman and child, and to arouse them to a living interest in safety? Probably not a person in this room will be able to go overseas to fight the Huns, but everyone of us can make a most valuable contribution if we do our utmost to keep the workmen in the shops uninjured and up to prime efficiency.

In St. Louis, last year, 510 people were killed by accidents and in the Western Pennsylvania District 1,202 lost their lives in the same manner. Think what a contribution would be made if, during the next year, these ghastly tolls could be reduced by one-half! That would be a real contribution to the winning of the war.

You have heard so much about Mr. Rasmussen and the Pittsburgh experiment that an introduction is scarcely necessary. Mr. Rasmussen will be glad to answer questions during the reading of his paper. Let us have a round table meeting.

THE WESTERN PENNSYLVANIA DIVISION PLAN

W. R. RASMUSSEN, PERMANENT SECRETARY, WESTERN PENNSYLVANIA DIVISION, PITTSBURGH, PA.

Mr. Chairman and Members of the National Safety Council: The Pittsburgh Local Council was organized on January 6, 1914, at the Hungry Club in Pittsburgh. Mr. R. W. Campbell, of Chicago, who was then Presi-

dent of the National Safety Council, and Mr. W. H. Cameron, General Manager, were present. Pittsburgh was the sixth Local of the National Safety Council to be organized.

The first President of the Local Council was Mr. R. L. O'Donnel, general superintendent of the Pennsylvania Railroad; Vice President, Mr. H. H. Robertson, of the Asbestos Protected Metal Company; Secretary and Treasurer, Mr. George W. Case, of the University of Pittsburgh; Chairman of Membership Committee, Mr. L. H. Burnett, assistant to president, Carnegie Steel Company; Chairman Publicity Committee, Mr. J. Denny O'Neil, Commissioner of Allegheny County; Chairman Program Committee, Mr. Clifford B. Connelley, Carnegie Institute of Technology.

The Local had an initial membership of forty-five. During the first year five meetings were held with a total attendance of 550. A general meeting was held on January 28, 1916, in Thaw Hall, University of Pittsburgh, at which time the following officers were elected: President, H. M. Wilson, director of the Associated Companies; Vice President, H. H. Robertson, president of the Asbestos Protected Metal Company; Secretary and Treasurer, Prof. George W. Case, University of Pittsburgh; Chairman Membership Committee, Wallace M. Reid, of the Ocean Accident and Guarantee Corporation; Chairman Program Committee, F. H. Wilcox, of the United States Bureau of Mines; Chairman Publicity Committee, M. C. Turpin, of the Westinghouse Electric and Manufacturing Company. During this period the usual activities of a Local Council were well administered, and the way was opened for more elaborate activities.

The third year found the industrial situation in a chaotic condition, due to labor troubles of the late winter and early spring. Only two meetings of the Council were held, but these were well attended, approximately 200 members being present on each occasion. Plans were outlined for a comprehensive safety rally, and the dates June 19, 20 and 21 were set apart for this purpose. The rally was very successful, having an average attendance of 1,000 at the meetings. Effective co-operation in the work was rendered by the Pennsylvania State Department of Labor and Industry, the Pittsburgh Chamber of Commerce, the Pittsburgh Department of Safety, and the Boy Scouts. Mornings were devoted to street parades and visits to the United States government exhibit train, stationed in Pittsburgh at that time. Afternoons and evenings were taken up with safety meetings held at the Soldiers and Sailors' Memorial Hall.

The Pittsburgh Local held its annual meeting March 13, 1917, and elected the following officers: President, H. H. Robertson, president, Asbestos Protected Metal Company, Pittsburgh; Vice Presidents: W. S. Tallman, superintendent, Central Tube Company, Ambridge; H. A. Schultz, chief safety inspector, American Steel and Wire Company, Pittsburgh; Prof. George W. Case, University of Pittsburgh; W. C. Titus, safety engineer, Jones & Laughlin Steel Company, Alliquippa Works, Woodlawn, and C. B. Auel, director of standards, Westinghouse Electric and Manufacturing Company, East Pittsburgh. Secretary and Treasurer, N. B. Davis, Northwestern Mutual Life Insurance Company, Pittsburgh.

PUTTING THE WORK ON A PERMANENT BASIS

During the year twenty-nine open air meetings were held, with an approximate attendance of 55,800. On September 5, 1917, President Robertson called a meeting of the Executive Committee for an informal discussion on questions of activities and their financing for the Division. It was explained that memberships in the National Safety Council were becoming increasingly hard to obtain—manufacturers feeling that the bulletin service offered by the Council was not sufficient to warrant participation in the work of the Local, as a somewhat similar service was offered by insurance companies to members free of cost. It was explained that this feeling was difficult to overcome, and that popular features might be added to draw more attention to the real activities of the national as well as the local organizations and to assist district committee members when actively soliciting new memberships. Members of the committees were willing to do all in their power to promote the Council's activities, but they did not have time to give the matter the attention it deserved. It was also explained that the method of financing the local was inadequate if a larger local program was to be actively pushed.

After careful consideration it was decided to provide the necessary funds for an active local program and maintain a permanent organization—the Executive Committee being instructed to consult with the national headquarters with a view to doubling the dues of local members—the extra amount to provide a working fund for the local organization. This permission was readily granted by the national officers. As a result, a district organization was immediately instituted, and a permanent Secretary placed in the field with a stenographer in charge of the office. A committee appointed to district the field outlined nineteen districts with a Chairman, Secretary and standing committees for each. A Program Committee was appointed and originated an elaborate series of activities—one section providing for monthly meetings for safety engineers to be held in Pittsburgh, to consider technical subjects of common interest; addresses to be delivered by the most able speakers to be had on each of the topics considered at these meetings. Plans were also made for four meetings a year in each district for superintendents and foremen, each meeting to take up a subject in which all were vitally interested; also four outdoor meetings to be held during the summer months in each district, with lectures and moving pictures for workmen. This brief outline was turned over to the permanent Secretary for elaboration and study. Other meetings were held and the tentative plan was ratified and enlarged. After eleven months of actual work it is a pleasure to report that the Western Pennsylvania Local is prosperous and well advanced in the work undertaken.

MEETINGS OF SAFETY ENGINEERS

Safety engineers' meetings have been held in Pittsburgh on the last Friday of each month, as follows:

Date—	*Speaker*	*Attendance*	*Subject*
Jan. 25, 1918,	Earl B. Morgan, Chief Safety Engineer, the Norton Company.	75	"Education in Accident-Prevention Work; Use of Abrasive Wheels."
Mar. 1, 1918,	C. W. Price, Field Secretary, National Safety Council.	207	"Shop Lighting."
Mar. 29, 1918,	Dr. Thomas Darlington, Secretary, Welfare Committee, American Iron and Steel Institute, New York City.	243	"Plant Hygiene: Health of Employes."
Apr. 26, 1918,	Dr. M. G. Lloyd, Electrical Expert, Bureau of Standards, Washingington, D. C.	226	"Electrical Hazards and Standards."
May 31, 1918,	A. H. Young, Director, American Museum of Safety, New York City.	228	"Labor Turnover in Relation to Safety."
June 28, 1918,	T. F. Foltz, Mechanical Engineering Department, Pennsylvania State Department of Labor and Industry, Harrisburg, Pa.	216	"Boiler-Room Hazards; Fuel Economy; Powdered Coal," etc.
July 26, 1918,	Sidney J. Williams, Manager, Accident Prevention Division, National Safety Council.	138	"Building Construction and Demolition."
Aug. 30, 1918,	Frederick L. Hoffman, Third Vice President and Statistician, Prudential Life Insurance Company.	108	"Reduction in Accidents; Use of Statistics in Encouraging Bases for Accident Records."

On account of the Seventh Annual Safety Congress being held during the month of September it has been decided not to hold a meeting this month, but on the last Friday in October we will resume our meetings with the subject of "Rules for the Guidance of Oxy-Acetylene Welders." The November meeting will consider "Plant Hazards; Standard and Narraw Gauge Railroads for Industrial Plants." For the December meeting we have the subject of "Exhaust Systems."

A conservative estimate places the number of workmen reached through these meetings at 500,000. The gatherings have been very much appreciated by executives, safety engineers and superintendents, and all have been interested in these particluar subjects. The lectures have been printed and sent to all members—an added service which has been greatly appreciated.

SUPERINTENDENTS AND FOREMEN'S MEETINGS

During the late winter and spring we held three meetings in each district for superintendents and foremen. The first series of these meetings was held from January 10 to February 6. Speakers, Earl B. Morgan and C. W. Price. Subjects, "Grinding Wheel Hazards" and "Co-operation for Safety." The total attendance at these meetings was 1,500.

The second series of meetings was held from March 11 to April 6. Speaker, H. L. Goodwin, safety and efficiency engineer of the Merry Optical Company, Kansas City. Subject, "Eye Protection." (While Mr. Goodwin was in this section he was called into eighteen plants in the Western Pennsylvania district to address the workmen, talking to more than 60,000. He also spoke at three high schools on "Eye Protection," reaching 568 students.) The total attendance of superintendents and foremen at the meetings was 1,503. Mr. Goodwin's lecture did a great deal of good in this district.

The third series of meetings was held from May 6 to June 4. Speaker, R. D. Young, supervisor of accident prevention and investigator of the Pennsylvania State Department of Labor and Industry, Harrisburg, Pa. Subject, "The Value of Workmen's Safety Committees." Total attendance, 1,780.

In each of the districts our members have enthusiastically supported these meetings. We expect to continue them as soon as cooler weather sets in. The Secretary will address the first series, beginning early in October, on the subject, "What Superintendents and Foremen Must Do to Get the Co-operation of Their Workmen in Safety and Efficiency."

The plan outlined by the Program Committee for workmen's outdoor moving picture and safety meetings in each district scheduled forty-five meetings per month for four months. Nineteen meetings were held during the latter part of May and early part of June, with a total attendance approximating 27,000, but on account of the extra daylight hour—it being 9:30 before these meetings could be started and 11 o'clock before the men were able to get to their homes—it was thought best by a number of our members to discontinue these meetings. In place thereof, it was decided by the Executive Committee to purchase a portable moving picture projector which could be carried right into the plants and films put on for the workmen during the noon hour or at such time as might be designated by the management. This part of our service has been the most successful thing we have done. One hundred and ten such meetings have been held in the various plants and more than 108,000 workmen have been reached. We are booked six weeks in advance all the time for this service.

SCHEDULE OF MEETINGS

We have held the following meetings this year:

		Attendance
5	Executive Committee meetings	102
8	Safety engineers' meetings	1,441
57	Superintendents and foremen's meetings	4,783

129	Workmen's meetings	135,000
12	Meetings of School and Safety Engineers	900
211	Meetings with a total attendance of	142,226

During the period of my secretaryship of the Western Pennsylvania Division, February 9, to the present time, I have organized twenty-six plants for safety. These plants now have regular safety organizations, hold safety meetings at stated periods and are doing efficient accident prevention work—all have materially reduced their accident records. I have also done personal work and lectured at safety committee meetings in seventy-six plants.

SCHOOL FOR SAFETY ENGINEERS

The School for Safety Engineers was started on May 23 of this year. After visiting a number of plants throughout the district I found that many of them had lost their regular safety engineers on account of the war—some having been drafted and others having received appointments by the government as safety engineers at arsenals, navy and shipbuilding yards. In many cases inexperienced men had been taken out of their organizations to do safety work, and these, because of lack of experience, were having a great deal of difficulty. So we decided to form a school for their benefit.

The school course consisted of twelve lessons, with the following general subjects:

1. "The Successful Safety Engineer; What He Must Do to Get the Co-operation of Every Employe."
2. "Safeguards," illustrated with slides. "A Few Fundamentals a Safety Engineer Must Know."
3. "How to Reach the Manager and Superintendent."
4. "How to Get Co-operation from the General Foreman."
5. "How to Get Co-operation from Subforemen."
6. "Bulletin Boards and Their Relation to Safety."
7. "Workmen's Safety Committees and Meetings."
8. "Instructing New Men and Getting the Co-operation of Older Employes."
9. "Labor Turnover in Relation to Safety."
10. "Plant Conditions," such as cleanliness and orderliness.
11. "First Aid."
12. "General Outline of Details a Safety Engineer Should Know."

The school was organized with 114 safety engineers in attendance, with an average of seventy-five for the entire series. I personally took charge of these meetings and gave all the lectures. When cool weather sets in I expect to resume this work, but on a different plan. Instead of attempting to give an entire series of lectures we have secured the services of an enthusiastic worker in each particular line for a stated subject. I am sure the plan will lead to more successful work and a wider appreciation of it.

THE OFFICIAL STAFF OF THE DISTRICT ORGANIZATION

The following constitutes our Executive Committee: The President, seven Vice Presidents, Treasurer, Secretary, Chairman of Boy Scouts' Committee, Chairman of Finance Committee, Chairman of Membership Committee, Chairman of Program Committee, Chairman of Publicity Committee, Chairman of Schools and Colleges Committee, Chairman of Standards and Plant Organization Committee, and the nineteen district Chairmen. The Executive Committee meets every sixty days; the various committees hold meetings as often as required.

Our present membership is 237. Since I became Secretary of the Division forty new members have been secured and six old ones lost. We have very little difficulty in holding our memberships and collecting the increased dues, after explaining the activities we are carrying on.

OTHER ACTIVITIES

In addition to the work outlined above, we have organized a course of systematic instruction in safety in the city and county schools throughout the entire district. The Local Council is working in close co-operation with the school authorities and furnishing weekly bulletins consisting of pictures and stories of common accidents to each district. Classes in safety are organized for children and the means for avoiding accidental injuries are made a part of the school work.

We have also attempted to hold the interest of both members and non-members by sending out literature, such as a pamphlet showing a map of the various districts and the location of Sectional headquarters, stating therein the plan of activities and the officers of the Division. We are continually soliciting the non-members. A recent pamphlet showed 348 concerns as members of the National Safety Council and the Western Pennsylvania Division. (Some concerns have four or five plants in different districts, hence the variation from membership figures.) With this pamphlet we enclosed a letter and application blank urging all industrial concerns in Western Pennsylvania to join both the local and national organizations.

As Secretary, I have visited every affiliated and non-affiliated plant in Western Pennsylvania—approximately 1,500 concerns. Of the 1,250 non-members I have promises from 321 to take out memberships. These are slow in coming in, but we will eventually get them.

During the fall we expect to put on a public safety campaign with a safety rally in each of the districts. A Committee on Public Safety, in co-operation with the city, county, State and borough officials, will work for the promotion of street safety, improved traffic regulations and the elimination, as far as possible, of general street hazards. A drive will be made to educate the public in this respect.

CO-OPERATION OF STATE AND OTHER PUBLIC OFFICIALS

In conclusion, I wish to say that the Department of Labor and Industry, through its acting commissioner, Mr. L. R. Palmer, has given us every

possible assistance. Mr. R. D. Young, supervisor of accident prevention and investigator in this district, has devoted more than one-half of his time in assisting Local Council officers in this work. Mr. Young's assistance has been particularly helpful, as he is able to reach the chief executives of many concerns not otherwise easily interviewed. Mr. Young has also gone into details with many of these executives, explaining to them that the Department of Labor and Industry was co-operating with the National Safety Council in this movement. Our meetings for superintendents and foremen have been well advertised throughout the district through this co-operation with the Safety Department of Labor and Industry.

It is well to remember that the National Safety Council can best reach its membership through a permanent local organization. When I first came into the District I visited a great many plants in the course of my activities. Much to my surprise, I found the National Safety Council's bulletins stacked up on the manager's, superintendent's or safety engineer's desks—too often none of these bulletins were posted in the plants. I sought to remedy this condition by showing these gentlemen that they were paying for service which they were not utilizing, through their own neglect in not posting bulletins. Other concerns had a single bulletin board at the front gate, pasted full of dirty and torn bulletins—it was evident that they had not changed them for a considerable time. A little educational work convinced these concerns that it would be good business to put bulletin boards in each department and change their bulletins regularly. This is now the uniform practice in Western Pennsylvania.

There are many ways a local Secretary can serve his members and the national organization. He must, first of all, have safety work close to his heart, not merely be working for a salary, but for safety itself—he must believe in his calling. He must be a diplomat—be able to understand his man and just how to reach him before he goes after him. Some employers can be reached by argument, by setting forth the dollars and cents side of it; others from a humanitarian standpoint, others through a sense of patriotism. All these arguments are true and convincing, but the appeal must vary to meet certain conditions. A successful Local Secretary must be a keen student of human nature.

My personal impression is that after our District organization has been in the field for a year or two the industries will better understand our mission and come to us for our service, relieving us of much of the onerous duty of personal solicitation.

The experience of Western Pennsylvania would suggest that every Local Council should have a permanent organization and should be financed in the same general manner as is the Western Pennsylvania Division. The first six months we were able to finance our activities in the sum of $6,000 through local dues. Since that time we have had to call on the national headquarter's office for some assistance, although we have sufficient dues outstanding to fully meet all our needs—the vacation season and shortage of help, in a number of instances, is delaying the prompt forwarding of dues to the local office. We are confident that this minor difficulty will prove but a temporary inconvenience—one which

may well be expected in the first year of our increased expenditures and manifold duties.

The permanent organization plan we regard as an unqualified success. We trust the system will be widely followed.

AN EXCELLENT RECORD

Since writing the above, I have been informed by the State Department of Labor and Industry that we are materially reducing lost-time accidents. We have slightly reduced fatal accidents in the first eight months of 1918. (Had it not been for the Oakdale disaster which occurred in our district the early part of May, killing 102 men, we should have a big reduction in our fatalities.)

We have reduced lost-time accidents in the Western Pennsylvania Division, for the first eight months of 1918, 28 per cent. This, we think, is a remarkable showing, when you take into consideration the way our plants and mines have been speeded up, payrolls materially increased and the large labor turnover we have had to contend with. Also that a great many women have been placed in machine shops, on cranes, and doing laboring and other work in many of our industries.

DISCUSSION

CHAIRMAN PRICE: Will you indicate the character of the men who attended the meetings—the position they occupy in their companies?

MR. RASMUSSEN: We had managers, safety engineers, superintendents and other plant executives—the men in charge of the work subject to discussion. Our notices were sent to the head officers and they gave instructions to the men they desired to attend the meetings. Many times the managers also were present. At our "Labor Turnover" meeting 75 or 80 employment managers were present.

CHAIRMAN PRICE: In notifying the managers of the meetings do you emphasize in the letters the type of men who should be particularly interested in the subject?

MR. RASMUSSEN: Yes, sir. For the "Labor Turnover" meeting we suggested that they send their employment department managers. The meetings are usually called for 12 o'clock.

CHAIRMAN PRICE: The day I talked they kept me answering questions for two hours and twenty minutes. My talk occupied about forty-five minutes. I never have had so many intelligent questions asked by men who are responsible for their particular lines. It was one of the very best meetings I have ever attended.

A DELEGATE: Is a record kept of the questions and answers?

MR. RASMUSSEN: No; our record shows only the talks made by the speakers. I can furnish copies of the addresses if they are desired by the delegates. Our moving picture meetings are held in any part of the plant where they can make a little room—sometimes in a storeroom—although I always suggest the tacking of paper over the windows. The

men usually attend during the noon hour. All the equipment needed is an electric light socket.

A DELEGATE: Do the men stand?

MR. RASMUSSEN: They usually stand. In some plants seats are provided: that is, benches are made out of boards.

Sometimes the meetings are held in the evening, or, if the plant works twenty-four hours a day, we hold the meetings between the shifts.

A DELEGATE: Do you have any difficulty in interesting the men?

SAFETY MOVING PICTURE SHOWS

MR. RASMUSSEN: We always have a crowd at the shop meetings—the usual procedure is for the men to give up fifteen minutes and the company a like amount at the lunch hour. Most of the men in these plants bring their lunches.

A DELEGATE: I suppose a large percentage of the men live near the factory. Do you have any trouble in getting them to come back?

MR. RASMUSSEN: We have no trouble in getting practically every man, woman and child in the plant to come to the meeting. It furnishes entertainment and they are glad to attend.

A DELEGATE: Isn't that the explanation—that there is no other entertainment in town?

MR. RASMUSSEN: Possibly in the mining districts; but you would be surprised at the attendance in the city of Pittsburgh. Over 5,000 people attended a meeting held at the children's playground. We also had a little band concert.

A DELEGATE: What pictures or films do you show?

MR. RASMUSSEN: "The rule of Reason" and "The House That Jack Built." Unless they call for more, two reels are plenty for one meeting. This occupies about thirty minutes.

CHAIRMAN PRICE: If you were asked to hold a community meeting in the park or go into the plant at noontime, which, in your opinion, would be the most effective?

MR. RASMUSSEN: That is a hard question. We can reach the men better in the plant, but the open-air meetings reach a great many women and children.

MR. HARDEN: Don't you find it important to reach the families?

MR. RASMUSSEN: I think that is very important.

A DELEGATE: Do you do that by public meetings?

MR. RASMUSSEN: Yes, we get out on a playground.

MR. GROVER G. KINGSLEY (Safety Engineer, Halcomb Steel Company, Syracuse, N. Y.): Do the moving picture interests object to your showing pictures in the park?

MR. RASMUSSEN: When the moving picture interests learned of our plans they offered, if we would furnish the films, to show them in their moving picture houses free of charge. A great many people—whether working people or not didn't matter to them—would be reached in this manner.

MR. CARL L. SMITH (Permanent Secretary, Central Mississippi Valley

Local Council, St. Louis): With the help of the park department we are showing pictures on the playgrounds in the parks of the City of St. Louis.

A DELEGATE: Do you find trouble in reaching foreign workmen?

MR. RASMUSSEN: No; there is always someone in the plant who will explain what is going on.

INTERESTING FOREIGN BORN WORKERS

MR. E. B. SAUNDERS (Assistant Field Secretary, National Safety Council, Fitchburg, Mass.): A gentleman in attendance has met that problem. Ninety percent of his workmen are Hungarians and Poles. He has a man to translate the descriptive matter into the language of the men. One night he will have a meeting for the Hungarians, and an interpreter will translate the descriptive matter and make some little comment in the language of that people. Another night a similar meeting will be held for the Poles. He says the system has worked out admirably.

MR. H. H. MATTHESON (Director of Safety and Service, Garfield Smelting Company, Garfield, Utah). In our plant we have Japanese, Greeks and Austrians. At first I tried to have a picture shown for each nationality, but it didn't take. Then I said "Everybody come!" and I got a Japanese and a Greek and an Austrian up in front—I got up there myself—and when the descriptive matter appeared I would interpret it, sometimes just the headlines or enough to tell what was coming. I would tell the Greek, the Austrian and then the Jap. When the interpreters explained the pictures those fellows would applaud and yell and were just tickled to death about it.

CHAIRMAN PRICE: The school for safety engineers was one of the most instructive experiences in educational work I have ever seen. It was a revelation to me. Mr. Rasmussen put it across. His experience in Omaha and the wonderful record he made while there was known and greatly impressed his audience.

A DELEGATE: Did the young men who were instructed have any previous technical education as safety engineers?

MR. RASMUSSEN: Some were well educated, others were not.

A DELEGATE: Were they practical men?

MR. RASMUSSEN: Yes. Some of the men had been in the work quite a little time and had some good ideas. Their ages ranged from about 20 to 40 or 50. The younger men were in the majority.

MR. MACNAB (Cleveland): Did you go on the presumption that they were just starting safety work?

MR. RASMUSSEN: I went on that presumption.

FORMAL DISCUSSION

MR. CARL L. SMITH (Permanent Secretary, Central Mississippi Valley Local Council, St. Louis): The opportunities afforded a permanent Secretary in a district like Pittsburgh, St. Louis, New York, Boston or any of the large cities are tremendous. You have the police department, the traction companies, the street and fire departments and other organiza-

tions that are willing to co-operate in the great movement. In St. Louis 5 per cent of the industries are doing efficient safety work—that is all. What you see here this week, in a public way, this 5 per cent is responsible for. We have gone to the Boy Scouts, to the coroner's office, to the police department, to every branch of the municipality in the last three months and everyone has been pleased to co-operate. The first meeting with the police in St. Louis was held by Mr. Price some time ago. Twelve hundred policemen assembled in the Coliseum, the largest building we could secure, to hear his talk. The police commissioners, the chief of police and the secretary of the police board each made short addresses—it was a very interesting meeting. As a result the police commissioners issued a direct order to every policeman in the city of St. Louis to get on the job and to prevent accidents.

St. Louis, this fall, will inaugurate just such a program as Mr. Rasmussen has outlined. We are going to have foremen's meetings, superintendents and executives' meetings, and a safety engineers' school. We have just started to outline the plans. We have twenty-five applications for the engineers' school now on file. We expect to have this course mimeographed and put in a form to suggest to the students just exactly what the course will be and what questions will be asked.

The public schools in St. Louis have taken up the safety movement and the superintendent of schools has directed one principal to devote his time to the compiling of a book on safety for children. The Harris Teachers College of this city will have a safety course and every principal of the public schools in this city will take this instruction. In other words, the public schools are going to teach the safety idea just as they teach spelling, arithmetic, etc.

The keynote of progress in the safety movement is the selling of the idea. If you can't sell it you might as well quit. Go to public men and convince them that here is a movement they should be interested in—that they must be interested in. Get every man, woman and child interested in it. If you can't do that the Local Council will not arrive. If you do you will have the whole community with you.

CHAIRMAN PRICE: Our next speaker is Mr. Marcus A. Dow, General Safety Agent of the New York Central Lines.

SUCCESSFUL METHODS OF SECURING ATTENDANCE AT SAFETY MEETINGS

MARCUS A. DOW, GENERAL SAFETY AGENT, NEW YORK CENTRAL LINES

Mr. Chairman and Members of the National Safety Council: This subject, presumably, is intended to deal with large safety meetings or rallies, rather than meetings of committees or small groups of men. I shall not claim to have the only formula for solving the problem of securing attendance at these meetings, nor do I wish to convey the impression that I am giving you the best and most effective means of securing the end

desired. I shall, however, tell you briefly just how safety rallies have been worked up successfully and crowded houses made the rule almost without exception at the numerous safety meetings held at widely separated points on the New York Central Lines. I think there are really three things that are essential to success in an undertaking of this kind, viz.:

(*a*) A Good Program
(*b*) Effective Advertising
(*c*) Co-operation of Officials

Let me begin with the first thing mentioned. It is self-evident that a good program is necessary for the success of the meeting itself. But this thing is also of vast importance not only in getting out the crowd for the meeting you are promoting, but also has its effect on future meetings if they are to be held in the same community. You might be successful through good advertising, a thorough canvass and close co-operation to fill your house the first time, but if your advertising was all camouflage and you inflict upon your audience a long drawn-out, uninteresting and tiresome program, you can rest assured a lot of your victims will not want to get stung a second time and subsequent meetings will suffer because of the reputation your first one gained. We have therefore made our rallies short of duration and, to use a popular expression, "snappy and full of punch." The time for our meetings never exceeds two hours. Our program usually consists of one principal address by a speaker who knows his subject and can handle it in an effective way. Sometimes we have one or two short talks in addition to the principal speaker, but the time of each speaker is allotted with exact regard to the length of the program and no speaker is permitted to exceed his allotted time. The entire speaking part of the program does not exceed one hour. The balance of the time is taken up with music and motion pictures. The program runs off on a time-table schedule. In fact, the chairman is provided with a special program showing the exact time each number must close and the next begin. To illustrate how closely this is adhered to, we recently held a rally on Sunday in a large theatre where we had to hold it after the regular matinee, fill our house, hold the meeting and empty the house in two and one-half hours. We allowed twenty minutes for filling the house and ten minutes for emptying it, had a band concert of three numbers, two speeches, two songs and a moving picture. The house was emptied and ready for the next show within two minutes of the time agreed upon, and it was a "peach of a meeting," although no better than our usual run of such affairs. Now the result of this is that our men know they are not going to be bored with a long, dry program, but are assured of one that is going to run on schedule and that there will be something doing every minute during its progress. We are fortunate in having in our department a singer who is capable and sings with fine effect. We use him repeatedly and count him as one of our drawing cards. Our safety films are of the dramatic kind, telling a story of heart interest, with a "true to life" railroad atmosphere, and are produced with the same artistic care as the best professional productions—another drawing card. Our meetings have been made so interesting and attractive that we frequently are

asked "When are you going to hold another one here?" and this receptive attitude goes a long way toward making the work in connection with getting up a safety rally like the proverbial "bed of roses."

EFFECTIVE ADVERTISING

Next to the program comes effective advertising. We first ascertain approximately the number of employes we are going to draw from, then print about twice that number of hand bills. These show time and place of the meeting and contain an outline of the program. They are distributed not more than four or five days in advance of the meeting. In other words, we sweep upon our prospective audiences suddenly, train our batteries of persuasion upon them and then hold the meeting before they have a chance to forget it or find some excuse for not coming. I believe it is much oftener the case that men will come on short notice, even canceling other engagements to do it, than to come if a longer period elapses between the meeting and the time you first spring it on them. They don't have to burden their minds to remember about it—they know it is the coming Monday or Tuesday, or whatever day it is, without any other Monday or Tuesday intervening. A short but intensive advertising campaign, as well as short, snappy meeting, puts pep into the whole proceeding and makes attendance almost irresistible. The hand bills already referred to are distributed by members of the safety bureau, who are sent to the community where meeting is to be held and remain there, doing nothing else but "work up" the meeting and handle all details connected with it during the time from the moment the first gun is fired until the meeting is over. They personally interview every foreman, every yardmaster, every man in charge of other men, and place upon such men the responsibility of putting hand bills and tickets personally into the hands of each one of their men. Each foreman is instructed to supplement the hand bills with a verbal request, sometimes almost in the form of a command, to "come to the meeting." In addition, bulletins are posted on all bulletin boards advertising it. Before this circularization begins I personally write all the department heads and get them to issue positive instructions down the line to their subordinates, instructing them to give personal attention to the matter of urging their men to attend. I have already spoken of tickets. We always issue tickets of admission. The foremen are given a supply with instructions to ask each man how many he can use and give him just that many, with the admonition not to waste them as they are valuable. There is a psychological effect in this, as the men holding the tickets feel they have something of value that should be used, and many a man has come to a meeting rather than waste a ticket of admission reading "admit one." Even on the admission ticket the principal features on the program are enumerated, in addition to the time and place of the meeting. The Safety Agent does not rest after the first distribution of hand bills and tickets has been made to the foremen. He makes another canvass the day just before the meeting, interviewing every man in charge and asking such questions as, "Have you talked to every one of your men?" 'Have you given out all your circulars and tickets?"

"Do you need any more?" "How many of your men will you guarantee are going to attend?" In other words, a personal check is made to see that each foreman has done his job thoroughly and that *every employe has been personally canvassed*. This is most important.

DON'T HESITATE TO BOOST

With further reference to the advertising of the meeting, something should be said in regard to the wording of your circular or hand bill. If you have a good program don't hesitate to give it a good boost. Modesty is a poor asset when you are trying to "sell" even free seats for a show which is worth more than the price. It is hardly necessary for me to dwell much on this point, but I will illustrate it by quoting one paragraph from one of our recent hand bills, where it refers to the motion picture that is to be shown:

"This Safety film, recently produced by the New York Central Lines, is equal to the best photo-plays of the day. A forceful, heart interest story written around the subject of Safety, capably enacted by competent professionals, pronounced by experts to be a film masterpiece. Beautiful and artistic, yet full of thrills. You will laugh, you will cry. Better than half the moving pictures you pay good money to see. Don't miss it."

Contrast the foregoing with the simple statement that such and such a Safety film, giving the title, is to be shown, and you will get the point. It is just like any show you go to see—you read all the dramatic critic or the press agent has to say and then go yourself to see if he is telling the truth. Curiosity knows no bounds when once aroused.

As a further advertising medium, we always get the local newspapers to print notices of the meeting, usually two or three days in advance of it and again the morning of the day it is to take place. This serves as an additional reminder and lends a certain degree of importance to it. Any meeting that is big enough to get space in your favorite daily must surely be worth going to.

Another point which I think may be mentioned under the head of advertising, is the place of meeting. In the larger cities particularly we usually try to pick out the best and largest theatre in town. In the first place because we need it to hold all of our crowd, and secondly because the reputation of a high-class theatre which puts on the best shows will have a certain psychological effect. There is an invisible drawing power to plush seats that ordinarily sell for $2.00 a piece when the woman of the family of your employe holds in her hand a couple of free tickets reading "admit one." And this reminds me that I must not forget that woman is a most important part of this whole proceeding. Our audiences are always half, or nearly half, composed of the female members of our employes' families. We include them in our invitations, emphasizing that fact on our circulars, and aside from the influence for Safety they will exert on the males (which is foreign to my subject) they also in many instances bring their men to the meetings so as not to lose the value of the aforesaid tickets reading "admit one," which have found the way into their receptive hands.

CO-OPERATION OF OFFICERS NECESSARY

The last of my three things need be but briefly commented upon. The co-operation of the officers is just as important in getting a crowd to your safety rally as it is to any other feature of safety work. From the superintendent down to the lowest foreman must pass the command to "get busy" and "talk up" the meeting. We always let it be understood that Mr. So-and-So, the big boss in the particular locality where the meeting is to be held, wants to see everyone there. He is going to be there himself and is counting on everyone on the division who is not working to come to the show. This spirit of official co-operation has been developed to a point on our road that in itself would insure successful attendance at most of our rallies.

In conclusion, I would say it has been the combination of the things I have enumerated that have spelled success for us in our Safety gatherings and have taught our men and their families to look forward to our meetings. Looking back over the last twenty-five safety rallies we have held on the New York Central lines in theatres or halls seating from 1,000 to 2,000 persons, I cannot recall one where we have not, literally speaking, had to "turn them away," and we can go back to any of those cities any day and repeat our former record attendance.

DISCUSSION

MR. DAVIDSON (New York): You have in contemplation the big railroads and the big plants, what about the little fellow that has a hundred, fifty or twenty-five men?

MR. DOW: I would handle it in the same way.

MR. H. H. ROBERTSON: (President Aspromet Company, Pittsburgh): In the small plant we sometimes fill out the ticket "Price 50 cents" or "Price $1.00." Then we stamp "Complimentary" across the face of it. We usually solicit the manager of the plant. We have in our rolls the names of the superintendents or officers who are directly in touch with the men. After we ascertain the names of the men and number of tickets, each department is thoroughly circularized. We do all the work.

CHAIRMAN PRICE: In other words, the letter sells the service.

MR. R. M. DENNING: Mr. Dow spoke about having meetings between the afternoon and the evening. How do you take care of men on the night run?

MR. DOW: We do not always get them. We work according to local conditions. We find, in some localities, we can get a large percentage of men to attend Sunday meetings. In other localities we find this is not an advantage and we hold the meetings on week day nights. We also have two lecture cars, with a speaker in attendance, that travel over our railroad every day. In that way we cover the field pretty thoroughly.

CHAIRMAN PRICE: Mr. F. M. Rosseland, President of the Chicago Local Council and Engineer of the National Safety Council, is the next speaker. You probably often wonder where all the brains come from that go into the Safe Practices pamphlets. Here's some of the brains.

THE IDEAL LOCAL PROGRAM FOR LARGE-SIZED COMMUNITIES

F. M. Rosseland, President, Chicago Local Council

Mr. Chairman and Members of the National Safety Council: Outlining the ideal program for a Local Council in a large-sized community, you will agree with me, is "a large order" but I shall attempt to give you an ideal that we are working toward in Chicago.

The program may be divided into three subjects: Industrial Safety, Public Safety, and Home Safety. We should consider industrial safety first, because it was for that purpose that the National Safety Council was organized, and because that work, once started, the other two subjects will force themselves upon us and clamor for attention.

Industrial safety should be striven for through the following agencies:

1. Safety rallies for workmen (they may not see the value of them but employers do so quickly).
2. Instruction classes for safety inspectors and junior safety engineers.
3. Inspirational meetings for foremen and superintendents.
4. The investigation of unusual industrial accidents and consultation with employers and executives in large plants.
5. Monthly safety dinners for executives.

Safety rallies for workmen (remember that while I may speak of *men* the program also embraces women employes) should be held at least once every four or five weeks, but at irregular intervals, so that workmen may not tire of them. The community should be divided into sections, so that workmen will not have to travel long distances to attend the meetings, and each series of meetings should be held on consecutive nights, until the entire community is covered. The programs in each section should be as nearly alike as is practicable, so that when a group of meetings is completed all the workmen in the community will have had practically the same message. Because of the large number of people to be handled, it is probable that the best program will consist entirely of moving pictures or, failing this, of stereoptican slides. Each meeting should be opened with a very brief—four or five minutes at the most—talk by the Chairman, who should be a local favorite or at least well known (and though this may be a repetition of what has been said in Mr. Rasmussen's talk and the discussion that followed, I will say that, after dividing a community into sections, a committee should be appointed for each section —made up of local men—and the Chairman of this section or some committeeman he may delegate should preside at the workmen's rally in his section). If the section be a small one, or the attendance small, a longer talk may be interjected into the program, but not otherwise. In any event, do not allow the rally to become tedious. Introduce some humorous speeches or provide good music—not mediocre amateur musicians—do anything that will not belittle the safety movement, to keep up the spirit

of the meeting. Begin on time and close the meetings at 9:30 or 9:45 at the latest. Remember, the audience must go to work early the next morning.

MEETING MUST HAVE A PUNCH TO IT

Each meeting should go with a vim and a snap. If an unsuccessful meeting has been held, go over the details carefully, analyze thoroughly and avoid a repetition. The value of these meetings is principally inspirational, giving the workmen an opportunity frequently to rub shoulders with men from other plants and to learn that accident prevention work is not their employer's hobby, but that other plants are also active in it. Well-managed safety rallies are of great value to the plant safety engineer, and the employer is usually heartily in favor of them. The difficulty will be to keep from lessening their value by holding them *too* frequently or without attractive programs. The old rule, "If you have nothing to say, don't talk," may be applied to the safety rally: "If you haven't a good program don't hold the rally." The best method is, where practicable, to prepare your programs in advance for the season, so that you may cover a certain definite number of subjects. Knowing just about when each subject will be considered, then at once begin to locate films and slides. The headquarters of the National Safety Council will be glad to help.

Instruction classes for safety inspectors and junior safety engineers have already been described by Mr. Rasmussen. I regard these as a most important activity. Eventually, we hope that colleges and universities will provide courses for safety engineers but, until they do, instruction classes such as Mr. Rasmussen conducted will be of a great value to employers and the movement generally. The program for the course should be outlined in advance, and the prospective instructors selected and their promises secured. In any event, alternates should be selected, possibly from among the Local Council's officers, so that the lecture or talk will be given even though the speaker originally selected fails to appear. Opportunity should be given—after the talk—for questions (not discussion) and the members of the class should be requested to make copious notes for their own use later. The entire course should be general, except that where the subject relates to a particular industry common in the community it may be well to be more specific. The aim should be to give a rather comprehensive survey, so that after completing the course the students will be better fitted to do not only their present work, but work in other branches of industry. The tendency of the age is to specialize, and we must avoid narrowing the work to the point where the proper perspective is lost.

MEETINGS FOR FOREMEN AND SUPERINTENDENTS

Inspirational meetings for foremen and superintendents will be most successful if the section already outlined for the workmen's safety rallies are utilized. The meetings will, of course, be smaller and should be held in an assembly hall which is easy of access. The same general rules out-

lined for the workmen's safety rallies should be followed, except that the program should consist of two or not more than three addresses by leaders in accident prevention work, either local or national, on subjects relating directly to the work of foremen and similar supervisory employes. The meetings should be very positively restricted to foremen and superintendents. Let them understand that it is especially for them, that workmen, strawbosses, etc., are not to be admitted, and if the meetings are well handled they will appreciate them all the more. I think that probably the most successful meeting of the kind was held during June of this year, under the auspices of the Chicago Safety Council. At this meeting, which was held in the auditorium of the South Chicago Masonic Temple, one thousand foremen and superintendents were present. The enthusiasm was marked and we still hear, occasionally, of the good work done. In addition to the speakers, the meetings should be closed with one good safety movie. It doesn't make much difference what the movie is about (it must be a safety movie, of course), if in announcing it the chairman states that the movie is exhibited so that the foremen and superintendents may see the sort of pictures which have been prepared especially for workmen, and so that they may also be reminded on some of the points to be looked for in their supervision of work.

If the attendance is small—but the experience is that the foremen will speak up in meeting—it may be well occasionally to hold round-table meetings, instead of having formal addresses. Do not, I beg of you, allow these round-table meetings to become testimony meetings of the kind which our fathers, at least, will remember were held at church prayer meetings. At this stage of the game it seems to me to be unnecessary and uninteresting to hear foremen get up and simply testify to the value of accident prevention work. Most of us today are convinced of this, and those of us who are not can best be convinced in some other manner. Let the discussion at the round table be of some definite operation, or of some definite construction; or have one or more foremen who are conspicuously successful in preventing accidents tell how they do it. The round-table meeting is also a splendid place for those present to secure information. Let them ask questions and have the answers made or attempted by others present. These inspirational meetings should be held about four times a year.

The investigation of unusual industrial accidents which may occur in the community is a very important phase of the work, but one that must be handled intelligently in order to avoid creating opposition to the accident prevention movement. The idea, of course, is to be helpful to the plant which has had the accident, and to assist other plants to avoid the same kind of accidents. There is even greater need for diplomacy in handling consultations with employers and executives of large plants. It is probable that this can best be done by an officer or a small committee of the Executive Committee. Care must be taken to avoid conflicting with the state inspection department and insurance company inspection departments and to avoid interjecting the personal element. Much real good can be done by direct reference to the National Safety Council's

service and library, and by suggesting plans or safeguards which have been successfully developed by members in the community.

MEETINGS FOR EXECUTIVES

We regard as very important the safety dinner or semi-banquet held each month, excepting June, July, and August, for safety engineers, superintendents, and higher executives. In large communities these meetings alone should have an attendance of 300 or more, and should be a very influential factor in backing up the other meetings outlined and the personal work of the safety engineers and safety inspectors in the plants. At these meetings any of the many phases of accident prevention, welfare and employes' service work generally may be discussed. The speakers should be prominent men, authorities in their own fields, and the meetings should be formal in their general character. Care should be taken at these meetings, also, to see to it that only men in the capacities mentioned are present. Let executives of companies feel that this is their meeting and that they may talk freely without treading on the toes of workmen and foremen; that they may discuss freely any phase of safety or welfare work that especially interests them. These meetings should be the monthly opportunities for the Local Council Executive Committee to get together with the executives who are approving the expense vouchers for the Local Council activities.

PUBLIC SAFETY

The very large field of public safety is well covered in a special report which will be made by Mr. Julien H. Harvey, Director of Safety of the Council, who has just completed a six months' public safety campaign of the City of Rochester, N. Y. I am unwilling to say how much of this work should be attempted by a Local Council, but I do feel that it should be handled by one of the strongest committees. This committee should be composed of prominent men, headed by the strongest business man it is possible to get. It is unnecessary that he be connected with any factory—simply that he be an influential business man in the city. The reason it is necessary to have influential men on this committee is that much of the work must be handled through the municipal authorities, and if the men are not influential they will be unsuccessful in securing the co-operation of the municipal authorities. The work will include the enactment of proper ordinances, the proper instruction of traffic police, the erection of the best known traffic signal stands, etc. In addition to these important features, educational safety work should be conducted for school children and their parents. The education of school children may be handled through addressing them at the public schools. Co-operation with the local board of education will be necessary in order to secure permission to do this. The instruction of their parents can probably best be attempted through addresses at meetings of clubs, societies and churches. Every possible use should be made of Fire and Accident Prevention Day, which has been observed each year in some communities for several years past. It forms a splendid opportunity for

getting the subject before organizations which would not ordinarily be interested.

If good speakers are selected I can promise you that you will have little difficulty in presenting your subject before the various organizations. The automobile clubs must be carefully educated, and the Local Council officers and members who drive automobiles should be careful to set an example and to talk constantly on the subject at every opportunity. If the local street car company is not already carrying on an active accident prevention campaign, strenuous efforts should be made to get them to do so and to secure their active co-operation in the Local Council's plan. The co-operation of the newspapers should be secured, so that matters concerning public safety which interest them will be referred to the Local Council, and so that due publicity will be given to the activities of the Local Council. I put this last, because it is probably the most difficult to obtain. The newspapers are publishing the news for money, and their estimate of what is news is very strictly adhered to and their advertising space is carefully determined by the managing editor.

HOME SAFETY

Unquestionably the most difficult subject of the three with which we started is home safety, and a special committee can probably best handle the work. The committee should be made up of men and women equally, and their activities will probably be restricted to newspaper publicity and to public school work. It is possible that they can arrange to have the various women's clubs, improvement associations, churches and social centers addressed on the subject two or three times a year. A very important feature of their work will be close co-operation with the coroner's office and the local building inspector's office. Through the coroner's office they should be able to secure information concerning accidental deaths, and through the building inspection department they should be able to secure information concerning unsafe conditions found by building inspectors. The latter reports, of course, will apply equally to the industrial accident prevention division as well.

If possible, it is advisable to secure permission to exercise supervision over the home help departments usually conducted by local newspapers. These so frequently contain information which, if followed, is very likely to result in accidental injury as, for instance, directions how each housewife may be her own electrician, may do the plumbing in the house or how a carpenter's work may be done by the small boy. The same sort of supervision should be conducted over the medical help columns usually carried by newspapers. These frequently contain information which is not quite up-to-date and which, if followed, may result in injury. I am thinking now particularly of the recommendations which I have frequently seen, that peroxide of hydrogen be used in the treatment of cuts. I believe that there is still some dispute in the matter, but I have been satisfied for some time past that it is unsafe to use peroxide, and that iodine, turpentine or some other antiseptic should be used. You will see that such medical hints, if they are not of the best, will render

more difficult the work of the safety engineer and the industrial plant physician. Our whole object should be to secure the maximum of co-operation.

PERMANENT SECRETARIES ARE NECESSARY

Gentlemen, I have no doubt that by this time you are wondering what on earth I can be thinking about to outline such a program for a Local Council! Please note that this is an ideal. I am fully aware that to accomplish the ideal the whole time of a permanent Safety Engineer-Secretary must be secured. As a member of the staff of the National Safety Council, as well as through several years' experience with the Chicago Safety Council, I have been convinced that to get the maximum good from Local Council work it must have a permanent Secretary. Mr. Rasmussen has outlined the splendid work he has accomplished—Mr. Smith and Mr. Saunders have equally good opportunities. The future of Local Council work is bound up in the securing of competent permanent Secretaries for each one and the continuance of whole-hearted co-operation with them. No one man can do all the work. We must have the Executive Committee and the officers actively interested and devoting a good deal of their time, but to accomplish all of the work which I suggested will be impracticable without a permanent local Secretary.

The need for the work is great. The employers and business men of the large-sized communities are willing to finance it once they are convinced that *you will deliver the goods.* Note that important proviso—that you will deliver the goods. So many thrilling but visionary schemes have been presented to them in the past that they must be assured by the very character of the men who are advancing the project, and by the complete plan which has been developed that it is possible to make good and that a competent permanent Secretary has been selected.

Permit me to say, in conclusion, in view of Mr. Price's kind words, that the Safe Practices pamphlets are not the work of any one man, but represent the consensus of opinion of the Council's Conference Committee, to whom the cause of safety is deeply indebted. My work has been the preparation of the original drafts and the correlation of the experiences of the members of the Conference Committee.

CHAIRMAN PRICE: I am very sorry, but our time will not allow discussion on this important paper. Our next speaker, Mr. John W. Costley, will describe what can be done in a small community. He has been remarkably successful and will tell us how he has directed the affairs of a live, snappy local.

HOW TO CONDUCT FOREMEN'S MEETINGS SUCCESSFULLY

JOHN W. COSTLEY, CHAIRMAN, TRI-CITY LOCAL COUNCIL, GRANITE CITY, ILL.

Mr. Chairman and Members of the National Safety Council: I shall talk only from the standpoint of foremen's meetings. In our Tri-City

Safety Council we have an organization of seven plants—the National Enameling and Stamping Company, the Commonwealth Steel Company, the American Steel Foundry Company, the Corn Products Refining Company, the Hoyt Metal Company, the National Lead Company and the American Car and Foundry Company. All are great institutions, perhaps some of the delegates are connected with them in some other cities. We have a number of other plants in our Tri-City that we have asked to come into the Council and I think they will before the year is over.

The Tri-City Safety Council was brought into existence two years ago. I had the honor, the pleasure and the privilege of being present at that time. I have always looked upon accident prevention work from the standpoint of one doing everything possible for the uplift of my fellow man and that was the idea I had in mind when I attended the initial meeting of the Local Council. When I understood the purposes of the work and saw the enthusiasm of the gentlemen pushing the movement, I immediately became interested.

Much of the credit for our success should be given to our Secretary. He has worked faithfully in the interest of the movement and has done much to promote the activities of the Tri-City Safety Council. An organization without a good secretary is in a bad way.

A number of the plans advocated this morning for the successful administration of a Local Council are in line with what we are practicing every day. For example, we have an active representative in each plant and our foremen's meetings are very successful. Our men take an active interest in the work: in fact, we are getting them all worked up. Each plant appoints its own safety representative to our Local Council and this group acts as the Executive Committee of our Local. We have an Executive Committee meeting once each month, preceding the meeting of the Council. The Executive Committee outlines our program and secures the principal speaker for the occasion. We spend about thirty minutes listening to a lecture on some selected topic and then hold a round-table discussion. We have given steel the most attention because a topic connected with that subject is of most interest to the men in our particular locality. The National Safety Council's suggestions are always interesting and we have followed the publications of the headquarters office with a great deal of pleasure and used the material contained therein to good advantage both at the meetings of foremen and at other gatherings. Our meetings depart somewhat from the usual in that our speakers often touch on subjects not contemplated in our original program. If a live subject presents itself we take advantage of the occasion to feature it. For instance, it might be a patriotic talk. We have often followed this practice during the last two years. On a number of occasions the speaker has selected his own subject for discussion.

We always have some one from the Commonwealth Steel Company, from the American, or from some other place on whom I call to start the ball rolling. After he speaks I call on Mr. Smith from the Hoyt Metal and by the time these gentlemen have given the subject a going-over I find that nearly every one in the house has grasped the essentials of the subject. If he hasn't and he wants to get it right away he enters into the

discussion and we continue the debate. That is the way we conduct our formal meetings. We have been disappointed a number of times during the last year in securing outside speakers, because they have been in such demand, although we have had some splendid talks. Our local speakers are always popular and as we usually add a song or some music, and change our methods from time to time we have no difficulty in holding the interest of our audiences.

FOREMEN ELIGIBLE TO MEMBERSHIP

We have 470 members; that is, the foremen and sub-foremen in the different industries are eligible to membership in our Local Safety Council, and I hammer continually for 100 per cent attendance, although we have attained that only on special occasions. I believe you gentlemen will bear me out when I say that not over 10 per cent of any organization in the country is active. During the last year attendance at our Council has been about 235, or 50 per cent.

When I was a boy I saw a sign in a clothing store and I couldn't figure out what it meant. It said: "We are going to hound you until you buy." That has appealed to me ever since I woke up to a realization of what it meant, and I made up my mind that as long as I was Chairman of the Council that I was going to hound the members until they came.

We hold a smoker during the general discussion which follows an address. On other occasions we serve a light lunch. Of course, we show the speaker the courtesy of not smoking when he is talking, but when he concludes we go ahead and smoke.

I believe in getting the active co-operation of the men and a successful method is this: I want to know everyone in our council of 470 men—whether his name is Tom, Dick or Harry—so that I can call him by his first name when we reach the general discussion and cigars. Our meetings last about two hours—I work myself, and I know the boys don't want to be up until 10 or 11 o'clock at night and then get up at 5 or 6 next morning. I try to keep that in mind all the time.

We assess each one of the plants to defray the expenses of our Local Council—last year this amounted to $50.00 each. When we asked them to pay it not one of them said a word. That was the order and they just paid it. When the Executive Committee sends word to the management of the plants, "We want this, we want that, and we don't want you to talk back" in every instance we get it. At the annual meeting we have a real banquet and we make the management pay for it. We send word, "We want every man at your plant who is eligible to attend the Safety Council banquet, and we want you." If he does not come we let him stay at home, but inasmuch as he is paying for the banquet he generally comes. We tell him the things we have done in the last year or in the last few months, and we ask him: "How do you like it?" He hasn't the nerve to say he doesn't like it, so he will get up before the whole body of men and say: "Boys, it's fine. Keep on going. I am behind you, it don't make any difference how much it costs." Then we have him. Then the next time we go after him for money he can't back out. Last year we concluded that

we couldn't get along without the ladies, so the Executive Committee put on a ladies' night. We had an attendance of 500.

MEETINGS ARE INFORMAL

Our Council has set aside formality. I want to greet you when you come in at the door, and if your name is John or Jim or Jack I want to call you by it. I want that feeling to exist in our Council as long as I am Chairman of it. It must be purely and simply for the uplift of the whole community and for the benefit of humanity in general. That is my idea of a Local Safety Council.

DISCUSSION

CHAIRMAN PRICE: I believe I am voicing the sentiment of every delegate present when I say that the address you have just heard is the most valuable contribution on this subject ever given before a meeting of the Council.

I wish Mrs. Wilson would give us her opinion of this admirable address and tell us what she thinks of our work.

MRS. JOSEPH R. WILSON (Philadelphia): The Local Councils are the big brothers to the mothers, the sisters and the children of our land. You are doing an admirable work. One of the greatest fields for activity and usefulness is in the public schools. It is our Christian duty to spread broadcast the importance of the safety propaganda, but above all should this splendid educational system be carried into the schools.

CHAIRMAN PRICE: I have always been interested in our next speaker, Mr. Saunders, because of his early training in efficiency. He is obsessed with the idea that safety is indispensable to efficiency.

MOVING PICTURE MASSMEETINGS FOR WORKMEN

E. B. SAUNDERS, SECRETARY, NEW ENGLAND LOCAL COUNCIL

Mr. Chairman and Members of the National Safety Council: My speech is not written, because I knew we would never get to this point in the discussion without pretty well exhausting the subject of "Moving Picture Massmeetings for Safety Workers." You have not really exhausted it because no one has told us why we should determine upon moving pictures as the most successful means of impressing this subject upon the mind of the worker.

My mind runs back over a number of years—they seem to be a great number just now—to the time when I was a boy, when we used to make our own toys to play with. The toy we enjoyed most was a crude box affair with pins stuck through it and a little peekhole in the front, through which we could look at the pictures as they were wound from one pin to the other—that constituted our panorama of moving pictures. I remember as a young man going to Chicago—perhaps some of you will recall, if you were there in the early days, that the panorama of the "Battle of Gettysburg" was on Michigan avenue, and just across the street from it was

"Jerusalem and the Crucifixion." You advanced to the center of the cylindrical building and you stood on the battlefield of Gettysburg. Near by were revealed broken muskets and cannon and stone walls and so on—the effect was very realistic. You thought you really stood upon the battlefield and were actually looking at those thrilling scenes, except that everything was absolutely silent. You had to draw upon your imagination. It was related that on one occasion, when a little group were looking on the wonderful scenic effect, that an old man, leaning upon the arm of his daughter, said: "You see that stone wall and that certain place. It was there that the 'Johnny Rebs' fired at me." Every one was attracted by his earnestness and in looking they saw that he was stone blind from the effect of that fight, yet it was all real to him. To him the impression was subjective, to the spectators it was objective. The same was true with the panorama of "Jerusalem and the Crucifixion." Sunday school teachers used to take their children there in order that they might have a more realistic idea of what took place at Calvary. Another panorama, "The Chicago Fire in 1871," was also very thrilling.

A STIMULUS TO THE IMAGINATION

Then we pass on to the stereopticon and the stereopticon pictures, which were perhaps as effective as any. Then came the "Passion Play at Ober-Ammergau," with its remarkable scenic effects and splendid acting. In the "Battle of Gettysburg" everything was still and quiet, and it depended upon the imagination almost entirely. In D. W. Griffith's "Birth of a Nation" everything seems to be actually taking place before you; the orchestra is continually working in effective music and the stirring scenes seem to suggest that you are an actual participator

So it is with all the moving picture films we have today, such as "The Hearts of the World," that were actually taken on the battlefields. Those of us who are not, for various reasons, privileged to be "over there" are made to feel, somehow, that we are all participators in a very real thing. If it were not for those moving pictures we should have to depend upon word pictures. Judge Lindsey gave us a splendid example of the latter method yesterday. No one who listened to his thrilling words could fail to see, through his imagination, just what Judge Lindsey saw taking place "over there."

The moving picture has stimulated the imagination of the working class as has no other agency in our time or at any time. You can talk all you desire about character analysis, the looking at the shape of a man's head and so on, but what we really depend on in judging character is expression, the play of the twenty-five little muscles on each side of the face. Watch the Neapolitan talk—he talks all over. Watch the Frenchman—they say he cannot talk over the telephone because he has to use both of his hands. It is the language of gesture and the moving pictures exemplify it as no other means has ever provided.

The moving picture makes things realistic and novel—so it is with the novelist. He evolves the plot, then he weaves in various incidents in connection with it, and so between the first and the last pages you have

actually gone through the remarkable experiences of a life. With the moving picture film the best artists appear before you—Geraldine Farrar left grand opera to go into moving pictures—we are getting the very best that can be presented to our eyes through that means. The government has made it an essential industry. I hold in my hand the United States *Official Bulletin* for Saturday, August 24, and on the second page the motion picture industry is recognized as essential by the War Industries Board.

We have developed the moving picture massmeeting idea pretty thoroughly in New England, and have had some very fine meetings, the audiences ranging anywhere from 500 to 2,000. Mr. Toomey, who is present, pulled off a real stunt in Boston before the men from the big retail stores when he exhibited the government film, "Fit to Fight"—I do not know of another man who could have done it so effectively and successfully. He put on two performances at the City Club with capacity houses. No other picture could have produced such an impression upon the audience as that film did.

REACHING A LARGE AUDIENCE

CHAIRMAN PRICE: Many have said that the moving picture furnishes by far the best and most effective medium by which we can reach the workmen; some have gone so far as to say that it is the only way in which you can effectively reach a large audience of workmen. What would you say to that?

MR. SAUNDERS: That does not seem to be very greatly exaggerated. Band concerts might be included.

MR. T. G. TOOMEY (New England Safety Council): The moving picture speaks a language that every person can understand

CHAIRMAN PRICE: Do you think it is one of the most effective ways to teach workmen the safety lesson?

MR. TOOMEY: It is the starting point.

MR. SAUNDERS: We have ceased to be a listening people. In the old days, when everyone went to church, everything was taken in by the ear. We have become a seeing people, so much so that we have overtaxed the eyes: that is one reason why so many of us wear glasses. Last year St. Louis killed 510 people, whereas in Massachusetts we killed only 453. Therefore, when you go to an employer with a safety appeal he doesn't see any very particular or good reason why he should ally himself with a safety organization, whereas we have twenty-three or twenty-four insurance companies writing workmen's compensation insurance in this state, each one vying with the other for business. Some of our most valuable members are working the National Safety Council methods to the limit for the insurance companies they represent, as they have a perfect right to do and as we want them to do.

In Massachusetts the two railroad companies that might help greatly in the safety movement are in the hands of receivers, or were until the government took them over. The street railways of Boston, that might add to the safety work, are both in receivers' hands. In Massachusetts we have five State agencies that are dealing with this department, none of

them entirely free from politics, and many industries largely controlled by political organizations—the industries that ought to contribute most generously to the safety movement are in the hands of receivers.

BULLETINS MUST BE APPROPRIATE

The larger industries in the State are very largely controlled by one board of directors; that is, one board or group centered in Boston; the chief officials are in Boston, have their offices there, and they are not easily accessible. You go to see one of these men and he will say: "We spend a whole lot of money to safeguard our people because the State government—the labor industry and boards—require it. Why should we put $100 or $150 into an organization that simply sends out a bulletin that doesn't fit our industry?" The National Safety Council bulletins, splendid as they are, do not fit, for example, the shoe industry, which is an important industry with us. I went to see some of the big cigar manufacturers and they said: "Our particular work is performed by hand. We do not use any machinery, and we almost never have an accident. We have improved the service of our plant and the men do not fear germ diseases, because tobacco is a good disinfectant. So why should we concern ourselves with safety equipment?" So with piano manufacturers, it is very doubtful if a piano manufacturer could be interested in the safety movement.

Every new organization begins somewhere in the vicinity of Boston. You know, Boston is not a place on the map at all—it is a state of mind. When we go to see some of the managers they say: "The next organization that we join is going to be an organization to prevent the formation of any more organizations." That is where we have to begin, and it seems an almost insuperable problem. It has taken quite a little time to do the efficiency work that begins with the analysis of the problem.

MR. POLLARD: Some of the organizations which started in Boston are among the most efficient service organizations in the world.

INTERESTING THE EMPLOYER IN BULLETINS

MR. SAUNDERS: As I walked along Washington avenue yesterday the names of the wholesale establishments stood out prominently. A great many were very familiar names, some I know are controlled from our vicinity. So you see we have this problem before us: To capture the men who are doing big things and solving large problems and to convert them to the safety idea.

We started with a few little bulletins. Here is one to the employer, telling him what sort of service we are going to give him. Bulletin No. 2 is a course in safety engineering. Instead of publishing it ourselves, it has been put out by the Board of Education. Any workman who takes that course is charged $2; if he completes the course and gets his diploma we give him back his money. A good many men, you know, begin the course, but they never finish it, although it contains only twelve lessons. We had a class of forty-five in Springfield this last year and they did some very good work. The State prints the little folders with no expense

to the Safety Council. It can be done, but you have got to find the right people and the right idea in order to do it. Bulletin No. 3 is an outline of the workmen's compensation act. It tells how insurance rates may be cut down through safety work. This bulletin is approved by the Massachusetts Insurance Department and the workmen's compensation companies are co-operating in pushing it. Then we have bulletin No. 4, which has to do with safety work in an industrial community: in this the Y. M. C. A. and the United States Government are co-operating. Simmons College in Boston, backed up by the Department of Health, has instituted a course of training for industrial nurses, who begin as graduate nurses. We have an organization of sixty or more nurses that meets regularly in Boston—the training is done by a splendidly qualified woman. This is maintained by the Anti-Tuberculosis Society of Boston. They co-operate with us to the limit and her salary is paid by the Anti-Tuberculosis association—so we get this safety work done without expense to us. The Commissioner of Labor, of course, is behind us, because he is a member of the National Safety Council. Mr. Moyer, who is at the head of the Department of University Extension of the State Board of Education, is here today, and he is thoroughly interested in the movement.

Last January the Governor appeared before the Legislature, and in his annual address he devoted four and one-half pages to accidents among industrial workers. He gave a very strong address, and made such a distinct impression upon the legislators that they appointed a commission to sit this summer and investigate the whole subject. The commission received us very graciously and asked us what they could do to further our work. We answered: "If you will give us a favorable notice in your report, when it comes out, we shall be satisfied." We shall be very glad to co-operate with you. I have no doubt that will be done, as they are deeply interested in the matter.

COST OF MOVING PICTURE FILMS

Just one more bulletin. The Industrial Extension Board is ready to approve a bulletin which we will publish this fall telling the workman what his rights and benefits are under the workmen's compensation act: if he is injured, how he shall proceed, to whom he shall go, and what he is required to report: not to go to a lawyer: that he can get all the advice he requires from the Secretary of the Industrial Board. Another bulletin is entitled "Alcohol vs. Safety." The Anti-Saloon League will no doubt co-operate in the issuance and distribution of this bulletin.

As to the moving picture safety campaign: We cannot use a standard film in a little portable machine, because the fire law of Massachusetts says that the film must be only so wide. When the bill was drawn creating the commission we received the promise that it would be drawn broadly enough to provide for the use of our films. It will be of great value to us if the law can be amended. The commission is going to allow us to hold a safety motion picture entertainment in the State House at Boston in order to show what kind of films we are producing before the workmen.

A DELEGATE: What is the cost of making an industrial motion picture?

CHAIRMAN PRICE: One company offered to write the scenario and make our films for 40 cents a foot.

Not less than ten, possibly fifteen million people are represented by the men in this room, coming as they do from such communities as New York, Boston, Chicago, Pittsburgh, and the smaller places. I believe every man and woman present feels as I do—*that it can be done.* In the Congress last year I felt that we didn't quite "arrive," but I am satisfied that we "arrived" today. Everyone will go out of this room convinced that *it can be done.*

POSSIBILITIES OF PHONOGRAPHIC RECORDS

We will now hear an experimental safety record made on the phonograph by Mr. C. L. Close, of the United States Steel Corporation. We have been trying for several months to develop the possibilities of the phonograph as a means for disseminating safety instruction at workmen's meetings, and for children in the home and in the school. (The record was reproduced and received with applause.)

MR. WILDONER (American Car and Foundry Company, Huntington, West Virginia): I should like to offer as a motion that the Program Committee, when arranging for the next Congress, provide one entire day for the Local Safety Council meeting, and that the afternoon session be a round table gathering for the exchange of ideas. We have heard a good deal about the big plants, but not much about those employing from 25 to 100 men. I know that the safety men in the small plants are very active and wide awake and much good will come from such a discussion.

CHAIRMAN PRICE: Our program today was for the discussion of Local Council activities and was intended to cover groups of plants in a community, workmen's meetings for large numbers of plants, foremen's meetings, and so on—we must remember that a Local Council is primarily a community activity. (The motion offered by Mr. Wildoner was seconded, and, when put to a vote, prevailed.)

The meeting adjourned at 1 o'clock.

LOCAL COUNCIL REPORTS

CHICAGO SAFETY COUNCIL

FRED M. ROSSELAND, PRESIDENT
Safety Engineer, National Safety Council
H. L. KRUM, SECRETARY
International Harvester Company (Deering Works)

CHICAGO, ILL., July 25, 1918.—Mr. Wm. H. Cameron, General Manager. *Dear Sir*: The following is a report of the activities of the Chicago Safety Council during the past year: Previous to the dinner meeting held in the Advertising Association clubrooms, Nov. 21, 1917, the following officers and Executive Committee men were elected: Fred M. Rosseland, President; L. P. Kuhn, M. D., Vice President; H. L. Krum, Secretary, and E. M. Switzer, Treasurer. (Later resigned and was succeeded by H. M. Webber, Chicago Telephone Company.)

Executive Committee: C. B. Scott, Bureau of Safety, Chairman of Program Committee; T. E. Barker, Miehle Printing Press and Manufacturing Company, Chairman of Membership Committee; W. E. Worth, Chicago Tunnel Company; W. E. Watters, National Malleable Castings Company; M. E. Arkills, Pullman Company.

Meetings of the officers and Executive Committee were held at regular intervals, frequently gathering at noon-day luncheon about ten days previous to the monthly safety dinner meetings. These meetings have been interesting, with each member taking an active part.

The year's program was arranged at a joint meeting of the Accident Prevention Committee of the Illinois Manufacturers' Association and the retiring and incoming officers of the Chicago Safety Council. A chairman for each meeting was appointed from the joint body. Eight safety dinner meetings were held during the year. Preceding these safety meetings "experience meetings" were held for the discussion of subjects of general interest. Attendance has justified a continuance of these meetings.

Oct. 25, 1917—Meeting called to order by President H. L. Gannett. Report of Nominating Committee presented and acted upon. Chair was later occupied by Vice President J. J. Heelan, who presided at general round table meeting at which topics of importance were discussed.

Nov. 21, 1917—"Education." Chairman, J. C. Smith. "College Spirit in Industry," by Chas. R. Hook, Vice-President American Rolling Mill Company, Middletown, Ohio. "Instruction of Employes as to Accident Prevention," by C. C. Richards, G. C. A., Chairman, Central Safety Committee, Chicago & Northwestern Railway Company. General discussion followed. Moving picture film, "The Rule of Reason," courtesy of New York Central Railway Company.

Dec. 19, 1917—"Fire Prevention." Chairman, H. L. Krum. "Lessons in Every Day Fire Prevention," by W. H. Merrill, President, Underwriters Laboratories, Inc., Chicago. "Nation Conservation by Fire Prevention," by Jas. F. Joseph, Secretary, Chicago Advisory Board, National Board of Fire Underwriters, Chicago. Motion Picture Film, "Story of the Flames," courtesy of State Fire Marshal.

Jan. 30, 1918—"Safeguarding," Sub-chairman, Chas. B. Scott, Manager, Bureau of Safety. "Safeguarding Emery Wheels," illustrated talk by Earl B. Morgan, Safety Engineer, The Norton Company, Worcester, Mass. "Safeguarding the Nation," by Julian B. Arnold, Lecturer, London, England. Discussion followed. Safeguarding Slides, courtesy of U. S. Steel Company.

Feb. 27, 1918—"Compensation," Chairman, H. G. Ellerd. "Compensation Experience in Ohio," by Hon. T. J. Duffy, Chairman, Industrial Commission of Ohio. "Amendments to Illinois Law," by Hon. Chas. S. Andrus, Chairman, Industrial Commission of Illinois, Chicago.

March 26, 1918—"Medical," Chairman, Dr. LeRoy P. Kuhn. "National Safety," by Col. Henry L. Raymond, M. D., Surgeon General, Central Department, U. S. Army, Chicago. "Medical Examination of Soldiers," by Major E. J. Doering, M. D., M. C. R., President, Board of Medical Examiners, U. S. Army, Chicago. "Medical Safety of Employes," by C. R. G. Forrester, M. D., Chicago. "Gas Bombs—Poisoning Effects," by Geo. L. Apfelbach, M. D., Chicago. Discussion by A. Augustus O'Neil, M. D., Ph. D., F. A. C. S., Medical Chairman, National Red Cross Ass'n. "Experience Meeting," 4:30 P. M. Demonstration of practical first aid, by Dr. Roscoe Huckin, Chicago Telephone Company. Samuel H. Reid, Bureau of Safety, Instruction in prone-pressure method of resuscitation. First-aid kits were brought to meeting by various industries and contents were discussed with end in view of obtaining their simplification and improvement.

April 30, 1918—"Employment," Chairman, Thos. H. McKenney. "The Human Side of the Employment Problem," by H. F. Perkins, Division Manager, International Harvester Companies, Chicago. "Schools for New Employes," illustrated talk by H. E. Miles, Chairman, Section on Industrial Training, Council of National Defense, Washington, D. C. "Employment of Men Over Forty-five," V. T. J. Gannon, Manager, Employment Bureau, Employers' Association, Chicago.

May 10, 1918—"Community Safety Meetings," Chairman, President Fred M. Rosseland. Special dinner meeting called to discuss subject of district meetings. C. W. Price, Field Secretary, National Safety Council, was present and told of great success of such meetings in other cities. District meetings for foremen were unanimously endorsed. Meetings for workmen were to be considered as a future possibility, dependent on interest shown in foremen's meetings. Of the subjects presented the following was chosen: "How to Interest the Workman in Safety." President Rosseland was authorized to appoint chairmen and arrange for speakers.

May 28, 1918—"Welfare," Chairman, H. M. Webber. "Relations of Employer and Employe," by William Butterworth, President, Deere & Co., Moline, Ill. "Some Suggested Principles in Human Engineering."

by Whiting Williams, Director of Personnel, Hydraulic Pressed Steel Company, Cleveland, Ohio. "Welfare Work," by S. J. Larned, Traffic Manager, Chicago Telephone Company, Chicago. Special music, Armour & Co. Orchestra.

COMMUNITY SAFETY MEETINGS FOR FOREMEN

The date and place of meetings, Chairmen and speakers assigned are indicated:

June 18, Palmer Park Field House, 111th Street and Indiana Avenue: Chairman, M. E. Arkills, Pullman; speaker, T. H. McKenney, Supervisor Labor and Safety, Illinois Steel Company, South Works.

June 19, Masonic Temple Hall, 91st Street and Exchange Avenue: Chairman, T. H. McKenney, South Chicago; speaker, W. E. Worth, Superintendent, Chicago Tunnel Company.

June 20, Civic Club, Harvey, Ill.; Chairman, G. E. Kuss, Harvey; speaker, W. E. Worth.

June 21, Deering Hall, 1734 Fullerton Avenue: Chairman, H. L. Krum, Deering; speaker, C. B. Scott, G. M., Bureau of Safety.

June 25, Central Manufacturing District Club, 1110 West 35th Street: Chairman, W. C. Kronquest, Central Manufacturing Company; speaker, W. E. Worth.

Attendance at the meetings was as follows: Pullman, 400; South Chicago, 1,000; Harvey, 65; Deering, 425, and Central Manufacturing District, 200; a total of 2,090 foremen from representative firms in the respective districts. Special music was furnished at Pullman, Deering, and South Chicago, the latter being favored by the "Coal and Coke Orchestra" of The By-Products Coke Corporation. Motion pictures were shown at each meeting, either "Fool Stunts" or "The Outlaw," made available through courtesy of the Reo Motors Company and the Liberty Mutual Insurance Company, respectively.

Growing interest is evinced in the increased attendance at the safety dinner meetings. Attendance: November, 1917, 221; December, 1917, 100; January, 1918, 200; February, 1918, 209; March, 1918, 218; April, 1918, 295, and May, 1918, 337.

The Safety Banner, introduced by our Local Council during 1917, has proven to be of inestimable value as a means of informing members of safety dinner meetings, with comment of past meeting, items of local interest and as a medium of communication between the Executive Committee and the members.

DETROIT SAFETY COUNCIL

E. S. RAYMOND, PRESIDENT
Travelers Insurance Company

C. G. ANTMANN, SECRETARY-TREASURER, NAT. WORKMEN'S COMP. SERVICE BUREAU

Detroit, Mich., Aug. 10, 1918—Mr. Wm. H. Cameron, General Manager. *Dear Sir*: The fall campaign of 1917 was started with regular monthly meetings of foremen and superintendents, in the form of dinner meetings

held at the Detroit Board of Commerce, and were well attended. On each occasion a prominent speaker was engaged to bring out the features of greatest importance bearing on the topic to which that particular meeting has been set aside. These major talks were then supplemented by impromptu talks by some of the leading superintendents. This procedure had the effect of making the foremen feel that their own experiences and thoughts might be beneficial to their fellow members and, with the feeling of restraint removed, valuable round table discussions followed.

Early in 1918 a series of district meetings was conducted. A division of the Detroit territory into ten units, each a center of industry and each supervised by a resident Chairman, proved to be a practical and very successful method of conducting these meetings. Under the supervision of the officers of the Council and the direction of the resident Chairmen, a proper amount of publicity gave assurance that those for whom the meetings were intended had been acquainted with the purposes and functions of the meetings. The enthusiasm displayed by the audiences on each occasion was a tribute to Dr. A. R. Hackett of the Solvay Process Company, who lectured at these meetings.

ROCHESTER LOCAL COUNCIL

HARRY S. MOODY, PRESIDENT
F. W. FISHER, SECRETARY

Rochester, N. Y., Sept. 4, 1918—Mr. W. H. Cameron, General Manager. *Dear Sir*: Since the organization last year of the Foremen's Group, the activities of the Council naturally class themselves under two headings: Those carried on by the sub-organization, the Foremen's Group, and those items accomplished by the main Council.

On the evening of Nov. 17 the Safety Council held in the assembly-room of the Chamber, a public safety mass meeting at which Mr. Marcus A. Dow, General Safety Agent of the New York Central Railroad, delivered a powerful address on "The Progress and Possibilities of Accident Prevention Work." Mr. Dow supplemented his address by showing the New York Central's stupendous and much-talked-of safety moving-picture film, "The Rule of Reason," which made a deep impression on the audience. The meeting was attended by 1,200 men, women and children.

The Chamber of Commerce long ago recognized the urgent need of intensive and far-reaching propaganda in the interest of public safety. Within the past four years the Local Council of the Chamber had carried on two campaigns which aroused the public conscience to the necessity of curtailing the ever-increasing number of accidents. These campaigns made a profound impression, especially on the children of the public and parochial schools, who organized a safety committee in each school and wrote 1,400 essays on the subject of "Safety." A course in safety was also prepared for their use. Not only the schools did effective work, but many industrial plants as well organized safety committees. Many public mass meetings were held.

The Rochester Chamber of Commerce, having been a leader in safety work, already had an organization to cope with the problems of a continuous safety campaign. Therefore, they readily accepted the proposal by the National Safety Council to co-operate with it in conducting on a large scale a public safety campaign of an experimental and intensive nature, to continue for a period of six months. In order to avoid conflicts with plans of the campaign, all other projects were postponed until March 12. On that date, at a noon meeting held in the Chamber assembly-room, the campaign was formally launched. C. M. Talbert, Director of the Department of Streets and Sewers of St. Louis, Mo., spoke on "The Development of the Public Safety Movement;" W. H. Cameron, General Secretary of the National Safety Council, "The National Safety Council;" Roland B. Woodward, Secretary of the Chamber, "The Need of Public Safety Work;" Julien H. Harvey, Director of the Campaign, "Plans for the Rochester Campaign." (The complete story of the Rochester campaign is printed by the Council in pamphlet form.)

Nine thousand posters were especially prepared for this campaign and placed in store windows, clubs, hotels, railroad stations, and all public places. These were changed weekly. Placards, changed periodically, were placed in all public garages. Large stickers, carrying appropriate slogans, were used to a great extent on windshields of automobiles. Pledge cards, for hanging in windows of homes, containing the slogan "We Are Helping to Make Rochester Safe," were distributed to parents through the school children. Large placards with various slogans were carried at different times on the front dashboards of cars by the street railway company. The whole city was deluged with posters continually, throughout the entire campaign.

Ninety thousand circulars dealing with "Rules of the Road," "Child Safety," "Street Safety," "Traffic Courtesy," and "Home Safety" were distributed through the schools, meetings, and our Safety Exhibit at the Automobile Show at Exposition Park.

More than one hundred meetings were held, attended by 85,000 men, women, and children. These meetings were held at luncheon clubs of men, women's clubs, engineering societies, chauffeur's unions, the Young Men's Christian Association, a local moving picture theatre; in fact, at every association of sufficient size to assure a fair-sized audience. As far as possible, the programs were arranged to suit the audiences and consisted of speeches, moving picture educational films, lantern slides, and the distribution of literature.

Special mention should be made of the splendid co-operation and courtesy rendered by the Rochester newspapers—four dailies and two weeklies—which in all gave space amounting to over 50,000 agate lines in more than 500 stories, articles, and editorials. Some of these were accompanied by cuts of dangerous places, photographs of accidents and other hazards. Many Rochester industrial concerns maintain house publications, issued periodically. Through this medium fifteen to twenty-five thousand employes were reached repeatedly.

During June, July and August five of the principal moving picture

theatres showed "Minute Films" taken in Rochester, each illustrating a specific hazard. More than 100 lantern slides, made from photographs taken here, were used in the campaign. These slides embraced such subjects as vehicles, pedestrians, home, child, and street accidents. One of the most effective measures was when Chief of Police, Joseph M. Quigley, on his own initiative, in co-operation with the campaign, opened a Traffic Court, in charge of a traffic officer of the police department. Police officers were instructed to report all traffic violations. Hundreds of drivers were summoned before this court and warned that further violation would result in their appearance in police court. Excellent results were obtained from this measure. After six weeks, because of fewer violations of traffic rules, this court was discontinued. Offenders were then sent to the police court, where they were properly penalized.

The success of the campaign is shown by the statistics collected daily by the police department. The first three months of the campaign show an increase in all accidents of 16½ per cent. as compared with the same period of 1917. The last three months show a decrease of 8.3 per cent. Accidents in which persons were injured show, for the first three months, an increase of eight-tenths of 1 per cent. The last three months show a decrease of 25.6 per cent. This is without taking into account the increase of 15 per cent in automobile traffic, which should contribute in the same proportion to the increase in accidents. These results are due to the National Safety Council in financing the undertaking; to the indefatigable and efficient efforts of Julien H. Harvey, Director of the Campaign; to the splendid co-operation of the subcommittees, and especially of the Public Safety Committee of the Local Council, which is composed of the following: Harry S. Moody, Chairman; John A. Robertson, Herbert W. Bramley, J. Warrant Castleman, Rev. J. Francis O'Hern, Dr. John F. Forbes, Joseph M. Quigley, R. A. Hamilton, Frederick W. Fisher, R. E. McDougall and Alfred Killip.

Although the campaign has been successful beyond our expectations, and we are highly pleased with the results of the effort, we feel that six months is too short a time to attain the maximum achievement in public safety work. I am gratified, therefore, to be able to report that members of the local Council have subscribed $6,000 to continue the campaign six months longer. At the expiration of that period it is our hope to place public safety work on a permanent footing in Rochester.

The Foremen's Group held a series of educational meetings, dealing principally with shop hazards and the ways and means of their elimination or improvement. The program of these meetings was as follows:

Nov. 21, 1917—Speaker, Dr. H. H. Baker: subject, "The Care and Treatment of Small Injuries".

Dec. 19, 1917—Speaker, F. A. Walz, Safety Engineer, Yawman & Erbe Company; subject, "Safety Devices in Woodworking Plants".

Jan. 16, 1918—Speaker, Samuel S. Landon, Construction Engineer, Todd Protectograph Company; subject, "Safety in Building Construction". (Illustrated with lantern slides.)

Feb. 20—Speaker, Dr. Walter A. Calihan; Lecture and Demonstration on "First Aid".

March 20—Speaker, H. W. Mowery, Safety Engineer, American Abrasive Metals Company, New York; subject, "Make Walking Places Safe".

April 24—Speaker, Julien H. Harvey; subject, "Rochester Public Safety Campaign"; general discussion of all kinds of shop hazards.

May 28—General discussion on "Accident Prevention in Relation to Labor Turnover".

These meetings, usually well attended, brought out many points of interest which were discussed openly and enthusiastically by those present. At the last meeting, the following officers were elected for the coming year: Chairman, Samuel S. Landon, Construction Engineer, Todd Protectograph Company; Vice Chairman, Frank A. Walz, Safety Engineer, Yawman & Erbe Company, and Secretary, Frank H. Reynolds, Department Superintendent, Eastman Kodak Company.

KANSAS CITY LOCAL SAFETY COUNCIL

E. G. TRIMBLE, PRESIDENT
Employers' Indemnity Corporation
B. S. BROWN, SECRETARY-TREASURER
Kansas City News Service

KANSAS CITY, MO., July 1, 1918—The Kansas City Local Safety Council, during the year 1917-18, held ten regular monthly meetings, September to June, inclusive. Nine of these were noon meetings at luncheons; one was an evening meeting at the Chamber of Commerce. The Foremen's Round Table had meetings once a month, in the evening. Attendance ranged from fifteen to fifty at the Safety Council meetings and from forty to one hundred at the Foremen's Round Table. The subject most emphasized has been the organization of plant safety committees.

Two important special events were arranged during the year. Jan. 19, 1918, a joint dinner of the Local Safety Council and the Foremen's Round Table, was held at the Coates House, at which 419 were present: owners and managers of plants sat down with superintendents, foremen, and members of shop safety committees. June 26, 1918, a "Win the War Rally" was held in Convention Hall in co-operation with the Kansas City Chamber of Commerce and the International Rotary Clubs. Two of the speakers were distinguished Rotarians: Mr. E. R. Kelsey of Toledo, Ohio, and Mr. Andrew Home-Morton of London, England. Isaiah Hale, Safety Commissioner of the Santa Fe Railroad, gave the safety point to the evening's program. There was community singing led by Charles Howard Mills; E. G. Trimble, president of the Local Safety Council, presided. This meeting was arranged to give employes of industrial plants an opportunity to hear war speakers and to catch the inspiration of loyal service. About four thousand employes, wives, and children were present.

At the annual meeting of the Local Council in January, the following officers were elected: President, E. G. Trimble, Employers' Indemnity Corporation; First Vice President, George J. Smith, Kansas City Railways

Company; Second Vice President, T. A. Ebaugh, Loose-Wiles Biscuit Company; Third Vice President, J. M. Ford, Factory Inspector, Board of Public Welfare (Later enlisted for war and was succeeded by C. W. Hammond, Superintendent of Plant, Kansas City Gas Co.); Secretary and Treasurer, B. S. Brown, Kansas City News Service; Assistant Secretary, R. M. Staker, Employers' Indemnity Corporation. A more intensive organization of the Local Safety Council for definite work was also undertaken as a consequence of which the following divisions and committees were designated and appointed: Service Division: D. D. Neville, Kansas City Bolt and Nut Company, Chairman; J. M. Ford, Factory Inspector, Board of Public Welfare, Vice Chairman; Service Committee: Hugh Mathews, machinist, Chairman; Membership committee: Lee Hall, Columbian Steel Tank Company, Chairman; Committee on co-operation: O. W. Thomas, A-B-C Fireproof Warehouse Company, Chairman.

Publicity Division: Howard Campbell, R. B. Jones & Sons, Chairman; T. A. Ebaugh, Loose-Wiles Biscuit Company, Vice Chairman.

Program Division: Parker B. Francis, Oxygen Gas Company, Chairman; Geo. J. Smith, Kansas City Railways Company, Vice Chairman; Fire Prevention Committee: Lyle A. Stephenson, Insurance, Chairman.

The Service Division got well started on a splendid program of activities: a questionnaire was sent to several hundred industrial plants to disclose those plants that have safety organizations and those which have not. Many responses came offering fullest information to visitors to the plants on the safety organizations that existed and many other responses asking that the Council's Service Committee visit plants to help organize such safety committees.

The Foremen's Round Table has shown more initiative in the past year. The foremen selected K. A. McVey of the Peet Bros. Manufacturing Company to succeed E. T. White as Chairman, and Mr. A. D. Russell of the Cudahy Packing Company as Secretary. Program committees have been appointed from among the foremen to serve for a few meetings, this work being passed around to give a larger number of men an opportunity to help, and to change the point of view on the program. The foremen have taken up the careful study of the Safe Practices leaflets. At the meetings, when these leaflets are discussed, the foremen and superintendents bring copies from their plants. The discussions are based upon the items in the leaflets, though usually running strongly to discussions of specific experiences related.

NORTHERN CALIFORNIA SAFETY COUNCIL

J. H. Colton, President
Pacific Portland Cement Company

W. A. Chowen, Secretary
California Inspection Rating Bureau

San Francisco, July 8, 1918—The Northern California Safety Council was organized August 10, 1917, at which meeting By-laws for the Council

were adopted, and the following officers elected for one year: President, Mr. J. H. Colton, General Superintendent, Pacific Portland Cement Company; First Vice President, Harold Mestre, Consulting Engineer; Second Vice President, Donald Macdonald, Vice President, Pacific Lumber Company, Scotia, Cal.; Secretary, Dr. Geo. E. Tucker, Director Medical and Welfare Department, Aetna Life Insurance Company; Treasurer, Mr. F. Huebsch, General Superintendent, Metropolitan Laundry Company.

Dr. Tucker later left California and was succeeded by W. A. Chowen, Manager of the California Inspection Rating Bureau.

On March 15, 1918, the members of the National Safety Council of Solano County, assisted by Mr. Colton, Mr. Mestre and Mr. Brownell, President, Vice President and Chairman of the Membership Committee, respectively, of the Northern California Safety Council, held a meeting and organized a Council which has been in successful operation.

May 13, a meeting was called for the purpose of organizing a local Safety Council in Oakland. That Council has now adopted the Constitution and has practically completed its organization.

Arrangements had been completed for an initial meeting before the Home Industry League on the matter of "Safety and Safety Councils," to be conducted by Vice President Mestre and Secretary Chowen. The date of this preliminary meeting has been postponed until September, but it was proposed to proceed to the organization of the San Francisco Council possibly preceding this proposed meeting.

At this writing there are 61 members of the National Council also members of the Northern California Safety Council.

HAMPDEN COUNTY BRANCH OF NEW ENGLAND SAFETY COUNCIL

The fall campaign started with a rally at the Y. M. C. A. assembly hall, Oct. 29, 1917. Mr. A. Van Schaack, President of the National Safety Council, and Mr. E. B. Saunders, Secretary of the New England Safety Council, were present. Two reels of safety pictures were shown entitled "The House That Jack Built," and "Workman's Lessons." The rally was attended by about 200 representatives of firms in Hampden County.

Round-table meetings were held monthly from January to May. The subjects discussed were "How to Organize for Safety," "Dangerous Practices," "How to Build Safeguards," and "Safeguarding Machines." These meetings had an average attendance of from sixty to seventy-five members and were very successful.

During the year the following committees were appointed and are actively engaged at the present time: Membership Committee, Activities Committee, Committtee on Safety Education in Public Schools, and Committee on Standardization of Accident Statistics.

Through the efforts of the officers of the Council a course in safety engineering was started under the auspices of the Massachusetts Department of University Extension. A class of forty-four members was formed with Mr. G. W. Cook, of the Travelers Insurance Company, as instructor.

So far as known this was the first class of its kind to be established, and has so far been very successful.

Through the efforts of the Membership Committee, the membership has been increased from the original fourteen, to forty-two members. The annual meeting of the Council was held April 15, 1918, at which time the standard by-laws of the National Safety Council were adopted. The following officers were elected for the next year: President, H. T. Martin, Head of Accident and Health Department, Fisk Rubber Company; Vice President, George E. Williamson, Chief Engineer, Strathmore Paper Company; Secretary-Treasurer, G. W. Cook, Senior Inspector, Travelers Insurance Company; Chairman, Membership Committee, L. V. Woedtke, Director of Safety, Fred T. Ley Company, Inc.; Chairman, Activities Committee, H. A. Sawyer, Manager of Aetna Life Insurance Company.

NEW HAVEN LOCAL COUNCIL

LYMAN H. MILLER, PRESIDENT
Assistant Superintendent, American Steel and Wire Company

C. A. CHIPMAN, SECRETARY-TREASURER
Geometric Tool Company

NEW HAVEN, CONN., July 10, 1918.—Mr. Wm. H. Cameron. *Dear Sir:* Following is a brief report of the activities of the New Haven Local Council for the year past, ending June 30, 1918: The officers are: Lyman H. Miller, President; W. C. Greist, Vice President; C. A. Chipman, Secretary and Treasurer; L. O. Pethick, Chairman of the Publicity Committee, and Dr. R. W. Langley, Chairman of the Membership Committee.

Regular meetings have been held, with a few exceptions, throughout the year, and the attendance and interest have been very satisfactory.

Dr. M. B. Westervelt, Surgeon at Winchester Repeating Arms Company, spoke at one of these meetings regarding his impressions gathered at the congress for surgeons, held at Chicago, October, 1917, as they might be applied to first aid treatment in industrial plants.

During the week of Dec. 3 to 8, safety massmeetings were held in Bridgeport, Waterbury and New Haven, at which safety films were shown to practically 100,000 people.

While arranging for these massmeetings it was found that, owing to the distance separating Bridgeport and Waterbury from this city, the New Haven Local was inadequate under its present organization to cover these outlying cities. At the luncheon held at the Hotel Taft, Dec. 6, at which Mr. Wm. H. Cameron, General Manager of the National Safety Council, and representatives from the various industries of the three cities were present, it was arranged that a State Council be promoted with additional Local Councils in all of the important industrial centers of the state. This plan has been partially carried out, as early in this year both Waterbury and Bridgeport Local Councils were organized. It is hoped that with the coming year this organization will be fully completed.

After several weeks of preparation the second annual State Safety Convention was held in New Haven, April 12, 1918. Representatives of industries from all parts of the state were present. The program consisted of a very enthusiastic all-day session in the Chamber of Commerce auditorium, followed by a banquet in the evening.

NORTHEASTERN OHIO SAFETY COUNCIL

W. B. PETTIBONE, PRESIDENT
Willard Storage Battery Company
C. E. YOUNG, SECRETARY-TREASURER
American Steel and Wire Company

CLEVELAND, OHIO, Aug. 17, 1918.—Mr. Wm. H. Cameron, *Dear Sir*: Following a two weeks' campaign and a talk by Mr. C. W. Price, Field Secretary, the following officers and executive committee were elected at the organization meeting held on Friday evening, Nov. 16, 1917, at 6:30 P. M., at the Cleveland Chamber of Commerce:

President, W. B. Pettibone; Secretary and Treasurer, C. E. Young; First Vice President, H. L. Gaddis; Second Vice President, Oscar McNab; Third Vice President, S. W. Tener; Fourth Vice President, Alexander C. Brown; Fifth Vice President, G. E. Wood; Sixth Vice President, C. E. Pettibone; Chairman Membership Committee, Oscar Mac Nab; Chairman Program Committee, H. L. Gaddis; Chairman Publicity Committee, Hugh Fullerton; Chairman Public Safety Committee, W. P. Presley; Chairman Glenville District, K. E. Roof; Chairman Newburgh District, G. E. Wood; Chairman St. Clair District, H. J. Weeks; Chairman West Side District, F. A. Anslum; Chairman Lakewood District, H. M. Winans; Chairman Elyria District, J. H. Knuff.

During the past eight months our President, W. B. Pettibone, resigned, as did two of our Vice Presidents, Messrs. Stephen W. Tener and Alexander C. Brown; also the Chairman of the Public Safety Committee, Mr. W. P. Presley, having been called to duties connected with the national crisis.

On account of the abnormal business conditions, considerable difficulty was experienced in perfecting our organzation. At a meeting held early in June, Mr. C. E. Pettibone, of the Pickands Mather Company, was elected President, to fill the unexpired term of Mr. W. B. Pettibone, resigned, Mr. Martin R. Marshall was elected First Vice President, to fill the unexpired term of Mr. H. L. Gaddis; Mr. Whiting Williams was elected Chairman of the Publicity Committee, to fill the unexpired term of Mr. Hugh Fullerton.

The Executive Committee has held regular monthly meetings with one or two exceptions, at which various programs and policies have been discussed.

The week of Jan. 14 our first series of superintendents' and district meetings were held. Card invitations accompanied by a circular letter

were sent out to over 800 Cleveland manufacturers. Dr. A. F. Voak, very thoroughly and clearly discussed First Aid. Our thanks are due to Dr. Voak, the Willard Storage band and orchestra, also the Boy Scouts, for contributing to the success of this week's program.

INDIANAPOLIS SAFETY COUNCIL

F. D. ENSMINGER, PRESIDENT
The Prest-O-Lite Company
R. N. PHELPS, SECRETARY-TREASURER
Eli Lilly & Company

INDIANAPOLIS, IND., July 30, 1918.—Mr. Wm. H. Cameron, *Dear Sir*: The following is the report of the Indianapolis Local Council for the year ending June 30, 1918:

On the night of Dec. 17 we held a very enthusiastic organization meeting, at which over forty leading manufacturers in Indianapolis were represented. Mr. Price, Field Secretary of the National Safety Council, gave a very interesting talk on the activities and objects of a Local Council, after which officers were elected and tentative plans outlined for our first public meeting. The Executive Committee held a number of meetings and perfected its plans for carrying on our Safety work, but due to the unusualy severe weather and our inability to secure the services of a capable speaker, we did not set a definite date for our meeting until April 3.

THE TEXAS SAFETY COUNCIL

V. R. CURRIE, PRESIDENT
The Texas Company, Houston, Texas
C. V. JARRELL, SECRETARY-TREASURER
Southwestern Telephone and Telegraph Company, Houston, Texas

HOUSTON, TEXAS, July 20, 1918.—Mr. W. H. Cameron, *Dear Sir*: At the beginning of the year the Texas Safety Council consisted of sixty-eight members; during the year twenty-three firms were added to our membership list, making a total to date of ninety-one. We had anticipated a greater increase in the membership of this Council, but our activities were restricted to a great extent by the number of changes among the officers of this organization, made necessary by enlistments in Government service of officers appointed at the time of organization.

During the year the Organization Committee supervised the formation of a local Council at El Paso, officially known as El Paso Local Council No. 35. The Local Councils at Houston, Dallas, and El Paso held their monthly meetings regularly.

The semi-annual Congress of the Texas Safety Council was held at Dallas, Texas, Oct. 15 and 16, 1917, during the Texas State Fair. This

meeting consisted of two sessions on the first day, at which a number of valuable papers were read and addresses were delivered by some of the prominent business men of Texas. The second day was taken up in round-table discussions, which were participated in by all members, from which a great deal of benefit was gained by those present. A number of safety films were shown, and the membership went in a body to the Council's safety exhibit at the Texas state fair grounds. This exhibit was a great success, being viewed by several thousand people, and altogether this Congress was very successful in every way.

In the majority of cases our members are practicing safety and conserving their manpower in every way possible. We are having splendid co-operation from the different municipalities in this connection, and we look forward to very beneficial work from this source. We have also interested various automobile clubs and endeavored to prevent a large number of automobile accidents that have occurred from time to time. We are glad to report that we have secured some of the largest ship yards in our State who are co-operating with us.

We are using every effort to impress upon the industrial concerns of this State and the public in general the necessity of extensive safety work towards the conservation of life and limb during this great world crisis, and we feel that they will all appreciate the necessity of backing up the boys at the front.

EAST CHICAGO SAFETY COUNCIL

J. C. Smith, President
Inland Steel Company
E. O'M. Reddin, Secretary-Treasurer
Hubbard Steel Foundry Company

East Chicago, July 1, 1918.—Mr. Wm. H. Cameron, *Dear Sir*: Here is the first report of East Chicago Safety Council Local No. 40. The Local Council is the outcome of activities begun by the safety departments of some of our local industries in this district. The organization meeting, a luncheon, was held March 12, 1918. We had fifty-four delegates present, representing nineteen of the thirty-five industries in this district. J. C. Smith, of the Inland Steel Company, acted as Chairman. A paper on "Safety Organization" was read by Mr. Smith. A full quota of officers were elected as follows: President, J. C. Smith, Inland Steel Company; Vice President, R. S. Bonsib, U. S. Metals Refining Company; Secretary-Treasurer, E. O'M Reddin, Hubbard Steel Foundry Company. Executive Committee: W. F. Grebe, American Steel Foundries, Chairman Membership Committee; L. O. Roberts, Standard Forgings Company, Chairman of Program Committee; G. H. Eddy, Green Engineering Company, Chairman Publicity Committee; A. O. Mitchell, Northern Indiana Gas and Electric Company, Chairman Public Safety Committee; H. E. Biedinger, Metal and Thermit Corporation, Chairman Finance Committee; Edwin W. Canine, Superintendent of Schools, Chairman Educational Committee.

The Executive Committee has held regular meetings at which the nature of the programs and the general policy of the Council were agreed upon. We have held dinner meetings and evening meetings and have discussed open-air meetings for the summer months. The following meetings have been held:

April 18, 1918, "Foremen and Accident Prevention," lecture by Charles B. Scott, discussion by W. E. Worth; motion picture.

May 29, 1918, Employes' meeting, "Safe and Unsafe Practices," illustrated by B. C. Christie, Chief Safety Engineer, International Harvester Corporation; motion picture.

Our Vice President, R. S. Bonsib, spoke at a meeting of the East Chicago Chamber of Commerce, and I am in receipt of a letter from them assuring us of their support and co-operation. We have also had a letter from the Manufacturers' Association to the same effect.

WATERBURY SAFETY COUNCIL

R. S. Sperry, President
Scovill Manufacturing Company
B. J. Hine, Secretary-Treasurer
Scovill Manufacturing Company

Waterbury, Conn., July 10, 1918.—Mr. Wm. H. Cameron. *Dear Sir*: Our first organization meeting was held March 22, 1918, and temporary officers elected. Mr. C. W. Price, Field Secretary of the National Safety Council, visited the Local, April 18, 1918, and assisted in arranging our program for the ensuing year. At our first meeting Mr. C. W. Price addressed about 250 of our superintendents and foremen. The Membership Committee assisted Mr. Price, and called on a number of the leading manufacturers, and eleven concerns joined the National Safety Council, and three concerns a short distance outside of Waterbury, already members of the National Council, joined the Local, making our total membership to date twenty.

Mr. B. W. Johnson, Chairman of Membership Committee, has eight concerns which are about to forward their applications for membership The prospect for a steady increase in membership is very promising.

Mr. R. S. Sperry, President, called a luncheon conference May 16. A representative of the Chamber of Commerce and city engineer was present. Permanent officers were elected and by-laws adopted.

Our first public outdoor meeting was held June 25 on the Green. It opened with a band concert in the early evening. National Safety Council posters were distributed, and after the speaking, moving pictures were shown. The attendance was about four thousand. The success of this meeting is very encouraging.

The reorganization of our Chamber of Commerce, in which an increased membership has been obtained, will help stimulate the activities of our Local. We can assure you that the Waterbury Local is, and will continue to be a success.

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, Telephone Elliott 1899

SEATTLE, WASH., July 10, 1918.—Mr. Wm. H. Cameron, *Dear Sir:* At a meeting held in the Henry Building, Seattle, Wash., Jan. 30, 1918, at which Mr. Clarence Parker, Safety Engineer, of Everett Safety Council, No. 32; Mr. S. H. Ash, Deputy State Mine Inspector; Prescott Oakes, Roslyn Fuel Company; T. N. Henry, Puget Sound Traction, Light and Power Company; H. C. Hilke, Seattle Cedar Lumber Manufacturing Company; Alvin Schwager, Schwager-Nettleton Mills, and Ed Campbell, Motor Shingle Company, were present, it was voted to organize a Seattle branch of the National Safety Council. The following temporary officers were elected: President, Prescott Oakes, Rosyln Fuel Company; Vice President, S. H. Ash, Deputy State Mine Inspector; Secretary-Treasurer, Alvin Schwager, Schwager-Nettleton Mills. The Secretary-Treasurer was instructed to apply to the National Safety Council for a charter. The meeting was then adjourned.

The next meeting was held in the rooms of the Metropolitan Club, Stuart Building, Seattle, Wash., March 20 1918. This meeting was called to order by Mr. Clarence Parker, who stated that the object of the meeting was to perfect a permanent organization. Mr. Alvin Schwager, temporary Secretary-Treasurer, reported that the application for charter had been favorably acted upon, the number assigned being 43, and said charter received.

The following permanent officers were elected for the ensuing year: President, B. W. Sawyer, Brace and Hergert Mill Company; Vice President, H. C. Hilke, Seattle Cedar Lumber Manufacturing Company; Secretary, T. H. Boyd, Industrial Insurance Commissioner of Washington; Treasurer, Alvin Schwager, Schwager-Nettleton Mills; Executive Committee: J. F. Ives, Stimson Mill Company; Ed T. Verd, Bryant Lumber Company and A. D. Cross, O. B. Williams Company.

The Executive Committee selected Mr. T. H. Boyd, Chief Claim Adjuster and Investigator of the State Industrial Insurance Commission, of Washington, as safety engineer, effective April 1, and established offices at 948 Henry Building, Seattle, from which point all of the work of accident prevention and reduction is directed among the lumber, shingle, woodworking and metal trades manufacturers of Seattle and vicinity that have taken out memberships in the National and Seattle councils.

By-laws were read and adopted and Membership, Publicity, Program and Educational, and Public Safety Committees were named. A resolution was offered to amend Section I of Article IV of the By-laws, by adding thereto the following: "The Executive Committee shall have authority, at their option, to elect and appoint a safety engineer at a salary to be named by them; said salary to be paid jointly as agreed by those members

of the Local Council who avail themselves of the safety engineer's services."

The next meeting of the Council was held April 27, the following being present:

President, B. W. Sawyer; Vice President, H. C. Hilke: Treasurer, Alvin Schwager; Secretary and Safety Engineer, T. H. Boyd: Executive Committee, Ed T. Verd.

It was duly moved and seconded that the following clause be added to Article IX of our by-laws: "It is declared and agreed that amendments are subject to approval by the National Safety Council." General matters of organization and policy were discussed and agreed upon and an active campaign for additional members was ordered.

The members of the Seattle Safety Council have engaged Mr. Boyd at a salary to perform safety work in their plants, investigate industrial accidents to their injured employes, see to it that they are promptly and properly compensated by the State in strict accordance with the schedules as set forth in the Workmen's Compensation Act of the State of Washington, and that prompt and proper medical and hospital services are rendered their injured workmen under the State Medical Aid Act.

Since April 1, we have gathered together a membership of thirty-six firms, aggregating 3,500 employes, appointed safety committees in each plant and addressed the men on the subject of accident prevention and reduction, safety and first aid. We confidently expect to increase our membership to the extent that it will represent 5,000 employes and to call a meeting of all safety committees for an evening of entertainment and interchange of views, which will, we have reason to believe, result in a vigorous campaign of education along the lines of accident prevention and greatly stimulate the activities of safety work.

We feel gratified over the successful work of our Council and the results obtained during the short period of its existence.

WORCESTER COUNTY BRANCH OF NEW ENGLAND SAFETY COUNCIL

J. F. Tinsley, President
General Manager, Crompton and Knowles Loom Works

L. M. Rice, Secretary-Treasurer
District Safety Inspector, American Steel and Wire Company

The Worcester County Branch of the New England Safety Council was organized Feb. 5, 1918, being a development from a committee of the New England Safety Council.

The first meeting, March 7, was a noonday luncheon, at which an outline of the work proposed for the Council was laid out. April and May noonday meetings were given over to papers on safety organization, and the use and care of emery wheels, followed by round table discussion. The regular

June meeting was held with the American Society of Mechanical Engineers, who gave one afternoon to matters pertaining to safety. The membership has a little more than doubled during the past three months. Three moving picture rallies were held during May and June under the auspices of two of the manufacturing members. Co-operative plans are under way by which the public schools and police department will enter into a safety campaign for the schools and general public.

SYRACUSE SAFETY COUNCIL

E. H. FIESINGER, PRESIDENT
Solvay Process Company

G. G. KINGSLEY, SECRETARY
Halcomb Steel Company

SYRACUSE, N. Y., July 10, 1918.—Mr. Wm. H. Cameron, *Dear Sir*: On March 4, 1918, Mr. Price, Field Secretary of the National Safety Council, came to Syracuse for the purpose of conducting a two weeks' membership campaign and to help us organize our Local Council. The Syracuse Chamber of Commerce showed us every courtesy, and we are greatly indebted to them for helping us to get started. We are now affiliated with that body.

When Mr. Price came here we had twelve members of the National Safety Council in Syracuse and vicinity. We now have thirty. On the Friday night before Mr. Price completed his work with us we held our first foremen's meeting. There were 350 foremen present, representing something like twenty-five industries. Mr. Price addressed the meeting on "The Value of Safety in Shop Practice." There was a good discussion afterward in which a number of foremen participated.

The second foremen's meeting was addressed by Dr. Chaffee, of the Solvay Companies, the subject being "The Foreman: a Necessity in First Aid." This meeting was attended by about 150 foremen, and was followed by a very lively discussion. Regular monthly Executive Committee meetings have been held at the City Club and Chamber of Commerce.

SPOKANE SAFETY COUNCIL

J. P. McGOLDRICK, PRESIDENT
McGoldrick Lumber Company

W. C. UFFORD, SECRETARY-TREASURER
Spokane Lumber Company

SPOKANE, WASH., Sept. 24, 1918.—Mr. Wm. H. Cameron, General Manager, *Dear Sir*: This Council was organized March 1, 1918, by a few of the larger lumber plants in this vicinity. A safety engineer was

employed and a spirit of co-operation between employer and employes was brought about, which has resulted in a splendid experience in accident prevention.

Safety committees were appointed in each department of the several plants. Monthly meetings of these safety committees have been held and an organization perfected called the Council of Safety Committees, with officers, by-laws, and programs for each meeting, and an occasional meeting for 6 o'clock dinner—the employers paying this expense.

A prize was offered for the best experience for the month of June. Such a large percentage of the membership reported "no disabling accidents requiring compensation from the State accident fund," that we were unable to make an award. A banquet was given to the safety committees, at which both employers and employes were present and took part in the program. For July and August the prize was doubled, and we are in very much the same predicament, as many of the plants make similar reports.

Mr. Price met the employers at luncheon and made a fine impression, awakening an enthusiasm among employers in lines not now covered by our Council.

This Council, in conjunction with the Councils at Everett, Seattle, and Tacoma, requested the State Industrial Insurance Commission to put in operation a merit rating system whereby an employer might get a benefit in reduced insurance cost by reason of his efforts along safety lines. This resulted in a hearing before the commission on Sept. 4, with the result that a committee consisting of employers and employes will prepare an amendment to the law to be presented at the coming session of the Legislature. This will be a progressive step in making accident prevention popular.

NEW ENGLAND SAFETY COUNCIL

J. W. Higgins, President
President Worcester Pressed Steel Company

E. B. Saunders, Secretary-Treasurer
Assistant to President, Simonds Manufacturing Company, Assistant Field Secretary, National Safety Council

July 15, 1918.—Mr. Wm. H. Cameron, *Dear Sir*: The second annual meeting of the New England Safety Council was held at the Boston City Club on March 21, 1918. This celebrated the first year of active work. President H. G. Smith acted as toastmaster and made the leading address. There were addresses by Lieutenant Governor Calvin Coolidge, Commissioner of Labor, Edwin Mulready; Commissioner of Health, Dr. Eugene R. Kelley; Director, James A. Moyer of the Department of University Extension, and Secretary Edward F. McSweeney of the War Efficiency Board. At the head table were Mr. William W. Kennard, Chairman Industrial Ac-

cident Board, and Mr. Hosea Harden, Inspector Insurance Department. Reports were received from our branch councils in Worcester County, Hampden County, and Boston. The new President, Mr. John W. Higgins, responded with stirring words.

The report of the Secretary-Treasurer reviewed the year's activities and outlined the present program of service. Our program of action has the approval of the Governor of Massachusetts and five state departments with whom we are closely associating ourselves as a volunteer advisory body. In addition we are co-operating with nursing organizations, the Y. M. C. A., Knights of Columbus, Anti-Saloon League, and other social service organizations. The Federal government, through the Public Health Service and Surgeon General's department, is finding our machinery convenient in its campaign against venereal disease.

Since the annual meeting the Council has enlarged its membership and strengthened its position. New branch Councils are nearly ready for formation. The Secretary visited Moncton, N. B., and addressed the Canadian Manufacturers' Association. As a result they unanimously voted to form a Council for Nova Scotia and New Brunswick.

The legislature has appointed a special recess committee on workmen's compensation. This committee is friendly to our suggestion, giving us special hearings and even planning for us to show some of our films in the state house to a large gathering of legislators, employers and employes.

ERIE SAFETY COUNCIL

O. G. Hitchcock, President
Hays Manufacturing Company
M. C. Goodspeed, Secretary-Treasurer
General Electric Company

Erie, Pa., July 20, 1918—Meetings were held monthly from September to June, inclusive. Five of the meetings took the form of inspection trips through factories, the actual inspection being followed by business meetings and a discussion of the points of interest seen during the evening. The other meetings were held in the rooms of the Erie Board of Commerce, all taking the form of round-table discussions after the business of the evening had been transacted. Various speakers, principally local men, acted as leaders in the round-table discussions, which followed a talk by them on the subject of the evening. The inspection trips, of course, showed the best attendance, running as high as 200. The regular meetings were smaller in attendance, averaging from twenty to twenty-five. One special public meeting was held during the winter at which time Mr. Herbert of the Cambria Steel Company gave a stirring and inspiring talk to a full, representative audience. Interest in the Local Council is gaining and we believe that next year will see a considerable growth in membership, attendance and enthusiasm.

CENTRAL MISSISSIPPI VALLEY DIVISION

H. SPOEHRER, PRESIDENT
Union Electric Light and Power Company
CARL L. SMITH, SECRETARY

ST. LOUIS, MO., July 8, 1918—Mr. Wm. H. Cameron, *Dear Sir*: Our regular foremen's round table meetings were held the past year with a good attendance. Originally we had three of these round tables in St. Louis, which we later organized into one general meeting, owing to the trouble of providing interesting programs and procuring proper speakers. We found this move to be a good one.

The following is a partial list of the speakers: Dec. 4, 1917, Clarence H. Howard, President Commonwealth Steel Company, "Fellowship Universal Safety." Feb. 19, 1918, Isaiah Hale, Commissioner of Safety Santa Fe Railroads. March 13, Dr. A. S. Barnes, Jr., "Safety and First Aid:" W. E. Bilheimer, "The Individual's Responsibility to Universal Safety." April 10, H. L. Goodwin, Merry Optical Company, "Injuries to Eyes:" George W. Thompson, Norton & Co., "Grinding Wheel Safety." April 15, Wm. A. Redfield, Secretary of Commerce, spoke on the "Human Factor in Production" to 2,000 people at a mass meeting in the Odean theatre. June 10, C. W. Price, Field Secretary, National Safety Council, "How to Reach the Workmen and Interest Them in Safety."

We have canvassed for new members by sending a series of three letters to ninety-nine prospective members. Our Executive Meetings were held monthly, at which time the safety situation was thoroughly discussed. We organized a strong Program Committee by writing to the managers of all concerns, getting them to appoint one man on this committee. By having only one representative from each industry it was felt that the committee would be more capable of adopting a program that would be interesting to all of the members. A list was compiled of all the present members with the names and numbers of employes and the names of their representative to whom all matters pertaining to Safety may be taken.

The results obtained the past year were satisfactory and plans have been made whereby a permanent Secretary will be secured for this district and the scope of the work increased.

EVERETT SAFETY COUNCIL

EARL M. ROGERS, PRESIDENT
Weyerhaeuser Lumber Company
E. A. POYNEER, SECRETARY-TREASURER
Ferry-Baker Lumber Company

EVERETT, WASH., July 5, 1918—Mr. Wm. H. Cameron, *Dear Sir*: Another year has passed and finds Everett Safety Council No. 32 in a prosperous and healthy condition.

Meetings were held on June 4 and November 22, 1917. The first meeting of this year was held on January 14. Clarence Parker, Safety Engineer, reported the activities of the Council for the last six months of 1917. The report showed a considerable reduction of accidents over the previous six months.

The employers of Everett pay Mr. Parker a salary to do safety work in the plants here and look after the industrial accidents of their injured workmen, to the end that they are properly and promptly compensated by the State, and to see that proper medical services are rendered, and in every way alleviate the sufferings of the injured workmen so far as it is possible for him to do. Among Mr. Parker's other duties, locally, he has found time to organize councils in Spokane and Seattle, and to secure a Safety Engineer for the Council at Tacoma, which was organized by him two or three years ago. He will proceed this coming week to the Grays Harbor country for the purpose of organizing a council down there, and then will go to Bellingham for the same purpose. He has been able to secure for the different councils in the state of Washington live, energetic men, who, I feel sure, could give the older councils many new workable ideas in accident prevention.

On March 25 the annual meeting of the Everett Safety Council was held at the Mitchell Hotel, at which a dinner was served, and nearly every member of the Council was present. The old officers were unanimously reelected. Subsequent meetings were held on April 24 and June 25.

HAMPDEN COUNTY SAFETY COUNCIL

FRANK HOWARD, PRESIDENT
Treasurer and Manager Lamb Knitting Company, Chicopee, Mass.
L. D. WOEDTKE, SECRETARY-TREASURER
Director of Safety, Fred T. Ley & Company, Inc., Springfield, Mass.

SPRINGFIELD, MASS., Aug. 7, 1918—Mr. W. H. Cameron, *Dear Sir*: The Hampden County Safety Council held its first meeting in May, 1917. The membership of the Council at that time was composed of fourteen firms located in the County, who were already members of the National Safety Council.

A second meeting was held June 8, 1917, at the Chamber of Commerce at which time the following officers were elected for the ensuing year: President, Frank Howard, Lamb Knitting Company, Chicopee, Mass.; Secretary and Treasurer, L. D. Woedtke, Fred T. Ley & Co., Inc., Springfield, Mass.; Executive Committee: Geo. E. Williamson, Strathmore Paper Company, Mittineague, Mass.; E. C. Spear, Cheney-Bigelow Wire Works, Springfield, Mass.; W. L. Nixon, Chemical Paper Company, Holyoke, Mass.; H. W. Morrill, Ludlow Manufacturing Associates, Ludlow, Mass.; H. T. Martin, Fisk Rubber Company, Chicopee Falls, Mass.

Plans for the following season and for an active campaign for increased membership were made.

COMMERCIAL EXHIBIT

An interesting feature of the Seventh Safety Congress was the various exhibits of manufacturers and dealers in safety devices, safe clothing, and general supplies used in accident prevention work. These exhibits attracted much attention; throughout the day (except while sessions were being held) the exhibit rooms were filled with interested safety engineers and plant executives. The number of exhibitors at the St. Louis Congress was smaller than at previous Congresses at which commercial exhibits were displayed in a separate building. However, the interest displayed in the carefully prepared exhibits more than made up for the comparatively small number of them.

Atkins, E. C., & Co., Indianapolis, saw guards.

Glauber Brass Manufacturing Company, St. Louis, sanitary drinking fountains.

Hardy, F. A., & Co., Chicago, Ill., safety goggles.

Howe Safety Appliance Company, Granite City, Ill., machine guards.

Gasco Protector Company, Waukegan, Ill., breathing apparatus.

Lee, H. D., Mercantile Company, Chicago, safe working garments for men and women.

Life Saving Devices Company, Chicago, lungmotor, life saving breathing device.

Mine Safety Appliances Company, Pittsburgh, Pa., miscellaneous safety devices.

Safety Engineering, New York City, *Safety Engineering* magazine.

Safety First Supply Company, Pittsburgh, miscellaneous safety devices.

Safety Service and Supplies Company Chicago, miscellaneous safety devices.

Sargent Company, Chicago, safety water gauge.

Smith, R. P., & Sons Company, Chicago, safety shoes.

Square D. Company, Detroit, Mich., safety electric switches.

Stonehouse Steel Sign Company, Detroit, safety signs.

Strong, Kennard & Nutt Company, Cleveland, miscellaneous safety devices.

Surety Guard Company, Chicago, machine guards.

Sweet, Orr & Co., Inc., Chicago, safe working garments for men and women.

Trumbull Electric Company, Plainville, Conn., safety electric switches.

Utility Garment Company, Chicago, safe working garments for men and women.

Hamilton-Brown Shoe Company, St. Louis, safety shoes.

Protective Signal Manufacturing Company, Denver, safety signals.

Do Your Bit to Make Streets Safe

Remember:

1. "The driver approaching intersections at your right has the right of way."—**State Law.** Observe the law.

2. At Street Intersections—no matter what your position—have your car under control; the other fellow may not.

3. When Changing Course—slow down, signal and cut the corner "on the square."

4. Blind Corners—You can't see through brick walls—neither can the other fellow—bring your car under control.

FIRST—THINK SAFETY
THEN ACT

Banquet (Informal)

St. Louis, Mo.

Sept. 18, 1918

MR. W. E. BILHEIMER, Toastmaster
Sales Manager, Franklin Life Insurance Company, St. Louis

THE following letter from President Wilson to Mr. Clarence H. Howard was read:

"THE WHITE HOUSE
Washington, 10 September, 1918.

"*My Dear Mr. Howard:*

"It is with sincere regret that I find it impossible for me to attend the Seventh Annual Congress of the National Safety Council. I know the importance and the influential character of the membership of that Council and should have deemed it a privilege to be present, but I must, in view of my public duties, content myself with asking you to extend my cordial personal greetings to the Council and my hope that its consultations will be attended with the most gratifying and harmonious results.

"*Sincerely yours,*
WOODROW WILSON.

"Mr. Clarence H. Howard, 1628 Pierce Building, St. Louis, Mo."

A Liberty Bond for $100, given by an unnamed St. Louis lady, was auctioned off, Mr. Isaiah Hale acting as auctioneer, the proceeds to be used in maintaining the Y. M. C. A. hut at Twentieth and Eugenia streets, near the Union Station, St. Louis. The bond was sold to Mr. Clarence H. Howard, who immediately donated it back to the Y. M. C. A.

TOASTMASTER BILHEIMER: Mr. David Van Schaack, the President of your National Safety Council, needs no introduction. (Three cheers and a tiger were given Mr. Van Schaack.)

ANNOUNCEMENT OF OFFICERS OF COUNCIL

PRESIDENT VAN SCHAACK: It is customary at this time to announce the results of the election of Executive Committeemen and Officers for the coming year. The eighteen elected members of your Executive Committee for next year are:

Mr. L. A. DeBlois, E. I. du Pont de Nemours & Company, Wilmington, Delaware.

Mr. Marcus A. Dow, General Safety Agent, New York Central Lines, New York City.

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

Dr. L. A. Shoudy, Chief Surgeon, Bethlehem Steel Company, South Bethlehem, Pennsylvania.

Mr. A. W. Whitney, General Manager, National Workmen's Compensation Service Bureau, New York City.

Mr. C. P. Tolman, Chairman, Mfg. Comm., National Lead Company, New York City.

Mr. Chas. R. Hook, Vice-President, Operating Division, American Rolling Mill Co., Middletown, Ohio.

Dr. F. D. Patterson, Chief, Division of Industrial Hygiene & Engineering Dept. of Labor and Industry, Harrisburg, Pa.

Mr. W. E. Worth, General Superintendent, Chicago Tunnel Co., Chicago, Ill.

Mr. J. B. Douglas, Manager, Claim Dept., The United Gas Improvement Co., Philadelphia, Pa.

Mr. H. W. Forster, General Manager, Independence Bureau, Philadelphia, Pa.

Mr. H. H. Robertson, President, Aspromet Co., Pittsburgh, Pa.

Mr. Francis P. Sinn, General Superintendent, The New Jersey Zinc Co., Palmerton, Pa.

Mr. J. M. Woltz, Safety Director, Youngstown Sheet & Tube Co., Youngstown, Ohio.

Mr. David Van Schaack, Director of Bureau of Inspection, and Accident Prevention, Aetna Life Insurance Co., Hartford, Conn.

Mr. R. M. Little, Director, American Museum of Safety, New York City.

Mr. H. W. Clapp, General Superintendent, Columbus Railway, Power & Light Co., Columbus, Ohio.

Mr. T. G. Toomey, Care Wm. Filene's Sons, Boston, Mass.

RE-ELECTION OF EXECUTIVE OFFICERS.

The next announcement is, in a sense, an embarrassing one, for your Executive Committee has done me the honor to re-elect me your President. (Applause.) I will not attempt to put into words my deep appreciation of the signal honor you have conferred upon me in re-electing me as your President. It is a privilege to serve in the ranks of an organization existing solely for the good of humanity. To be asked to act as its head is an honor of which a man may deservedly be proud—it is an honor which also calls forth the best efforts of which he is capable. I do not take this expression of your continuing confidence in the man to whom you have entrusted the active conduct of your affairs as in any sense personal to myself. Whatever success the National Safety Council has attained so far has not been due to any one man and it never will be due to any one man. It is the result of cordial co-operation, that real spirit of fellowship on the part of our entire membership, which spirit, once it gets behind a thing, cannot fail to push it forward. I thank you very much.

The other officers elected by your Executive Committee are:
First Vice President—Mr. C. P. Tolman.
Second Vice President—Mr. H. H. Robertson.
Third Vice President—Dr. Frederick L. Hoffman.
Fourth Vice President—Mr. Francis P. Sinn.
Fifth Vice President—Mr. A. W. Whitney.
General Manager, Secretary and Treasurer—Mr. W. H. Cameron.
Field Secretary—Mr. C. W. Price.
Manager Accident Prevention Division—Mr. Sidney J. Williams.
Assistant Secretary—Mr. J. J. Lamont.

A RECORD IN PUBLIC SAFETY

If I may infringe for one moment upon the province of the toastmaster, I want to ask you to join with me in giving three rousing cheers and a tiger to the city which has given us such a magnificent welcome—a welcome expressed not only in the hospitality which is shown us everywhere, but also in that record which shows that St. Louis can put through whatever it undertakes, that record which permits no accidents to happen in this city while the National Safety Council is in session. (Applause.)

TOASTMASTER BILHEIMER: The next speaker is a man who has a vision. Most people in the world live down with the valley folk, they never see anything but the towering crags of commonplace circumstances; but this speaker has climbed the road up yonder and viewed the sunrise of a thousand possibilities in an effort to save human lives. Not only is he a man with a vision, he is a friendly man. The world today needs a little more friendliness, and the lines come to me:

"When a fellow hasn't got a cent and is feeling kind of blue,
And the clouds hang dark and heavy and won't let the sun shine through;
It's a wondrous thing, Oh, my brethren, for a fellow just to lay
His hand upon your shoulder in a friendly sort of way.

"It makes a man feel curious, it makes the tear drops start,
He sort of has a flutter in the region of the heart;
You can't look up and meet his eyes, you don't know what to say
When his hand is on your shoulder in a friendly sort of way."

I take pleasure in introducing to you a man who has always had his hand on the shoulder of his fellowmen in a friendly way, Mr. R. M. Little.

FORETHOUGHT VS. AFTERTHOUGHT IN SAFETY

Mr. Toastmaster, Ladies and Gentlemen: It is impossible for me to arise after this introduction and speak upon the subject which I had in mind to speak about tonight, namely, "The Principle of Forethought in Relation to Afterthought in Safety." Suffice it to say that I will touch the high spots only and not trespass upon your time. I have sat in the sectional meetings of our Congress and at the general sessions, and have

observed how earnestly your minds are all gripping the practical problems of the safety movement in the relation to industry generally, and therefore I should not attempt tonight to speak in any definite way about the methods and principles of the great movement which we have so much at heart. Let me say this, however, if I do have a vision at all, and sometimes I think I am looking through a glass darkly, and I suppose we all are—yet I do seem to see, above the tumult and the crashing and the awful period of life through which we are passing, that there is a better day coming, and a better condition of human life generally, and to this better condition this National Safety movement is to make a very substantial contribution. The world is very rapidly undergoing a complete change. Not one of us here tonight could have imagined two years and a half or three years ago that we would hold the thought tonight which we hold most dearly, that we would launch ourselves upon programs to which we give ourselves without reserve. We are moving so rapidly that we cannot measure how greatly are being changed our thoughts, our habits, our organizations, our movements, our ideals. Yes, we all have visions today as perhaps we have never had them before, and therefore, when this great world struggle is over, we shall have changed the organization of life in very many particulars. It will be the same old life, ah, yes! but deepened, sweetened and purified, and into it will have come a larger valuation of the human element, in the home, in the school, in the church, in the shop, in the field, in the mine, in the mill, on the ship, in the forest, and everywhere. After this war, a man will be esteemed of more value than a sheep.

THE IDEALS AND PRINCIPLES OF THE WORLD WAR

It is utterly incongruous to think that we would have entered into this great world struggle because of our idealism and give two, three or four million of men to be trained and disciplined for war, many of them to go overseas, there to join with our great allies, to win the victory, and to mobilize our national resources behind our Army and Navy and place upon ourselves all this responsibility to make the world safe for democracy, and then to return home, and not unite together here at home as American citizens to work out for the humble toilers, for all people in our country, the meaning of the Declaration of Independence, and Mr. Lincoln's Gettysburg address and second inaugural and President Wilson's magnificent announcements of the issues, the ideals and principles of the world war. (Applause.) We might as well stand on the shores of the sea and try to hold back the incoming tide as to try to hold back the inrushing ideas for the reorganization of society. They are coming in waves. They are coming in their vitalizing power. They are going down deep into the roots of the organization of society, to make all things new and help us to live a better life. And unto this is to be contributed by the safety movement sound principles, true methods and right adjustments, because the safety movement has meant from the first to conserve human life as well as to conserve business processes.

I sat in one of the sectional meetings the other day and listened to some of the very clear-headed representatives in the meeting discuss the

winning of the "big boss" for safety, and whether you could do it because it would pay him, or whether you could do it because it is humanitarian. The conclusion was that the big boss is very human. Both motives appeal to him. The safety movement does pay, it rests upon good economics, and it also rests upon the great principles of justice. We are working together in this great movement with three of the greatest motive powers that send human life forward in constructive action: it pays, it is just, it is humanitarian, and therefore the safety movement will do something to help in the reconstruction period which we are into now, and which is to go on for a long time after the war. (Applause.)

If I were to try to say anything as to the principle of forethought vs. afterthought, it would be merely this: That much of the success, security and happiness of human life, depend upon forethought and planning ahead. Some one has been bold enough to say that if all people could look six months ahead, the world would be transformed. That is probably true, but all people cannot look six months ahead; we are not endowed with omniscience, but we do learn something of the principles of life and know something of the laws of nature to enable us to forecast with a considerable degree of certainty the future, and the Safety movement is helping to do that sort of thing.

MEN WITH FORESIGHT NEEDED

Gentlemen, take these thoughts, if they are worth anything in reference to the principle of forethought vs. afterthought in safety. A few people seem to have a sixth sense and to see ahead quickly. Most people have to follow. They also learn something about foresight and aftersight by experience, and then they gain it by attention to their surroundings. Those who first see ahead must teach the others, who in turn learn a great deal by experience and go forward, and have judgment and understanding concerning the contingencies of living in the realm of accidents, safe practice, safe habits, and safe conduct. All of us who are engaged in the safety movement and trying to inculcate safe practices in working men should not forget this, that if a man is naturally a little reckless and not disposed to regard consequences, if we are to help him to be a man of good judgment and cautious movement, then his whole life needs to be surrounded with the atmosphere of safety. This brings me to the thought that society has always made progress by following its leaders, and the men who have foresight must see for those that have not.

Who are the men with foresight? For the most part they are the managers and they should surround other people with safe conditions, which will encourage them to think safety, and practice safety. It is utterly incongruous to think that you can go any place where a large number of men are engaged, and teach them the habit of safety and looking forward and watching for accidents and the contingencies of life when they are surrounded by disorder and lack of plan and forethought everywhere. On the other hand, where everything is orderly and systematic it encourages the man to look forward, as the management has, and practice safety. What I am getting at is this: The management determines where a plant shall be, not the workmen. The management determines

what sort of a plant shall be built, and not the employes. It is the management that determines what sort of machinery and tools and constructive operations shall enter into the work shop, and not the working men. It is the management that determines how the plant will be lighted by day and by night. It is the management that determines what sort of air the men will breathe, and the kind of water they will drink. It is the management that determines how the plant will be approached, the entrance to, and the exits from it. All these basic principles are under the control of the management, and if the management wishes to inculcate in the workmen the principles and habits of safe practices, it is up to the management to discharge its own responsibility first, in order that the employes may get the atmosphere and practices out of which he will absorb the principles and the idea of safe practices. (Applause.)

THE SPIRIT OF AMERICA

It is my judgment that the basic responsibility for forethought is with the managers, and if they are not forethoughtful you will not make much progress with the working men. There is something of the spirit of dare in the average American, the spirit of taking chances, something which distinguishes our boys "over there" as they go over the top, and causes the English and French generals to say "Magnificent! Wonderful! But you can't hold them back!" It is a defect of our national virtues, a remnant left with us of the old pioneer days, our individualistic spirit, when we thought it was good to take chances and to be brave. If that is the spirit that generally prevails, how are you going to discipline and reduce it to order and law and safe practices? We can never do it with unsafe and unsanitary general conditions of work and of transportation. (Applause.)

Take this illustration: There was established, not long since, along the Kanawha river, a plant with 1,600 acres, adjacent thereto 900 acres for the men's homes, and when they first laid out that plant there was put in, right from the start, a good safety organization with a competent safety engineer, who is here tonight. It has been running since January, and with an average of about 10,000 men they have had the remarkable showing of only six deaths and 2 per cent of accidents, in relationship to a thousand employes. The most remarkable thing in the prevention of accidents that I have known in a new enterprise has been accomplished at Nitro, W. Va., through forethought. (Applause.) They had a phenomenal record because of their forethought. Let's not forget that in the education for Safety there must be not only the education of the working man and the foreman and the shop superintendent, but the education must go into, and perhaps more often start with, the management—the general manager, yes, and the board of directors—they must think it and plan for it.

PRE-EMINENTLY A PRACTICAL NATION

One reason why I feel that the safety movement will make a large contribution to our better industrial relations in the near future is because of the general atmosphere that is being created in our country at the

present time. Before we entered the war the Kaiser said we were a Nation of money grabbers and dollar chasers and wouldn't fight for ideals. He is finding out. There is nothing the American people will arise to with as great enthusiasm and as unanimously as ideals. (Applause.) We are pre-eminently a practical Nation. The average American business man has to be shown, whether he "is from Missouri" or not. He wants to see and know whether a thing will work out or not. But with all his hard-headed practicality, he is also an idealist. He holds to his ideals and will part with his money rather than sacrifice his principles. That being generally true, all of us interested in the safety movement have a chance now as we never had in the past to make safety count, from the boards of directors down and out to the yards, the surroundings of every working man in our country.

NEED FOR CONSERVATION OF MAN POWER

Anyone who can think at all must recognize that there is a great urgency that we make it count, because of the tremendous need for the conservation of our man-power and the man-power of the world. We do not know the cost of this war and even if we could put it in statistics, we would not know their meaning. But slightly can we imagine what it will mean for our generation and the generations yet to come. At the very least, the man-power of the world will be reduced by 20,000,000 men, and that right in the productive years of life. The most reliable statistics published last fall indicated a total by death up to that time of 12,000,000. We partly obscure our losses, especially as to when and where the men fall in action. It is a necessity, from a military point of view, that they should be obscured. We do not know, therefore, what the losses are; but, conservatively, they will be 20,000,000 men of the very time of life when most productive, most necessary for the work of the world. This number includes the probable total of deaths and disabilities from all causes. Not only are we to lose in man-power this great number of men from out the world's industries and life, but there is to be accumulated a bonded indebtedness that is almost to spell bankruptcy for many of the nations involved. At the present time, brave, chivalrous France has spent one-half her national wealth—forty billion dollars. Germany is at least as much in debt. Belgium has been ravished, likewise Serbia and Rumania. Great Britain's debt has mounted up to forty billion dollars, and if we go on for a year and a half our own bonded indebtedness will be at least ten times what the nation's bonded indebtedess was at the close of the Civil War—fifty to sixty billion dollars; and, instead of raising one billion dollars a year to pay the expenses of the national government, we shall have to raise three or four times that amount for every year the rest of us shall live.

The wealth, where is it? We say, in the soil. Yes, and in the forests, in the mines, all throughout the national resources. But what brings it forth? What produces it? What makes it fluid? Labor, and without labor you can't produce wealth from nature. And here is the loss of man-power; here is the great task of conservation. The whole world, in

some respects, will have to be reconstructed; certainly, northern France and Belgium, and I hope that even Germany will have to reconstruct very much of her territory. (Applause.) Serbia, Rumania—all these countries, the very best and richest on the continent of Europe—must be reconstructed, and the world must be knitted together as never before, and we in America with our vitality, with our resources, with our strength, are to do much of this work. We are to help establish a credit system that will enable business to continue; we are to help adjust all the international relations of the world and to do this we must have manpower. When this war is over, there will be nothing in all the world so valuable as an able-bodied, productive working man. (Applause.)

MAKE OUR WORK PLACES ATTRACTIVE AND WHOLESOME

Therefore, gentlemen, let us be brave of heart, clear of mind, persistent and winsome in spirit in every one of our particular places as we are promulgating the principles and ideals and practices of Safety, and do everything that we can to make our mines and our mills, our factories and our transportation systems, and everything else attractive and wholesome, in order that men will work in such relationship that they will be contented and happy within themselves, productive for their employers and society, and everybody will be full of happiness and joy, because they feel the throb and thrill of a great constructive life in a united world purpose to help advance the cause of humanity and make life sing with its higher and deeper meaning, for which so many of our own sons and our brothers must die. We who are safety men have our chance. (Applause.)

RESPONSE BY TOASTMASTER

TOASTMASTER BILHEIMER: You are to be congratulated upon having heard in this most eloquent speaker, who had words so fraught with meaning, as to the need of human life; of listening to the Director of the Museum of Safety of New York, affiliating with you, a component organization. You have spelled here tonight, by having him on your program, that word that is being spelled all over America in letters that glow, that word that we know as *co-operation*. A hundred years ago Germany started to build a wonderful machine. She was very attentive to each cog, each ball, each wheel. In 1914 she launched it against civilization. We waited three years, so that we might go in a united people, and then we did go in, and today, after sixteen months of effort, we are matching, cog for cog, wheel for wheel, spoke for spoke, the machine that took Germany one hundred years to build. More than that we are more than matching them in individual manhood. There isn't an American boy on the Western front tonight but who is more than a match for any five Germans. (Applause.) Those words of Kipling come to me as I think of the war:

"Oh, East is East and West is West, and never the twain shall meet,
Till earth and sky stand presently at God's great judgment seat;
But there is neither East nor West, border, nor breed, nor birth,
When two strong men stand face to face, tho' they come from the ends of the earth!"

I met a strong man tonight, I grasped him by the hand, I felt his personality as it surcharged my very being. I met a man who has devoted the better part of his life to helping us build a machine that is whipping Germany, and when I looked into his eyes I knew he was a man, and then these other words came to me:

"There are two kinds of people on earth today.
(Just two kinds of people, no more, I say)
Not the saint or sinner, for 'tis well understood
The good are half bad and the bad are half good.
Not the rich or the poor, for, to count a man's wealth,
You must first know the state of his conscience and health.
Not the happy or sad, for the swift-flying years,
Bring to each man his laughter and to each man his tears.
No; the two kinds of people on earth I mean
Are the people who lift and the people who lean.
And where'er you go, you'll find the world's masses
Are always divided into just these two classes.
And, oddly enough, you'll find, too, I wean,
There's only one lifter to twenty who lean!
In which class are you? Are you easing the load
Of overtaxed lifters who toil down the road,
Or, are you a leaner, who make others bear
Your part of the labor, and worry and care?"

As I looked into the face of my new-found friend I knew I had discovered one of the world's lifters. Then another thought struck my fancy, that he was an old friend of yours, had been before the National Safety Congress before as an after-dinner speaker. More than that, he comes tonight as your friend and on behalf of the National Safety Council I greet you, Mr. Schermerhorn, in the words of Oliver Wendell Holmes:

"There's no friend like an old friend, who has shared our morning days;
No greeting like his welcome, no tribute like his praise.
Fame is the simplest sunflower, with gaudy crown of gold;
But friendship is the breathing rose, with sweets in every fold."

On behalf of the National Safety Council, I present to you the rose of friendship, fragrant in the memories of the past, glowing in the doings of the day, and what you, in conjunction with this organization, will accomplish in the future. Ladies and gentlemen, the editor of the *Detroit Times*, Detroit's foremost citizen, a strong man, one of the world's lifters, a man who is an old-time friend of your organization—Mr. James Schermerhorn. (Applause.)

MR. JAMES SCHERMERHORN

Mr. Toastmaster, Ladies and Gentlemen of the National Safety Council: After that rhapsodic outburst, I am reminded of a man who was presented in the same too laudatory way to the audience and he rose and

said: "My friends, I am tremendously interested in the gentleman who has been presented to you, but I haven't the honor of his acquaintance." I was relieved, however, as he developed his splendid tribute, to find that when he contemplated me in that friendly and analytical way he did not discover that I belong to the "lean." Sometimes, when confronting friendly assemblages, I refer to my rotundity, and I have to use the fat man's French and say "This is my one bum point." (Laughter.) I forgive all that he has said in the excess of his kindliness and when I remember his vocational enthusiasm I think of that other man who, during the famous insurance investigation, went up into what he called the tallest "steal" building in New York, the "Equitable" building. He said he went up fifteen stories and then he found an insurance man, and that was another story. I can understand his method. I know that he brings to you, indirectly, this evening, the merriment and the enthusiasm, those fine, engaging practices and systems he has worked out in his own successful career, because when he appeals to you to take up the great concord of song, those welling choruses, he has in mind the ten-year endowment policy as he cries: "Pick it up, pick it up!" (Laughter.)

I realize that he is in fine fettle, since he has heard the favorable report of the coroner concerning a disappearing death rate. He could bring you, if time permitted, other suggestions and warning words for a Congress like this—particularly one rather mournful and calamitous instance, where a poor widow was approached by a friend. "I hear you lost your husband." "Yes." And the sympathetic lady said "Was he insured?" The widow said: "No, he was a total loss." (Laughter.)

I also find that the Holland Dutch are strong here. Brother Van Schaack has the same trouble that the Schermerhorns do. Every little while some one asks me if I use the soft German pronunciation and I tell them "not lately." But it is with the Van Schaacks as it is with the Schermerhorns. There is really no material difference, geographically speaking, between Holland and Germany, because Holland is a low-lying country, dammed on every side. (Applause.) So, as to Van Schaack and Schermerhorn, if they haven't been getting in Dutch, you have been getting the Dutch in. I am reminded of the fellow who said: "Always, Hans, when I am passing the house, I see you sitting at the window; always at the window. Why are you always at the window?' Hans said: "Somebody must look out for the family." (Laughter.) So your President and your speaker are engaged in the interest of looking out for the National Safety Council. I have been inspired by what this evening has brought of harmony and enthusiasm and constructive suggestion.

THE PRICE OF SELF-GOVERNMENT

Every day the casualty lists are bringing us the terrible price, the great price of the survival of self-government. We do not shrink from it, but we know how much of desolation and woe these tidings from the battle-front bring, and so, as the boys "over there" cheer and hearten one another with quips and jest and jollity, those of us who tarry at home have a right to derive from such festive occasions as this as much of

relaxation and comradeship as we may. It is a time not only for merriment and amusement, but a time for memory. My thoughts have been going back some thirty-three years to a particular summer's day at West Point, the United States Military Academy, when the gray-coated cadets were being reviewed by "Little Phil" Sheridan, who, you will recall, came from Winchester upon one occasion at so fast a clip that the milestones looked like a cemetery. I don't want to be boastful about my own commonwealth, but they do say that the horse that "Little Phil" rode upon that occasion came from Michigan, so he was a distant precursor of the modern Detroit flivver, used by "Poppy" Joffre in his great joy ride from Paris to the Marne. This was the fulfillment of Scripture, because it is written in Nahum, in the second chapter, that

> "The chariots shall rage in the streets, they shall jostle one against another in the broad ways; they shall seem like torches, they shall run like the lightnings."

There is another Scripture foretelling the coming of Detroit's leading industry, in Isaiah, where it is prophesied that

> "In that day the Lord will take away the bravery of their tinkling ornaments, their round tires like the moon, their hoods and chains and mufflers, and instead of sweet incense, there shall be stink." (Applause.)

"Little Phil" Sheridan was very popular with the West Point cadets, not only because he was a dashing cavalryman, but because there was a great deal of fun in his rotund, sawed-off corporosity. Sometimes I think of him in connection with the two shopgirls at one of Victor Herbert's operas. One of them, between the acts, wishing to show her knowledge of music, said: "Don't you think Mr. Herbert has a large repertoire?" The other one said: "I wouldn't say that, but I think he is getting quite stout." (Laughter.) "Little Phil" was quite stout, greater in circumference than in altitude. One day one of the cadets asked him what was the most ludicrous incident of his career in the Civil War, and he said it was when he saw a tall, raw-boned Irishman trying to subdue an army mule. In the course of her gyrations the mule got one foot in a stirrup and Pat said: "That settles it! If you're going to get on I'm going to get off." (Laughter.) A third of a century has gone, with the swiftness of a weaver's shuttle, yet I can descry that scene as vividly as if I had seen it this afternoon in one of your vitagraph parlors. I can hear the gush of music from the West Point band, can even see the statuesque drum major, almost as impressive as St. Anthony's nose, doing sentinel duty among the hills of the Hudson.

As "Little Phil" was reviewing the West Point cadets on this occasion, he saw in command of the battalion a well set-up young officer, every inch a soldier, who carried himself like a Field Marshal. He was from Missouri and he had shown them, for he was Captain of Cadet Company A. And I recall, even at this distant day, the squad drills of the battalion, when we were going through those formations and that system of training

and setting-up ordeal that our young men are now enduring so patriotically and bravely, all except Pat, who was kept digging trenches, even on Sunday, and they heard him repeating softly, "In six days God made heaven and earth and on the seventh we have to dig it all up again." (Laughter.)

A GLIMPSE OF GENERAL PERSHING

But there came a day at West Point when the murk was in the sky and the clouds swept up the Hudson, while the artillery of the heavens vied with the seacoast battery as it boomed the General's salute of thirteen guns in memory of the outstanding leader of the Civil War, General Ulysses S. Grant, who, you remember, left his humble business of selling cordwood in this great city one day and went where stern duty called and where a crisis in the national affairs beckoned him. He had passed away in the quietude of Mount McGregor, and was being borne down the river to the place of sepulture at Riverside. As the battalion was ferried across the river to salute Grant's funeral train this same Captain of Cadet Company A was in command as that black-draped train passed slowly by, and we presented arms and the band played "Sweet Spirit, Hear My Prayer." It was prophetic, although we did not know it then, but that cadet Captain who was in command as we said farewell to the greatest figure of the Civil War was destined thirty-two years later to lead the United States Expeditionary Forces into the trenches of Flanders and to kneel at the grave of Lafayette and say, in his simple soldiery way, "Lafayette, we have come"—brave "Black Jack" Pershing of Missouri. (Applause.)

Soon after graduation Cadet Pershing showed that the honors bestowed upon him at West Point were worthily conferred. He subdued the Indians of the Southwest, and later, when a particularly resourceful and dependable commander was needed to subjugate the vicious Moros in the Philippines, Pershing was assigned to that duty, and for his success in pacificating the Islands, President Roosevelt advanced him over several hundred men of senior rank in the United States army and made him a Brigadier General. Then he showed how his soul was steeled for the discipline and deprivations of life when he was recalled from the Mexican border in the summer of 1915 by that distressing tragedy in his home, in the Presidio, by the Golden Gate, where one night his wife and three children were burned to death. He tarried only long enough to "make them a grave where the sunbeams rest when they promise a glorious morrow," left his only remaining little one with his wife's parents in Wyoming and went back again to the border, later heading the punitive expedition sent in pursuit of Villa into Mexico.

"LET US HAVE PEACE"

General Grant lifted a prayer in the hour of dissolution at Mount McGregor, when he said "Let us have peace." And this inscription you will find upon the tomb where he sleeps the sleep that knows no waking, the noble mausoleum at Riverside that is a shrine to all of his prideful coun-

trymen. "Let us have peace," said Grant, after he had done so much to reconcile the Nation that was in the throes of hatred and fratricidal strife. General Sherman lifted his voice as an indictment against war when he said that although he had drawn the sword on many occasions he had never known an issue that could not be settled without an effusion of blood. "Let us have peace" was the plea of both these great Generals. It was in the twilight hour of a great century, when civilization and education and religion and all the things that make for progress and tranquility seemed to assure us that the sword was indeed in the scabbard where Grant had put it: and we thought the sword would never be unsheathed again. If the blade were raised again we thought it would be in some such unsanguinary way as the curio collector explained to his friends, when showing them through his house full of treasures and pointing to a sword over the fire-place, said: "I well remember when I first raised that sword. It was at an auction store; a man bid a dollar and a half and I raised it to two dollars.' (Laughter.)

Then we thought that the pen would keep the sword sheathed—that through its appeal to tranquility and to reason the battle flags would be furled and war notes would be hushed in the parliament of men, the federation of the world. You remember in that beautiful play of "Richelieu," Bulwer Lytton makes the Cardinal to apostrophize:

> "Beneath the rule of men entirely great
> The pen is mightier than the sword."

Then, a little later, he exclaims:

> "Take away the sword;
> States can be saved without it."

It was the pen concerning which Wolfe, when floating down the St. Lawrence the night before his ascent of the Heights of Abraham, someone in the boat quoted softly those deathless lines of Gray's "Elegy"

> "The boast of heraldry, the pomp of power,
> And all that beauty, all that wealth e'er gave
> Await alike the inevitable hour:—
> The paths of glory lead but to the grave"

turned to one of his compatriots and said: "I would rather be the author of that poem than to take Quebec on the morrow."

DREAMING OF PERPETUAL PEACE

All hail the pen, the pen of appeal, the pen of explanation, the pen of publicity. Surely so great and potential an instrument as this should keep the peace. Dr. Jordan went up and down the land saying: "We will never have another great war. Nations or sections will never throw themselves into a costly struggle, because the financial exchanges would not be able to finance another war. It would be too costly under the modern methods of making warfare. It would be impossible to raise the credits

to conduct a war." That was his contention and we had begun to rest complacently in it.

You remember when Franklin—represented by the life insurance company of which the toastmaster is the local representative—I am trying to enforce the doctrine of publicity, my friends, for the benefit of our toastmaster—I was going to tell you that Ben Franklin said "Drive thy business; let not thy business drive thee." But you know for a time we were terribly in danger of being arrested for fast driving, for there was the danger of the impairment of the national fibre through excessive commercialism. Then you know how the events of the last year or so swept away all the assurance that tranquility was to be our blessed portion through the sway of cross and pen and enlightened selfishness or business. The business men of America have responded to the call for service in a way that shall make a luminous and inspiring page in the history of sacrifice, in unselfishness, giving of their services and means without thoughts of compensation, giving up thoughts of goods and prices and profits, most of them, until this great adventure for self-government is carried through to a glorious fruition. You and such as you are not like Mrs. Casey, when they asked her if she would give something for the inebriate asylum. She said: "Sure, I will give Casey." (Laughter.)

NOT IN VAIN ARE THE BATTLES IN PICARDY AND FLANDERS

You are willing to give what you would like to retain, so that there shall be no faltering in the vindication of democracy. Grant said "Let us have peace." You are saying to industry, "Let us have peace." You are saying to employers and employes what Lincoln said to North and South: "You cannot be enemies; you must be friends." You are preparing for that finer day of democracy, of industrial co-operation and justice, when the boys come marching home and find that those who have stayed behind have been working out a scheme of industrial democracy and mutuality that shall be worth giving one's life for, and that they shall not have fought and bled in vain in Picardy and Flanders, because organizations like yours are promoting good will and good understanding in the vast field of production. Splendid is the principle you have brought into industry, proving that it has a soul, a real concern for the welfare of the worker.

Let me bring before you the spirit of 1917 and of 1918. The spirit of 1776 had three heroes in that valiant little group. There are four figures in the present picture: the man with the sword, the man with the cross, the man with the pen, and the business man, with his Liberty bonds and Y. M. C. A. receipts, his contributions to the Red Cross; yea, and his participation in the conservation scheme demonstrated in the National Museum of Safety with its devices and methods for safeguarding life and limb and health.

A friend of mine came back not long ago from Paris and he brought me a message he found upon Victor Hugo's dressing table. This is what the great Victor Hugo wrote, something he saw with the prescience of his gifted mind: "I stand for a thing that does not yet exist. The party of the

revolutionary civilization shall come up in the twentieth century. It shall go out first as the United States of Europe, and then the United States of the World." Let us hope, as our armies press toward Potsdam, bearing our glorious symbol of freedom and liberty and justice it shall not be long before the Christian statesmanship of the great democracies will be sitting around the council table making a covenant that shall bring in the truth of old, when it was written "How good and how pleasant it is for brethren to dwell together in unity." Then shall we celebrate anew the spirit that you are putting into American industry and production, the beautiful spirit that breathes through one of our great hymns—

"Oh beautiful, for spacious skies
And amber fields of grain,
For purple mountain majesties
Above the fruited plain.
America! America!
God shed her grace on thee,
And crown thy good with brotherhood
From sea to shining sea!" (Applause.)

TOASTMASTER BILHEIMER: Mr. Schermerhorn must leave in a few moments to catch his train. As he walks through us to the door may we all clasp our hands and say good-bye to him—let us all say: "Good-by and God bless you, Mr. Schermerhorn."

As we disperse I wish that we might sing one of the old songs, just softly, together. Sing with me, very softly, "In the Evening by the Moonlight."

THINKING SAFETY

Last winter, in the city of Indianapolis, the water system broke down. The alarm was spread in all the daily papers and the public was informed of the imminent danger of allowing even the smallest fire to start, because it might result in the destruction of the city. For four days this condition existed and during this time not a single fire alarm was turned in. Why? Because, of necessity, the people **thought safety.**

Of the countless deaths and injuries from accidents, a vast majority occur because people do not think safety. We allow our minds to wander from what we are doing and as a consequence unintentionally expose ourselves to the hazards from which accidents ofttimes result. It is not enough to know a host of safety rules; we must train ourselves to think safety at all times. When necessity demands, we do it—just as was done in Indianapolis. We should understand that the necessity is always there, though not always discernible. It is only by being on the alert at all times that we can assist in eliminating preventable accidents.

Health and Industrial Relations Division
Employes' Benefit Association Meeting

St. Louis, Mo.

Sept. 17, 1918

DR. L. A. SHOUDY, Chairman
Chief Surgeon, Bethlehem Steel Company, Bethlehem, Pa.

W. L. CHANDLER, Vice-Chairman
Assistant Treasurer, Dodge Sales and Engineering Company, Mishawaka, Ind.

TUESDAY MORNING SESSION

CHAIRMAN SHOUDY: The Section will please come to order. Mr. Fleischer, who was secretary of the Section, at the present time is in France. He went over on some government work for tuberculosis, and expects to be back in about six months. That is why we have no representative as Secretary.

The idea of a separate session for the Employes' Benefit Section was suggested by Mr. Chandler for the purpose of discussing problems of real interest and value to employers and employes alike. As the plan is Mr. Chandler's I will ask him to take the chair and conduct the proceedings.

CHAIRMAN CHANDLER: I think that the credit for this gathering really belongs to Mr. Eaton. He has long taken an active interest in the subject and has done much to make our Section a success. In preparing the program for this meeting the general subject has been split into eight topics. An effort has been made to group the sections in logical sequence, and the first topic, "How to Solve Its Problems and Operate It Successfully," sent out in the form of a questionnaire, was subdivided as follows: "Is it profitable for an establishment to have an employes' benefit association among its employes? Can it be self-supporting: (*a*) In a small shop? (*b*) In a large city? Should membership be compulsory? Should any employes be excluded or any distinctions made and should it be managed by employes or by the employer, or jointly?"

Mr. F. S. Bigler has consented to address the Section on our first topic.

THE EMPLOYES' BENEFIT ASSOCIATION—HOW TO SOLVE ITS PROBLEMS AND OPERATE SUCCESSFULLY

F. S. BIGLER, VICE-PRESIDENT, MICHIGAN BOLT AND NUT WORKS, DETROIT, MICH.

Mr. Chairman and Members of the National Safety Council: I must state frankly that I am not an authority on benefit associations nor have I in any sense an extensive or accurate knowledge of the operation of such associations. My experience in this line has been limited to the operation of the association of our own plant, which is small in comparison with many of the concerns represented in the National Safety Council. At the time I accepted the invitation to prepare a paper on this subject I had very incomplete knowledge of what had been or was being accomplished in other plants. I feel very humble in attempting to contribute to this meeting any ideas of my own, after reading the articles published by some of the authorities on the subject—especially Mr. W. L. Chandler's analyses of the by-laws and experiences of some six hundred associations—with the conclusions and suggestions he has made as a result of the experiences in his own company. Several changes and improvements for our own association have been suggested to me by the reading of Mr. Chandler's articles, and I recommend their careful study by those who are at all interested in organizing mutual benefit associations.

Because of the varying conditions in different concerns, it would seem that no hard and fast rules can be laid down for solving the problems that arise in operating benefit associations. In a small plant there is the advantage of a closer personal relation between the executives of the company and the employes than can exist in a large concern. This *is* a distinct advantage, for, although the management of the association may be left entirely to its members, they often need, and are quite sure to ask, the co-operation of the company in solving questions or carrying out desirable propositions not provided for in their by-laws. On the other hand, in a large organization the volume of detail work is so great that it cannot be efficiently performed by non-paid officials, and, in the employment of paid officials who give their whole time to the business of the association, it becomes possible to carry out many helpful humanitarian features not feasible for the smaller association.

I am qualified by experience to speak only from the viewpoint of a relatively small organization, and shall confine my remarks mainly to experiences in our own plant. It is possible that some features of our association may be unique and it may honestly be called successful—which is my excuse for giving in detail the fundamentals of its organization and some of its experiences.

OUTLINE OF DUES, ASSESSMENTS AND BENEFITS

Our association is in its sixteenth year of operation and with each succeeding year it has become more firmly established, to the satisfaction of both the employes and the company. Briefly stated, the conditions of

membership, financing and benefits are as follows: Any factory employe in good health, between the ages of 18 and 55, who has been in the employ of the company for three months, is eligible to membership. The initiation fee is 50 cents; reinstating fee, 50 cents, and dues, 30 cents per month. A death benefit assessment of 50 cents is made on the death of any member and an assessment of 25 cents is made on the death of the wife of a member. A sick benefit of $7.00 per week is allotted for ten weeks during any part of twelve months from date of first sickness. No sick benefit is paid in cases of sickness clearly caused from immoral conduct or excessive use of intoxicating drinks. On the death of a member, a death benefit of $100.00 is paid to his duly authorized beneficiary and a death benefit of $25.00 is paid to a member on the death of his wife. All members of the association who leave the employ of the company are entitled to half benefits as long as they keep up their dues, which remain the same.

The company goes fifty-fifty with the association in the payment of all benefits to members in the employ of the company. That is to say, on presentation to us of duly executed vouchers showing payment of sick benefits or death claims we reimburse the treasury with 50 per cent of such payments. This puts upon the company practically half the cost of maintaining the association, but we feel that the results, tangible and intangible, well warrant the expense, even from a cold-blooded business point of view—if that were the principal reason for fostering the association, which it is not. The average annual contribution of our company for the last two years has been close to $2.00 per member. But the true and lasting satisfaction realized from promoting such an association is the knowledge of the practical assistance and good cheer which is being carried to members and to their families in their times of need. Anyone who is shut in by illness is visited at least once a week by the relief committee, which keeps him in touch with his associates at work. this spirit of mutual interest and helpfulness, we find often counts for more with the sick than the weekly money benefit he receives, although that is of most substantial assistance when the pay envelope is discontinued for a time.

In our association, membership is entirely voluntary, and, consequently, there have from time to time been slumps in the percentage of employes belonging to it, because of lack of aggressiveness on the part of members in boosting the association.

MEMBERSHIP LIMITED TO WORKERS

To quote Mr. Chandler: "No form of insurance will sell itself." * * * And again: "No matter how good the plan, it will not sell itself. It must have barbs on it; it must not work too smoothly. There must be things happening to keep alive the interest and enthusiasm of all the members. It is not sufficient to depend upon the secretary or any other one man to secure all of the members; all employes must be warmed up and kept warm so that a new man coming into the plant will immediately feel that influence and want to come in."

This has been our experience and has led the company to co-operate with the association in campaigns for selling memberships to new employes. One method has been to call the employes together and explain the conditions, purposes and advantages of belonging to the association. After one of these meetings sixteen applicants for membership resulted immediately. We have also been in the habit of assisting the secretary of the association in the preparation of bulletin notices of meetings, in which he tries to arouse interest with some particular punch. We have now commenced the publication of a house organ, in which we intend to feature strongly the benefit association. But in whatever we do to foster the growth of the association, we endeavor to avoid anything that could imply an intent to direct its management, as we wish the members to know that the association is theirs, to be operated by themselves. For this reason we have opposed any attempt to extend membership to the office force.

The officers of the association are as follows: President, vice president, recording secretary, financial secretary, treasurer and sergeant-at-arms, all of whom are elected every six months. There are also three trustees —one trustee being elected every six months, to serve eighteen months— with a provision that neither the financial secretary nor the treasurer can act as trustee. The financial secretary collects the fees, dues and assessments and pays the same to the treasurer. The treasurer banks all moneys and pays all claims by check. Three signatures are necessary on each claim before check can be issued. If the treasurer is not bonded, I would recommend a warrant and check being combined, so that the bank will not honor a check unless the accompanying warrant bears the necessary vouching signatures. This should provide the necessary guarantee and avoid the labor and inconvenience of procuring a new bond for the treasurer after each election of officers. At present, instead of banking all its funds, the association is investing largely in war savings stamps.

The constitution provides for the auditing of the accounts of the trustees, and, inasmuch as our company reimburses their treasury with 50 per cent of all amounts paid out in benefits, we have been furnished with copies of their financial statements. As the trustees were frequently unfamiliar with methods of accounting, these statements were not always as complete as seemed desirable, and, therefore, some time ago we suggested the advantage of having the accounts audited regularly by a certified public accountant, and offered to furnish this service—if agreeable, to use our own auditor. This has since been done.

OFFICERS AND THEIR DUTIES

The constitution provides also for appointive committees as follows: "*Article 9 Committees*: Section 1—The relief committee shall consist of three members of the association (not more than one from any one department), appointed by the president and confirmed by the association, and a representative appointed by the Michigan Bolt and Nut Works.

"Section 2—The relief committee shall represent the association in the shop. They shall welcome and introduce all new members; take and

report on all applications for membership, and look after the interests of the association and the members in general. They shall visit the sick at least once a week, and report at the next regular meeting.

"Section 3—The entertainment committee shall have charge of all entertainments given under the auspices of the association. It shall be composed of three members appointed by the president."

Our representative on the relief committee is our welfare director, who makes it his business to follow up, as closely as he can, all absentees whether they are members of the benefit association or not, and to keep in close touch with those who are ill.

A regular business meeting is held once a month and a smoker once a year. For several years the association has been in the habit of inviting to the smoker the officers of the company and some of the members of the office force. On several of these occasions there have been prominent speakers. It is with genuine pleasure that the officers of the company mingle with the employes in this good fellowship.

Another marked advantage in the benefit association, which has not received the emphasis it deserves, is that it is proving to be a most effective agency for the Americanization of the foreigners who are with us and who are glad to learn our ways and become Americans in spirit, speech and act. Many of them have only small chance for mingling as closely with Americans of older stock as is offered in such an association as this, where brotherly interest and helpfulness are emphaized as strongly as the insurance features.

The results of Mr. Chandler's findings in his investigation of many associations are extremely interesting in regard to the percentage of employes belonging to these associations. To quote again from his pages.

"In associations operated by employes without the co-operation of the employers the percentage of members to total number of employes varies from 20 per cent upward, the average being about 30 per cent. In cases where the employers co-operated in jointly managing the associations the average was over 60 per cent, and where the employers managed the association alone the average was over 75 per cent. This points to one very important moral, and embraces one of the essential features of organizing such an association. In addition to that, it shows very forcefully the need for reorganizing a great many of the associations now in existence. Consequently, I believe these features, which are essential for organizing, will be equally essential when reorganizing an association."

ASSOCIATIONS PROMOTE HIGH IDEALS

While a larger percentage of employes may be induced to join an association which is managed entirely by the employers, I strongly believe that mutual benefit associations should be operated by the employes, with the co-operation of the employers, and that membership in them should be voluntary. Undoubtedly the last word has not been reached in the management of these associations, as well as in other efforts along these lines. But as I believe that, if we are striving toward a democratic ideal in the government of a nation, we should not abandon or discard

that ideal simply because the known democracies have not measured up to it; so, although statistics and figures point to apparent greater results in these associations when managed by the companies, I believe that in the long run the objects and aims of such mutual associations will be better conserved if the members have the opportunity and gain the experience of managing the organization themselves.

As the mutual benefit association has already justified its existence and is destined to stay with us, it behooves those of us who think it worth while to see that the organizations in our plants represent only the most helpful and up-to-date methods possible to be obtained. To this end we should keep ourselves posted as to what is being done along these lines and I would recommend again a careful study of the article on "Employes' Benefit Associations," by W. L. Chandler, published in the May, 1917, number of *The Annals of the American Academy of Political and Social Science*: also a series of articles on the same subject and by the same author published in *Industrial Management*, beginning in the issue of January, 1918. Mr. Chandler has made a thorough investigation of the organization, development and operation of industrial benefit associations and his illustrations, analyses and conclusions should be considered carefully by all who are at all interested in this subject.

In conclusion I would urge that every concern, great and small, which has not already a mutual benefit association, should take steps immediately to establish one. I know of no agency equal to it for breaking down and destroying class prejudice and suspicion of unfairness. Antagonisms disappear in direct proportion to the mutual regard and comradeship established and developed with an honest purpose, to work out together and solve the problems that arise in the association. Moreover, such an organization is a most potent factor in making effective the safety committee of which every concern needs a good live one. The very small labor turnover in our plant is directly attributed to the spirit of good will and contentment resulting largely from these two agencies.

CHAIRMAN CHANDLER: Our next general topic, "Its Relation to the Employer and Employe and Best Form of Management," has been split into a number of subheads dealing intimately with each phase of the subject. Mr. Jamieson is absent, so we will pass on to our third topic, hoping to hear Mr. Jamieson's paper later. Dr. Bascom will be our next speaker.

THE NEED FOR MEDICAL SERVICES AND OTHER BENEFITS

H. M. BASCOM, M. D., CHIEF SURGEON, ILLINOIS TRACTION COMPANY, PEORIA, ILL.

Mr. Chairman and Members of the National Safety Council: From a public health standpoint, competent medical and surgical treatment is necessary to protect the health and earning capacity of the employes. The compensation laws of the several States provide for the surgical care

of employes injured in hazardous employment, while actually in operation of their usual duties, but the very numerous accidents occurring to employes when off duty as well as the numerous diseases not incident to employment must be cared for in some other way, by the employe himself, and are often neglected till a serious condition exists. This could have been prevented by early attention by some experienced physician. When taken over by the government the railways were notified that hospital or benevolent associations would not be considered as a necessary expense chargeable to the railways, therefore, they must be self-supporting. Consequently, it became necessary for several roads to revise their methods of operating such associations, that had been an expense to the railways, the employes contributing in part to the existence of such very necessary institutions.

The need of medical service, it seems to me, is paramount to all other needs. This, of course, should include hospital care and nursing. Many employes think themselves in need of medical service when they are not, especially if such service is free or part of their contract. Others are sure they do not need medical attendance when they are really sick, running a temperature, and should be in bed. The physician or nurse is the only one who can judge the necessity and should have free rein or reign supreme in this matter. Medical attention at the proper time, at the first intimation of disorder, conserves health, life and earning capacity. Never was the old time-worn adage, "A stitch in time saves nine," more true than in the immediate care and attention to the employes.

BENEFIT ASSOCIATION TO BE SELF-SUPPORTING

The Illinois Traction System, that I represent, has such an association, some 3,000 employes contributing 1 per cent of their wages each month for its support. Since its organization, eleven years ago, there has been expended for physicians' services, hospital bills and extra nursing, druggist bills for medicine and surgical supplies, approximately $200,000, the company paying about one-fourth of the amount—a little more than $50,000. Since the recent change of dues to a 1 per cent rate we expect the association to be self-supporting. We have also a death benefit feature in which the employes who wish to belong to it contribute about the same additional amount, according to the amount of salary received, for each death, paying the beneficiary of the employe $1,000. Membership in the hospital association is expected; membership in the death benefit and total disability fund is expected, if physically fit, but not compulsory. The same examination is accepted for the hospital association and death benefit as is accepted by the company under the compensation law. All divisions being recruited from young men our death rate has been exceptionally low.

The association is controlled by a board of trustees, elected annually. The president, vice president and secretary of the association are the only representatives of the company in the association. There are twenty trustees, representing different properties, so you can see it is in fact an association of employes. It has been my good fortune to have a corps of

150 very efficient physicians, as well as about thirty first-class hospitals under contract, that give the very best care and attention to the employes —much better than they could afford to employ individually. The association has the following advantages: *First*, preservation of life and health; *Second*, care and comfort during sickness or accident not coming under the compensation law; *Third*, quicker recovery to conserve the earning capacity of the employe, benefiting employer, employe and employe's family; *Fourth*, the reflex benefit of bringing the employe and employer nearer together, showing all concerned that their interests are mutual.

ADVANCES FROM FUNDS

At the present time we are helping care for two employes in Colorado, suffering from tuberculosis, and one at a sanitarium in Springfield, Ill. In three cases we have advanced several hundred dollars from their death benefit, to support these very advanced cases of tuberculosis. Of course, in such cases it is necessary to have a personal knowledge of the immediate necessities as well as the actual condition of the individual. In each case the employe has died within three months of the time the advance was made, so no mistake has been made in the diagnosis of the disease. This, as well as a knowledge of the family necessities, has been left to my judgment There is nothing that brings the employe and employer nearer together than the care of the employe, in case of sickness, to let him know he is a part of the institution and that his welfare is being looked after. It is in this way I get near enough to the employes to cause them to listen to me regarding safety welfare, the use of safety appliances and safety methods—getting their confidence in one way imparts confidence in another.

At the bottom of every bulletin issued from my office for the last year or more—an average of three or four a month—appears some line of caution or some matter borrowed from the words of cheer sent out from the headquarters of the National Safety Council. It has become a byword with us that these squibs are read by the men before they read the text of the bulletin. The question, "What's new this time?" has been asked before the really important part of the bulletin is considered. Just what has been the percentage of decrease of accidents is hard to say, but when the idea of *thinking safety* has been instilled into the employe the first important step toward safety practices has been accomplished.

RECONSTRUCTION OF EMPLOYES FOLLOWING ACCIDENT

This falls to the lot of the physician or surgeon, it is becoming one of the greatest needs. At present the medical journals and the public press are full of the subject of reconstruction of the disabled or wounded soldiers returning from the front. It seems to me the matter should be considered nearer home as well.

One of the greatest needs of physicians and surgeons is the reconstruction of injured employes, that they may be fitted to some useful employment perhaps less hazardous than before receiving injury.

DISCUSSION

CHAIRMAN CHANDLER: Our fourth topic is "How Shall we Select the Amounts of Benefits?" In other words, before we can decide what our dues are to be we must first agree upon the benefits we are to pay. No one, it seems, has been selected for that topic, so we will include it in the general discussion.

DR. SCHRAM (Fairbanks-Morse Company): I would like to ask Dr. Bascom a question in reference to his hospital contracts: I take it your men are pretty well scattered and you have several hospitals. How do you get in touch with men some distance from you? How do you know they should be in a hospital? Do they go to other physicians? How do you keep in touch with those physicians and hospitals?

DR. BASCOM: Unfortunately, our business is scattered. We have hospitals in Kansas, in Missouri, a number in Illinois and two in St. Louis. I personally make the contracts with the hospitals. All steam roads, unless they have hospitals of their own, have contracts with hospitals.

The contracts vary, although they probably average a little less than the ordinary charges for personal care. This last year the rates have been advanced about 25 per cent, just as we are now paying $30 to $35 per week to trained nurses we formerly secured for $20 to $25. The local physician or surgeon decides whether or not it is necessary for the employe to go to the hospital. I have confidence in these men, and if they decide that an employe needs hospital attention they see that it is given. The hospital bill is sent to the local physician and he O. K.'s it before it is sent to my office. My work is all administrative; the surgeons under me do the actual work; they are all men in whom I have perfect confidence.

MR. ALBERT (Western Union Telegraph Company): We have no benefit association, but our company has a voluntary finance plan, managed by the company, to which the employe contributes nothing except continuous service. I want to ask Dr. Bascom what relation the payments his association makes bear to the payments required by the compensation law? Is the association's benefit in addition to what the company pays under the compensation law, or does the association pay the excess, if any, or do they pay nothing?

DR. BASCOM: Payments coming under the compensation law are handled by another department—the hospital association is absolutely separate. The $1,000 that we pay as a death benefit is in excess of any amount paid by the company. Under the compensation law the company pays what is coming to the employe and whatever he gets from the hospital association is in addition to that amount.

SICKNESS AND ACCIDENT BENEFITS

MR. BRUSSARD (Sharon Steel Company): Do I understand the doctor to say that compensation relief benefits for sickness are paid for injury, and if so, is that compensation in addition to that specified by the com-

pensation board? In that event, if that be so, compensation during illness or injury would be greater than compensation for continued employment. Is that true?

DR. BASCOM: The hospital association pays nothing except doctors' bills, hospital bills, druggists and nurses, unless there is a death. There is no weekly benefit. If there is a death, the benefit is in addition to what the compensation law requires. The hospital association is managed by trustees, and the company has very little to do with it other than a general supervision and a guarantee that if there are not enough funds in the association they will see that the bills are paid. Accidents occurring when the employe is not in actual employment—accidents occurring, say, at home—are taken care of by the hospital association.

CHAIRMAN CHANDLER: Have you two benefit organizations, the hospital and the benefit association?

DR. BASCOM: No; we pay no sick benefits.

MR. BRUSSARD: Several years ago I was connected with the Employes' Benefit Society of the National Tube Company at Loraine, Ohio, acting in the capacity of assistant secretary. Our men were all members of the relief association, but they lived all over that section, covering a radius of about sixteen miles. We found that our by-laws were violated in about 90 per cent of the cases, in this way: We required a notification within twenty-four hours after the beginning of the illness of any of our members, but as a rule when the man returned to work he came into the office and told us he had been sick for a week, ten days, a month or three months. Our surgeon conceived a plan by which we would be notified immediately of the illness of any member of the association and this is the way we worked it: We called a meeting of the Loraine Medical Society, at our expense (we included a dinner) and all the doctors in the county were present. We prepared postal cards, leaving blanks for the name and check number and the diagnosis of the disease, and placed the cards in the hands of the physicians with the request that they mail us the card immediately upon being called to attend one of our employes. In three years' experience we had only four delinquent cases.

Our rules required that the employe be examined by one of the association's physicians. The surgeon knew that by notifying the company the physician would get in contact with him and the two would examine the patient—he was, therefore, assured a competent fee for consultation. He also knew that he would be paid for his services if the claim was a proper one and was presented to the company. We found that in paying compensation, according to the voluntary relief plan then in force by the corporation paying benefits as prescribed by our by-laws, it raised the average weekly earning to about 104 per cent, while the man was disabled on account of sickness, as compared to his earning capacity while well. We found that a great many of our men were taking vacations—extending periods of disability which normally would be from six to eight days to eighteen to twenty-one days. Then the cost of insurance was reduced and benefits paid only for disability on account of sickness or injury received outside of our employment. I think that in the formation or drafting of by-laws or rules for health insurance or sick benefits we should take

into consideration the provisions of the compensations acts—that the compensation acts are deemed fair and the payments equitable—and that our benefits should be very close to the standards fixed thereby. I also believe that where compensation is paid benefits should not be paid.

ADMISSION TO HOSPITALS

DR. BASCOM: Perhaps I did not understand Dr. Schram's question. Every foreman is provided with two books. One we call the "pink slip" and the other the "accident slip book." An employe does not go to a physician without an order from his foreman; the physican takes him to a hospital, if he thinks it necessary. With the "pink slip," which is the hospital association's order in each case, there is a coupon, made out at the same time as the order. The coupon goes to the superintendent and informs him when an employe is disabled or is sick; so we have a check both ways..

MR. BRUSSARD: That is, if he goes to the company physician.

DR. BASCOM: Yes, sir. If it is a serious case and the local company physician cannot be found, the association pays for one visit to an outside physician.

MR. BRUSSARD: What is your rate per month to employes for that service?

DR. BASCOM: One per cent of his wages. The association is now self-sustaining.

CHAIRMAN CHANDLER: I had an experience in placing an association on a self-supporting basis that may be of some help. Our association was operated by the employes and one of our officials had served as treasurer of the association ever since it started, about twenty-five years. He had a big heart, but he had an idea that the corporation should absolutely keep its hands off the association. He would not even offer suggestions, except in remote cases, on the theory the employes should be privileged to run the association any way they wanted to. It was a fine sentiment, but I finally convinced him that the corporation had in its organization executives who could make suggestions for co-operative efforts the employes should have and were entitled to. About 15 per cent of our employes were members of the organization at that time, but after about one month of the new plan the membership doubled, without any solicitation other than the instilling of enthusiasm by agitation for a more adequate organization. Under the old system they had to beg fellows to come to a meeting so they would have a quorum to elect officers and assessments were levied every six months. They had a system of flat dues and flat benefits but the dues were not sufficient to carry on the work.

Our first effort to assist the association was to investigate the experience of other similar organizations in the United States. This developed certain principles and indicated that certain dues would cover certain benefits. As a precautionary measure I added 50 per cent as a loading for safety, to arrive at what, in my opinion, should be the basis of dues and benefits in our plant. Some changes were necessary and the benefits

differed somewhat under the new plan and a change in dues was also instituted. Out of curiosity I figured this out—the new dues were half a cent per week less for the equivalent of the benefits previously paid. I was rather fearful: if the association could not live on 10 cents, what would they do on 9½? I went over the figures again; it seemed to me that 50 per cent higher than the average in the United States ought to be safe —if we could not make our organization come that close to the average we ought to give it up. I stuck to my original recommendation and we went to work on that basis. We have been operating three or four years, since the reorganization, and are declaring dividends. By getting a bigger percentage of your employes into an organization you bring down the average loss experience and economize on dues.

GUARDING AGAINST MALINGERING

The question of the amount of benefits to be paid in addition to compensation comes up in practically every organization. Our by-laws provide that no member may draw, from all sources, in excess of 90 per cent of his wages—that includes lodges and labor unions, if he has any, and other insurance, compensation or whatnot. The Indiana law gives a man 55 per cent of his wages after the first week; our association pays after the first three days, so for four days an injured man receives full insurance from the benefit association. After compensation begins he would receive not to exceed 35 per cent of his wages, because his compensation pays him 55 per cent. In this way we guard against the possibility of a man being paid a bonus through malingering.

Some organizations pay from the first day a man is sick or hurt: others do not pay for the first three days, others for the first week, some for two weeks. Another type of organization provides that if a man is sick, say, two weeks or three weeks, they will go back and pay for the full time. Many have a waiting period of seven days, they do not pay for the first seven days unless he is sick three weeks, then they pay for the full period. That strikes me as a very bad feature. It is a bonus system, in a degree, because if a man is sick, say two and a half weeks, you virtually say to him: "Now, Bill, you be sick a few days more and we will pay you for those few days and give you a bonus for another week." Of course, he will be sick the full three weeks. I think that is a danger which this Section ought to go on record as opposing. It has been incorporated, I think, on the theory that a man who is sick for three weeks needs the money. He certainly does, but I believe the way to correct it is not to make him wait a week. The average wage-earner, in normal times, begins to feel the pinch before the end of the week. Three days will obviate some of the minor cases of sickness and trivial accidents. A man's credit standing in a community ought to be such that his grocer and butcher will extend him credit over three days if he needs it, and his wages ought to finance him through a three-day sickness; so that, to my notion, three days is about the right length of waiting time. I would like to hear the question of the correct waiting time discussed—when benefits should begin.

CORRECT WAITING PERIOD

MR. FRANK E. CHAPMAN (Superintendent Employes' Benefit Association, International Harvester Companies, Chicago, Ill.): Our by-laws provide that the first seven days of sickness or disability should not be counted. At the quarterly meetings of our board of trustees new members have often advocated an amendment whereby benefits would be allowed for the first seven days after a period of three or four weeks. This has led to a good deal of discussion in the several meetings, but on a statistical showing made by the superintendent and myself the board has always voted down the proposition to wipe out the first seven days. We feel that it is good business not to pay for the first seven days, to do so would tend to prolong the period of disability of short-time cases; that is, cases ranging thirty days or under.

MR. ALBERT (Western Union Telegraph Company): Our waiting period on sick benefits is one week. Accident benefits begin the day following the day of injury; that is, the day on which no wages are paid as such. This has not worked detrimentally, I think, in any case.

CHAIRMAN CHANDLER: Do you make a distinction in the waiting period of accidents occurring out of business hours?

MR. ALBERT: An accident outside the course of employment is classified as a sick case and treated in the same manner.

MR. GOLDIE (Cadillac Motor Company): Our benefit plan has a one-week waiting period on sick cases; that is, for the first seven days we do not pay benefits unless the disability extends over a period of fifteen days—then we go back to the date of disability. I made an investigation and the statistics I gathered seemed to show that in something like 1,200 cases of disability, reported in one year, we paid benefits on approximately 200. Objection was raised to not receiving benefits for the first week in only one or two cases. No objection was raised by our advisory committee. The question of abolishing the waiting period has been raised several times, but we have found it advisable to continue the practice as it eliminates a lot of petty cases. We pay accident disability benefits from the day of injury, whether the accident occurred in the shop or out.

MR. BRUSSARD: Do you pay benefits in addition to compensation under the workmen's compensation act?

MR. GOLDIE: Yes; compensation in all shop accident cases, from the date of disability. The question of advisability has been raised a number of times. Our Michigan compensation law requires only 50 per cent of wages and in these days that does not give very much cause for malingering. We have had one or two cases of alleged malingering in the past year, but they were rather indefinite and I paid little attention to them. I do not think our plan has caused much difficulty.

AVERAGE DUES IN BENEFIT ASSOCIATIONS

MR. BRUSSARD: What are the monthly dues for $6 a week benefits?

MR. GOLDIE: Ten cents a week. We have three classes; the first class costs 10, the second 20, and the third 30 cents, but benefits are not paid in

proportion to dues. The purpose is to keep as many men as posible in the first class, which pays $6 a week. We do not want a money-making proposition and out of our 7,000 members about 6,700 are in the first class. Our overhead is taken care of by the company. We have the right to make special cases out of certain disabilities and treat them in the hospital at the benefit society's expense. In the last three or four weeks we have had a number of cases of bad tonsils. We sent them to the hospital, classifying them as benefit cases.

MR. BRUSSARD: In ordinary cases does the association pay medical expenses?

MR. GOLDIE: We furnish free medical care in all cases, both hospital and medical, but we do not pay outside physicians. If a member wants to go to an outside physician he has that privilege, but he is required to furnish us a certificate of disability from that physician and we pay him benefits only on that certificate. We maintain a staff of seven full-time physicians and do not believe it is necessary for a member to go outside our organization.

AVERAGE PERIODS OF DISABILITY

CHAIRMAN CHANDLER: I have one of the charts Mr. Bigler referred to and it may be interesting to read some of the statistics I was able to gather, showing the percentage of cases which ran for a given length of time. The record is blank prior to the fourth day; that is, I was unable to gather any statistics of value for the first three days. The chart begins with the fourth day. Twelve per cent of cases were of four days' duration, so by eliminating the fourth day, in addition to the first three, we eliminate 12 per cent of all the sickness and accident cases which we should otherwise have. The fifth day constitutes 10 per cent, so by eliminating the fourth and fifth days we eliminate 22 per cent of all sickness and accident cases. The sixth day is 16 per cent, so by making a man wait six days, beginning benefits on the seventh day, we would have 38 per cent of cases eliminated. Figuring six days to a week, 38 per cent of cases of more than three days would be eliminated by making a man wait one week. Passing the week, 8 per cent were seven days—you will notice there quite a peak in those four percentages. The six days, or one-week period, is 16 per cent higher than any other of the days, indicating that if a man is sick nearly a week he will make it a week for even time. Then, going to the eighth day, it drops to 6 per cent, the ninth day 3 per cent, the tenth day it is back to 4½ per cent, eleventh day 1 per cent, and the twelfth day, or two weeks of working days (that is twelve working days, of course, which means two weeks), it is 4 per cent. The period of three weeks includes about 65 per cent, as I remember, of the total cases of sickness and accident, so that every day you prolong the waiting period you eliminate a large percentage of cases. There is quite a difference of opinion among the managements of different organizations as to how long the waiting period should be, and I think, in justice to the men, that is one of our big problems and there ought to be a closer approach to a standard in that regard.

MR. SANFORD (General Electric Company): The General Electric's meth-

od of paying employes is to retain about one week's pay; for example, one section will be paid on Friday up to and including the previous Saturday, so that for the first week a man is out he has the money coming which he earned the previous week. Benefit payments begin on the second week and in that way there is no time in between the time he leaves work and the time he starts drawing benefits—that he will have to look to the corner grocer for credit. Of course, when he comes back to work he does not draw his pay until the second week.

MR. CHAPMAN: Our experience has been that where a man is disabled and the butcher, grocer and candlestick-maker know that he is a member of the Harvester Company's benefit association he gets credit.

CHAIRMAN CHANDLER: I think that will generally be found to be the case. In a number of cases grocers have 'phoned us or otherwise ascertained the man's standing. We pulled off another stunt which has operated rather well. We interviewed the undertakers and established a line of prices for specified equipment in the way of funeral expenses. Certain caskets and certain services are given for a standard price—this was done to protect a widow against excessive prices. The undertaker knows that we will guarantee payment of his bill at least to the extent of the benefits, and the widow gets a 10 per cent discount. The undertakers professed to favor this arrangement, because they knew they would get their money promptly. The widow instructs us to pay the bill and we use our influence to keep the bill down as much as possible.

AVAILABILITY OF BENEFITS

MR. TURNER (Eastman Kodak Company): We have a welfare fund of $1,000,000 and the income is used in payment of certain benefits and accident compensation, but we have no sick benefit plan in the accepted meaning of the term. We investigate each case and supply what we think is necessary, but we put it up to the employe to provide for himself where he can. I'd like to get an expression of opinion as to whether it would be advisable to change our method to a more definite plan and arrange a schedule of benefits, or whether we should continue the voluntary plan. The men do not contribute. We only step in when we find a man needs assistance and each case is investigated.

MR. BIGLER: Before we leave the subject of the waiting period I think we ought to discuss a question that is right in line with it: How long should an employe wait, after he subscribes to a benefit fund, before the insurance or the benefits are available in the event of sickness? I think it has been found by companies writing health insurance that a waiting period is advisable. Is it advisable to have a suspension of time between the date a man subscribes to a benefit fund and the time on which the benefit becomes available if he is taken sick?

MR. BIGLER: If I am not mistaken it is three months after he joins our association before he receives benefits. We have no physical examination.

MR. CHAPMAN: The Harvester Company benefit plan requires that every applicant for membership shall pass a thorough physical examination, this includes family history for tuberculosis, etc. The application, when

recommended favorably by the medical examiner, comes to my office and is checked. Sometimes we find that we have had the applicant a dozen times on our membership books, especially in these days of large labor turnover. The application is made effective from the first Monday after it has been favorably recommended by the doctor—there is no waiting period whatsoever before that man is eligible for benefits if disabled by sickness after the first Monday. In certain cases—where there is an unfavorable history and he is off frequently on account of rheumatism, or is subject to lumbago or tonsilitis—we require him to sign a waiver. If he is disabled from any of those causes he is not entitled to disability benefits, but he does not waive the right to the death benefit.

CHAIRMAN CHANDLER: It seems that we are divided into two classes of associations: One, like the Harvester, has the benefit of the advice of a company physician; the other does not have that benefit and must depend upon sizing up the man or getting something of his history, with the probability of his then being infected or liable to some sickness which is not yet on the surface. Our decision must rest somewhere between those two classes. I have some information on the length of time a man must wait before becoming eligible for benefits after he joins a benefit organization. It has nothing to do with how long he must work before he may become a member, but how long he must wait before benefits are paid after he becomes a member: "Of the associations paying temporary disability benefits 42 per cent provide that members are eligible as soon as they join the association. It is interesting to see that this provision is found in 88 per cent of the associations managed by establishments, in 54 per cent of those managed jointly, and in only 35 per cent of those managed by employes." That is true where associations are managed by employes—they are much more inclined to be severe with their membership.

"Fifty-eight per cent of the associations require a specified length of membership, ranging from one week to twelve months. Thirty-eight per cent of the associations having a specified time require membership of either thirty days, four weeks or one month; twenty-six per cent require either ninety days, twelve weeks, or three months; 11 per cent require either sixty days, eight weeks, or two months; 10 per cent require six months; the remaining 15 per cent are thinly scattered. A few pay at once in case of accident."

A QUESTION OF FAIRNESS

The whole question is one of fairness; the only reason for making a man wait is to make sure he is not "putting something over." Our organization is composed of men who have to size up a man or get an opinion from a physician. We had a man in the office who had been with us for years, but it never occurred to him that he could accept the invitation to come in. One day he volunteered to join. That was peculiar, in view of the urging that had taken place, so we sized him up a little and the committee decided he looked as though he might possibly have tuberculosis. They told him that, according to the by-laws, he would have to provide a health certificate; they would pay for the examination and

he should report to a certain physician. He came back with a clean bill of health, he was all right; he was admitted and we were glad to have him. We have a waiting period after joining of thirty days, and very shortly after that period was up, he developed tuberculosis—one lung was gone. The boys felt that they had been "stung," but they took care of him and sent him to a tuberculosis camp nearby. The physician who signed the certificate either deliberately "put it across" or he didn't know his business if he could not spot the absence of one lung. That shows what we are up against and the need for a waiting period.

MR. SANFORD (General Electric Company): Do you think that man went to the doctor or sent a substitute? I have known of cases where men have applied for employment, and, knowing they had something the matter with them, sent substitutes to the doctor for examination. Our examining and hiring departments are so connected that a man cannot put that over on us.

CHAIRMAN CHANDLER: Not in this particular instance. The doctor admitted it was a case of bad judgment.

MR. BIGLER: Mr. Chairman, if you will permit I would like to answer the gentleman from the Willys-Overland more definitely than I did by reading our by-law that applies to this subject: "To be entitled to receive benefit, a sick member shall notify the relief committeeman of his department. No member shall be allowed benefit until he has been a member of the association for three months, and no member of the association, who, at the beginning of any sickness, has two months' dues or assessments standing against him shall receive any benefit for that sickness. Nor shall any member who has been in arrears become entitled to benefit until thirty days after he has placed himself in good standing. Whenever requested by the relief committee, a doctor's certificate shall be furnished, and signed by the relief committee." That is always done now. A card or certificate is ready for the physician to sign before payment is made and that card comes in with the signature of the physician, also the signatures of the relief committee, and the superintendent before it is paid.

MR. PERKINS (Morris & Co.): What are the best means of approaching a prospective member?

SELLING BENEFITS TO EMPLOYES

CHAIRMAN CHANDLER: That is a good subject, "Salesmanship." How are we going to sell the plan to employes?

MR. BIGLER: I am going to carry back the suggestion that came from the Harvester Company—improved credit by the grocer and candlestick-maker.

CHAIRMAN CHANDLER: I had an experience that was enlightening. The new by-laws for our organization were put out in printed form to all employes with the statement that they would be offered as a suggestion at the annual meeting of the association. The meeting was packed, previously they had been unable to get a quorum without coaxing people to come—this time they were afraid something might be done to injure them, therefore they were out in force to defend themselves. After the discussion a committe of twelve was appointed and they met every Wednesday

afternoon, on company time, for about three months. During that time the employes were all at sea, they did not know what the committee would finally recommend and all through the plant—each department was represented, by the way—the committeemen would get suggestions from this, that and the other fellow, to be sure and guard this particular privilege, and so on. During those three months a great deal of interest was aroused; no new memberships were taken, because every one was in much doubt about what was going to be done. But as soon as the by-laws were settled the membership doubled in thirty days without solicitation of any kind. Membership remained about level for three or four months: at that time it was discovered we had piled up a larger surplus than we had in the previous twenty-five years, indicating that while the new dues were half a cent less per week for equivalent benefits they were possibly more than ample. I suggested to the directors, who were all employes, of course, that they ought to declare a dividend. They were scared to death, they had been having assessments so long that to let go of any money looked absolutely silly. It was put up to them as being unfair to the men to hold their money if it wasn't necessary, so they reluctantly decided to declare a dividend equal to the dues for two weeks, but they were so fearful that nobody said anything about it. They were afraid to tell the employes, but on a given pay day each member was handed an envelope containing the cash for two weeks' dues. The men were not expecting it and didn't know what it was until they read on the envelope that the relief association was prospering; that they had a little more money than they felt should be collected and were returning it; by getting an employe to join they were not only doing him a favor by giving him the protection, but also benefiting themselves and making their organization more prosperous. One fellow expressed it pretty well by saying that he had been a member ever since it started and he had paid lots of assessments, but this was the first time he had ever heard of a dividend. Enthusiasm prevailed all over the plant and in the next two or three months, without solicitation, the influx of new members amounted to as much as the previous big jump, so that the membership was three times what it had been when we adopted the new by-laws. The initiation fees of the new members amounted to a little more than the dividend, so the organization had a very much increased membership and wasn't out a cent. We have since had other dividends, but they have not produced as good results. They show to the members that the organization is prosperous and give it a fine standing. Where organizations are financed by the corporations that does not help, because all know that they are substantial, but where the employes carry the load, either partially or wholly, the matter of establishing a credit standing for the organization is an important one in salesmanship.

SOCIAL AND BENEFIT CLUB

MR. C. E. MURPHY: I organized a fellowship club for the purpose of promoting welfare and to help our men while they are sick or injured. The club is controlled by the men in the plant, although the executives look over the minutes and records and assist in keeping them in order. The

dues are 50 cents a month—about 25 cents for insurance and 25 cents for social affairs—as we cover both fields. The president of our company dropped in at one of our early meetings (by the way, he is a great, big Southerner, a warm-hearted man) and after listening for a time he said: "Gentlemen, I am glad you all got together. I am going to do something for you. I am going to build you a clubhouse and, in addition, I will give you a dollar for every dollar you put in the club." He kept his word, too, and our clubhouse is a splendid one—it cost him $30,000. I did not realize just what he meant when he promised to give a dollar for every dollar we put in the club. I did not think much about it at the time, but after the club was in existence a year I realized the problem I was up against. In organizing the club I looked over the by-laws and plans of seventy-five or eighty similar organizations and based my estimates on those records. At the end of the year we had a lot of money and we started out to spend some of it for social affairs. We gave several smokers, dances and other entertainments. The young fellows in the plant liked the dances and the older members preferred the smokers. Several of the fellows caused a little agitation, they wanted all the money kept for insurance purposes, but others wanted to continue the social affairs. On top of this the president stepped in and said: "We will spend some of the money for baseball." So we built a nice big field and organized a team. Our suits and equipment cost close to $300. We paid the bill promptly and every one was pleased, but about a week lated a check for $300 came in from the company to reimburse the organization. I am up against a problem—I have too much money in the treasury. I do not like to cut the dues and the men do not want to let the dues go for a month or two. I am inclined to agree with them on this point because our employment is such that men come and go at all times and our labor turnover is heavy. We charge 50 cents as an initiation fee. A lot of new men see the clubhouse, the ball park and the athletic field and they want to join the club. They work a couple of months, pay in their money and often drift away. The hard problem is how to spend the money.

MR. CHAPMAN: You might increase your disability benefits.

MR. PERKINS: The last two years have been abnormal and living expenses, of course, have been very high. Has any organization raised its initiation fees and dues, and also its benefits, during that period?

CHAIRMAN CHANDLER: One problem we ought to consider is that of fixed benefits for all members. Some members of our association are also members of lodges or have other sources of insurance, so that while the benefits paid by the E. B. A. are ample for one man they are inadequate for another who does not have such additional benefits. I think we ought to consider the question of having two, three or four classes of benefits. In our case the dues vary from 50 cents to $2 and are graded according to requirements, so long as the benefits paid the employe do not exceed 90 per cent of his wages from all sources.

A SLIDING SCALE OF DUES

MR. A. H. KIEHN (Clark Equipment Company, Buchanan, Mich.): Six years ago we started our benefit association and levied a tax of 3 per cent

on the dollar for the benefits drawn. Before we decided on a plan Mr. Clark offered to put a dollar in the treasury for every dollar paid in by the employes. The men turned it down—they were afraid the company would run the business—so we started the 3 per cent plan. At the end of the year the association had a deficit of about $600. We raised the rate to 5 per cent, but were not much better off. Now we have a sliding scale; 1 per cent per dollar on not over 75 per cent of the man's wages per week. We have money to burn.

The last questionnaire, "How Shall We Select the Amount of Benefit?" offered a difficult proposition. Formerly I had charge of the welfare work, hospital, etc., of the Packard Motor Car Company and it was my experience that when the association paid benefits for accidents covered by the State law it was hard to get the men back to work. And we had to revise our plan. Whenever an accident drew compensation under the State law it was not covered by the benefits of the association. To select any definite plan for amounts of benefits we must take into consideration the accident laws of the various States we are operating in.

CHAIRMAN CHANDLER: It may be of interest to read some figures I compiled at the time Indiana was considering the adoption of a compensation law. I wanted to know how the proposed 55 per cent of wages agreed with what the men really took out voluntarily in the way of benefits. With us, having graded benefits, a man might choose such as he wanted, and nearly two-thirds of the men who took out memberships chose less than 55 per cent of their wages as their benefits, the remainder ran up as high as 90 per cent. Some few took all we would let them have, but something like 60 per cent took not to exceed 55 per cent—showing that the compensation act really reflected about what a man would insure for if he was left to himself. During the year those figures were compiled no one was influenced as to the amount of insurance he might take. Since that year we have tried to influence the men to insure in an ample amount.

DR. SCHRAM: Some of our men are taking out a lot of insurance, outside of mutual benefits and outside of their compensation. What is being done in the various companies to educate men up to take out honest, straight insurance?

MR. CHAPMAN: Old-line insurance?

DR. SCHRAM: Accident and sickness insurance in outside companies. Some companies represented in Beloit are not treating their policy-holders fairly. The accident or illness report will come to me to fill out and on it the question will be asked: "What would you be willing to accept in lieu of any possible claim?" For instance, if a man will probably be off a month, at the end of two weeks he will be asked such a question—the idea is to settle as quickly as they can and as cheaply. I do not see how we can control that in reference to keeping insurance at 90 per cent; the man will go to a downtown physician, when he is sick, and then, just before he returns to work, he will pay the physician a dollar and get his illness certificate for the insurance company filled out.

MR. KIEHN: That is strictly a welfare proposition. Old-line insurance companies are under State laws, the assured has no right to sign away any of his rights.

DR. SCHRAM: I found that out by writing to Madison.

BENEFITS DO NOT KEEP PACE WITH LIVING EXPENSES

A DELEGATE: Is it found that the lower paid men generally take the lower amount of insurance or do they strike the higher?

CHAIRMAN CHANDLER: The average benefit in the United States is about $1.00 a day. We found that true in our own case. Even today, with the wages our men are getting and living costs where they are, they hang on to that dollar a day. It is really disheartening, sometimes, the amount of "wind-jamming" it takes to make them realize they must increase their insurance in the E. B. A. to cover present conditions. The men who take less than $1.00 a day are either pretty well loaded up with outside lodge insurance or old-line insurance—something of that kind—or young fellows who do not draw very much, or men who, like some of our officials, join because they want to—because they want to boost the E. B. A. With us a salaried man draws no relief benefits unless his salary stops: some of the office men go in out of patriotic motives, others because they want the club privileges. Our organization operates the Dodge Club, with club-rooms downtown, and you can't get into the club unless you are a member of the E. B. A.—a little more salesmanship.

Another point regarding memberships: We sometimes have an entertainment committee that is a "dead one": their entertainments are not of interest to the membership and little by little the membership will peter out. Last winter we had a real, for-sure entertainment committee. They announced their first three entertainments, and started the first one. A man could not attend the entertainment unless he belonged to the club and he could not join the club unless he belonged to the E. B. A. Without any solicitation sixty men applied to the club for admission in one week. Of the sixty, twenty-eight had to join the E. B. A. to get into the club. This shows the influence of a few live wires on the membership committee.

Another point is that of the company donating money. I have a theory that men never appreciate things they do not earn. They are suspicious, as some one has said; the fact that a company offered to donate money was *prima facie* evidence, to them, of some ulterior motive. I believe in always showing the motive, so that any suspicious character in the organization will know what the motive is and understand that it is all right. Whenever we make a donation it ought to be based on the association accomplishing certain results. Some organizations have a plan of this sort: One employer will say to his organization, "Increase your membership to 80 per cent of the employes and for every dollar you spend on your sick benefits we will spend a dollar; in other words, we will split the losses with you, or we will add a dollar a week to your sick benefits; or we will double your death benefit"—something of that kind. But the organization has to earn it. Then the motive is "We want the employes in your organization, because you will keep them well and they will do better work." You express a motive and they have to earn the donation. Other employers have offered to do so much in case the membership aver-

aged 80 per cent, and so much more if it went to 90 per cent. The plan has worked well in most cases, but I have found this disadvantage: The men who were sick or the family of one who died were the only ones to benefit, while if the donation could be in the form of dues everybody would benefit. It seems to me that it might be wise to consider the corporation paying some percentage of the dues in the event that membership percentages have been maintained for given lengths of time; that is, not to pay so much of the dues every month, but every three months, say, if the membership was up to a certain standard, the company would pay that week's dues. Everyone in the plant would then feel the effect of the contribution and know that it was made.

CLASSIFICATION OF WOMEN MEMBERS

MISS KETECKY: What is the experience of getting women members into an association?

CHAIRMAN CHANDLER: We have both men and women members. Very few organizations made any distinction.

MISS KETECKY: Women are hard to interest; a good many of the married women work only a short time to catch up with the family expenses or something of that kind; the single girls are sometimes hard to approach.

CHAIRMAN CHANDLER: You would like to have this discussed from the standpoint of salesmanship?

MISS KETECKY: Yes.

MR. CHAPMAN: The Harvester Company, in its twine mills, employs a very large number of women, mostly machine hands, and a very large percentage of those employes are of foreign nationality—Polish, Russians and Austro-Hungarians. Salesmanship is put right up to the employment department. When the applicant for a job in the twine mill comes in she gives her name and address and what she can do and is told that a physical examination is required as a condition of employment. After she is examined she is told that a benefit association is maintained by the employes and the company and that "for 1½ cents on every dollar you earn you will be paid half wages if you are disabled on account of sickness, after the first seven days; if you are injured outside of your employment you will get half wages from the hour of the day that it happens." We divide the day into four parts, up to 10 o'clock in the morning we pay for a full day; between 10 and 12 half a day; the afternoon it is also divided, but no time is allowed after 4 o'clock. "If you have any one dependent upon you in case of your death those persons will receive from the association, if your death is due to sickness, an amount equivalent to what you would have earned in the calendar year prior to the beginning of your disability. If your death is due to accident—for instance, if you are killed by a street car while going home—the amount is doubled. If you lost your hands, feet or eyes certain benefits, ranging from half of a year's salary or wages, for the loss of one eye, up to two years' for the loss of both hands, or both eyes, or the loss of one foot and one hand. All for 1½ cents on every dollar you earn."

FOREMAN ASSISTS IN MEMBERSHIP CAMPAIGN

The applicant says: "I don't know how long I am going to work. I want to wait and see." All right, she is put to work: she is not urged to sign unless she wants to become a member voluntarily. After she has worked thirty days a statement is made up of the number of employes in each department; those who are 100 per cent are put at the top of the list, then right on down to the lowest department in membership. There is a spirit of rivalry between the foremen or heads of departments. The list goes to the superintendent and he calls in John Jones, the superintendent of a department—foundry, for instance, where there is a heavy employment—and he says: "John, only 65 per cent of the people in your department are members of the benefit association. What is the matter? Here is another department that has about the same number of employes and they have 90 per cent." The foreman says: "I am going to have 90 per cent," and he goes to the timekeeper to find out who are and who are not members. He gets to those who are not members and explains it to them all over again. We make no distinction between men and women.

MR. BIGLER: Is there a waiting period between the time of signing the application and when they begin to receive benefits?

MR. CHAPMAN: If they are employed this week the membership becomes effective next Monday. If they meet with an accident on that day which does not arise out of the course of their employment they draw benefits. If they become disabled from sickness on that day, or the following day or days, they draw benefits for sickness because they have passed the physical examination and we have accepted them, subject only to waiver for physical defects.

CHAIRMAN CHANDLER: The purpose of the Program Committee, in the formulation of the work of this Section of the Congress, was to gain a consensus of opinion on certain well-defined subjects. As an outcome of our work we hope to accomplish a great deal of good not only for ourselves, but for those who are not able to be here. The proceedings of this meeting will go to some 3,000 or 4,000 corporations and indicate a solution of many vexed questions.

The Section then adjourned.

WEDNESDAY MORNING SESSION

CHAIRMAN CHANDLER: In the United States, out of 342,000 employes, members of benefit organizations, my information shows the average turnover for a year is 33 per cent. That is ridiculously small compared to the turnover in our plants, so it would seem reasonable that if we get a bigger percentage of our employes into the plan we ought to experience a more favorable turnover record. It behooves us to get more members. If we have no benefit organization we should get one; if we have one, make it a whole lot better, so that it will appeal more to the men and thus give them a greater benefit for their money.

IS SUPERVISION OF BENEFICIARIES NECESSARY?

JACOB OSWALD, MANAGER, FELS & CO., PHILADELPHIA, PA.

Mr. Chairman and Members of the National Safety Council: Is supervision of beneficiaries necessary? Where a beneficial organization is for employes and only employes of a firm or corporation, and has no official or chartered existence without the name of the firm or corporation to back it up, supervision of beneficiaries is at least advisable, if not absolutely necessary. An association of this type should be regarded as practically one of the "departments" of the firm's organization and as it is for the benefit of the employes of one individual business establishment it would naturally follow that the official head of the organization should be one of the firm's managerial staff in order to insure stability.

Particularly is this true of an association whose treasury is fathered by the firm, by means of an original working capital-surplus and by partly paying the sick and death benefits. As membership ceases when employment ceases, it naturally follows that the firm is sponsor for the association and by supervision can prevent disorganization due to shifting labor conditions, mismanagement and contentions which might arise without the controlling factor of such supervision.

Assuming, then, that supervision by the management is necessary, it would be essentially correct to have the officers of the association automatically selected from the managerial staff of the firm. Thus the officers would only be instruments to carry out the policy of the management. Their official capacity would be not elective, but appointive. The membership, then, are not privileged to choose officers or to have a voice in the vital affairs of the association. True, they can be assembled or elect representatives, yet this is a formality only, and they must bow to any policy or proposition the management may deem advisable to present. Thus we see that anything in the nature of a constitution and by-laws is not essential. The policy of the association, therefore, is an adjustable one and is changed, from time to time, in the same measure that any business adjusts itself to the changed conditions which time imposes.

LITTLE ATTEMPT AT MALINGERING

Speaking from my own experience of twenty years as manager of the Fels & Co. Beneficial Association, I may say: The less supervision, the better. The practice we have followed successfully entails a minimum of work and expense with good results. Our visiting committee consists of one man, who is selected principally on account of his willingness to do the work. He receives as compensation his dues remitted, carfare and a gratuity of $5.00 per year. At times, when the sick list is especially large and spread over much territory, he is privileged to do some visiting during working hours, for which he is paid. His duties are to visit each sick employe, after he is reported and his name posted on the bulletin board, once a week, providing he is out that long—pay him his benefit and report to the board of directors on his condition.

We allow the beneficiary every reasonable freedom from restrictions.

We do not insist on his having a physician see him unless he has neglected to report himself sick to the association and claims benefit without the visiting committee having seen him. In such a case we ask for a physician's certificate before we pay.

We find very little attempt at malingering and absolutely discourage spying on members. We recognize the fact that a member has the right to benefits when, in his own opinion, he is not in a fit condition to work. We find that the difference between the benefit and pay when working—which is one-half—is sufficient safeguard against excessive absenteeism or malingering. An additional safeguard is the clause in our by-laws which does not allow benefits for the first three days a member is absent. Before we adopted this clause we paid benefits from the first day, but not less than one week. We then had many stay out the whole week and draw benefits even on a slight indisposition. The result was very high dues and general dissatisfaction among the members, which threatened to disrupt the organization.

Malingering does occur, but mostly in cases where a member is also a member of a number of other beneficial organizations and where his total benefits amount to more than what he can earn if working. But these cases are rare in employes' beneficial associations where the supervising board and manager are the executives of the plant and have the power to dismiss an employe for misconduct, though I do not know of a single case in my experience where this power had to be used for actual or attempted malingering in connection with our beneficial organization.

REVISED CONSTITUTION AND BY-LAWS OF THE FELS & CO. EMPLOYES' BENEFICIAL ASSOCIATION

Article I. *Object*—The object of this association shall be to secure benefits to each member in good standing, when so sick or disabled as to be prevented from attending to his usual occupation.

Article II. *Membership*—Sec. 1. Any man or boy in the employ of Fels & Co. is eligible to membership, provided he be in good health at the time of application and has been in such employ not less than one month. The name to be posted for four weeks before accepted. Sec. 2. There shall be two grades of members, distinguished by the amount of dues paid and benefits received.

Article III. *Dues*—Dues will be collected pro rata to the amount of benefits paid out the previous month. One-third to be paid by the firm and two-thirds by members. No member who fails to pay his dues for four weeks after the day of collection shall be entitled to benefits; after paying up he will be treated as a new member.

Article IV. *Meetings*—Representation of the members is assured by having an elective body consisting of one or more members out of each department, known as delegates, and elected by their fellow members annually. These delegates meet with the board once a month or at the call of the president, to approve the action of the board and make suggestions or recommendations and make decisions. These, however, are subject to the approval of the works manager.

Article V. *Officers*—Sec. 1. The officers shall consist of a president, vice president, a recording secretary, a financial secretary, and a treasurer. Sec. 2. The factory executives constitute a Board of Directors, the constitution and business principles to be their guide. Sec. 3. No salaries or gratuities will be paid to any officer.

Article VI. *Committee*—The president shall appoint a committee to be known as the relief committee whose duties shall be to visit the sick, report their condition and pay the benefits. The expenses of this committee will be paid and their dues remitted by the association.

Article VII. *Benefits*—Sec. 1. The benefits of the members of the first grade shall be $1.50 per day; those of the second grade, 75 cents per day; a holiday falling on a week day will be paid. Benefits to commence three days after a member is reported sick. In case of death of a member of the first grade in good standing, the sum of $70.00; the member of the second grade, the sum of $35.00. Sec. 2. Sick or disabled members shall be put on the sick roll from the time they are reported sick to the president, committee, foreman or superintendent, and announcement of such report has been made at the meeting of the board. No benefits paid to a member during the first, second and third days. Orders for benefits shall be made out only after the report of the committee has been accepted and the orders approved by the board. Sec. 3. Discharge or being laid off from work ends the membership. Sec. 4. The total period during which benefits can be paid shall not exceed 60 days in the year, said year beginning on the first payment of benefits.

FEES, DUES AND ASSESSMENTS

W. L. Chandler, Assistant Treasurer, Dodge Sales and Engineering Company, Mishawaka, Ind.

Gentlemen of the National Safety Council: Are entrance fees desirable for new members and for reinstatement of old members?

Should revenue be collected by dues or assessments? The proper amount of dues for various combinations of disability and death benefits, with different waiting times and durations of benefits.

The matter of entrance fees is variously handled in different classes of organizations. I found in organizations conducted solely by employes, with very little co-operation from employers, that 80 per cent of them had entrance fees, varying in amount, but $1.00 seemed about the average. Forty per cent of organizations managed jointly by employes and employers had entrance fees; of those managed by employers, only one had entrance fees. In our company we thought we would influence new employes to decide one way or the other by putting the initiation fee up to $2.80 payable in seven installments, but if they joined within thirty days from the time they were employed we reduced the initiation fee to $1.40, also payable in installments. Our object was to have a "dead line"; a man inclined to put off a decision will keep on putting it off, but if you have a dead line he will decide that "now is the time." Of course, the psychological moment is when he is employed.

QUESTION OF AGE LIMIT

I also found that one or two organizations had a provision that after a man reached the age of 45 he paid a higher initiation fee. At the age of 46, for instance, he would pay an additional dollar; if he was 47 he would pay $2.00, and so on. That seems to me to be the wrong idea. If a man is an extra hazard because of his age—I do not say that he is, but if he is—collecting another dollar from him when he joins helps precious little. If he is an extra hazard you have to get an extra premium from him every week or every year in order to be just to the other members. I prepared some statistics from our organization which left me considerably in doubt as to whether age really constituted an extra hazard. I took them from the standpoints of sickness, accident and death. In one year the middle ages seemed to be most hazardous—that is, ages from 30 to 35, but the next year it was the other way, so I concluded that age could not have much to do with it. Our by-laws provide that men over 45 may join; they pay the same dues as the younger man but receive less in benefits. We found it somewhat difficult to collect dues every week—it makes trouble for the timekeepers and the secretary and treasurer in checking up their dues and receipts—but where dues are uniform much of the trouble is eliminated. Occasionally when a man draws benefits he draws proportionately less, depending upon his age. The percentages are between 10 and 30, if I remember, and 60 is the oldest age at which they are admitted. While no objection has been raised to the plan it has resulted in some of the men joining at younger ages, and from the standpoint of a man not waiting until he has passed 45 before he joins the plan seems fair enough. The fellow who joins when he is young and continues to pay dues for many years is building up a reserve—morally if not financially. Benefit organizations may not build up much of a financial reserve, but they do build up a moral reserve.

Another feature of my subject is that of "Reinstatement Fees."

A man who quits his job in our organization for any reason has to pay a fee to get back. Theoretically, this is all right, but we have an awful time collecting. Each fellow has a very good reason why he ought to be reinstated without extra charge. Our men seem quite inclined to eliminate that feature and I shouldn't wonder if they finally voted to do so. If a man is fired he will use that as a very good reason why he should not be penalized if he is rehired and wants to get back into the organization.

Next is the matter of "Dues vs. Assessments." Now and then a person speaks of assessments but really means dues—the premiums are collected every week and it is known in advance just what they are going to be; they are uniform throughout the year. An assessment is a fluctuating amount of premium that is fixed by the board of directors of the organization, and a man never knows the amount he will be assessed until he is informed by the officers—the amounts differ from time to time and are levied at irregular intervals. Prior to our re-organization an assessment was levied about every six months, but if you asked any one of the members (except one of the directors) they would swear up and down that they came once a month—nothing but assessments all the time. If the

organization is compelled to resort to heavy assessments, or to frequent assessments, it gives the members the impression, either consciously or unconsciously, that the association is not prospering, when above all we want them to feel that the organization is an unqualified success and perfectly safe and prosperous, so that if they are sick there is no question but that they will get their insurance benefit. If the dues are uniform and just high enough so that once in a while we can declare an unexpected dividend—my goodness, but it is a fine organization! It is necessary to have authority to levy an assessment—you may have an epidemic or something of that kind—and the by-laws ought to provide the means for doing so, but it ought not to be exercised except in the remotest need.

EFFECT OF DIVIDENDS

Yesterday I referred to the effect of a dividend and called attention to the fact that our organization was nearly twenty-six years old before we declared one—we had had plenty of assessments, however. I was the actuary of the organization and when I assured them positively that a dividend was absolutely safe the officers reluctantly agreed to it. The influx of new members was great enough, without solicitation, to return to the treasury more money than the dividend amounted to, showing the stimulating influence of that course. Since that time a dividend has not had the same result, but we all feel that the organization is all right and prosperous and the men have no fear that they will not get their money. Yesterday some one suggested that money was piling up too rapidly and that benefits should be increased—I want to emphasize the desirability of that course. If we can spend our surplus in giving our members medical, dentists' or oculists' care—something the corporation may not be giving, or in some way offer a service they otherwise would not receive—it would be far better than blowing in the money for idle amusements or returning it to them. The dividend amounts to so little in actual money that it does not keep the wolf from the door, but if you can spend the money for something that looks bigger than the amount itself, you have accomplished a good deal.

The whole idea I have in mind is the creation of a bunch of enthusiastic members. A secret society I belong to had a commander who spent money like a drunken sailor, but every dollar went for something that would increase the enthusiasm of the fellows, and you ought to have seen the others rush to get in. When a man is hired and hears all around him favorable comments on the employes' benefit association, he is more apt to join than if he hears nothing about it or if he hears a little knocking going on.

The question of dues is very similar to setting prices on goods at a manufacturing plant—you have to know what goods you are to furnish and how much they cost—so in determining the amount of dues you must ascertain what the benefits are to be, what you will give a man for his money. A number of things may be embraced in dues; for instance, you may cover temporary disability due to sickness or accident or both. Permanent disability, which may be the loss of a finger, is pretty well cov-

ered by compensation and I question the advisability of a benefit association attempting it. But permanent disability may also be due to sickness, and I found in our organization that if a man was disabled from sickness —in fact, for any cause—for more than thirteen weeks, the chances are, not necessarily and absolutely sure, but it is quite apt to prove that it will result in a permanent disability. To illustrate, one man had lumbago: there was no shamming about it, he was in bad shape. He was laid up thirteen weeks, but the day after he returned to work. He was still sick, but the benefits did not keep up. He still had lumbago and naturally he was not a highly efficient employe, but he did go back to work—if his benefits had kept up he would have been sick as long as they held out. We had another case where a man died within a certain time after his thirteen weeks were up. The point is that in the two years that I kept the records there wasn't a single man out of those who went beyond thirteen weeks who went back to work except the man with lumbago. It is my impression that we should consider a man who goes beyond thirteen weeks to be totally disabled.

BENEFITS FOR TOTAL DISABILITIES

Are you going to provide benefits for fellows who are totally disabled if they sustain the loss of a finger and so on which is covered by compensation? Are you going to pay benefits on the death of a member? Some associations pay benefits on the death of a member's wife. One point that appeals to a manufacturer originally came to my attention in this way: I was asked to talk before two associations of insurance men who write this kind of business. They held their conventions at Milwaukee on succeeding days. On our way over we stopped at a third convention at Chicago, where they were discussing the advisability of changing their basis from 50-50 to 60-40: in other words, they had been in the habit of reserving 50 per cent of their premiums to pay losses, spending 25 per cent of the remainder for commissions to agents and the rest for expenses and profits. They concluded they would have to pay agents a higher commission, therefore they had better reserve only 40 per cent and spend 60 for commissions, expenses and profits. They went at it hot and heavy. They didn't know who I was and I had a pretty good time. Finally I asked if I might say something as a layman; they said "Yes," so I told them what I thought about it and it started a real scrap.

In one employes' benefit association, run by employes, I found a man from the shop going around to collect dues. "I haven't the money today, Joe." "Well, I'll come around tomorrow." That fellow was taking the company's time to collect the dues, but it did not show on the records. It was costing the corporation a lot more than if the paymaster had deducted it from the men's pay. Where the employer is carrying the overhead, either consciously or unconsciously, the employe gets back in benefits more than 100 per cent. Revenue also comes from other sources. For instance, a fellow came in and wanted to sell a book. I turned the proposition over to the relief association; they thought it was a pretty good thing. The books cost 90 cents and sold for $1.25. On field days

the concessionaires turn in considerable amounts to the relief association. There are a number of sources of revenue other than dues, so that even if a man never draws benefits he is still ahead. Compare that showing with the fellows who are not satisfied with a 50-50 division and want to make it 60-40! I feel that we should be able to say to our members, "If you want to insure your wife, go ahead and do it. It will not cost the company anything to deduct a little more out of your pay as long as they know how much it is to be." We put that up to our boys and a good many of them went into it. We provide for insurance against the death of the wife. Then we also provide, for similar reasons, for the death of a child between 2 and 15 years. Under 2 years it would seem somewhat hazardous, at least the stock companies are a little fearful. We adopted rates which were obviously rather high for both the wife's and the child's benefit because we wanted to be safe, but they are under the average charged by the old-line companies.

Another point about industrial insurance, as the stock companies call it: We will say their average premium is 9 cents per week, yet they send a man to the house to collect it. Just think of the cost of collecting 9 cents per week. If a man goes to their office and pays the 9 cents he gets a lower premium, but most of them do not do that.

SOCIAL ACTIVITIES

The next item that might be covered by "Dues" is that of a club for social benefits. Let the men run it. It gives them a place for their meetings and social facilities; a hall, games of pool, cards, and reading room or library. We provide that a man must be a member of the benefit association in order to get into the club; it costs him only 5 cents a week additional, so that to take care of it you must have social benefits.

HOW TO COMPUTE DUES

As far as I am able to observe, men are inclined to view dues in terms of so much per week. This strikes me as being proper, because monthly dues look larger and a man thinks he is paying more even if he is not—10 cents a week sounds better than 43 cents a month. It is 43⅓ cents, to be exact, but he does not figure it that way. at 10 cents a week he thinks he is making 3⅓ cents.

How to pay benefits is another point. Men are in the habit of figuring their wages by the day, therefore benefits should be figured the same way. In figuring them by the week you consider fractions, so it really comes back to a daily benefit.

As a sidelight on our problem, it is a fact, I believe, that stock companies find that the $1.00-per-day policy is the general favorite throughout the United States. Since wages have gone up and living expenses have increased we have had a hard time convincing our fellows that they ought to increase the amount of their protection. A good many of them see the point, but still take a chance.

So much had been said about 10 cents per week as dues that I wanted

to determine how much 10 cents per week would pay for and I prepared a chart. It was prepared hurriedly and is not very legible, but the curve shows what 10 cents will buy and the vertical lines illustrate the number of days' waiting time. I start with three days' waiting time for thirteen weeks or less. The horizontal lines in the right hand column represent various numbers of weeks—thirteen at the bottom, twenty-eight at the top. In other words, 10 cents will pay for thirteen weeks' benefit if you have three days' waiting time; if you have fourteen days' waiting time you can give them twenty-eight weeks' benefit: if you increase your waiting time eleven days you increase the benefit fifteen weeks—quite a latitude. If you wish to provide twenty-six weeks' benefits you have thirteen days' waiting time; if you give them six days' waiting time you can give them seventeen weeks' benefit, if you have seven days' waiting time you can give them nineteen weeks' benefit. The chart is a very good illustration of the influence of waiting time. Two weeks' waiting time eliminates 55 per cent of your disability cases. These figures are based primarily on our own experience; wherever I could get figures to check against I used them, so I am satisfied these are safe for almost any organization.

In figuring rates it is necessary to have a reasonably representative membership, but one-third of these figures constitutes a factor of safety, as I added 50 per cent to our actual experience as a precautionary measure—that is where our dividends come from.

PERCENTAGE RATHER THAN VOLUME OF MEMBERSHIP

MR. J. M. EATON (Detroit): How is that affected by volume of membership?

MR. CHANDLER: I think it is affected by percentage of membership rather than by volume. That was a thing we had to determine: Whether a small shop could operate a relief organization. A harness factory with forty-five employes and 80 per cent membership went ten months without a collection of dues—they limited dues to two months because they did not need the money; they only had $5 a week benefits. They did not receive a cent from the employer, he did not co-operate with them in the least. This was the smallest association that I investigated, but I found many successful organizations with less than 100 members. I found but two had disbanded or failed; one wrote me the reason they disbanded was that one-third of their members had left their employment and their by-laws provided that they might retain membership and that this one-third had drawn two-thirds of the benefits—you see the undesirability of continuing a membership after a man leaves his employment.

I have another chart which attempts to meet the question by starting at the other end. It starts with $1 per day for thirteen weeks. The horizontal lines in the right-hand vertical column represent days of waiting time; the vertical lines shown by the bottom row of figures represent cents per week dues—including the 50 per cent factor of safety. We start with 10 cents and three days' waiting time; that is three days' waiting time will

cost 10 cents per week. If you increase that to fourteen days' waiting time, 6½ cents will cover it and still contain that fraction of safety. If you want seven days' waiting time you have 8½ cents; 7 cents would call for thirteen days' waiting time, 8 cents would call for nine days' waiting time. I will try to answer any questions pertaining to the charts.

A DELEGATE: That does not cover a death benefit?

MR. CHANDLER: No; straight disability due to either sickness or accident. In our organization we divide our dues; we have an arrangement whereby a man may take varying amounts, covering either death or disability, or he may take any combination he chooses. The charts do not include wife, child or social benefits. We have 50 cents, $1.00, $1.50 and $2.00 benefits, provided the total does not exceed 90 per cent of his wages.

A DELEGATE: How does that fit into compensation?

MR. CHANDLER: The by-laws provide that the 90 per cent total is from all sources. A salaried man receives no benefits until his salary ceases, then the thirteen weeks start from the time he begins to draw benefits. In Indiana the man who draws compensation receives 55 per cent of wages —the relief association cannot pay him to exceed 35 per cent; compensation begins at the end of the week, while relief benefits start on the fourth day. In the interval between the third and the eighth days he receives full insurance from the relief association, but that drops as soon as he begins to get compensation. If there is any element of doubt about the compensation which he is to receive the adjustment is made later.

A DELEGATE: How do you determine the relation between the dues and the benefits?

MR. CHANDLER: If you wanted to base both the dues and benefits on wages, you would have to know the relation of sickness to total payroll and to compute it in advance you would have to know the average disabilities in proportion to your wages. I am not prepared to give information on that point at present.

DEALING WITH HABITUAL SICK CASES

A DELEGATE: What influence would it have as to a man with a record of being off five or six weeks each year?

MR. CHANDLER: It is manifest that condition would influence your losses very greatly, because a man of that kind is bound to continue such a practice if it was at all habitual with him. A man might have typhoid fever and be off a long while, but a fellow who is habitually sick is a hazard. If the company hired a man of that type the relief association would take him in, that is the disposition of the membership. A point I have heard emphasized is that the average executive is unable to comprehend the viewpoint of organized labor. For example: In our band I tried to fix up a graduated scale; in other words, a beginner ought not to receive as much as a finished musician. One of our best soloists contended that everyone ought to get the same amount. I could not comprehend it, but I think that is really representative of the spirit of labor.

A DELEGATE: The union scale?

MR. CHANDLER: Yes. It was explained in this way: People are divided into two groups, one being a collectiveistic group. For illustration, like the wolves, they hunt together and never attack alone. Another illustration was the attitude of the Germans—come across one and he will surrender immediately; they have to be in a group in order to fight. So a certain class of people are collectiveistic in their ideas: they go in a group, they all want the same thing—to be treated alike. The other group is of the individualistic type, like the executive, or the cat—the cat hunts alone. The executive does his own thinking and wants pay according to what he is able to produce. The devil will take care of the other fellow, he is looking after his own interest. When I got that through my head I comprehended the labor situation better and I think I was benefited greatly.

I have still another chart. This one is intended to show the relation between the different weeks of benefit and what increase in dues must be made, assuming in all cases $1 per day as the benefit. The first thirteen weeks covers $1.00 a day up to this point—10 cents per week dues. The question often comes up, "What will it cost if you make the period twenty-six weeks?" Our experience is that if you want to make the benefits $1 a day for twenty-six weeks you must make the dues 13 cents per week; in other words, you double the time, but you do not have to double the dues. In organizing a new society it is relatively easier to make it twenty-six weeks than it is in an old organization, such as we have—I was not able to convince our fellows that we ought to make it twenty-six weeks. If you want to make it $1.00 a day for fifty-two weeks it will cost you 17 cents a week—10 cents for thirteen weeks, 17 cents for fifty-two weeks. Somebody asked me: "Suppose we want to make it permanent, sick or accident"—not for the loss of a finger, but for permanent disability while he was unable to work. As near as I can ascertain from our own figures and those of other associations which I have had an opportunity to check, by adding 2 more cents to that 17, making it 19 cents per week, you can pay 25 cents a day indefinitely after the end of fifty-two weeks' benefits. That figure, I believe, is absolutely safe. Theoretically, you ought to be able to do so even with an extra cent, making it 18 cents, but to be safe I made it 2. That represents disability benefits only; not for dependents or deaths.

A DELEGATE: Do you provide for the death of a member or dependent?

COMBINATION OF INSURANCE BENEFITS

MR. CHANDLER: Yes, but we do it in a different way. A man chooses his own combination; we have four units, as we call them. A man may insure for different amounts of disability. Fifty cents a day costs him 5 cents a week; $1.00 a day costs him 10 cents; 15 cents, then, should give him $1.50, and 20 cents ought to give him $2.00. When I put that up to our bunch of shop men on the committee one fellow said "Why, if a man can insure for $2.00 a day he ought to pay more than that." They wanted to soak him for enough to make it a good deal higher, but they finally

compromised on 25 cents if he wants $2.00 a day—they were scared that some fellow would insure for $2.00 and bankrupt the treasury. We have had one or two losses on the $2.00 men, but it is just as the stock companies find in life insurance—the best risks are the executives, the men drawing big salaries. Losses are a great deal lower on executives than they are on other risks and it has been our experience that those who take $2.00 insurance draw out proportionately less than the others. I do not know whether that is because they take better care of their health or not, but naturally the more intelligent men do one of two things: *First*, they earn more; *second*, they are more apt to realize the need for protection and to secure it.

We have another benefit for death: If a man wants a $50 benefit it costs him 1½ cents a week; if he wants $100 it is 2½ cents and so on; he can take 50 cents a day and a $200 benefit—he can take out any combination he desires.

A DELEGATE: What is your maximum death benefit?

MR. CHANDLER: At present it is $200, but I have a proposition to raise it to $1,000. I imagine that they will be afraid to do it, but I have an idea that I can compromise on $500 for the present and later work it up to $1,000, it ought to be at least $500. A $50 benefit for the wife costs 5 cents a week: $100, 9 cents: $200, 12 cents. If an employe has children he can insure the whole brood, each child on a $25 benefit costing him 2 cents a week. If he wants a $50 benefit it costs him 4 cents.

A DELEGATE: Over 2 years of age?

MR. CHANDLER: Over 2 and under 16. In arriving at cost I think it is essential to eliminate some of the variable factors. If you have too many variables in the one problem it is hard to solve, so I arrive at the disability and death benefits separately, then you can put them together any way you choose.

A DELEGATE: Do you operate without assistance from the employer?

MR. CHANDLER: The only assistance our organization ever had from the employer, in a money way, was some years prior to our reorganization. They got into a hole and the company paid them $600.00, a little more than the full amount.

A DELEGATE: What officers do you have?

ELECTION OF OFFICIALS IN BENEFIT ASSOCIATIONS

MR. CHANDLER: A president, treasurer, secretary and board of directors; they meet on company time. The secretary used to be one of the foremen, but it was bad for us to have him running around the plant; he was not on his job, he was looking after sick men and so on. I picked one of my assistants and moved his desk and then I said to him: "Luke, it's up to you to study this problem and so arrange that the men will pick you for secretary." He worked hard and tried to help them and in about three months we had an election. "Who are you going to have for secretary?" Some fellow suggested that Luke would be a good man—they wanted him and so we let them have him. Practically all his time is devoted to the

organization and so we are carrying the overhead, but it does not show on the books of the organization. When the new by-laws were under consideration the committee of twelve met with me every Wednesday afternoon for three months on company time. The directors meet every Monday from 5 to 6. The company makes this contribution, but not in dollars and cents.

A DELEGATE: Do they pay any of the actual hospital expenses?

MR. CHANDLER: We have just recently hired a nurse and bought a very complete hospital equipment, I don't know when we will get it, but it is ordered. In the last week or two the nurse has visited some of the homes where sickness has occurred. We are just starting the work and allow her to make most of her own arrangements. Prior to that time the men paid for medical service from their benefits, not through the association direct. That is one of the problems we brought here for discussion: Whether we should provide medical attention?

We have all heard of Mr. Goldie and of his splendid work. His subject is very interesting.

SIDE ISSUES WHICH MAY BE INCLUDED TO ADVANTAGE

J. H. GOLDIE, MANAGER, WELFARE DEPARTMENT, CADILLAC MOTOR CAR COMPANY, DETROIT, MICH.

Mr. Chairman and Members of the National Safety Council: It was my pleasure, two years ago, to hear Mr. Chandler discuss his thrift club, which, I understand, has been unusually successful. It is not necessary to go into a lengthy description of the operation of a thrift club, more than to say that in connection with the benefit society and our method of collecting dues we are following very much the same method as the Dodge people and one or two of the other concerns represented here. We have the dues deducted from the payroll by our paymaster. In handling the thrift club the only thing requisite, after necessary enthusiasm is aroused among the members, is to have them designate the amount of money which they wish deducted from their pay for the benefit society and added to the thrift club or savings fund, or whatever you have a mind to call it. There are so many people in a big industrial organization who never save any money, that compulsory saving—that is, compulsory after they have designated the amount that they wish to save—becomes valuable to them. The first thing a man knows he has quite a little nest egg. If it is left to the employe to put his money in the bank he will do so one week and draw it out the next. We have not attempted the organization of a thrift club, but the matter is being discussed among some of our older members and I find they are heartily in favor of it.

Another thing we have found very valuable, although we are not operating it in connection with our benefit society, is a loan fund for employes, but when I say "loan fund" I do not mean that we are running a bank—we

are operating a loan fund for emergency cases only. We have limited the amount of the loan from this fund to $50 at any one time. In starting this fund we attempted to take from the shoulders of the paymaster the disagreeable task, every pay-day, of making a lot of payroll deductions, due to advances made to workmen. Our experience was that on a payroll of approximately 8,000 people we had pretty close to 2,000 advances at one time. In looking about for some method of handling this fund we discovered among our accounts an item carried as a liability under the head of "Unclaimed Wages," men having left at various times with a half-day or a day's wages due them. This had accumulated to a large figure and was carried as a liability belonging to no one in particular, so we conceived the idea of using it as our loan fund, and we are still using it. This loan fund is being operated in this way: We devised a very long and complicated application for a loan; we make the applicant give a complete history and the reason why he needs money, how much he makes and what he does with his money. There are two reasons for that: One is not to get a bad loan and the other is to make it just as hard as possible for a man to get a loan if he does not really need it. The fellow that does not need it will not go through this system to get it.

LOANS OR ADVANCES TO EMPLOYES

Loans are made payable so much every payday, if the employe so desires. The money is not deducted from the pay, like it was under the old system, we put the man upon his honor to repay it—he states in his application just when he will do so. If he fails to pay, however, we have the right, under this application, to deduct all of it from his pay at any time. That is done on an assignment which is made a part of the application. We have approximately 7,500 employes and all but about 300 are members of the benefit society. Once in a great while a man comes in who wants a loan and he wants it pretty badly; he runs up against the snag, the rule that loans are made only to benefit men and that is used as a lever to get him into the society.

Something has been said about social activities in connection with the benefit organization. I think, perhaps, in a plant where there is no well-organized welfare department and where they have not already taken care of such things, it is a very fine idea to operate it in connection with the benefit society, particularly where membership in the society is optional with the men. In our plant we make it a condition of employment, so that everyone employed during the last three years is a member of the benefit society. Where the membership is voluntary, as in some of the smaller organizations, I would think that social activities, particularly those in connection with club or outdoor work—field work in the summer time—would be very admirable features and would tend to increase interest.

One important feature that I think we ought to consider in benefit societies, where the membership can stand the pressure, is a death benefit for the wife or the children. Mr. Chandler's suggestions on the addi-

tional amount of dues necessary will help a lot of us in working out plans to that effect. Our benefit society, at the present time, is not paying death benefits on account of the wife or the children, but we have a death benefit in all cases of members.

MEDICAL SERVICE FURNISHED TO ALL EMPLOYES

One other feature is important in connection with the medical work of the benefit society, particularly where the benefit organization has its own medical staff or the medical staff of the company is at its disposal (as in the case of our company), and that is a re-examination or a periodical examination of members, following the lines of some of the larger life insurance companies. We have discussed that in our organization from the standpoint of the company as a purely welfare proposition—keeping up the physical standard of employes—but we have not arrived at any particular decision. I believe, for the benefit of the members themselves, it should become a voluntary arrangement in the benefit society and in time will work out very successfully—an examination at least once in six months; if other conditions are satisfactory it might be oftener, but once in six months has been my idea. The examination should include urinalysis and things of that sort as often as may seem necessary. We have not tried these extra stunts in connection with our benefit society, because, as I say, we have a welfare department that is handling almost all those things. We have staff physicians on the company's payroll and their services are at the disposal of the members. For some time we did not take care of employes other than benefit members in cases of sickness, but we have promulgated a rule that absolutely every employe now has free access to the medical department for any kind of sickness or accident.

DISCUSSION

A DELEGATE: Why did you furnish medical attention to members?

MR. GOLDIE: We always furnished medical attention to members; now the rule applies to everyone in the plant.

A DELEGATE: Why did you do that?

MR. GOLDIE: Our management contended that as long as we were maintaining a high-priced medical department we ought to give everybody the advantage of it.

MR. CHAPMAN (International Harvester Co., Chicago): To what extent, if any, do your employes come in conflict with the medical profession? What is their attitude on the subject?

MR. GOLDIE: None that I have been able to ascertain. They are very friendly to our organization. Perhaps because we do not attempt to limit medical care in relation to the payment of benefits to our own medical staff—if an employe desires his own physician, that is optional with him, but we do not pay for that medical care. We pay sick benefits under a certificate of his own physician.

MR. CHAPMAN: In assuming medical care for your employes have you considered the possibility of liability for any act of the physician?

MR. GOLDIE: We have exercised as great care as possible in the selection of our medical staff.

A DELEGATE: That is a very important factor.

MR. GOLDIE: I appreciate that it is.

MR. CHAPMAN: You spoke of your organization membership, I understand it is compulsory?

MR. GOLDIE: It is, in connection with employment. When a man applies to our company for work he is required to pass a physical examination. At the time the examination is made the application for membership in the benefit society is filled out. In many cases the employe does not know he is a member until after he is in. Last summer we had approximately 4,500 applications for employment and only one rejection for membership in the benefit society.

ATTITUDE OF TRADE UNIONISTS TOWARD FUND SOCIETIES

MR. CHAPMAN: What is the attitude of the labor men on the subject of compulsory membership?

MR. GOLDIE: For a long time the labor organizations labored under the delusion that our benefit society was a system the company had for getting money with which to pay compensation. That, of course, was not true. We pay compensation under the State law and we have benefits as well. In the last year we had only one objection on the ground of enforced membership among all the applicants for employment in our works where we could trace it to a labor organization, and that was only about two weeks ago. I understand that this man did not object to the physical examination, but refused to be written up in the benefit society, on the ground that we were violating the law in doing so. He was told to come back the next morning. When he did so the physician called me up and asked me what to do about it. I told the physician to turn him down, not to accept him for employment. I found out afterward that this fellow was the chief organizer for a labor organization, that he had been trying to organize our plant as well as some other open-shop plants. He came back that morning with a copy of the session acts and attempted to show our examiner the statute which prevented us from taking members into the organization. I understand that the matter has been taken before one of the labor unions in Detroit and resolutions have been passed to investigate the matter.

MR. CHAPMAN: Do you find the Insurance Commission of Michigan classifying you under the head of organizations conducted for profit? We have had that question arise.

MR. GOLDIE: The question has been discussed on a number of occasions with the Insurance Commissioner but he has not reached a decision.

CHAIRMAN CHANDLER: The next speaker does not need an introduction. I will ask Mr. Eaton to take the stand.

GETTING AND MEASURING RESULTS

J. M. EATON, ASSISTANT TO PRESIDENT, LINCOLN MOTOR COMPANY, DETROIT, MICH.

Mr Chairman and Members of the National Safety Council: I have officiated at the birth of two benefit funds and at the death of one—at the present time I am not connected with any. Mr. Goldie and I have had a common experience in the administration of his fund, because we fought the problems together for quite a while. I was there a short time before he arrived and he was there when I left. Some interesting things have been said this morning and Mr. Chandler has made some remarkably interesting statements in reference to what can be done with a fund—how much dues we must have and what benefits we may pay. I disagree with him in practically every other statement he made because I think that it is an almost impossible task to try to put on paper the limit of possibility in the organization of a fund. When I started in to organize a benefit society in Detroit I had no more idea of what ought to be charged, or what we might pay, than the man in the moon, so I wrote to all the people that I knew had funds, and those who were kind enough to take the time and trouble to write me told me that they did not know. I finally got hold of a man whom I thought knew as much about the operation of a fund as any one in my acquaintance, Mr. Malcolm H. Wallace, who had been with the Westinghouse Electric Company, and said: "Mr. Wallace, I am going to start this fund, whether it goes up in six weeks or not. How much ought I to charge?" He answered: "Take the Westinghouse book, cover to cover, and go ahead." That was practically what we did. That fund, as Mr. Goldie will tell you, has paid considerably more in benefits than the fund to which Mr. Chandler referred and has made money hand over fist. They have a good, healthy membership all the time. The problem in that fund has not been to get members—it has been to keep them after once getting them, because on the first page of the book it says that it is a voluntary organization. A man does not have to go into it unless he wants to and does not have to stay in unless he so desires. The big job with us is to keep them in and have them in such frame of mind that they won't want to drop out.

PROMPT PAYMENT OF INSURANCE BENEFITS

One point has not been touched upon this morning that I would like to bring out and emphasize just as strongly as I am able: The matter of prompt payment of benefits. I know of a fund where the collection of sick or accident benefits is a long and painful process; it takes the sick man quite a time to get his money. The biggest argument in favor of a plant benefit society, as against the stock company which occasionally comes around and tries to horn in on your business, is that the payment of benefits is more prompt than in a stock company. There is no long string of affidavits and doctors' certificates to get out, as in one of the dollar-a-

month outfits. It used to be that every day we had a gang of fellows around the plant trying to sell stock insurance. I do not think that they come around any more. At the Westinghouse plant, after we got our benefit fund into operation, we saw only one of those men, whereas previously; on payday or the day after, I have known twenty of them there soliciting insurance business.

The little side issues are the real way to get results. I would hate to run a benefit fund solely on a dollar-and-cents basis; I would hate to feel that I was successful only if I had a good, big surplus in the treasury. I would want to feel, rather, that the fund was something that every man in the shop belonged to and in part belonged to him and that he would recommend it to his friends.

I am going to impose on Mr. Goldie a little bit and tell you some of the things he has done in connection with this fund in his organization, in addition to what he told you. The usual number of tuberculars were found, and, as you know, they are an awful problem—to the fund and to the company. The Cadillac fund had, I thought, an unusual number, and when you get one of those fellows he runs the full twenty-seven weeks. After that you do not know what to do with him, although as Mr. Goldie told you, they continue the benefits beyond the twenty-seven weeks. There is a provision in the benefit regulations whereby payments thus made apply against the death benefit and may run on indefinitely or until the death benefit is used up. There is also a provision which leaves the control of matters of that sort almost entirely to the superintendent of the benefit fund and I think in all such cases the full death benefit was finally paid, even though there were charges against it on account of continued payments of benefits.

KINDLY FEELING IMPORTANT TO SUCCESS

In order to get the result you desire, a kindly feeling on the part of your men toward the fund, you have to resort to little side issues. No man comes into Mr. Goldie's office with any sort of a request but what he is asked what I might say is a constitutional question: "Do you belong to the benefit society?" During the time I was with the company—the man who is the president of the company I am now connected with was president at the time—no man ever went into the president's, the vice-president's or general manager's office with any sort of a request, whether it was to buy an automobile on time or to get a load of scrap wood, but was asked that same question: "Do you belong to the benefit society?" We started with a purely voluntary fund; we opened the door for thirty days and let them in without a medical examination; they flocked in, no trouble about it at all. Of course, a great many were not in and we never lost an opportunity to talk the benefit society to them. We did not turn his request down because he did not belong to the society and he was not granted favors because he did, but the asking of the question had its effect.

We have had comparatively little trouble in Michigan with

the trade unions—we do not have anything to do with them. Neither have we had any trouble with the Insurance Department, but I have had trouble with myself. I have been so busy that I did not live up to our regulations—I ask the men to do it, but I do not do it myself. We have an advisory committee, the superintendent passes upon all matters and they may be appealed to the advisory committee. We are supposed to elect a full committee every year, but sometimes we run along for a good while and the members continued to serve until their successors are chosen. The gentleman to whom Mr. Goldie referred, Dan, sued us and said that we hadn't had an election of the committee and had, therefore, fallen down legally and that there was no committee. The committee then serving had been elected two years previously and we had not had another election. Dan couldn't make the judge see that and he would not let it go to the jury, but it showed me that we were legally lax and had overlooked, perhaps, an opportunity to make ourselves strong on membership.

FRICTION DURING ELECTION OF OFFICERS

During my experience there we had two elections; the first one was the greatest thing I ever witnessed. The candidates got out and electioneered and there were charges of corruption—the fellow in the warehouse was supposed to have bought his place. This was our first committee election. The story was circulated that I was making $20,000 a year out of the benefit society. The second election was conducted in a more orderly manner, but it took us practically two years to regain our courage after this second election—possibly we would not have had it yet if it had not been for the lawsuit. All of you have some sort of a committee and had your share of experiences. I used to feel that I would rather take a licking than go to an advisory committee meeting. I was the goat, you know; when I would refuse to pay a fellow because he got drunk and fell off a street car I had to get up and argue it out with the committee. We had a printer on the committee,—he was in charge of our printing shop,—and it was said by his enemies that he got his place on the committee by printing a few extra ballots. He was a mouthy individual, always had something to say, and usually directed his remarks at me. Every time the day arrived for a committee meeting, particularly if our president were there, as chairman of the committee. I did not want to attend. I think, however, I was wrong in harboring such a feeling. Perhaps I did not know how to handle the committee.

I had one other experience with a committee in South Bend. The fund had been in operation for twenty-five years. They collected 25 cents a month and they paid $7 a week for sickness for thirteen weeks, sickness only, and a $50 death benefit. They had a dance every year and what money they thought they could spare went to this entertainment. The employes were about evenly divided, Hungarian and Polish, and it had come to a point, after twenty-five years' experience, where they had to have two meetings a month rather than one, as provided by their by-laws, because the Hungarians and the Poles always had a fight, so they

had two meetings. The sick committee decided whether or not a ı should get his benefit. How that organization got through twenty years and had something like $2,500.00 in its treasury I was never abl discover.

A committee was appointed to try and revamp the association and pt on a better footing. They came into my office to talk matters over never had such a stormy session in my life and I never want another like it. This was a sick committee, you understand—I wish you m have been at that meeting! The fund broke up after they had a big f in a Polish hall and one Hungarian had his skull fractured.

I think that the only way to successfully get members is to make condition of employment and I am very strongly of the opinion tha the matter is properly presented you will have very little back fire. W I was with the Westinghouse Electric Company I presented the merit membership in the benefit fund to about 21,000 men annually and of number only two men walked out, saying they preferred not to work place where they had to join such a fund. The balance went in cheerf and remained cheerfully, because the benefits were paid promptly. Ti was very little question as to proof and no one went around to the h to see a man particularly, it was very largely up to the man to furı some simple proof of his right to draw benefits. Possibly at times fund lost a little money that was paid out for benefits that ought no have been paid, but if my experience counts for anything we can out a good deal more than we do and still have a little left over.

DISCUSSION

CHAIRMAN CHANDLER: I am glad Mr. Eaton did not take the stand the rates I suggest are too low. The figures embody practical safety a per cent of the casualty. I think the rate should be high, but just high remains for each man to decide, but they ought to be high enougl we can have dividends.

MR. EATON: Two or three years ago, in Detroit, we had this though mind: No one knew exactly the direction in which he was driving, it would be desirable to get together as large a group as we could in est in the fund and see if we could not devise some way of tabulating keeping records of our insurance, so that we might come together a year and compare notes. Mr. Chandler has done a tremendous lo work and I think that we fall short in our appreciation of his efforts am hopeful that at this conference, the first of its kind, something gible will result. I would suggest that a committee be appointed that out of their work some good plan may be evolved at a future m ing of the Section.

CHAIRMAN CHANDLER: As I understand Mr. Eaton's idea, from prev conversations with him, it is that before statistics can be formulated must have uniform records. It seems to me very important that we I a committee and that it be given whatever time may be necessary formulate a method of compiling records, so that when we meet ı

year we will have something worth while to talk about. The following year we should have worth-while figures.

MR. CHAPMAN: What have you in mind as to statistics?

STATISTICS VALUABLE IN FORMULATING INSURANCE PLANS

MR. EATON: I am quite sure there are a considerable number of things that might be recorded and be of immense value. The combined experience of all the benefit funds in the country, if gotten together in an intelligent form, would be most valuable in considering health or welfare insurance.

MR. CHAPMAN: The Harvester Company fund has been in business since Sept. 1, 1908. Realizing that some day specific information would be called for, we started with the very first day and kept a tabulation of certain diseases by nationality and by department in the various plants, mills and mines. We have that much specific information; we know the average number of cases of rheumatism and of other diseases during a certain period. A firm of actuaries, after looking over our books, said that our information was full and complete and that no other organization in the United States had compiled such information. Our annual reports have been requested by the United States and foreign governments, by public libraries, colleges, railroads and various organizations. We feel complimented on the fact that we are able to compile information that is considered of some value. If a committee is to go into the proposition it will be necessary to have a uniform statistical basis and that can only be achieved by taking the various annual reports, examining and analyzing them, and deciding upon what information is available. I should be very glad to co-operate with any committee that may be appointed.

MR. GOLDIE: I move that the chair appoint a committee of five to take up this work: the Chairman of this meeting to be a member of the committee. (The motion was seconded, voted upon and carried.)

MR. PIERCE (Morris & Co., East St. Louis): I would suggest that each delegate present act as a sub-committeeman and report his findings to the general committee for tabulation.

CHAIRMAN CHANDLER: That is an excellent suggestion. In that way we shall be able to gather together a great deal of essential information. Is there anything further to come before the Section?

MR. WILLIAMS: I move that we hold two meetings next year. (The motion was seconded and carried.)

CHAIRMAN CHANDLER: As there is no further business the Section will stand adjourned.

The Home

Few of us realize, from the standpoint of num bers, there are more "home" accidents than any other one class. Many of these are very trivial, others are of a very serious nature. It is well, therefore, for us to consider this phase of accident prevention work and ascertain just how such accidents occur. The investigation of over 29,000 accidents by the coroner of Chicago, in an eleven-year period disclosed the fact that over 15,000 occurred in the home. In many instances more than 50 per cent of the fatalities from accidents in a community result from injuries sustained in the home. Death due to an automobile or street car is generally treated by the daily press in a lurid manner, but an accidental death in the home receives scant attention and for this reason we do not realize the part "home" accidents play in our daily list of casualties.

How do these accidents occur? Falls are probably the most important single cause. They occur from defective ladders, falls on stairs caused by obstructions or defective handrails; on slippery floors; stumbling over loose rugs or small objects; from low-silled windows, on slippery sidewalks, etc. Cuts from kitchen tools, glass jars, razors, scissors, etc. form another considerable portion of our home hazards. Burns resulting from boiling water, matches, stoves, etc., annually cause many deaths or serious injuries. Carelessly placed poison also plays a part. In how many of your homes do any of these hazards exist? Safety teaching is a problem that touches us all and there is no place where it should receive more careful attention than in the home.

Health Service Sectional Meeting

St. Louis, Mo.

Sept. 17, 1918

DR. L. A. SHOUDY, Chairman
Chief Surgeon, Bethlehem Steel Company, Bethlehem, Pa.

W. L. CHANDLER, Vice-Chairman
Assistant Treasurer, Dodge Sales and Engineering Company, Mishawaka, Indiana.

TUESDAY AFTERNOON SESSION

CHAIRMAN SHOUDY: In the absence of Secretary Fleischer, who is in France in the interests of the tuberculosis survey for the government, I will ask Dr. Schram to act as Secretary.

The report of your Chairman will be very informal. Instead of devoting our time to a consideration of matters which have passed into history I propose that we proceed to outline a plan for the Health Service Section to follow during the coming year.

As a suggestion, suppose we attempt the formulation of certain standards and submit them to the Executive Committee. The headquarters office, having these on file, will be able to furnish definite information on specific points to those interested and be enabled to answer the query: "What data have you touching this particular subject?" For instance, I might want to take up the subject of "Physical Examination" and I could write to Mr. Cameron and receive the information desired. If I wanted to know what kind of a program the Safety Council recommended for the keeping of data concerning physical examination, I would receive a form card as a guide. Of course, we will not be able to formulate one card that will cover definitely the requirements of every industry, but if we prepare a standard card, and it conforms as nearly as possible to all the requirements we have found necessary, additional information can easily be noted on the back or on a supplementary card. We can work out such a card and cover the statistics desired if we know what is wanted along these lines. For instance, in the steel industry there may be some things

that we want to know that the canning industry does not care for, but in compiling statistics at headquarters—speaking again of physical examinations—there will be points that all of us will want. To make our examinations flexible, we should work out a card that on one side will cover all the information needed on physical examinations, but may not cover every point that some of us would like noted, then turn the card over and put thereon the little points you desire to enter. I think that is possible.

DATA SHOULD BE AVAILABLE AT HEADQUARTERS

If some one wrote to General Manager Cameron and asked "What standards have you on shop hygiene?" or "What can you tell us about shop sanitation?" he could turn to these statistics and give you all the data he has available. We need new standards to meet wider requirements, a broadening of the subject. We should have available the experience and findings of professional men in other industries, and this data should be on file at the headquarters of the National Safety Council.

The same is true in medical supervision. Some of the plants, or all of them, may want light on the subject "What do you include under medical supervision?" If you should write Mr. Cameron "What have you on the subject of medical supervision?" and he could give you accurate information it would be of immense service. If he sent you a great deal more than you needed you could use that part you desired, but until we give him the standards and the data necessary to compile the statistics we all desire so greatly he will be unable to fulfill your requests.

It would be advisable to have pamphlets prepared not only on the subjects I have mentioned, but on shop sanitation, shop hygiene and the safeguarding of the purity of your water supply. This information ought to be immediately available, in practicable, workable form, in the office of the National Safety Council. Other members would like to have model systems of keeping dispensary records; death or other cases; what is the responsibility between the foreman and the doctor and what responsibility is required as between the doctor and the dispensary—what is the common practice? All of that can be worked out to the advantage of the National Safety Council and to our Section. We should do this work if we are to get the full benefit of the Section. At present we are gathering the odds and ends. We do not know what this member wants or that one, but if the information I have suggested is available and you can write to the Safety Council and get the data you want we will have the hearty co-operation of all the professional men in the various walks of American life and industry: Let us co-operate with them and see if we cannot get something done.

APPOINTMENT OF NOMINATING COMMITTEE

As a nominating committee I will appoint Messrs. Waltz, Eaton and Dr. Hourigan. The committee will report Friday.

The first subject for this afternoon is "Practical Health Work for the Industries, Large and Small," a paper by Dr. Darlington. He is one of

the fathers of health sanitation in the industries. He has worked hard and it has taken time to develop the fruits of his efforts.

PRACTICAL HEALTH WORK FOR THE INDUSTRIES, LARGE AND SMALL

MAJOR THOMAS DARLINGTON, AMERICAN IRON AND STEEL INSTITUTE, NEW YORK CITY

Mr. Chairman and Members of the National Safety Council: My address will probably disappoint most of you, because I have not had an opportunity to prepare properly for this afternoon. At the same time I have some very definite ideas on illness in industry and what can be done. Yesterday I read to those assembled at the opening meeting a list of the things that could be done by the employer: a long list, which related to almost everything pertaining to health and comfort. You may think that many of these things are merely theoretical, but everyone of these things are being done—and done well—somewhere, in some steel plant in the United States. Everyone of these have been put into practice and are practical. It depends upon the place: partly, upon the size of the place and character of the industry: though most can be applied to every form of industry. This brings us to the question: What illness is to be looked for in industrial work, what are the so-called occupational diseases? Personally I do not believe much in occupational diseases. I wonder, if all the things I spoke of yesterday were done in industry, how much illness in industry would be left? Phosphorus and lead have been spoken of on many occasions as the most important occupational diseases. In the prevention of such diseases the thing of most importance is the care of the man himself: his personal hygiene, his home, and his surroundings. It is necessary for everyone to understand his own body as a machinist would understand and care for his machine, and that point—the care of the worker by himself—has been very much neglected.

CAUSES OF SO-CALLED OCCUPATIONAL DISEASES

In speaking of occupational diseases are we sure that a particular disease is one of occupation? Not long ago I had occasion to visit a certain steel plant. The owner said to me: "We have one thing we want you to investigate; it is known as nailmaker's consumption." There was little about that plant which would lead to tuberculosis as far as I could see. It was plain to me that there was no disease brought about by this particular line of work; there was nothing especially relating to the occupation that would lead to or have any connection with tuberculosis. Inquiry into the living conditions of these men showed the houses in which they lived had been built many years before. They were situated in a valley, without sewers, and the people used privies, which had been moved from one place to another until the soil had become polluted and gases came from the soil. The houses were old and not well ventilated and the men were living in these infected houses. So consumption came; due

largely, in my opinion, to unhygienic living; more especially as the people shut their windows at night and closed the shutters besides. What else could be expected? In looking over a situation like this it does not do to jump at conclusions. We must carefully investigate every factor before we can decide the cause of disease and what is best to do.

Before everything else workers should have a thorough physical examination, whether they are ill or not. In some places, not understanding the reasons for it, this cannot be done, though by proper education of the men you can probably get them to go to the doctor's office and be looked over. When that is done we have accomplished something that is worth while. First we must know what we have to cope with, after that comes the education of the workmen themselves in personal hygiene along the lines we spoke of yesterday. You should educate the man to take care of himself, and there are very few people in this work who know how to do this. Even physicians do not know any too much, especially when we come to consider that the mistakes in diagnosis are perhaps 50 per cent and that among the best physicians; in Boston at one of the best hospitals we have in this country, the diagnosis is often revealed only by the postmortem, so we cannot expect other people and the world generally to know very much.

4,500,000 HOSPITAL CASES EACH YEAR

Take the question of the tooth brush: Many of the different diseases, such as heart disease, rheumatism and various other obscure diseases, can be traced to the teeth. All that was known in 1888, but it took twenty-eight years for the truth to sink into the medical profession, and now, thirty years after its discovery, the knowledge is just reaching the people. That is one of the difficulties we have to overcome. It must be taken for granted that every workman knows nothing whatever of medicine and that he does not know how to take care of himself. Of course, they think they do, just as a young mother thinks that just because she is privileged to have children she understands how to care for her baby, but she does not, and many children are lost because they do not. This lack of knowledge is one thing you must figure on. How are you going to educate the workman? We might educate the people all over the United States; for instance, 4 per cent of the people in the United States—4,500,000—pass through our hospitals every year.

Suppose, while in the hospital, we could teach them the necessity of washing the hands, which is one of the problems we have to deal with; suppose we could educate them to keep their windows open at night; suppose we could get them to take proper care of the teeth and some of the other things relating to personal hygiene. These four millions of people educated to such things would become teachers of others and what a wonderful thing it would be for us and for our country. But suppose we go a step further: Let us take this knowledge into the industries in which we are so much interested, where we have a physician connected with nearly every plant. If we could educate the workmen of today properly to take care of themselves what a wonderful thing it would be. Even in the United States Army but little is done. The men get the little that the

officers teach them and that is all. The only way we can give this education is by repeating it over and over again. The public is very slow to learn.

DISEASE SPREAD BY VERMIN

I had the privilege in New York, on the Board of Health, of starting what is known as the Bureau of Child Hygiene and we began a physical examination of the children. We started with the heads of the children and we washed, or caused to be washed, 618,000 heads in New York in one year. We did not publish it, because we did not know what St. Louis might say. But, of course, that was an education in itself to the public, an education in cleanliness. We know that various diseases are carried by lice, just as certain other diseases come from mosquitos, flies, bed bugs, roaches and other insects. A large number of diseases originate in that way. Typhus fever and trench fever come from lice.

How are we going to educate the workmen? We might commence with circulars printed in words of few syllables in the different languages; that has never been done to any extent. We have talked and talked for many years, but it has not accomplished much. Such circulars could be put into the pay envelope. Instruction could also be given in the form of lectures. It has been talked about, but very few have done anything. In the Bureau of Child Hygiene in New York we sent out postal cards, giving information to the parents about the child's physical condition, telling of any physical defect, and asking the parent to fill out and mail the return postal card stating what, if anything, had been done to remedy these defects. How many do you think we received? Only 2 per cent, but that 2 per cent was worth while. Let us not forget that anything that means the saving of a human life or the making of a human life happier is worth while. Life has more than a money value—it is something that cannot be paid for.

I believe that the time is ripe for this education of teaching the workers to take care of themselves. The worker can do much, but it is only by patience and continued effort that he will ever be brought to see the importance of these things. Going back for a moment to the so-called occupational diseases, he should be educated as to what—in dusty occupations, for instance—the getting of dust in the nose and chest is going to do for him. That the breathing of dust has a tendency to tuberculosis and a factor in its production. Breathing dust causes an irritation, the irritation causes a cough, and the cough injures the lungs so that infection can take place. There would be comparatively little lead poisoning if every worker would wash his hands properly, but many do not. It is the question of care of the man for himself. We put many things down as charged to occupational diseases which belong to merely lack of personal hygiene.

HEART DISEASE OFTEN RESULT OF INFECTION

Many think that it is simply hard work that makes heart disease. Perhaps it does, but it is not the principal way of contracting it. A man gets arterio sclerosis principally through the introduction of certain

poisons into the system and from arterio sclerosis he ultimately dies. Old people die from hardening of the arteries or arterio sclerosis; that is to say, the arteries have muscular tissue and that muscular tissue becomes thicker and thicker, so that the passageway becomes smaller and smaller; the walls are so inflexible they cannot expand and contract and ultimately death results. Doubtless many people get arterio sclerosis and die before their time through hard work, but I also believe that most of the cases of arterio sclerosis and most of the heart diseases comes from an infection—germs getting into the blood. The germs get into the mouth and are swallowed; they go down into the intestines where they make poison and these poisons are absorbed and set up an inflammation in the linings of the arteries. They may also be absorbed in the blood from abscesses at the roots of the teeth or they may be absorbed by our tonsils.

One thing we are liable to have this winter is an epidemic of influenza. It has gone all over Europe and has reached this country as the result of our returning men from the front. When the germ gets into a person and he contracts a disease like influenza or pneumonia it generally increases in virulence and the next person who gets it has it worse and grows more virulent as time goes on. Unfortunately we did not get it in the summer, consequently we are to have it this fall and winter and there will be many cases of pneumonia and many deaths unless we are very careful. Can it be avoided among your workmen? Yes, it can. At Hog Island last year, by care, inspection and education we avoided it largely with the men who were working there.

WAYS IN WHICH "FLU" IS CONTRACTED

There are a number of ways in which the germs can be gotten—in the shops, in the houses where the workmen live, in the restaurant where they eat, where they congregate to eat their lunch from dinner buckets, or in the saloon where they go to drink. Much was done by better dish-washing. Men at Hog Island were watched closely and when it was discovered that a man had a so-called "cold" he was taken to a separate building and put under the supervision of a specialist. The specialist shrank the inflamed membranes with certain drugs and disinfected his nose and throat; then took a sample of his nasal or mouth secretions. This was examined under a microscope and frequently the secretions showed germs of pneumonia. The physicians immediately got busy and treated the condition so that, if possible, the germs might be destroyed before they found their way from the nose and mouth down into the lungs. When we talk there is a spray from the mouth at all times and that spreads infection—some people spray a great deal more than others. An investigator found, by experiment, that if you sneeze one can find germs fifteen to twenty feet away; he caught the germs on a plate. These germs are taken into another person's nostrils and mouth and, coming in contact with a broken membrane, will set up infection. Is there anything we can do to teach workmen not to talk, or cough, or sneeze in the other fellow's face? Such things can be brought about only by proper education.

As to your examinations: Your first duty is an examination to show

what condition the worker is in. You cannot get men to come in by trying to force examinations upon them; you should bring that about in another way. Don't shove. Don't say "You have got to do so and so" or try to compel them. That is not the attitude you should take. You should use the method always employed in our armies; not like the German army, where the officer compels the men to go, but like the French, where through love of country and their officers, the men follow them through fire and water. In days of old, in Scotland, at the death of Bruce they put his heart in an iron casket, and when the battle raged at the highest their leader threw the casket before him and cried: "Forth, heart of Bruce, as thou was't want! Douglas will follow thee or die."

WORKER MUST HAVE CONFIDENCE IN PHYSICIAN

It is necessary to impress upon a worker that it is for his own good that you are putting this opportunity before him, not that you are trying to exploit him or to find an excuse to discharge him. Impress upon him that it is in his own best interests that he be examined and put in the best of physical condition, thereby increasing his efficiency and the amount of his production, making him more valuable to himself and to those for whom he works.

As I have repeatedly said, first comes education. But what is the use of educating a man to wash his hands if you have not the facilities for him to do it, or if you provide dirty water for him to wash in? I talked for a long time to the management of a large steel plant to try to get them to put in showers. Why? Because of the material difference it makes in the men when going home; that, in turn, has an influence on their home surroundings—whether a worker goes home sweaty and dirty, in his foul-smelling clothes, or whether he is clean and attired in clean clothes.

For example, there is the Tennessee Coal, Iron and Railroad Company, where sometimes over 80 per cent of the negroes take a bath every night and dress in clean clothes to go home. The man that does that, by the time he gets home, has lost his grouch if he had one. He eats a good meal, does not take dirt home with him, and does not quarrel with his wife because she does not want dirt brought into the house. He goes away from the plant, leaving his fellow workmen with a smile, feeling rested and like a new man. He likes it, because he knows that the public is learning to respect him and that he does not have to get on the cars in a condition where a man is ashamed of himself, because he is dirty and covered with perspiration and with a shirt that smells. They know they are dirty and instinctively shrink from their fellow beings on account of a realization of their repulsive condition. There is, however, no need for a man to bring clean clothes and take a bath if he has not a locker to put them in. Lockers also should be provided. I told a certain company about this sort of thing and they put in showers, but later they said to me "Our workmen never use them." I said: "Let us find the reason." We turned the faucet and mud came out of those showers, muddy water; if a man were to take a shower he would be worse when he finished than when he began his ablutions—he would be worse than if

he had not taken any at all. You must treat the men in your industries just the same as you want to be treated yourself.

EDUCATE THE WORKER ALONG PHYSIOLOGICAL LINES

One of the first things to be looked into is the water supply; it must be wholesome, because that helps keep men well. A man should drink seven glasses of water a day; in some cases he should drink a great deal more. There should be first-class showers, first-class water closets, good sewage and a sewage disposal plant; this latter so that one may not injure one's neighbor further down the stream. Again when the weather is hot, the man must be kept cool. Why? I was on the border for awhile with General Funston. In some of the marches a number of soldiers were compelled to drop out on account of the heat. Why? They had on too many clothes and became overheated. There is just so much blood in the body and that blood is brought to the surface of the body through heat: as a result the internal organs are anaemic; the heart, the liver, the stomach and all the other internal organs are robbed of their normal blood supply and cannot perform their work and, as a consequence, some of these organs are not able to resist the bacteria on account of their weakened, anaemic condition. On the border there were many serious cases of appendicitis, because the blood supply was taken from the intestines to the surface of the body and left no resistance to bacteria.

The education of the men along physiological lines will accomplish much. It is up to us to have more than good intentions. We teach the worker the danger from dust, we teach him that disease can be brought into his home by flies, vermin and insects—we teach him that if there is nothing around to attract flies, no waste or refuse of any kind in which they can breed, there will be no flies. Once I wrote a circular on the fly to try to get people to clean up, for if they would clean up around the house and stables there would not be any flies. When they read the circular many people said to me: "If flies are so bad why did God make them?" I thought it was up to me to make some kind of an explanation so I put on the outside of the next edition of the circulars: "Flies were wisely ordained, but we ought not to need their services; where filth and waste are allowed to accumulate flies are needed for its disintegration and dissolution, but if filth and waste are removed the necessity for the fly is removed." At the institute these pamphlets are printed in many languages. Just to see if they were properly done I went one night to a little restaurant run by a Bulgarian and showed him a circular in the Bulgarian language and said to him, "Can you read that, 'Flies are wisely ordained,'" and he said "'Sure!' but that's funny!" I asked: "What does it say?" He said: "Flies are ministers of God, but we do not need them." He not only had the flies ordained, but consecrated as well.

We must teach the workmen to clear their homes of insects and of vermin. Whether or not that can be done depends much on the care that the home receives, and much in the character of the house itself; whether by reason of its construction or age it will harbor vermin. One should find how the workmen live, I do not care how large the plant is, try and get acquainted with the employes.

PERSONAL HYGIENE A GUARD AGAINST DISEASE

Soon in all industrial establishments we are going to have a terrible amount of contagious disease—influenza and pneumonia. Are you going to be put out of business this fall and winter by an epidemic of these two diseases going through your plants? If we are to avoid it, you will have to teach the workers, first, that these diseases take hold of them when they are fatigued; not so much in the morning, but when they come home tired: when their bodies are not in a condition to resist these germs of disease. If you can teach them how to avoid fatigue you will not have much sickness; you will not have so much loss of time by your workmen —these diseases can be avoided by personal hygiene.

There are two great causes of death that should be looked after in the industries: The first is pneumonia, the second is tuberculosis. In the city of New York two-sevenths of all deaths are due to these two diseases. Next comes Brights' disease. What is that? It is an infection of the kidneys, and when we speak of infection remember that 95 per cent of infections occur through the mouth or the nose. In the South they have another problem, that of the hookworm, which produces so much anaemia. With that disease people find it hard to work, because they have not sufficient red blood; they have not the material for circulating oxygen and they tire easily.

We must also consider the effect of illness. What happens when a man is absent from work? Someone else must take his place. The substitute is less efficient, he produces a smaller output at the same wages, gets less results, whether at the bench or machine or in supervision of workmen. All that is expensive.

The practical thing is to try and work along the lines of least resistance, educate the employe to the necessity of facing these problems and difficulties on the basis of what it means to him. He does not understand the benefits to be derived from drinking water, he does not understand the physiology and hygiene of the body, he does not always understand the necessity of having good sewage facilities or having plenty of fresh air in the home. You should provide for him in winter a properly heated place, a place that is well lighted without overcrowding. He must be taught the dangers of dust, gases and fumes. He must be taught first-aid to the injured. There should be hospitals and trained nurses and do not overlook the social workers for through this means you are going to educate the greatest number.

TRAINED NURSE HAS MANIFOLD DUTIES

It is in the home where you get the greatest amount of illness, and right here I want to say that I do not care how small the plant is there should be at least one good trained nurse as a social worker to investigate home conditions and teach hygiene in the home—to lessen the danger of contagion in the home. She should also be able to teach cooking and the proper preparation of food, for it is true, I am sorry to say, that a large majority of workingmen's wives do not know how to cook properly and I think you will all agree with me that good cooking has a

great deal to do with the prevention of disease. Some "foods" are poisonous, they are naturally so—like mushroons and certain kinds of fish. We also have a menace in certain canned goods; sometimes they are "leaded," sometimes the canning method is not right and these should be guarded against.

Those in charge of the home should be taught to cook the foods that are the most nourishing, generally these are also the most reasonable in price. Disease is caused, sometimes, by eating polished rice—this is a disease usually found in the East. Experiments with rice and other foods (made upon animals) have taught us much and some very interesting things have been discovered. We find there is something more than taking protein, carbo-hydrates, fats, etc. A certain investigator took a lot of rats and gave them a single diet—put them on a cereal. They did not grow nor breed at all. Then he put them on a balanced dietary, gave them different things—protein, carbo-hydrates, etc. They grew about halfway: small and stunted and did not live very long. The life of a rat is thirty months and most of these lived from nine to fifteen. They bred very small families. Then the experimentor added something more—cabbage—and they grew up, raised large families and lived thirty months. He tried again, and added a little butter fat, obtaining the same result. Such things are called vitamines. It seems quite evident that cabbage leads to fecundity—at least with rats.

TROUBLES AT HOME EXPENSIVE TO EMPLOYER

Again the cooking: There is something in the value of good, properly prepared, clean food, which is not as yet appreciated. I think the time will come when plants and factories will see the necessity of providing such food for the noonday meal for such of their employes as are not near enough to go home and so get rid of lunch buckets. Furnish the meal at cost—a properly balanced diet of good food, the kind that is going to do the man good. On top of that try to teach the men how to live at home and how to feed the children. Remember, home conditions make a great difference with the men working in your industry. If a man is kept awake at night with a crying baby, if he has scarlet fever in his home, or measles, or any other contagious disease, you may suffer through an accident to the man. Nearly all of these diseases can be avoided in the home. We should then have trained nurses who will teach the people at home how to avoid disease. That will lessen expense and home expenses also means fewer fingers lost in machines. If there is a sick child at home it is easy to believe that the workman has his mind somewhere else than on his machine.

When I first went on the Compensation Commission of the State of New York I was informed that a great number of accidents were due to alcohol. Out of 38,000 cases that came to my attention only about twenty-five were due directly to alcohol. Most of these accidents could be traced to carelessness; many because the workers' thoughts were somewhere else. Some girl was thinking about the young man she was going out with that night, or the young man was thinking about his girl. A man

was thinking about the family at home—perhaps he had had a quarrel with his wife in the morning: the result, an accident occurred.

I was in practice a long time and have helped to bring into the world hundreds of babies. I have been around long enough to know that home conditions bear directly on the men's working conditions and that one of the things we should do is to better the workingmen's home conditions. We should teach the things that enable the worker to take the greatest care of himself and of those he loves. Not long ago I wrote a pamphlet, not for workers but for employers—for the chairman of the board of directors, the president, the managers and the safety workers; they must also be taken care of. This took the form of ten commandments and I want to read them to you:

TEN SAFETY COMMANDMENTS

1. Keep your mouth closed when breathing, also when angry.
2. Drink cold water with your meals, also between them.
3. Bathe daily; a shower, if possible.
4. Eat slowly, this leads to eating sparingly. Make your meal a ceremonial pleasure.
5. Never read or transact any business while eating; unless you obey you will die early from arterio sclerosis.
6. Exercise daily and breathe deeply while so doing. Avoid over-exercise, never go to the point of fatigue.
7. Work ten hours and sleep eight; the balance for recreation and meals. Always rest on Sunday.
8. Ever keep a contented mind. Equanimity means longevity.
9. Neglect no attention to the body; employ a physician to examine you at regular intervals and pay attention to his information and direction.
10. Be moderate in all things; even virtue in excess may become a vice.

CHAIRMAN SHOUDY: When you come to the Safety Council you always receive something worth taking home. You may not be able to put into practice everything Dr. Darlington has told you, but if you try I think some of the things will prove feasible and lead to others.

DISCUSSION

DR. A. J. LANZA (Past Assistant to Surgeon, United States Public Health Service, Pittsburgh): I want to bring to the attention of the Section a standard card for physical examinations. A committee of the National Research Council, after many months of work, has evolved such a card. Those who have seen it take it as a distinct advantage over anything produced heretofore. This card, which is now being used at Hog Island, is printed in standard size for filing on a standard blank. The point wherein it differs from other blanks is that it takes account of the

race of the person examined—a point that has been largely overlooked. The work of the draft in this country emphasizes what was not realized before, that the same physical standards do not apply, for instance, to the short Italian as for the tall Scandinavian, and if we want to realize the most from the physical records—get out of them all that they contain—we must know the race to which the man belongs. I would like to move that this standard examination card receive the approval of and be adopted, tentatively, by the Health Service Section. (The motion was seconded.)

ORIGIN OF THE MODEL BLANK

DR. F. L. HOFFMAN: I happened to be chairman of the committee which prepared this card; the other members were Dr. J. J. Reilly, chief surgeon of the International Shipbuilding Company, and Major Davenport, chairman of a corresponding committee on military records of the army. The purpose of the card is a correct ascertainment of the man's racial antecedents. It asks for the birthplace of the father and mother, which are infinitely more governing as to the evidence of his racial origin than his own birthplace. The physical measurements are in conformity with the recommendations of the Royal Anthropological Society of Great Britain, the Committee on Anthropology and the National Research Council, of which this committee is now in a way a subcommittee, appointed by the medical section of that council.

The measurements are very simple: they are asked for in the metric system, which is not as confusing and make for rapidity with which the additions and multiplications can afterward be made, and adding to the exactitude of the measurements themselves. We ask only for the weight in the nude, or with the clothing on, or both. We ask for the height, standing or sitting, and for the arm span. We ask for the inspiration and expiration of the chest, for the curve of the arm and the strength of the hand, and we ask for the lung capacity. Now, if you wish, you can leave out anything that is immaterial. You can do so, providing what you put in is according to standard requirements. There are multitudes of blanks; we have gone over, I suppose, several hundred. All ask various questions in various ways, and the questions on the blank are arranged in the sequence in which the examination is made, so that it may be made in the shortest space of time.

We are taking observations under this system at Hog Island, with 5,000 measurements, and we know exactly to a second how long it took. Of course, at Hog Island all the men are stripped, and they are thoroughly examined. When we get through with the physical measurements we proceed with the medical examination. The medical end of it limits itself to six or seven distinct, very simple groups for examination. It begins with the nasal pharynx, then it makes observation as to whether there is a thyroid enlargement. It continues with the chest and determines whether there is a tubercular condition. It then proceeds with the abdomen and passes on to the question of hernia. It then proceeds with the genito-urinary organs and passes to the question of haemorrhoids. A blank is left for the examining physician to fill in relative to

any past diseases, so that anyone can enter up the fact that there has been rheumatism or skin disease; whatever it may be, there is room for it. We kept in mind two fundamental principles: That we first wanted exact knowledge about the man's physique and racial antecedents, and if we did not have that all the averages, all the mass of measurements, all the gross results of countless measurements, broadly, yield no returns that are applicable to any particular racial group. Take the men drafted into the army: An inquiry was received by Col. E. B. Smith of Chicago from an examiner in Arkansas, "Doctor, what can I do with my negroes? Most of them have less than two inches chest expansion and I am turning down a lot of perfectly good fighting material because the army requirement is that he must have two full inches of expansion or more. I have tried to make them breathe deeply but they do not know how." In other words, that is a racial characteristic that if you do not take into account you are turning down a large number of perfectly good men. It is to be hoped that we will, in the near future, work out an efficiency standard looking to the requirements of the particular labor requirements, and we will have to get a line on the different racial characteristics to know the general physique, the physique in relation to bodily strength, physical measurements and physical resistance, and we can never get that from a mass of useless and immaterial reports.

RESULT OF THOUSANDS OF EXAMINATIONS

There is no use collecting a mass of material that will have to be relegated to the scrapheap. I speak on this subject from some knowledge of my own, having made something of a special study of this matter, first through my own inclination and then from the standpoint of doing all that was possible in getting this data in the most feasible and workable shape for the industries. I think the blank represents about the best judgment we can arrive at and goes back over the many thousands of examinations that have been made. We have brought out such material as we think has subsequently proved valuable for many services, and if we could get, as a tentative measure, an endorsement of this idea, it would mean a great deal. The card can be altered, it may be altered a great deal, I suppose, before we are through, though, as I said, it represents the results of the information and knowledge we have been able to gather through many thousands of examinations. What I have said is the result of a great deal of thought and study, and it comes from the heart, aside from there being very practical reasons and what we consider the highest scientific reasons for its adoption. I do not think that what we have accomplished should be ruthlessly and carelessly wasted. The card is practicable and feasible in that it involves less labor than is generally consumed in noting down an examination of this kind. It is 4x5 inches, standard cabinet size, and it seems to me to embody all of the information that is necessary. If it is necessary to add anything, turn the card over and make such additional notations thereon as it is thought necessary. (On motion a vote was taken and the recommendation concurred in.)

CHAIRMAN SHOUDY: Our next speaker comes to us from a wide field of experience. I am sure you will enjoy the paper by Dr. Tucker.

THE MEDICAL ADMINISTRATION OF WORKMEN'S COMPENSATION LAWS

DR. GEORGE E. TUCKER, AETNA LIFE INSURANCE COMPANY, SAN FRANCISCO, CAL.

Mr. Chairman and Members of the National Safety Council: Based upon the theory that industry should be held responsible for its damage to human machinery and that the cost of industrial injuries is a just charge against the cost of production, state legislative bodies, actuated by a sense of justice and impelled by a high regard for humanity, have written this theory into law. In those instances where legislative provisions are wide enough and the law properly enforced the results have been largely satisfactory. On the contrary, compensation acts having provisions narrow in scope and niggardly in benefits have been unsatisfactory to administer and unfruitful in constructive accomplishments.

The maximum benefits accruing to industry, to industrial workers, and to society from the application of the compensation principle to industrial injuries are to be derived from laws whose framers recognized the importance of at least four factors:

1. The necessity of bringing the benefits to as large a group as need and are justly entitled to them.
2. The necessity of encouraging employers of labor to aid in the prevention of accidents.
3. The breadth and depth of provisions for the repair of an injured employe and his restoration to industry.
4. A fair consideration of the amount of cash benefit needed to prevent the social and economic disintegration of the worker and his family.

It is not sufficient to frame the act to include these factors if you fail to give proper consideration to the act's administration. Where any legal principle governing personal injury damages is called into operation as often as it is under a comprehensive compensation scheme, some permanent state body should exist so to administer the law as to economize in litigation and to see that speedy justice is given to everyone. The assistance of the legal profession in the administration of compensation laws is now confined largely to an interpretation of the intent of the legislature, as expressed in the various provisions of the law, and a determination of the right of the various states to give expression to such principles.

Aside from the judicial functions connected with the adjudication of claims the problem of administration is largely medical, preventive and curative. The proper medical administration of compensation laws contemplates something more than the administration of the medical pro-

visions of such acts. Viewed as a medical problem, the profession has urged the enactment of legislation looking toward the prevention of industrial injuries and their unfortunate results. To accomplish this, comprehensive safety, medical and cash benefit provisions are necessary.

SAFETY PROVISIONS

Employers should be required to furnish employment and places of employment which are safe, and to use such safety devices and safeguards and to adopt such practices as are reasonably adequate to accomplish this end. To enforce these provisions a state body should have the power and should have funds available to create a safety department, from which there should emanate, from time to time, rules and regulations governing the various types of industry. Such rules and regulations should be promulgated by that body and steps taken to bring about their enforcement. Likewise, provisions should be enacted governing the removal of safety devices and safeguards, interference with their use, and the use of methods adopted for the protection of employes.

This bureau should further have the power to establish and maintain museums of safety and hygiene, in which there should be exhibited safety devices, safeguards and other means and methods for the protection of the life and safety of employes, and to publish bulletins on any phase of this general subject.

MISCONDUCT OF EMPLOYER OR EMPLOYE

Although workmen's compensation laws, in their origin, did not contemplate consideration of the factor of fault, nevertheless, with human nature constructed as we find it, it seems highly desirable that misconduct on the part of employer or employe should be subject to penalization, and employers who, at the expense of time and capital, safeguard the lives and limbs of employes should be rewarded to an extent commensurate with the degree of success attained as indicated by their experience.

But few state compensation laws provide a penalty for both employer and employe for misconduct. In California when the injury is caused by the serious and willful misconduct of the injured employe, the compensation otherwise recoverable by him is reduced one-half, but such misconduct of the employe is not a defense to the claim of his dependents if the injury results in death, nor is it a defense to the claim of the employe if the injury results in a permanent partial disability equalling or in excess of 70 per cent of total. On the other hand, where the employe is injured by reason of the willful misconduct of the employer, or his managing representative, the amount of compensation otherwise recoverable for injury or death is increased one-half, but this increase of award in no case is permitted to exceed $2,500. The latter provision constitutes a safety measure through the inclusion of a clause to the effect that an employer shall not be permitted to insure against this penalty.

Under the provisions of the California law a safety department has been created which consists of fifteen safety engineers and ten other employes. Two safety museums have been established and annually

funds amounting to $150,000 are devoted exclusively to the campaign for preventing industrial accidents. The activities of this department are in a large degree dependent upon information obtained from the statistical department, as furnished in the analyses of the frequency and nature of accidents occurring in the various industries.

MEDICAL PROVISIONS

Any compensation law which does not in its inception have for its object the restoration of injured men to industry and the full repair of the damage sustained as the result of the industrial injury, is to that extent faulty and should be amended. It is self-evident that compensation laws should provide for full medical and hospital treatment during the period of disability, without limitation either as to total financial outlay or time during which such aid should be given. We have all witnessed the sad spectacle of the application of limitations placed by legislatures, through the provisions of their compensation acts, upon workmen seriously injured in the course of their employment. In spite of our years of experience in the application of the compensation principle to injured workmen there are still certain states which make no provision for medical aid, other states limit the time period and the financial expenditure to such an extent that medical benefits are exhausted before first-aid treatment is completed, and in but four states is full and unlimited medical and hospital aid available to injured men—California, Connecticut, Idaho and Washington.

If the medical administration of compensation laws, or the general results obtained from treatment, have been unsatisfactory in states with faulty medical provisions the blame should not rest entirely with the insurance carriers, nor the employers, nor with the medical profession, but to a large degree with the legislature responsible for the enactment of the faulty law. The premium rates provided for insurance carriers, to carry this class of risk, are based upon the responsibility which they assume in connection with the various industries and their liability is created and provided for by law. For them to assume a liability other than that upon which their rates are based would be out of accord with good business practices, and must ultimately result in financial disaster, There are instances, however, where, in order to save the payment of excessive cash benefits, it is better to ignore the limited provisions for medical aid and to assume liability for medical and hospital benefits in excess of those indicated in the act.

Experience in the handling of large numbers of injured workmen from industry has shown that, wherever possible, immediate first aid should be rendered by a physician. This is especially true in the case of major injuries. In spite of the educational propaganda which has gone forward from various agencies that have concerned themselves with the whole question of proper first-aid treatment, there are still too many industrial institutions in which proper treatment is seldom, if ever, accorded the injured, and efforts of the unskilled and untrained volunteer are more often detrimental than beneficial.

ESTABLISHMENT OF EMERGENCY HOSPITAL

To overcome this situation, in connection with the medical administration of large compensation risks, or groups of risks, it has seemed desirable to the insurance company with which I am affiliated to bring the medical attention to the injured man, rather than to transport the man to the service. The practice of employing physicians located in industrial centers has not been highly satisfactory. To overcome this it has seemed desirable to establish emergency hospitals in locations where a sufficient volume of business is available and to employ an attending physician and nurse to furnish continuous service during working hours. Since ideal medical facilities contemplate full twenty-four-hour service, control of the treatment and the distribution of seriously injured cases to the proper specialists for operation, and, after treatment, the emergency hospital—or hospital unit, as we term it—has greatly improved the conditions surrounding these risks.

The average general practitioner, with his office located in industrial centers, is prone to adhere to his own ideas as to how specific injuries should be handled and any suggestion on the part of the agency charged with the responsibility of restoring the injured man to industry is promptly and effectively ignored. The private practitioner is too often concerned primarily with the possibility of retaining the case and recovering a fee. His office is maintained for the purpose of acquiring patronage and handling business which comes to him by virtue of his reputation and his location. Too often medical assistance is selected upon purely irrelevant grounds. Insurance companies are concerned with results and their selection is more often based upon capability rather than personality.

The right of choice of physician should be conferred upon the parties responsible for the results of treatment. If we relieve the employer from the responsibility for restoration of his injured men we should, to be consistent, relieve him of responsibility for the prevention of their injuries. If we, by law, decree what industry shall do and provide a penalty for noncompliance, to be consistent we should not take away the power to reduce the penalty through preventing the injury. As a safeguard to the interests of the injured employe and as a protection against incompetent treatment, a provision might be included that would permit the employe, upon request, to have a change of physician, such physician to be chosen from at least three nominated by the employer and who are competent to treat the particular case, if three be available.

The establishment of medical units—fully equipped emergency hospitals—by private insurance carriers and the employing of a physician or physicians on full time, the selection of a proper location and the control of the method of treatment and the cases to be treated, furnishes an adjunct to the medical administration of compensation not comparable in its results with those usually obtained from the employment of private practitioners located either in the neighborhood or at some distance from the risk.

The handling of major industrial injuries is rapidly becoming a specialty within a group of specialties. It involves, first of all, early treat-

ment, the employment of all known medical and surgical aids, including X-ray, laboratory service, the utilization of hospital facilities, special apparatus, and, all too frequently, the orthopedic appliance expert. We are dealing with a class of patients who are accustomed to working, and an interruption of their usual activities for a prolonged period, as a rule, prolongs their disability and interferes with their return to their usual occupation.

The period of reconstruction should begin immediately with the period of convalescence. Experience has shown in the handling of casualties in the armies of our allied forces that delay in beginning of active interest in occupation during early convalescence frequently results in the creation of a permanently invalided soldier.

TRAUMATIC NEUROSIS

Since the pathology of traumatic neurosis is obscure and since, in fact, there may be no real anatomic disturbances, the influence of certain etiological factors now fairly well known should and can be avoided.

One of the state industrial accident commissions, through a special investigation, has made a study of 100 cases of traumatic neurosis which have come under its observation during the last three years. From a review of the material obtained in this study it is evident that there are no constant factors present in all of these cases. The age of the injured, the nature of the injury and the symtomatology are all variable. Two factors, however, are fairly constant; first, a history of suggestion of the extreme seriousness of either the injury or the patient's conditions; the other, the factor of the amount of compensation to be received. These cases almost universally complain of indefinite pains, most frequently accentuated by exercise or work. Usually there is some impairment of the function of one of the senses. There is a state of general nervousness, usually accompanied by external evidence, such as tremor. Patients complain of sleeplessness, dizziness, loss of appetite, etc. In most instances the symptoms are subjective and it is very seldom that there are definite objective evidences of injury present.

In examining the history of fifty of these cases, of which seven made satisfactory recovery, thirteen underwent complete industrial rehabilitation, eighteen made definite improvement, but there still remained symptoms which interfered with complete restoration to full earning power, and twelve cases in which the patients did not improve. In practically all of these the injured worker considered his injury much more serious than it actually was. Uniformly there is a history of a wife or relative who has constantly urged that the patient's condition was much more serious than he really thought it was, and a suggestion of either relative or friend that he would never be able to return to work. The attending physician has frequently been responsible for prolonging the period of disability in these cases, because of his discussion with the patient of the very serious nature of the injury.

It is the type of individual subject to the development of a neurosis, following either serious or minor injury, that must be most carefully

handled. If this most unfortunate complication which has developed in so many industrial patients since the adoption of compensation laws is to be avoided, the services of a trained specialist are necessary to recognize the possibility in such a case from its inception. There is nearly always the element of simulation, and the average physician, handling only a limited number of workers who have sustained industrial injuries, lacks the experience which enables him, except in the most flagrant instances, to detect it.

TRAUMATIC HERNIA

Also of especial interest in connection with the medical administration of compensation laws are the cases of so-called traumatic hernia. Although hernia is a congenital disease and in the perfectly normal subject the abdominal walls and the surrounding structures are so formed as to make it impossible for traumatism or accident to produce the condition, unless there is a tear or puncture of the abdominal wall, nevertheless, there is a tendency on the part of Industrial Accident Commissions to allow medical and hospital benefits and compensation during the period of disability for practically all cases of hernia for which claims are made.

Herniacal sacs are usually present for years, and in many instances they remain empty. "When the bowel or omentum enters this sac, at a time when the patient is undergoing strain or effort, the sufferer believes that this hernia was formed then and there, when, as a matter of fact, the entrance of the bowel or omentum into the sac was the last of a long series of antecedent and preparatory changes. The supposed sudden development is always dependent upon a mistake in observation." One authority on this subject has compared the traumatic origin of hernia to traumatic hemorrhoids. He contends that no continuous strain, be it ever so vigorous, ever resulted in hemorrhoids. "To have hemorrhoids one must first have diseased veins of the rectum. * * * If the hernia, or the protrusion of the intestines through a forced abnormal opening in the abdominal wall, was brought about suddenly—at once, from one particular strain—there would be a history of tremendous, excruciating pain, as the wall, its muscular fibers, gave way and allowed the intestines and the 'sac' to slip through. *Such is never the case.* Rarely can the claimant tell just when the protrusion occurred, except that at some particular time he noticed a 'swelling,' in most cases after a physical effort of some sort."

In spite of the fact that the best scientific opinion is to the effect that hernia is seldom, if ever, traumatic in origin, and that the acquiring of a hernia in the course of employment is not a just charge against the industry in which the worker was at that time employed, nevertheless, industrial accident commissions, whose membership is practically always made up of laymen, continue to allow these claims. The employer, apparently, has no recourse other than to follow a campaign of education of commissioners, which may ultimately result in a change of their attitude toward this non-traumatic but diseased condition.

Of less frequent occurrence, but of equal interest, are the cases of so-called traumatic sarcoma and traumatic pneumonia. Time will not permit of their discussion, but every case can justifiably be viewed with suspicion. More often the sarcoma and pneumonia antedate or precede the trauma, and all too frequently their presence is a direct cause of the unfortunate accident. In other words, the disease frequently causes the accident, but only rarely does the accident cause the disease.

FINGER INJURIES

Of the 4,265 permanent injuries occurring in California in the years 1914, 1915 and 1916, 2,437, or over 50 per cent, were finger injuries. An investigation of some 200 cases of non-infected finger injuries, conducted in 1918, discloses the fact that in 48 per cent unsatisfactory results were obtained, as evidenced by conditions present two and three years after amputation. The interest of the commission in this class of cases was based upon their knowledge that "to the average laborer the fingers are the essential tools of his craft, and anything which impairs their function seriously cripples his usefulness." The cases were grouped into those: *First*, with insufficient pad on the stump after amputation; *second*, unsatisfactory scars; *third*, ends of severed nerves caught in scars after amputation; *fourth*, deformed nerves following amputation; *fifth*, trophic disturbance, with impairment of circulation; *sixth*, immobility of fingers with consequent loss of use, and, *seventh*, miscellaneous defects.

This 48 per cent of unsatisfactory results occurring in finger injuries, although not all should be considered preventable, is a most powerful argument aginst the unwise and careless selection of surgeons to handle this type of injury. In this series of cases the subjects were mostly young, and were practically all healthy, vigorous laborers, with no inherited constitutional defects to account for the failure of the attending physician to secure useful fingers after amputation.

The tendency for states to provide compensation benefits to industrial workers sustaining an *injury* which arises out of and in the course of their employment, in contradistinction to compensating for *accidental* injuries, has introduced an administrative complication requiring careful study, anlysis and decision. Adhering strictly to the theory that industry should be held responsible for its damage to human machinery, it is evident that all occupational diseases become compensable under such a law. In California, the word "injury" having been substituted for the word "accident" as it commonly appears in most compensation laws, under the judicial interpretation of this term other diseases originating in the course of and arising out of the employment, such as typhoid fever, pneumonia, malaria and tuberculosis, commonly looked upon as having no connection with industry, become compensable. A new responsibility, therefore, is delegated to the employer, and there is a direct financial incentive for him to provide proper hygienic surroundings for his employes, with a maximum of fresh air and sunlight. Hours of labor and the question of fatigue are factors which they must consider, not only because of their bearing upon the frequency and the nature of accidents,

but also on their contributory relationship to the acquiring of such diseases as tuberculosis. They become immediately concerned with a pure water supply, and, if eating facilities are provided by them, the condition of the food and its preparation are matters which may very materially affect their compensation loss ratio. Recovery under such a law is possible for the effects of the inhalation of harmful dusts, and premium rates are materially modified where possible detrimental conditions are alleviated through the introduction of adequate exhaust systems.

PHYSICAL EXAMINATIONS

Although there has been a tendency for industrial workers to frown upon the practice of employers to require physical examination prior to employment, this practice deserves commendation and constitutes a distinct benefit alike to employer and employe, except in those instances where such examinations are used for the purpose of rejection of applicants for employment or discharge of employes. The view that the benefits from physical examinations are to be derived from proper placement instead of rejection is evidenced by the fact that one of the very large industrial manufacturing plants in which the practice of making physical examinations of employes has been carried on for years shows from an analysis of their records that of the thousands of employes and applicants for employment examined by them less than one per cent were rejected because of physical disqualifications.

During three years' service of the writer with a private manufacturing industry between two and three thousand applicants for employment and employes were given complete physical examinations. As illustrative of what may be accomplished by proper selection of workers for various occupations our experience with fifteen employes in 1914, constituting what was known as the yard gang, as compared with our experience with the same number of employes in a similar class of work in 1915 is suggestive.

The manufacture of Portland cement, involving as it does large quarry operations, necessitating the use of explosives for quarrying purposes, constitutes a very hazardous industry. In the mills the machinery is of the heavy type, and there is a maximum hazard present in but few other manufacturing plants. The department known as the yard provides work which is less hazardous than that found in any other department, with the exception of sack cleaning. In 1914, applicants for employment and employes not classed as skilled mechanics who gave evidence of high blood pressure, or previous injury to arms or legs, which had resulted in interference with function, or who showed evidence of existing disease, the presence of whuch multiplied the hazard of their employment in other departments, were selected for yard work. Out of a payroll of 626 men the fifteen workers, constituting the so-called yard gang, were responsible for 14.4 per cent of all of the accidents occurring in the four principal departments. This, in spite of the fact that the greatest exposure, not only as regards hazard but as regards numbers of men, was in the mills, quarries and in construction.

PREVIOUSLY EXISTING DISEASE

In 1915 the number of employes was reduced from 626 to 348, and opportunity was presented for the selection of fifteen first-class physical risks for yard work. These fifteen first-class physical risks, exposed to the same hazard as the fifteen bad risks employed in the previous year, were responsible for two accidents, or 1 per cent of the accidents occurring in the four principal departments. All factors that were present in 1914 were present in 1915, with the exception of the selection of a different class of men based upon their physical examination.

There is no question but that the workers who are suffering from previously existing diseases suffer a prolonged period of disability, too frequently show unsatisfactory results from treatment, and are a constant source of expense to the employer, and, indirectly, to the community at large. Information gained from physical examination prior to employment and re-examination at regular intervals during the course of employment, supplemented by treatment—when treatment is indicated—would, if properly applied, become an important factor in the prevention of accidents, in shortening the period of disability, in avoiding permanent disability, and overcoming a part of the expense incident to high labor turnover.

The arterio sclerotic, the tuberculous, the mentally defective the epileptic, and the workers with seriously defective vision, should be considered as handicapped workers, in the same sense as the employe who has lost limb or its use, and they should be carefully placed in occupations where they may become useful and not a menace to either themselves or their fellow employes.

In the study of handicapped workers and their placement, which has been so much accentuated by the war, there should be included an investigation of desirable and safe occupations in which men or women suffering with physical disabilities, brought about by previous injury or disease, may be profitably and continuously employed.

PERMANENT DISABILITIES

This discussion of the question of physical handicap naturally leads us to a consideration of the benefits which should be provided for the injured worker who sustains a permanent disability as the result of an accident arising out of industry. Unfortunately, in practically all of the states the amount of compensation payable to workers who have sustained injuries resulting in permanent disability is based upon wages, without consideration of the two other essential factors, namely, age and occupation. Presumably a continuation of payment of cash benefits after the injured worker is able to return to work is based upon the theory that the earning power of such an employe has been reduced and the payment of compensation benefits, in addition to the reduced wages, enables him to successfully rehabilitate himself.

The injustice of ignoring the age and occupational factors is apparent. A young man is more adaptable and can learn a new trade or readily

adjust himself to new surroundings and new conditions. In right-handed men the loss of the major or right hand is a serious handicap until the left, or minor hand becomes accustomed to performing the work previously carried on by the lost member. The degree of helplessness of a young worker is not at all comparable to that from which the individual past middle age suffers. Likewise, the day laborer or a man engaged in bench work is not handicapped from the loss of the major hand to the same extent as a musician whose livelihood has been gained, for instance, from the playing of the violin.

This inequality of permanent disability awards can be obviated through the establishment of a permanent disability rating department and the employment of a trained man to measure the degree of permanent disability, if any, which arises out of serious injury in any given case. At all times the question as to the length of time necessary to bring about reconstruction and rehabilitation should always be considered and compensation should be payable over a sufficient period of time to insure the prevention of an otherwise successful producer becoming a strictly consuming parasite. The welfare of society demands this, and the welfare of the individual and his family demands it. Such results from the application of the compensation principle should be expected.

COMPENSATION BENEFITS SHOULD BE ADEQUATE

The proportion of wages which victims of industrial accidents should receive, if properly determined, should be sufficient in the cases of married men with families to prevent the necessity of a wife or children prematurely engaging in industry. For the benefit of the social whole, children of industrial workers should enjoy the educational advantages which fit them to satisfactorily compete in the struggle for a livelihood under the conditions and in the surroundings which prevail during their generation. To permit the disintegration of the family of a worker earning a $6.00 per day wage and the lowering of his place in the social scale, because of having sustained a serious industrial injury, and because of inadequate compensation benefits during the period of treatment and convalescence, defeats the very purpose for which compensation legislation has been enacted. A maximum benefit of $8.00 to $10.00 or $12.00 per week is not sufficient to maintain a sufferer from a serious disability for a prolonged period of time in the status which he and his family enjoyed prior to the accident. Likewise, it seems highly desirable that provision be made for life pensions, so that the sometimes lucrative occupation of the lead pencil vender and professional mendicant will no longer find its recruits among the discards from industry.

It would also seem fair and just that the employe who has given a hand, an arm or a leg to industry, should receive a substitute in the form of a useful artificial member, and compensation laws should so provide. On the other hand, industry should be so protected that it would not be required to pay for damage for which it is not responsible. In death cases the right of autopsy for either party to the claim, subject, of course, to the order of the industrial accident commission, should be a vested right.

Refusal of the privilege of examination in death cases, where there is a question as to the cause, should be looked upon as an effort to conceal the evidence, and in California it is now so considered.

The hearings of claims by compensation administrative bodies should be in the form of an investigative hearing, rather than court trials. For this reason expert medical evidence and medical evidence as to fact should be admissable on a much more liberal and less technical basis than in trial courts, but this departure does not justify deviation, so far from established rules of evidence, as to permit the introduction of unsupported hearsay testimony by interested parties and basing of a finding solely upon such evidence.

In the last analysis compensation laws and their proper administration should bring from society, through industry, a reasonable and just return to industrial workers and their families, and the benefits which we all enjoy from the utilization of industrial products should not be obtained at the expense of unnecessary human sacrifice.

CHAIRMAN SHOUDY: We will discuss this paper, as well as the one which will follow, later in the session. Our next speaker is Mr. H. L. Goodwin.

THE CONSERVATION OF THE HUMAN EYE

H. L. GOODWIN, EFFICIENCY AND SAFETY ENGINEER, MERRY OPTICAL COMPANY, KANSAS CITY, MO.

Mr. Chairman and Members of the National Safety Council: In my lectures through the State of Pennsylvania during the past few months, under the auspices of the National Safety Council and the Department of Labor of the State of Pennsylvania, I have attended many safety conferences and heard a great deal regarding the spirit and co-operation of safety men. There is something I would like to add to that spirit and co-operation, and that is personality. No two men or women are alike—that which differentiates them is their personality. You meet a man for the first time and you carry away with you a vivid impression of his countenance, a tone of his voice and perhaps the memory of a look into his soul—his personality has played its part and won. I claim that business and the subject of safety is based upon the same thing. Follow the life history of any successful man and you will find, through the free and untrammeled expression of his personality, why he has been successful. He has overridden all opposition; moreover he has been himself, a living breathing man, and not a soulless machine. I beg of every man in the safety movement, in addition to what is called spirit and co-operation, to put his personality into the safety movement, so that it will be indelibly impressed upon the minds of the workmen under his jurisdiction. To these men under your jurisdiction, you are your brother's keeper, he is your brother, that he may go beyond the four walls of the industry in which he labors during the day and remember your personality within the four walls of his home. While awaiting my turn to speak I counted the number of persons that came into this room, and up to this time they

number 182. Out of this number I counted seventy-two who have acknowleged a defective vision and have corrected the defect. There are others present who are owners of spectacles or eyeglasses that do not at this moment have them on. Will they kindly raise their hands? I see at least forty hands, in addition to my original count of 40 per cent. From appearances all here are blessed with the financial where-with-all to buy a pair of spectacles or eyeglasses and to have their eyes tested. I want to say to those present: What do you expect we should find with the four millions of men in the industries if we should take a census or check over the men? In days of yore it might have been possible that a man did not have the price of a pair of glasses, but that cannot be said now, as the working man is getting better wages.

THE CAUSE OF MANY INDUSTRIAL ACCIDENTS

In some of the industrial plants where I have had an opportunity to examine the workmen, we have found at least 70 per cent with defective vision. A short time ago I attended a meeting in Pittsburgh and heard a safety representative of one of the big corporations say: "If we could only analyze the causes of trivial accidents * * * we are all here for the prevention of accidents." We have found one of the causes of trivial accidents, larger accidents and even fatalities. It is called defective vision. We found why we have what is termed the "human grouch" in industry, also how and why a man carries a chip on his shoulder. The fellow who takes instructions from the foreman, the superintendent or his superior, sometimes takes them because he has to. I have seen him carrying a chip, this "human grouch"; he would assault his superior if he dared. He will go to any limit that he can.

I am blessed with four boys, from 7 to 17, and one day my wife said to me: We have an incorrigible. I have been studying this boy; he seems the only one of the four that I cannot do anything with. The boys are Indians—thank God for that!—but this one boy was deemed a wild one; he is the second oldest, 14. His mother controlled him until he was 9. At 10 he was obstreperous. at 11 he couldn't be controlled. What should we do? We commenced to analyze the boy, we went to his school teacher, she watched him through the day, his mother watched him when at home. The boy did not lie and did not steal and he had a decent disposition; at that I think he would fight a steam engine—we could not do anything with him. Investigation was made as to his progress with his studies—his grades were about 70 per cent on an average. I said to his teacher: "Watch this boy for a further period of ten days, I am trying to find out what is wrong."

Being an eyeman and knowing the evils of defective vision I went after that first because his teacher said to me, after days of investigation: "Your son is always reading over here [left side]—never with the book at the right side. At home we noticed the boy was always reading at the left angle, never at a right angle—he wanted his book at the left. The normal reading distance at this angle is 14 inches, but he never held it there. We went to an oculist, he said this boy needed glasses. The

glasses did not do any good, so we kept on for four months more of investigation. We finally found an oculist that said this boy did not exactly have defective vision, but he did have what was known as spasmodic muscle trouble, such as is found in offices or among stenographers taking dictation continually at one side. It makes one eye abnormal. Then it was a simple proposition with this boy; we put him under test instrument, we retarded one eye, we developed the muscles, the six recti muscles of the abnormal eye and brought them back to normal; then we had it. We then prepared a pair of glasses that he should wear permanently. After a year and four months this boy has discarded his glasses and the little "human grouch" in the family has disappeared; his grades are up to 90 and his mother is happy.

The same thing applies to men in industry. Take a man leaving home in the morning, dinner pail on his arm, and follow him down the lane or sidewalk to the plant—with defective vision; a workman who worked in the morning, feeling more tired than when he retired the night before—temples ache, base of the brain in pain, stomach affected; he has a spine which I assume is more like a wishbone than a backbone. What do you expect with a man coming into the four walls of the plant in the morning in such a condition? He is not responsible, he cannot concentrate upon his work and his mind is not thoroughly upon the thing which he is doing. The first thing we know his finger goes into a machine. A workman is pushing a truck, his mind is not concentrated upon what he is doing, he steps the wrong way and an accident results. We have cases of men walking into boiling pits, owing to defective vision.

CAUSES OF BLINDNESS

I wanted to bring the above before you before I go deeper into the eye. I am not fortunate enough to have a blackboard, but I have a drawing here—eye drawing—that will give you a further insight of what I am talking about. We are trying to put additional eye protection into the industries. Many plants are taking it up. The subject of goggles and eye protection is only in its infancy and has not outgrown its swaddling clothes. This eye drawing is about 300 times larger than the eye itself and represents a cross-section. First; this is what is known as the cornea, the front of the eye. The cornea in the human eye is not over a quarter to an eighth of an inch in thickness; more precise, about six millimeters. If, for any reason, a piece of steel, a particle of dust, dirt or sand should penetrate the little cornea and get into the part which is known as the crystalline lens—hardly larger than the nail of your little finger and filled with a substance like the white of an egg—or go into the anterior chamber, also filled with vitreous humor, and a particle of that fluid, even as small as a pin point, work out, as the fellow said, slangly speaking, it is "all night" with you. Blindness is there. Therefore, protect that little cornea. It behooves me to beg every man in this audience, whether he be superintendent, foreman or executive, not to go into any plant unless you have your eyes protected, and you, as an executive, should go through wearing your goggles. If you were close enough so that you

could scrutinize me closely you would find that I am minus about three-quarters of an inch of hair on my forehead. That happened last March in a Pittsburgh steel plant. We were near one of the furnaces when careless workmen opened the rear door, the flames shot out, burned all the hair not protected by my hat, also my eyebrows. Thank God! I had on my eye protectors. If you do not wear eye protectors, men, and teach your men under you to wear them—I don't wish you any hard luck, but somebody will be groping in darkness wishing that he had worn his goggles.

Do any of you executives know where, if you lost an eye, you could buy one? If you had all of Mr. Carnegie's or all of Mr. Rockefeller's money, you could not buy one that would give you sight. Think it over, and while you are thinking it over, wear your goggles. I do not want any person in this audience to become a member of the blind or half-blind family. *Wear your goggles.* Keep your goggles with you, as executives, superintendents and foremen—wear them as an example to your workmen.

To give you a further insight into the eye, or what correction of defective vision means, we term the eyes the windows of the soul—a better expression would be "the cameras of the brain," but even that does not tell the whole story. Our eyes are the windows which permit the light to enter, the cameras which photograph the objects we look at, they are the "telegraph stations" which notify the brain that a picture has been taken and of what it consists. To understand thoroughly how different conditions can affect the eyes, let us consider of what the seeing apparatus consists and how it compares with the commonplace camera. The front, transparent, portion of the eye is the cornea—the window through which the light must enter—and if this window is clouded or marred, vision is interfered with. If we now consider the camera, we find that light, on entering, must first pass through the lens to be focused on the sensitive film or plate. So with the eyes, the light passing through the cornea next reaches the crystalline lens and is focused on the retina of the eye, which corresponds to the plate or film in the camera. Here the resemblance ends, because nature, in her infinite wisdom, has made the sensitive plate a screen of delicate nerve fibers which come together as the optic nerve—through this the brain receives the message of what the eye has seen. In the camera the instrument is made "longer" or "shorter," so the picture shall be clear. The length of the eyeball cannot be changed, but here again nature has provided for it by forming a little muscle which automatically causes the focusing power of the eye to increase. If the plate of the camera is defective the picture will be poor—so if the retina of the eye or the nerve be in any way affected the picture that the eye forms will be poor. We are then forced to the conclusion that any factor which causes a derangement in the mechanism of seeing, whether it be in the transmission of the light, the forming of the picture, or the notifying of the brain (any one of those conditions), interferes with eyesight. On account of workmen laboring under present-day conditions probably as much as 95 per cent of the eyes are "not perfect." Glasses nowadays are an absolute necessity and it is folly for a person

to "just try to get along in some way" without them, when at a slight expense they may enjoy absolute comfort with their eyes and freedom from unnecessary eye strain, and at the same time get rid of a certain "nervous irritability" which usually accompanies the eye strain.

AN ARMY OF BLIND MEN

To impress upon you thoroughly what the conservation of the human eye means and also blindness from industry, I want to take as an example the standing army of the United States government of two or three years ago on the Mexican border, about 25,000 men. I want to march them through the streets of St. Louis this afternoon—picture a march of these 25,000 men by a given point with you as spectators. These stalwart men in uniform, fine physical specimens, but instead of the gun over the shoulder with a bayonet at the end, I want to put that bayonet down to the ground—with these 25,000 splendid specimens of manhood blindly picking their way through the streets. For good measure add another 25,000 stalwart specimens—blind, absolutely blind—with bayonet to the ground, blindly picking their way by a given point! How long do you think it would take them to pass? For additional good measure add another 25,000 going the same way, and for extraordinary good measure add 5,000; then you have the sum total of 80,000—then you have the total of what has come out of our industries in the United States, partially or totally blind, in the last twelve to fifteen years! So fearful is this thing of eye accidents, blindness from the industries, that the State of Pennsylvania, I understand, has enacted legislation that makes compulsory the wearing of eye protectors. In the event that a workman will not work with his eye protectors, or they are not provided by the plant, that there shall be a fine of not less than $50.00 or a sentence of thirty days in jail, or both, at the discretion of the court. Manufacturer or employer is subject to the same penalty if he will not furnish proper eye protectors.

To portray further and give you an idea of what this awful thing of blindness in the industries means I have in my travels talked with and interviewed seventy-nine blind men on the street corners of the United States. I have not been looking for the man with disease marks on his face, but I have been looking for the man who had an industrial scar. In nearly every case investigated the man had come out of the industries in the United States or Canada, blind; blind from being careless; blind from being a chancetaker—he did not wear his industrial goggles or eye protectors.

I have been into some of their homes, I have had a meal with some of these men; I have been in blind institutions, and if, in a measure, any one in this audience would like to know or feel for a moment what the blind go through with, do as I have done and remain in darkness. I have lived six hours on a Sunday with my wife and children with my eyes blindfolded; finding my way in darkness through the house, to the kitchen, upstairs, and I have endeavored, in a measure, to live the part of the poor devil, the blind chancetaker from the industries. Try the experiment, then you will realize how you safety men should preach—

strong! But you must preach stronger and you would, if you realized what a horrible thing it is. I have, in a measure, lived the life of these blind men; I have wandered around stumbling into first this and that—many times I have stumbled and fallen blindly.

I have done all this that I might get an insight into what it means, this blindness. I have gone into the park with my wife and children and I have listened to their description of things about me—the flowers and grass, and trees—and tried to picture in my mind the awfulness of living in this darkness for the remainder of my life.

In the hope of picturing to you what this industrial blindness means I am going to portrary to you a composite picture of these seventy-nine men that I have interviewed. Here is what the blind chancetaker has to say to you, through me:

SPOKEN IN BLINDNESS WITH CUP AND CANE

"Men, I am blind. I come from the land where the grass is still green and the trees are just taking on their autumnal color. But, men, I am blind and I cannot see. For sixteen long years I worked in the shops of the Tennessee Coal, Iron and Railroad Company at Ensley, Ala. I went in as an apprentice and from there I went up to foreman; and, yes, men, they told me that within a few days I was slated to be assistant 'super.' But, men, that was not for me. One day, while I was coming up the main aisle in the main shop, I saw my good friend Bob Owen attempting to sharpen a tool. Bob could not do it in a workmanlike manner, so, men, I went over to Bob, and, taking the tool from him, went to the emery wheel. I heard the buzz and buzz of the wheel, and, men, I saw the sparks fly and fly, and from the end of the tool, men, there flew a tiny sliver of steel into my eye. During my pain and misery my good friend, Bob Owen, took from his hip pocket his old, dirty handkerchief and from his vest pocket an old, dirty tooth pick, rolled it up in his dirty handkerchief, and endeavored to 'pick' from my eye, instead of rolling it, the sliver of steel. But, men, that was not for me.

"Then they took me to the first aid or emergency room, but the big eye magnet could do no good. Then, men, they took me to the big hospital on the hill, and there good Dr. Evans tried to relieve me, but, men, without success. For weeks my eyes were bandaged and I was in a dark room, and each day my good wife, Mary, came to me, and, kneeling by my bedside, she talked to me and tried to comfort me in my pain and misery. I said to her: 'Never mind, dearie; I am going to save the other eye. I will soon be back in the shop and you and the kiddies will be all right again.' But, men, evidently that was not for me, the careless chancetaker! I didn't follow instructions. I didn't wear my goggles. I didn't practice, men, what I preached. Then, men, after another period of pain and suffering—the agony of which you know not what it means—when I thought things were all right, they told me that sympathetic blood poisoning had set in and that I was going to lose the other eye. And then, men, I did. I was in total blindness, darkness and despair. Now, men, if you want to know what the careless chancetaker means, if you want to know

what blindness means, come and live with me one livelong day. Up in the morning, a meager breakfast, and with a tin cup and with a cane in my hand, and with a bunch of lead pencils and a sign 'Please help the blind!' The little towhead, she takes me by the hand, and, men, down the street we go, fighting our way until we reach the corner of Nineteenth and E streets. There I take from under my arm my camp stool and I sit down, and there, men, I sway too and fro to the beat and tick of my heart, and it would seem that each beat would beat out my life, and yes, men, I hear the pennies fall and the nickels and sometimes dimes—each drop seems like a 'hunk of lead upon my head.' If it could crush me I would be happy; but, men, that is not for me, the chancetaker.

"DADDY, CAN'T YOU SEE?"

"Then, men, when the day is gone, and the grind has been hard and I am weary, the little fellow—little Bob—comes after me, and taking his daddie's hand in his he leads me gently to that little cottage, which once, men, I did own, but which no longer is mine; the mortgage has eaten it up. And there my good wife, Mary, meets me at the door and puts her arms around my neck. Men, they tell me that she no longer weighs 140 pounds, but less than 100; she has washed herself away at the washtub for subsistence for me and for the kiddies. Then, men, they sit me down and the little towhead climbs upon this knee and with her baby arms around my neck she says: 'Daddy, daddy, can't you see me?'

"No, men, I can't see my little girl; it is because I am blind. I was the chancetaker. And then, men, little Bob on this knee, with his tiny arms around my neck, and with his baby fingers on my eye lids, trying to open them, says: 'Daddy, can't you see me?' No. men, I can't see my little boy or my little girl; it is because I am blind. Men. once I was a skilled laborer, but now I am a blind, blind beggar."

CHAIRMAN SHOUDY: I am sure it strikes home to the heart of every man and woman present, you men and women who are managers, superintendents or foremen in the industries. The picture that has been portrayed before you I am sure is so indelibly impressed upon your minds that you will take it home with you and practice what you preach. It should enable each one of us to be more appreciative of the blessings that we have and thankful for the opportunities that are afforded us, by our teaching and example, to prevent untold misery and suffering.

We will now hear a paper by Dr. Ralph W. Elliott.

THE VALUE OF THE DENTAL CLINIC FROM THE STANDPOINT OF THE INDUSTRIAL SURGEON

DR. RALPH W. ELLIOTT, THE NATIONAL LAMP COMPANY, CLEVELAND, OHIO

Mr. Chairman and Members of the National Safety Council: When asked to read a paper on this subject I sent letters to various industrial medical and dental clinics, asking the results of their observations on cases that had been referred to the dentist by the physician for advice, diagnosis or

treatment. Perhaps the time has been too short, but the fact that only three or four answers have been received would lead one to think that most of those engaged in this branch of industrial work have neglected the systematic study of the cases in the dispensaries that have come either for examination or treatment and that they have thereby missed many opportunities for doing good for their employes. In the majority of clinics it would seem that mere record cards have been filled out, together with the total number of persons examined, treated or rejected, and that no attempt has been made to follow up the cases or to diminish the number requiring treatment by a careful study of the records and an analysis of the underlying causes responsible for the disabilities. Only occasionally has a note been made of the transfer of a case to the dental clinic or to a hospital for treatment; rarely do we find any record of the result of such treatment appearing on the original card.

This paper, then, must be regarded as a preliminary study of this important subject, and it is presented with the thought that it may stimulate a more careful survey of the field and ultimately bring about a more extensive and scientific study of individual records and a closer co-operation between surgeons, dentists and nurses.

Several years ago Sir William Hunter called attention to the extraordinary frequency with which oral sepsis is overlooked by all concerned—the patient, physician, surgeon and even the dentist. It is not the purpose of this paper or my desire at this time to point out how common a cause of disease mouth infection is, how grave its effects, or how often it is lightly regarded. Presently, however, I shall cite a few typical cases that have recently come under the observation of our physicians; these show what remarkable benefits frequently follow the removal of the sources of infection in the mouth.

IMPORTANCE OF ORAL SEPSIS

The special interest of dental disease arises from this: That dental cario-necrosis is the commonest and most prevalent infection in the body and that this infection is of a "mixed" character, including not only harmless organisms, but also all the most active pathogenic organisms known to the bacteriologist.

The importance of oral sepsis, or mouth infection, from an industrial standpoint has been repeatedly emphasized by numerous cases brought to our attention. These have resulted in considerable loss of time, lessened productivity, caused more or less crippling of individuals, general lowered resistance to infections and have even been the unsuspected sources of persistent ill health, due to secondary infections in the heart, stomach, kidneys and joints.

A brief resume of a few typical cases encountered in either routine physical examination of employes or in the dispensary service will show the value and necessity of careful attention to the oral findings:

Four cases of diabetes, all old and valued employes, two of them in fact in positions of great responsibility, had an average of nearly 10 per cent of sugar, progressive loss of weight, and were in a greatly debilitat-

ed condition. Their mouths all showed chronic pyorrhea, alveolar abscesses and a general pus infection. The rapidity of their improvement following radical, and in one case almost heroic treatment, was most startling. All four cases are now in good health, never miss a day, and three have been sugar free for months.

Recently an employe who had grown up in her department decided to leave because of a general inflammation of nearly all the large joints—she was so crippled that she could no longer do the work assigned to her. She was referred to the factory dentist, who finally convinced her that most of her trouble was due to the septic condition of her mouth. After the removal of an old, ill-fitting bridge and the extraction of several neglected roots the joint pains disappeared and she is a cheerful and contented operator today.

SOURCE OF INFECTION LOCATED IN MOUTH

One of the most striking cases encountered was that of an assistant sales manager, who had lost nearly six months' time on account of such a severe case of sciatica that he had spent most of his time in bed or hobbling about on crutches. The source of his infection was located in his mouth. Following an X-ray examination seventeen teeth were removed, each with a root abscess. The sciatica has disappeared, likewise the crutches.

Three cases of high blood pressure without apparent cause cleared up when old tooth stumps were removed and cavities filled. Blood pressures of 170, 160 and 170 dropped respectively to 130, 140 and 152. Associated symptoms—headache, insomnia and dizziness—also disappeared. This had led to the practice of insisting that the blood pressure be taken in all cases examined, either in our dispensary cases or in our routine physical examination of new employes.

A foreman with bloody dysentary, suppurative conjunctivitis, insomnia and subject to frequent fainting spells, on examination of the mouth showed pyorrhea, old stumps and loose, blackened fangs. The decayed teeth were extracted and the pyorrhea treated. He has no trouble of any kind now and works and sleeps well.

Several cases of habitual fainting spells, which had puzzled one of our doctors, cleared up promptly following the removal of infected teeth. This group of cases is of especial interest, as one of the most demoralizing accidents that ever occurs in a room full of girls is to have some one faint.

DISCOVERY OF SYPHILIS AND OTHER DISEASES

In a small group of cases a careful analysis was made of abscesses, covering a period of one year. During the first six months they had no dental supervision, but during the second period they all received more or less careful prophylactic treatment. An interesting observation was made that in 25 per cent of the cases the average saving in the actual number of days was one-third. Of course, it is impossible to draw definite conclusions as a result of our findings in such a small number of cases, covering a period of but a few months: however, they serve to emphasize the

necessity of a more careful and systematic study of medical and dental cases presenting themselves in our clinics.

Another interesting group of cases was those that were referred to the medical department by the dentists. Two cases of syphilis were recently discovered by the dentist in the course of his routine examination of old employes. Both were in the secondary stage, with pronounced mouth symptoms and in a most dangerous condition with respect to the liability of infecting their fellow workmen.

Numerous cases of diseased tonsils have been first seen by the dentist. The industrial dentist should, I believe, receive special instruction in diseases of the mouth, other than those directly related to the teeth. He should have an opportunity to see, with the physician in charge, all such cases that come to the medical clinic for treatment.

We all know that such cases as the above are typical and that they could be duplicated in any of our industrial clinics. They cannot but make us realize that a careful examination of the mouth, gums and teeth by a competent dentist is of as much importance as the determination of the condition of the circulatory and respiratory systems or the detection of disorders of the kidneys and the digestive apparatus. Examination of the teeth should be, therefore, a part of the routine physical examination of employes and the correction of diseased conditions in the mouth, by systematic prophylactic treatment, should be regarded as of the same importance as the treatment of organic disorders by drugs or the opening of an infected finger.

Therefore, the industrial surgeon of today has insisted upon the addition to his staff of a dental surgeon. Too often, though, the two departments are conducted as though they were separate activities. To correct this the dental dispensary should not be located in part of the building remote from the medical department, but should adjoin the physical examination laboratory and the medical dispensary. The doctor and dentist, if not full-time men, should both be on duty at the same hour. Careful medical and dental records should be kept in a file readily accessible to both departments. The results of the combined medical and dental treatment could thus be carefully studied. Needless to say, in this scheme of organization the physicians, dentists and nurses should all be under the supervision of one department head, preferably, I should say, the medical department rather than the welfare department.

THE PHYSICIAN AND THE DENTIST

There are at least sixty large industrial organizations in the United States that have well-organized dental clinics. Of these I do not know of one that has not been established because of the demand of the physician in charge that he be given this additional help in his work. From the standpoint of the industrial surgeon, therefore, the dental clinic is an absolute necessity. Without it his work must be regarded as incomplete and, of necessity, unsatisfactory. We know—you and I who are active in this work—that by intelligent co-operation the dentist and physician can truly accomplish wonders. Not only is this manifested in

the improved physical wellbeing of the employe, but his healthy body means that he will be cheerful and contented and will be able to do more and better work.

The geographic distribution of our factories prohibits frequent general conferences, but periodic meetings at intervals of every two or three months, attended by managers, nurses, surgeons and dentists of branches in towns centrally grouped, have fostered such a spirit of co-operation and have been the source of such inspiration and mutual helpfulness that these gatherings have become one of the most useful units in our plan of organization. Similar groups will eventually be formed throughout our entire industry.

I hope, too, that this spirit of co-operation in industrial work will be one of the chief factors that will eventually bring the two professions—dentistry and medicine—closer together and result ultimately in that ideal condition in which dentistry shall be no longer a separate profession, but a specialized branch of medicine; when the dentist shall be a graduate in medicine, devoting himself to diseased conditions of the mouth and jaws. To a limited extent this ideal has even now been realized in the oral surgeon, who, trained as a physician and with a subsequent surgical experience, finally completes his professional training by perfecting himself in the art of dentistry.

CHAIRMAN SHOUDY: Mrs. Semple, who was to have read a paper, has been detained. She sent me her paper and Miss Edwards from the Kimberly Clark Company of Wisconsin has kindly consented to read it.

WOMEN IN INDUSTRY, THEIR WORK AND THEIR HEALTH

MRS. SAMUEL SEMPLE, MEMBER OF THE INDUSTRIAL BOARD, PENNSYLVANIA DEPARTMENT OF LABOR AND INDUSTRY, HARRISBURG, PA.

Mr. Chairman and Members of the National Safety Council: In all the history of the world, war has never been kind to women. In primitive societies the dedication of men to the supposedly higher task of war left to women almost completely the drudgery of the maintenance of family, social and commercial life. In more advanced societies the recurrence of war brought to women added burdens and the wasting influence of anxiety and bitter sorrow, and in all societies and in all ages war brought upon large classes of women degradations that beggar description, that cheapen the sex, even in the eyes of its sympathizers, and dragged down the standards of the race for years and even centuries. With a clear recognition of all this and a distinct feeling that, on the whole, the present great war is no exception to its predecessors in its influence on the women of the world, it is nevertheless possible to gather from the present situation the record of certain by-products of advantage to women that have been the results to date of the present war.

The first, and in many ways, the most notable of these, has been the reestablishment of the dignity of the old-time occupation of housekeeping. For years the woman who merely kept house has been referred to

economically as a "spender." That she was a "producer," as she handled raw materials and manufactured them into foodstuffs and clothing, was a forgotten fact. But when armies were to be fed and great international populations saved from starvation the American world, at least, wakened to a realization that the woman in the home is a partner in the business of the world—and found her a partner efficiently "on the job." Whether or not this recognition of the reality of woman's partnership in world business affairs, through the activities of the home, will register itself in economic justice within the family remains to be seen. When men cease to "give" money to their wives and decide to accept them as equal partners in the business affairs of life this justice will have begun to rule in the family.

The next notable point of gain to woman, rising out of the present war, is the recognition of her service in the business affairs of the world outside of the home. Employing industry has been largely in the habit of considering itself as "supporting" the women it employed. This has been true, even of industries carried on almost entirely by woman operatives. Under the stress of war conditions today and the resultant labor shortage the knowledge of the debt to woman labor is being forced upon industry. More and more insistently organized industry is turning to women and its debt to her—past, present and prospective—is being somewhat ungraciously acknowledged in the demand that she shall prepare to do more and more of the world's work, and, that, in doing it, she shall relinquish much of the legal protection won for her in recent years as the mother of the race and the center of civilized life. Whether or not out of this second recognition of the reality of woman's partnership in world business affairs, through activities lying outside the home, there shall come to the women of today and tomorrow the justice of an equal wage and equal citizenship remains also to be seen. In the meantime women are at last gaining a broader economic opportunity, and that broader economic opportunity is undoubtedly the "women's work" that is named as part of the subject of this paper.

BROADENING OF ECONOMIC OPPORTUNITY

In order to understand just what constitutes the broadening of economic opportunity for women today it may be worth while to glance at the period immediately before the outbreak of the war—1914. The last census of the United States listed a little over 300 occupations in this country, and in almost 300 of them women were engaged. That meant that pioneer spirits, led by individual circumstances or by a wish for new experience, sometimes hard pressed by necessity, had ventured into almost every occupation followed as a means of livelihood in this country. It was also true that in most cases the women were present in small numbers, and that generally they were present on suffrance, so far as the industry was concerned. So remarkably true was this latter point that, even in an industry largely dependent upon women, and feeling the pressure of the labor shortage in a highly industrialized state (not Pennsylvania), it was possible within the last three months for an employer asking exemp-

tion from the woman's labor law to threaten, in case his request was refused, to discharge the women and employ men in their places. It was still further true that this spirit of suffrance toward women workers registering itself in general in a smaller wage for them, as compared with men, and a general air of surprise when they manifested intelligence comparable to that of men in the same line of work. Contrasted with that is the willingness today to open every industrial door to women, and, indeed, to thrust them through some doors where their entrance is of doubtful wisdom. The contrast extends even to the matter of payment, for, while the golden age of equal pay is still in the distance, women today are receiving wages hitherto unheard of. Their economic betterment is registering itself, sometimes unwisely, but steadily, in the main—to the greater self-dependence and clear-headedness of the sex.

Involved in the economic betterment of women at the present time is the opportunity presented for the abandonment of old employments in favor of those which present a contrasting advantage. Inasmuch as the munitions plants represent just now perhaps the highest level of wages in factory employment for women, and to a great extent combine with that attraction the further advantages of new buildings, of excitement, of novelty, of patriotic appeal, and of what is frequently the type of work described as "light," the pull to those occupations away from the old lines of factory employment is considerable. Interviews with employment managers in munitions plants have generally brought the statement that most of their workers have had previous factory experience. This new engagement has simply meant better wages and an employment more to the liking of the worker. The latter point figures still more strongly in the present shift from domestic service as a wage occupation for women to factory or commercial employment. An inquiry in 1915 led to the conclusion that in cities of from 40,000 to 70,000 in Pennsylvania, where industrial occupation for women was not artificially stimulated, the number of women in domestic service about equalled the number of women in all other occupations combined. That is decidedly not the case today. A part of the economic benefit to women as a by-product of the war is the chance to leave an occupation that still smacks of feudalism, and step over into some more independent method of earning a living. In this the advantage has been distinctly one of preference of employment since domestic service in general has come to be very well paid. Here, again, a secondary by-product of the war, as it relates to women, is in doubt. Whether the housekeeping of the future is to be so reorganized that domestic service will not be needed, leaving outside industry in practically complete possession of the field of employment of women, or whether the conditions of employment within the home will be so changed that household service can compete successfully with other occupations—this is to be determined in the future. Meantime a large class of women have moved on to something which they consider better.

A WIDE FIELD OF ACTIVITY

A letter from a writer of magazine articles some months ago expressed interest in the fact that newspaper statements credited women with

operating drill presses somewhere in Pennsylvania, and asked if that were not the first time that women had ever been known to operate machines. And yet that man's mother doubtless owned and operated a sewing machine, he probably wore underwear and hosiery knitted by women on machines, the cloth in his suit, the handkerchief in his pocket, the silk in his tie, his umbrella and the lining of his overcoat, and even the shoes on his feet were probably the result of the work of women on machines. So little do we think through the things of daily life, and so easily are we led astray by small novelties. The fact that the machine in question dealt with metal instead of with cloth or leather turned attention aside from the main point, which was that the intelligence and skill of women had handled complicated machinery in textiles and in stitchery for years, and had thereby made a vast contribution to the industrial wealth of the country. Even in the handling of metals woman's work did not begin with the war. To quote from a brochure on the Wartime Employment of Women in the Metal Trades, issued by the National Industrial Conference Board: "As early as 1867 women were grinding drills, tending light machines, and performing filing operations in a machine shop in New Bedford, Mass. By 1872 they were commonly employed in the manufacture of nails and tacks. Gradually women were introduced into similar occupations in other industries, as in the manufacture of electrical machinery, apparatus and supplies, which, in 1914, engaged a larger number of women than in any other branch of the metal trades." The same study goes on to give an avowedly incomplete list of eight processes in the metal trades which were performed by women as early as 1908. The superintendent of a Massachusetts industry recently told of a town in the state, dominated by the metal trades, where women had been employed for twenty years as machinists—not merely operators of machine tools—and where the standing of these women machinists was attested by their unquestioned admission to the machinists' unions. To quote again from the brochure mentioned above: "The expansion of women's activities at this time [in the metal trades] may be regarded, not as a radical innovation, but rather an acceleration of normal development." The railroads of the country are making what is perhaps the most comprehensive effort now in process to employ women in places formerly held by men. The Pennsylvania Railroad alone, in the single state of Pennsylvania, reports the employment of women in sixty-nine different occupations. These run the gamut from office to track work.

Women *can* run machines, women *can* work in metals. Indeed, it may be accepted as a business truism that women *can* do practically anything men can do. In the mental field, purely as an academic question, it was pretty clearly demonstrated in a series of studies and experiments carried on in connection with the University of Chicago about eighteen years ago, that there was little if any foundation for the old theory of sex differentiation in the quality of brain. It may be about as positively held that there is no sex in the quality of brawn, whatever difference there may be in the quantity. In the study of the selection of industrial occupation for women at this time a distinguished Philadelphia physician

writes: "I am proceeding upon the basis of the belief that a woman of equal strength can perform any work that a man does, provided allowance is made for the anatomical and physiological facts."

Since the theory that woman *can* do all these different kinds of work is upheld by the fact that she *does* do them, it remains to ask how satisfactorily she does them. Here testimony differs. The most condensed and comprehensive material on this line that has come to hand is again that in the brochure on the Wartime Employment of Women in the Metal Trades. The summary given therein, on this point, is based on an investigation of 127 plants and reads as follows: "In a majority of establishments included in this investigation, where women were employed in the same work, they have equaled or excelled men in respect to output In some processes their superiority is marked. As a rule, however, they have not been employed on highly skilled work, and it is on light, repetitive work, requiring little experience or initiative, that they have made their best record. Nevertheless, it cannot fairly be concluded from available evidence that women are unfitted for highly skilled operations, since, in this country at least, they have had no adequate test of their ability."

A study of the tables on which this summary is based reveals an apparently marked connection between what might be termed the "weight" of the work and the rate of output by women. In other words, the quantity of brawn and endurance enters into the answer to the question of how women are doing all this work.

WAGES PAID WOMEN WORKERS

One other point should be clearly stated before leaving this part of the subject: The introduction of women into all new industries (new to women) and the acceleration of the rate of their employment is almost universally based upon a lower wage scale, as compared with payments to men. This was true in the days when women broke their way into the business of teaching school, receiving $12.00 to $16.00 per month, when men received $20.00 and $25.00. It is true today on railroads and in machine shops, where, in many cases, women receive from 2 to 10 cents an hour less than men on similar work. Even where the statement is made that the women are paid the same as the men it often means that the women are paid what was paid to the men who previously held the same positions, not what men would be paid if they held those positions now. Some firms even frankly say that their policy is to pay women only from 70 to 85 per cent of what they would pay men for similar work. Superintendent after superintendent has said: "They say it's a matter of patriotism to employ the women and release the men, but let me tell you it is because they get them cheaper."

With a great degree of justice it may be said that it does not matter if women are paid less than the men, provided they are receiving a higher wage now than ever before and are having the chance to make their way into occupations more to their liking. The other side of the shield is found in declarations such as that made by the managing head of one of

the largest concerns in the country that the industries must be allowed unrestricted freedom in the employment of women if they are to retain their American supremacy; for, said he, women represent cheap labor and cheap labor must be the dependence of the American industries after the war. If many industrial leaders believe that—and signs are not lacking in that direction—it is quite possible that the threatened economic struggle after the war may be not only international, but bitterly and unrelentingly intra-national as well.

It is then clearly the logic of fact that women *can* do and *are doing* practically all kinds of work. It remains but to ask what, of all these kinds of work, women *ought* to do. That "ought," under present world circumstances, should concern the women themselves and society from the American point of view—world welfare—not only now but in the period of reconstruction after the war. This "ought" seems to be what was in the mind of the person who assigned the subject of this paper.

There are not lacking those at the present time who say that all considerations of personal or social "oughtness" should be submerged in the one desire to win the war; who advocate as the quick and ready way to this end the indiscriminate use of all human material—man, woman and child—that can be gathered. A critical observer analyzing this situation might be pardoned if he arrived at the conclusion that the most ardent advocates of this policy are those whose personal lives have not been harshly touched by the war, either as regards ease, relationships or privations. But, gladly accepting the present and paramount duty of winning the war as the first consideration for all woman as well as for all men, is there any line to be drawn as to what work women entering the industrial world today ought to be asked or permitted to perform?

OLD LINES OF DEMARCATION WIPED OUT

On the personal side, as pertaining to the women themselves, their economic opportunity and their industrial relationships, it may be said with positiveness that certain old lines of demarcation of woman's sphere should be rubbed out. If a woman can more nearly approximate economic justice outside the home than within it, the privilege of seeking it should be hers. If she can secure a better wage working in metals than in cloth, there should not be any feeling that in seeking the better paid occupation she has endangered her womanhood, even though she has donned the bloomers or overalls appropriate to her new work. A certain proportion of the disapproval of the entrance of women into many lines of employment is founded upon sentiment, held in the thought of honor to the women, but as hampering as the binding of Chinese feet. A certain other proportion of this disapproval is founded upon distrust of the mentality of women and upon the conviction that morality can be preserved only in comparative seclusion. It seems to be a matter of history that at one time even a baby carriage was looked upon as a machine whose operation was likely to endanger the stability of a woman's character. It is then, perhaps, not a matter of wonder that a drill press or a lathe should be looked upon with suspicion.

Perhaps we may arrive at the possible conclusion that women ought to be permitted to do anything that they may wish to do (it being conceded that their wish will be governed somewhat by economic advantage) and that does not carry with it a special menace to them as a sex, over and above that which is involved for men in the same occupation. In view of the fact that many industries are notoriously and criminally unsafe, even for men, this statement needs to be guarded by a clause to the effect that no women should be admitted to what is for them a new industry until it has been made decently safe for human beings. A certain cheap form of patriotism is opposed to this, on the ground that safety is not a prime consideration in the front line trenches. It may be said in reply that safety for women and children is, beyond dispute, one of the reasons why American men are in those front line trenches, and to endanger that safety at home while men are giving their lives for it abroad will scarcely give true aim to the ammunition sent across the seas.

What are the specific industrial risks to woman because of her sex? Whatever may be said of night work in well-organized, specially guarded groups (and much opinion on both sides is now being expressed) there seems practically no room for a difference of opinion on the sex risk of night work performed by women in isolated locations, whether in railway towers, in out-of-the-way corners of industrial plants, or in telephone exchanges which place one woman in a deserted business block. Neither does there seem to be room for two opinions as to the sex risk for women or girls acting as call boys for the railroads, or as meter readers or testers, called into buildings of all kinds. Again, in certain chemical employments, the special risk for women, over and above that for men, seems to be pretty clearly conceded and defined.

In addition to these risks, arising from special employments, it is clear that to all women in all occupations there are certain dangers that do not affect men because they arise from fundamental anatomical and physiological differences between the sexes. Continuous standing is one of these dangers, the recognition of which has led to legislation as to seats for employed women. The lifting of heavy weights is another danger necessarily much greater to women than to men. A recent visit to a factory located women who in the course of the day lifted 34,000 pounds by continued muscular effort, unaided by mechanical appliances. Women are being placed at handling freight, at loading and unloading coal and bricks, and even in some cases at laying railway ties and track. It seems to be established by medical standards that women are more susceptible to fatigue and to nervous strain than are men and that the results of both, with women, are especially serious and lasting.

HEALTH NECESSARY TO EFFICIENCY

In view of all these facts, and because of the continuously increasing entrance of women into a wider circle of employment, the Industrial Board of Pennsylvania has been attempting to develop standards to guide the placing of women industrially. This is not merely a matter relating to the women themselves, but is tied up with the development of

general industrial efficiency, is attested by the reports of the British Health of Munitions Workers' Committee. That report, the result of careful study of the admittedly reckless employment of woman labor in England during the war period, presents the conclusion that, for purposes of efficiency, employment should be classified as very light, light, heavy and very heavy, and that the labor of women should be utilized only on the light and very light. In narrower experience, under less vital pressure, the observations listed in the before-quoted brochure on the Wartime Employment of Women in the Metal Trades tells the same tale. When women are given heavy work to do their performance and output is less satisfactory. Unbroken health and industrial efficiency seem to go hand in hand. If this lesson is learned in time the American industrial world, in its wartime utilization of the labor of women, may demonstrate the mathematical truth that scientific altruism and scientific selfishness amount to one and the same thing.

A successful manufacturer in a New England state, a large and sympathetic employer of women, has written that the whole subject of proper employment for women, in his experience, is complicated by the fact that most women industrially employed also carry some degree of home responsibility. In other words they carry two jobs—this is true of a large percentage of the unmarried as well as of practically all of the married women in industry. Here the question of "ought" in the employment of women becomes of social importance and touches the standards of American life. Employment so heavy, so nervously strenuous, so long continued or so poorly placed as to hours as to undermine a woman's health means a social effect on the future or present home and family that constitutes poor patriotism toward America.

It is worth while to face the fact that opinion as to what is the real and necessary effect of some of these points upon health is undergoing a change at this time—a change that may be needed and a change that also needs to be carefully watched, lest it should mean something in the nature of the old fable concerning the man and the bed—an arbitrary fitting of women to work rather than the wiser adaptation of work to women.

SOCIAL EFFECTS OF EMPLOYMENT OF WOMEN

The social effects of the employment of women must include the effects upon family and child life. In some of the more unrestricted states, as regards employment for women, resulting in the increased employment of married women by day and by night, the courts are already reporting increased delinquency among children, social agencies are reporting uncontrolled juvenile life in general and physicians are calling attention to an increase in infant mortality. To meet this situation, and also to make available to industry a larger supply of woman labor, there is arising a desire to establish in this country, as there has been established in Great Britain and France, a system of day nurseries or *creches* for the small children of working women. Someone has well characterized such plans as "molasses to draw flies" in the winning of young mothers to industrial employment. Surely if such a system should become necessary in this

country it should not be left to the perhaps biased guidance of industry itself, nor to the fitful interest of private philanthropy. It should be under the care of the public school system of the country—a downward extension of the kindergarten system—requiring a system of employment certificates for the mothers and working in close co-operation with the mothers' assistance schemes. The greatest asset of a contry is its children and the public school system, centered around the thought of the value of all the chidren of all the people to all the people, should be utilized to help solve today's vexing questions of the further industrial employment of women.

Another phase of the social aspect of the employment of women is the query: To what extent women ought to be urged into industries not best adapted to them while the use of alcoholic beverages is permitted to reduce the working efficiency of the manpower of the country? Also there are not lacking those who charge that limitation of output on the part of male labor is partially responsible for the call to women to press into industry immediately. All these points must be considered in the social aspect of the question: What "ought" women to be urged and permitted to do at this time?

The remaining thought—the world application of this "oughtness"—is simply a wider scope of the social view. To insist today that America should do thus and so with its women, because Great Britain or France is following that policy, is to miss the point of America's place in the world's progress and ideals. Presence in England, in the summer of 1911, when the great strikes began, revealed the fact that men left trains standing on the metals because the "railway servants" of the country were contending for a minimum manhood wage of a pound a week and thousands of women in the jam factories of London were on strike against a wage of 7 or 8 shillings per week, staking their all in an effort to secure 10 shillings per week. The wage question in this immediate connection is beside the point, except as it illustrates the difference in industrial standards between the old world and the new. America will have lost a great part of that vision "without which the people perish" when she deliberately elects that her working women shall tread the path that has been trodden by her sisters across the sea.

Nothing has been said as to the effect of the health and welfare of the woman worker and of her family upon the continuity of her effort in the industrial world. It surely needs no demonstration, beyond the mere statement, that the healthy, unworried worker is capable of the greatest output and the longest continuance in occupation. Today, when the country faces a great and stern world task that must be performed, it is good to know that her women can do almost anything that is needed, that they are eager to do whatever is asked of them, and it is also good to know that the world of industry itself is making very careful inquiry as to what is the wisest and best assignment that it can make to these new recruits to its labor forces.

CHAIRMAN SHOUDY: The last paper on our program for this session is by Dr. A. J. Lanza. I know you will be interested.

SHOP HYGIENE AND SANITATION

DR. A. J. LANZA, PASSED ASSISTANT TO SURGEON, UNITED STATES PUBLIC HEALTH SERVICE, PITTSBURGH, PA.

Mr. Chairman and Members of the National Safety Council: You may be interested in some of our experiences in putting women to work in places where heretofore they have never had women employes. First, I would like to tell of two personal experiences along the line Dr. Elliott referred to and also of our friend the oculist.

In one of the candy factories of Milwaukee there was a woman who was afflicted with a ten-hour grouch. The superintendent said: "We will have to get rid of that girl: she is upsetting our whole department." I sent for her and asked her what was the matter. She said: "I don't know," and began to cry—as most women do. By the way, if some of you men are putting on women for the first time in your industry you need not be surprised at an outburst of tears, for that is one of the things that a woman has to do. This girl began to cry for all she was worth. "What is the matter?" "I don't know: nothing is right." After a little visit I noticed that the girl's teeth were decayed and her gums shrunken, so I said: "I think your teeth are the matter: it looks to me as though your teeth are pretty bad. My advice is that you go to a dentist and let him look you over. Remember one thing, that you cannot keep on this way: if you do not get right your day is gone." She went to a dentist and when she came back to work every tooth in her head was gone. After awhile her false teeth arrived. She is not married yet, but is on the job. Her eternal ten-hour grouch is gone and she is making a corking good forewoman. I could give you dozens of cases of girls and boys who have been put in A-1 condition after we have persuaded them to visit a dentist.

I can take you into a factory where there were forty-seven cases of headaches or chronic stomach trouble and show you that thirty-four (that is a high percentage) either needed glasses or a change in glasses. We found two had on window glasses and did not know it: they paid $3.50 for them. These girls were doing very fine work and taxing their eyes to the utmost. This led to a careful study of the light and placement of machines, also to the obtaining of the services of an excellent oculist (at cost) to the girls. There was a decided increase in production after the eyestrain was relieved.

POINTS TO BE OBSERVED IN WOMEN WORKERS

Women entering industry for the first time are confronted with an entirely different life than that of the home, school or clerkship work. The first thing to take up is the careful selection of the woman for the job. Of course, where possible, if there should be two young women of equal ability and good, common sense, it is perfectly all right to select the good-looking one—good-looking people are pleasant to have around. However, I have known foremen who are very frail morally and their too-weak backbones have made them very much less efficient by having

an overly goodlooking woman in their department. It is well to have the foreman realize that he is not selecting a wife but a woman to do the job in question. A woman who is pretty heavy around the waist and thick through the shoulders and chest does not make the best operator of a machine or on work which requires much lifting, as she is pretty apt to get winded quicker. A girl with hands like hams who has spent a good many years at work which has roughened them, will not, in all probability, be a girl to handle small parts quickly. I do not know very much about the scientific hiring of women. If you cannot afford an A-1 employment secretary pick a foreman that the Lord has endowed with good, common sense to assist in selecting women operatives—by this I mean that the selection should be carefully made. After the selection is made and the woman placed at her respective work she should be surrounded by as clean, attractive atmosphere as is possible.

The foreman, if he has never had women in his department, should be thoroughly instructed in the ways and methods of handling women and wherever possible they should be placed next to a worker who is kind and helpful, one who is willing to assist the new worker along the line of her occupation. If the woman is placed on work which is considered hazardous from the standpoint of women but not necessarily so for men, she should be put in a good, woman overall suit and a neat looking "overseas" cap which is perforated, thus keeping the hair free from dust and safeguarding her from belts and the danger of getting the hair caught in the machinery. (The perforated cap allows sufficient air to get to the hair as a preventive against it falling out.) A straight-last shoe with not too low a heel (a good, common sense one), good, strong leather and a sole that will keep the woman's feet free from footache. There is nothing which is so conducive to discouragement as tired feet. Tired feet produce a physical condition which goes to every part of the body, lessens vitality and subjects the individual to accidents. In order to overcome the "silk-stocking" habit encourage the girls to wear good canvas leggings. This will overcome the chilly feeling from the knees down which is bound to come when the girl discovers she is minus the skirt which heretofore has afforded a protection that she did not realize.

PROPER CLOTHING AND SURROUNDINGS

Regarding the question of dress. If it is not absolutely necessary that the women wear overalls I would by no means encourage it. Women are not made for overalls for various reasons and every woman will be better off if she is dressed in simple, plain every-day womanly clothing. I have heard some fadists on this subject say that it would be better if all women wore overalls. I wonder how they would like to have their wives or daughters in college go around in them? Next to the question of dress is the question of a place where women may change their clothing. It is imperative that they be furnished with a neat, clean locker room, with a washroom adjacent, especially where the work is dirty and the women are compelled to change to street apparel.

If the physical condition of your factory is such that your women may

spend one-half their time standing and one-half their time sitting you will find that they will come to the end of the day less tired and physically in better shape. Women do not necessarily object to doing dirty work, provided they have adequate washing facilities and plenty of hot water, soap and towels and are given adequate time before lunch and closing time in which to wash up.

It is well to stop and consider, for the sake of the foremen, some of their characteristics. Women, as a rule, are more sensitive and at light work they acquire greater speed than men. Physically women are not constructed in bone and tissue the same as men and it is folly to even think that they have the same physical endurance. For a time you can speed women to pass the men, but after watching a group of twelve for five years I am convinced that the woman has not the physical endurance of men. It is also well to be very frank with your foreman about their physical disability and handicap. Many of your troubles will be overcome if you can get an A-1 nurse or social service worker for your plant, some one to whom the girls can go with all their physical disabilities. There is one thing every girl in your employ should understand, that she is not to leave the department without notifying the foreman. Of course, your foreman must have the common sense and decency not to ask a girl where she is going and when she is ill what is the matter with her. Under no circumstances allow a foreman to "bawl" a girl out in front of another; also caution your men against the use of profanity. A girl came to me one day crying because a foreman swore at her. I knew the man in question, he was of irreproachable character and when I asked, "Are you sure he swore at you?" she said: "Well, I was the only person there and the air or machine could not answer back."

It is very hard for a man not to show preference for a good-looking or attractive girl. This will breed trouble in the department for the foreman and among the girls. I cannot emphasize strongly enough the great importance of training your foremen along the lines which must, of necessity, seem non-essential to you, nevertheless they are a cancerous growth in your peaceful organization if allowed to grow and will cost you dearly in dollars and cents.

WOMEN SHOULD NOT BE EMPLOYED LONG HOURS

You ask me regarding the hours of labor for women and whether I think women should do night work. I certainly think that women are better off on an eight-hour day and while I realize the hardship of competition and an eight-hour day I think that no woman should work over nine hours. Women should not work nights unless war measures makes it imperative and then only when the government cannot supply an adequate number of men. Women must fall into line and take their place, not as a matter of choice but of necessity, and it may even be necessary for her to tax herself beyond her physical endurance. She will do this not as a matter of choice but from a standpoint of patriotism, on the same ground that our boys are taxing their physical endurance to the utmost to protect humanity.

The main objection to women working nights is that it is almost a physical impossibility to drive into their heads or lives the fact that they must not work nights and days, too. You cannot do a full eight or ten hours' work in the factory and then go home and do the family washing, the family ironing and the hundred and one things that must be done every day. When women realize that men do not wash or iron their own shirts or darn their own socks or put the kiddies to bed maybe women will be more able to compete with men in industry. Man cannot serve two masters, neither can women fill two jobs.

With the physical equipment of the factory should be a clean, light, airy, plain lunchroom, which supplies at cost plain, substantial food. Many girls bring their own lunches, but it would go down very much more comfortably if they had a good soup (I do not mean "shadow" soup), coffee, a salad or something that will take the dry edge off a sandwich that has been packed for five or six hours. In many cases it would be better if you could encourage the girl to take her entire lunch at the plant, even if you only supply sandwiches, coffee, soup and fruit. This, of course, should be put on a self-supporting basis; by that I mean it should pay for the labor and the produce consumed.

We must not forget the importance of a first-aid room where, when girls are indisposed, they can retire. Many a girl, if she could have one or two hours quiet rest, would be able to resume her work and stay on her job for the entire afternoon; you not losing production nor she losing her pay.

MAKE YOUR MACHINES FOOLPROOF

It seems unnecessary to say anything about safeguarding machinery, but there is an angle which sometimes men do not see. When a woman is hurt she does not want to return to the machine that she was hurt on. This, as you know, is different with men. They may lose a finger in a calender and go right back as soon as their hand is healed up—not so with women. If Mary gets hurt on a machine the whole neighborhood knows it. The dear mother and sister have spread it around broadcast and Mary's neighbor does not want her daughter to go to work in a place where she is going to be mangled. Moreover, when one girl is hurt it affects the entire group. They are all more or less nervous and production is lessened. It is most essential that where you are putting women in industry for the first time that you see the machines are made foolproof before they are equipped with workers.

Last, but not least, I want to speak of the moral safeguarding of our women. It is a deplorable fact, but nevertheless true, that many men in industry seem to feel that because a girl works for her living he is at liberty to take any little license that he sees fit. Ofttimes the girl does not know how to resent it. She gives a nervous giggle, not from any sense of pleasure, but from sheer nervousness—she does not know how to resent the familiarity. Alas, too often, I have found cases where girls have been absolutely wronged. What has aroused the blood of the men in America as much as the atrocities that have been committed against the

women and children over on the other side? If our boys have gone to offer their lives for the sake of humanity, that women and children may be protected, it seems only right and fitting that men who are captains of industry should see that the women that come into their factories are safeguarded and that they do not employ men of shady reputation to be over their girls. If you discover a man who has committed such an offense are you going to smooth it over and keep him because he is a good worker and produces money for you, or are you going to kick him bodily out of your factory and make an example of him? Many men are decent, not from any sense of righteousness, but from fear of the law. This is a regrettable fact, but if we cannot get people to be decent for decency's sake, for heaven's sake let us make them decent through a sense of fear.

I want to make three points clear: 1. Set a single standard of morality for men as well as for women. 2. See that your foremen are of irreproachable moral standing. 3. Do not keep men of loose morals in any department or group. You cannot afford to.

DO NOT PERMIT FAMILIARITY WITH WOMEN WORKERS

One day in a large factory in Cleveland I noticed a good deal of petty familiarity on the part of the boys towards the girls—there was a tendency to pull and maul and handle the girls. The thing was brought to the management's attention. He at first smilingly and kindly said: "Don't you think you are really putting thoughts into men's heads that are not there?" When he was asked "Do you suppose Pete Jones would dare put his arm placidly around your daughter's waist if she stepped into the elevator?" Like a flash he replied: "Well, I guess not!" Then when he was asked: "Why, then, aren't you willing to see that the girls who are making bread and butter for you receive the same courteous consideration that you expect the men of this firm to show to your wife and daughter?"

The man who was head of the firm was of irreproachable character, but thoughtless. The minute the thing was put to him on that basis he fired up at once and certainly made it clear to every last man of that factory that they were to keep their hands off the girls and that if any man was caught making remarks or making suggestive jokes around the factory he would be promptly fired. That man set the standard for his entire mill and, as I know, it is a mill where girls are perfectly safe. You may say that was a little matter. Was it? The man who takes the petty familiarity may not be the man who does the most harm. True, but the man who is lying in wait to trap the girls is watching and he sees that you take petty familiarities with her: he goes further and says to that girl and does that which if it were committed on your child you would choke him. True, the moral offenses are numberable in industry, but they have been sufficient to cast too long a shadow and it is for you men to see that it is absolutely wiped out, wiped out forever—the way our boys have been giving their lifeblood to wipe out atrocities on the other side.

A PLEA FOR JUSTICE FOR THE FOREMAN

There are a few words I would like to say regarding the foreman. I feel that, as a usual thing, he is the man who is to be most pitied in the entire industry. He is kicked by those below him and jacked-up by those above him. After all, is he really to blame? Why did you make him a foreman? How did you happen to pick him out? Did you take John because he was a pretty good machinist or because he was pretty good in this line or that? He may have been with you for twenty-five years and, therefore, you thought it was about time to recognize him by way of a foremanship. He has been efficient in his line in the factory from the start; he has been faithful and loyal and so you thought you would make a foreman of him, when he was no more fitted to be a foreman than a speaker would be to run a Parisian millinery shop. Why? He may know machines, he may know the product from A to Z, but alas! he does not know the one great essential thing of foremanship or leadership—he does not know people. It is absolutely impossible to run a factory or a department or run anything that has to deal with human beings unless you know them. It is just as essential that you know the individual as you know the machine, in fact, more so, and alas! we blame the poor foreman for our own lack of insight—our own poor judgment in selecting him.

I know foremen who get less in their pay envelopes than the men under them and, whether you will admit it or not, as a usual thing the men soon discover it and have not much respect for the man who cannot command and make as much as the rank and file of workers who are under the foreman. The great trouble is that the executives and superintendents have not given sufficient time to the careful training and development of their foremen. After all, no matter how fine your machinery, no matter how fine your executive force, or how wonderful your staff of superintendents, do not forget that they are *not* next to the man —they cannot be by virtue of their job. It is the foreman who stands next the men, your direct producers: it is the foreman who has the opportunity to develop loyalty or disloyalty.

WORKMEN MUST BE GIVEN COURTEOUS TREATMENT

The great trouble is that too many foremen have directed their men too much like the German Generals, from the rear, and have not gone ahead to show and teach them the way. They have come from the old school with the old ideas, where lording it over the man was thought to bring results. That day is gone forever when you could command a man in profane language: the day has come when you can fire a man only in a courteous way, for if your foreman kicks him out you can make up your mind that it goes out to the whole neighborhood and sooner or later you will be short of labor. The world is tired of being kicked and cuffed and the day is upon us when the working man, when the foreman, the superintendent and the executive expect one of the other Christian courtesy and they have a right to expect it. Set your standard in the execu-

tive office and see that it goes the entire length of your organization. Many of the troubles which now seem monumental will in due time solve themselves in a way you know not.

A word to executives: It will not hurt you to saunter through your factory unattended. Look for the good things and though you see imperfection do not immediately go to the superintendent or foreman and begin to criticize—they jump at the idea that every time the boss comes around there is going to be trouble, and landy! how they hate to see you go in the plant. Recognize your men on the street when you see them; if you do not know them get acquainted—that is where many employers lose out.

CHAIRMAN SHOUDY: We have been fortunate this afternoon in having so many splendid papers. I wish to express the appreciation of the Section to the speakers and especially to Miss Edwards for helping us out of a difficult situation.

The Section then adjourned.

WEDNESDAY AFTERNOON MEETING

HEALTH SERVICE AND GOVERNMENTAL JOINT SECTIONAL MEETING

CHAIRMAN SHOUDY: The Health Service and Governmental Joint Sectional meeting will please come to order. The purpose of this meeting is to agree upon definitions and to correlate the work, if possible, in the reclamation of industrial cripples and those who are returning from our fighting army. I have just received this message from Lieut.-Col. Harry E. Mock: "Business of my chief overseas causes revocation of my consent for St. Louis. Very sorry." We are all sorry that Colonel Mock cannot be with us. He is very much interested in industrial medicine and surgery, and everything that pertains to welfare and safety of the industries.

CARE OF THE INDUSTRIAL CRIPPLE

Dr. Farnum of the Avery Company, chairman of the Section last year, and one of the fathers of safety and welfare in our industries, telegraphs that he is sick and that the doctors refuse to allow him to leave the hospital. With your consent I will send a telegram of greetings and sympathy to Dr. Farnum.

"The Return of the War-Disabled to Industry" and the responsibility of the industry for industrial cripples is one of the greatest problems, if not the very greatest problem, that industry is called upon to face. You will agree that industry has not done all that it should in the care

of the industrial cripple and that it has taken the world war to teach us to care for our industrial cripples as a group. Now is the time to line up with the government and after the war cripple is cared for let us take up the problem of the industrial cripple and carry on the work. The reconstruction of our fighting men will have taught us a lesson and the relationship that we feel for the fighting man should be continued in the interest of the industrial unfortunate. Professor Prosser, of the Board of Vocational Education, Washington, D. C., is unable to be here, so I have asked Mr. Winslow to present his paper.

THE TECHNICAL RE-EDUCATION OF THE WAR CRIPPLE

C. A. Prosser, Director of the Board of Vocational Education, Washington, D. C.

Mr. Chairman and Members of the National Safety Council: The United States has begun to develop our industrial and vocational education on a comprehensive plan, supported by the government, under a law that insures efficient work and so planned as to meet the needs of the local situation. Conservation of our natural resources was and still is a popular demand. The necessity of conserving our human resources is even more important. This war has compelled us to realize the value of man-power. When the war is over our man-power must be used at maximum efficiency to restore the world to normal conditions and to maintain ourselves in the face of competition that we are sure to meet.

We are the richest country in natural resources, but many times the value of the raw material is added to it by various manufacturing processes. American workmen must add this value before the product goes to the markets of the world. We have been sending vast quantities of material in a more or less finished condition for others to manufacture into the finished material for the world market. This work belongs to us. To be able to secure the intelligent labor and skill necessary to hold these world markets for the benefit of our industrial population we must not only train our future mechanics to a point of maximum efficiency but must conserve our present and future man-power. We can no longer sit complacently by and accept a record of 14,000,000 accidents a year as a condition which cannot be remedied. We must not continue to kill 50,000 men, women and children each year, which is more than all our losses, to date, on the fields of Flanders.

ACCIDENTS ARE RECOGNIZED AS PREVENTABLE

Accident prevention is conservation. "Accidents do not just happen, they are caused." Fifty per cent of our accidents are recognized as preventable. A very large per cent are the result of carelessness of some one, perhaps the careless act of a fellow workman or possibly carelessness on the part of the employer who failed to provide safe work-

ing conditions. From whatever cause accidents are expensive, producing both an economic loss and needless human suffering.

Caution is a habit. Habits are most easily formed when young. If we can train our future mechanics to use caution and avoid risk as a regular practice in their work we will decrease the accident waste. An increasingly greater and greater number of our industrial army is going to be trained in our public schools. The schools have demonstrated their ability to train technical men. They have shown how they can meet an emergency by training thousands of army mechanics in a short time. They are to show that they can give our future mechanic a foundation on which he can build till he will outstrip all competitors.

In connection with his training in how to deliver the goods, the mechanic must learn how to preserve his efficiency as a man. The American has the advantage in native ingenuity and resourcefulness. He must get rid of his reckless disregard of danger to himself and others.

SCHOOL SHOPS SHOULD BE MODELS OF SAFETY

Schools must teach safety and health. School shops must at least maintain the standards demanded of the commercial shop. They should be models of safety. Pupils should be compelled to work with machines and tools equipped with up-to-date safety appliances. It is often difficult to get older mechanics to use devices for their own safety. The young workman should be trained to use these protections. Another reason for complete protection of the pupil is the seriousness of maiming a person in the beginning of his career and compelling him to go through life only partially efficient or perhaps wholly dependent.

The Federal Board for Vocational Education touches these schools in a very direct way through the state boards. We propose to take an active part in safety and hygiene training as an important part in vocational education. This seems to be an unprecedented opportunity by reason of the unique chance to inculcate these ideas at the most fertile source, to bring about ultimately more actual concrete results in accident prevention and safety education than has yet been accomplished.

A series of bulletins have been planned to form a basis for this work in the schools. In general these bulletins will be of two kinds:

1. General instructions that apply to all lines of work: Health, exercise, care of the body, conservation of time, how to study, drills in concentration, choice of a vocation, etc.
2. Specific instruction for each industrial group: Accidents that are peculiar to the group, guards for machines, precautions necessary to safety, what to do in an emergency, first aid, suggestions for getting lectures from outside sources such as factory inspectors, shop superintendents, employers.

The safety instruction must be adapted to the several types of schools: All-day, part-time, continuation and evening. Each trade teacher must adapt the work to the class he has in hand, but safety training must be a definite part of the instruction and not merely incidental.

The bulletins can be used as a basis for the work in safety instruction but should be expanded and adapted to local needs and conditions. Local accidents should be discussed and suggestions should be made for prevention of similar accidents in the future. The school conditions should be investigated and other shops visited with reference to safety methods in use.

SAFETY BULLETINS PRACTICAL TRAINING IN ENGLISH

Much of this work can be made a very practical drill in English. Oral discussions furnish good training. All Americans should be able to get on their feet and express their ideas. The school should encourage interest in and discussion of public questions, mutual improvement, co-operative buying, accident and life insurance, workman's compensation, etc. Cannot the schools be brought in touch with the national safety societies and so cultivate the feeling that they are part of the national safety movement, get the publications of the societies, the use of slides, films and lectures that are to be obtained through this source? Prizes might be offered for special work, suggestions, or designs and so encourage interest in Safety.

The schools are human efficiency producing plants. The pupils are the raw material. The product is the boy or girl who leaves the school more or less fitted for life's work. The employer furnishes the market for the output of the school. The schools must study the demands of their market. The market must indicate to the schools what kind of training is needed. Both the schools and the public are beginning to realize that the old idea of education is not meeting the conditions of the present. We are slowly getting away from the idea that Johnnie is on the direct road to the White House; and that if he is not quite able to land that job he should at least be a professional or business man. Many fond parents have, in the past, felt that they had rather their son would measure ribbon in a drygoods store than become a skilled mechanic. But now many are beginning to realize that brains and training are demanded for success as a mechanic as well as for success as a doctor or a merchant, and that the work is quite as honorable.

CO-OPERATION OF PRODUCER AND CONSUMER

This change is calling for an education that will fit for this kind of work. The school will welcome interest and suggestions from the employer as to what kind of training is needed for success in the industrial market. The methods are being developed. Do not sit back and wait for the vocational school product to come to you and then find out that it is not what is needed. The producer (the school) and the consumer (the employer) must get together now, in the formative period, and agree on the kind of training needed and how it can best be given. Then encourage the boys to take the school training by giving them a chance to make good. It is discouraging for a boy who has given several years to a course of training in a trade school if he has to start on the same level as a boy from the street who has had no training whatever. Do not sidestep by saying "If he is any good he will come to the top." He may

if he has a chance and is not lost in your organization. If the school is any good, encourage those who take the training by recognizing its value when they come to you for employment. If it is not what it ought to be, take an active interest in it and help make it what it should be. It will pay in satisfaction and in dollars and cents. You are doing a great work in conserving our industrial population. We welcome your interest in our schools. We want your help. Together we can develop a system of training that will do wonders for the industrial development of the country.

DISCUSSION

CHAIRMAN SHOUDY: Mr. McMurtrie is also absent, but his paper will be incorporated in the proceedings. I would suggest an informal discussion on "The Reconstruction of the War Cripple."

A DELEGATE: I made a few observations, during the first year of the war, and as to what Germany and Austria were doing. I was on duty over there and had occasion to watch them and their methods. Four months after the war started vocational schools were started for the instruction of crippled soldiers. The schools took in many lines of activity, especially carpentry and wood working and the working in leather. After a man became efficient he was placed in a factory especially constructed for the work of the cripples. I have seen two or three dozen legless men leave a school at one time, take a street car and go home from work, having spent the ordinary eight hour day in the school. In the school they were busy producing work which could be done in a sitting attitude. The men were instructed, where they have an arm off, to hold the piece of leather, by a special device with the stump, and to sew with the other hand. In connection with these schools they build permanent barracks, all designed to take care of the cripples after the war. At the present time they take care of soldiers only but after the war, I believe, it is the plan of the government to care for other disabled men as well. In this way they expect to settle the problem of what to do with their cripples; many of them are already producers; in fact, there was no place where I went through Germany that I did not see everybody at work at something. That was during the first year of the war.

CHAIRMAN SHOUDY: How soon did they start their reconstruction work after a man was brought in from the base hospital?

RE-EDUCATION OF WAR CRIPPLES

THE DELEGATE: He was given a complete rest. Unless he received a very serious injury he left the base hospital in six to eight days. If he was not called back to service, he was put in one of these vocational schools. If he had lost a limb, of course, the period was longer and he was given all the surgical treatment necessary.

MR. WILLS MACLACHLAN (Inspector, Electrical Engineers' Association of Ontario, Toronto): Possibly it would be of interest to you to know what the Canadian government is doing. When a man comes over from the other side he is put into a hospital and before he finishes his medical

treatment vocational aids look after him in teaching him bedside occupations, such as basket weaving, embroidery, clay moulding and so forth. The idea is to try to get the man's mind at work, to interest him again in industry. It is also the first chance he has of making any money; he sells the little things that are developed—some of them making as much as $5 or $6 a day. The aids for that work are usually girls, taken from the same class as your volunteer Red Cross nurses would be taken. We call them B. A. D.'s, and those girls watch over the men. They are under the supervision of a vocational officer in charge of the hospital and they learn from the man what he has in his mind and what he would like to do. At the same time the vocational officer, or the doctor, will interview the man and find in detail what he has been doing in the past and report as to what he thinks the man can be best put to doing in the future. Various industries have been surveyed, with the idea of finding where the returned wounded soldier can be put to work. Bench work is gone over to find out if a man can work at it with one leg, by supplying him with a stool. If he has to raise his arm above the shoulder and if he is doing work in which he has to use his right hand, then work is provided which he can do with that hand: in case he has lost his right hand, work is provided which he can do with his left and he soon becomes accustomed to it. These surveys are brought together with the ideas of the board and it is then decided what line the man had better get into. Take, for instance, a man from a foundry who has a shrapnel wound in the back or groin. He can't go to work there if it is lifting work, but if there is a boiler shop connected with the foundry they might develop something; he could work at the benches on the boiler plate or lay out the development of the boiler—that was done in the C. P. R. Anchor shops in Montreal.

SHOP METHODS AND COURSES OF STUDY

The men are given an intensive course of about two months in the trade school and from there they are sent directly to the vocational branch, where they receive what we call "shop mathematics." They also get mensuration and some analytical geometry—they are all called "shop mathematics." The men are then taken down to the shop, put under a foreman and taught to work laying out boiler plates; later they are visited once a week by the vocational officer and if that officer finds that medical attention is necessary they are taken from the vocational branch and the whole plan is revised.

If it is found that home conditions are not right, or that some assistance is necessary, visiting nurses are utilized, the same as you have in your industries. The teaching outside of and in the hospital is done by girls that have been given intensive training and who, in most cases, were not teachers before. This has been found to be the best and most successful way of meeting the problem in Canada.

CHAIRMAN SHOUDY: Mr. Little, in the absence of Mr. Mackey, Mr. Prosser and Mr. McMurtrie, will you be so kind as to tell us about the re-education and re-construction of the war cripple?

THE RE-EMPLOYMENT OF THE WAR CRIPPLE

MR. R. M. LITTLE, DIRECTOR, THE AMERICAN MUSEUM OF SAFETY, NEW YORK CITY

Mr Chairman and Members of the National Safety Council: Our country is to do full justice to all those who fight in its defense. In addition to the War Risk Insurance act which provides family allowances, compensation for injury and life insurance for soldiers and sailors, Congress has also made provision that the men who are disabled in service and are unable to follow a gainful occupation shall have the right and opportunity of retraining, in order that they may take their places in the industries and receive proper pay and be economically independent. Plans have been worked out to avoid the mistakes which were made at the close of the Civil War, and if the plans are successful we will not need many homes for soldiers nor see crippled soldiers selling lead pencils and begging on the streets.

The Rehabilitation act places the responsibility for the physical and mental restoration of the men under the authority and direction of the Surgeons-General of the Army and the Navy. Medical and surgical service follows the soldiers and sailors onto the battlefield. First aid stations are organized near the front lines. Medical officers share with the fighting men the hazards of war and many of them are called upon to make the supreme sacrifice. Base hospitals are established in the rear, and there will be sixteen great hospital centres at home. In fact, the work of restoration begins in "No-Man's Land" with "first aid" and is continued in the base hospitals, and will be completed, as far as possible, from a physical and mental point of view, in the military hospitals at home. Everything that medical science and surgery can do for our disabled soldiers and sailors will be done at whatever cost. Never was an army organized under better medical and sanitary direction than the American army.

SERVICE RENDERED BY PHYSICIANS AND SURGEONS

The elite of the medical profession has been enlisted in the service. This noble profession has reason to be proud of the splendid response of many of the best trained and experienced surgeons of our country who have turned aside from lucrative private practice to give their best efforts in behalf of those who fight for their country's honor. Formerly, the army medical service was only concerned that wounded men in the field should receive prompt attention in order that suffering might be assuaged and as many as possible be returned to the fighting lines, but the medical service of today incorporates an additional idea in its program, namely: To salvage the waste of the battlefield for civilian life. We cannot be satisfied to permit the heroes of the battlefield to return home with scars of victory upon them but incompetent for the responsibilities of life. Infinite care and patience will be exercised by medical officers, to the end that the brave-hearted and heroic lads who face the enemy on battlefields shall be returned to normal and independent life as far

as possible. More can be done for them than was the former custom. Marvelous are the achievements of modern surgery in preserving life and restoring disabled people to usefulness. Therapeutic measures are to be used in the hospitals which will prepare the disabled men, mentally and physically, for more advanced vocational training during the long period of convalescence through which thousands of them must pass. They will be taught drawing, basketry, weaving and other light occupations, which will have the two-fold purpose of occupying their minds and inspiring them with the hope that they can live useful lives. Some of the articles which they make may have a commercial value and while ward occupations may not often lead to a new trade or have much economic value after the war they do assist in preparing men for more substantial efforts.

FEDERAL BOARD FOR VOCATIONAL EDUCATION

The Rehabilitation act provides that the second stage of rehabilitation shall be under the authority and direction of the Federal Board for Vocational Education, which was established by the Smith-Hughes Act, and was organized in August, 1917. The board is composed of three Cabinet officers as follows: The Secretary of Agriculture, chairman; the Secretary of Commerce and the Secretary of Labor; also the Commissioner of Education and three members who give their full time to the work, one representing manufacturing and commerce; one agriculture, and one labor. Doctor Charles A. Prosser is director of the board.

Briefly, the board's responsibility for rehabilitation may be summarized from the act as including the following duties: "To prescribe and provide suitable courses of vocational rehabilitation for all disabled soldiers and sailors, who after their discharge from the service are, in the opinion of the Federal Board, unable to assume a former occupation, or to enter upon some other occupation, or having entered upon some occupation are unable to continue in it successfully. To make these courses available without cost for instruction and under such conditions as the board may prescribe to any other disabled men who, after discharge from the service, are entitled to compensation under article III of the war-risk insurance act. To provide such facilities, instructors and courses as may be necessary to insure proper training. To prescribe the courses to be followed in individual cases. To pay, when in its discretion such payment is necessary, the expense of travel, lodging, subsistence and other necessary expenses of persons while following the prescribed courses. To do all things necessary to insure the vocational rehabilitation of disabled men. To provide for the placement of rehabilitated persons in suitable occupations, utilizing in its discretion and with the approval of the Secretary of Labor, the facilities of the Department of Labor in so far as may be practicable in the placement of rehabilitated persons. To make or cause to have made studies, investigations and reports regarding vocational rehabilitation of disabled persons and their placement in suitable occupations, doing this when it deems it advisable so to do, in co-operation with or through other departments and bureaus of the government. To co-operate with the War Department and the Navy Depart-

ment to effect a continuous process of vocational training, initiated in the hospital before discharge from the service, continued after discharge, and ending in the workshop—the Federal board acting in an advisory capacity as regards the initiation and conduct of such training in the hospitals, and the War and Navy Departments in an advisory capacity as regards 'care of the health of the soldier and sailor after his discharge.'"

SPLENDID WORK DONE IN DOMINION OF CANADA

In order to approach this difficult problem in the most practicable way, the Federal board and its advisors have made a careful study of the rehabilitation work in France, England and Canada. In May, the board, in co-operation with the Red Cross, sent twenty-eight men and women to Canada to make a careful first-hand study of the splendid work of the Dominion. Without attempting to describe that work in detail, I should like to give you a sketch of what they are doing. Representatives of the Dominion Hospital Commission meet their disabled men in the hospitals; tell them of the opportunities which await them at home for retraining and employment; attractive circulars and bulletins are printed which are used in the hospitals and upon the ships, that the men may be apprized of what awaits them when they get home. The best hospitals of the Dominion have wards set aside for rehabilitation work; hospital aides work in conjunction with the surgeons who have the men in charge. A careful study is made of each individual man as to his history, former occupation and possible future. Delicate and sympathetic arrangements are placed around him to inspire him with a new hope. Every possible method for restoring his nerves, muscles and body to usefulness are employed. When a man is able to leave the hospital he is sent to a technical school where he may learn a trade. In Montreal the great technical school is filled with disabled soldiers and sailors learning to be machinists, electricians, cabinet makers, draftsmen, stenographers, secretaries, etc. The men are kept in the technical school for several months at the expense of the Government, and until they can be placed in some industry for their further schooling and development.

TRANSFER FROM GOVERNMENT TO INDUSTRIAL PAYROLL

An industrial survey has been made of all the varied industries of the Dominion. The managers have cordially co-operated with the government officials in the scheme. A wise placement officer fits each man into some place in an industry and then keeps in close touch with him to observe his progress. The management does not pay him wages during this educational period, but when he is able to do a normal day's work, without too much fatigue, he is transferred from the government payroll to that of the industry. Indeed, it is remarkable what can be done for disabled men, provided the scheme is comprehensive and varied enough to suit their different needs, but, at best, it is a long difficult process which involves the willing co-operation of the man and many different agencies. The surgeon, hospital aide, hospital equipment, ward-occupation, technical school, teachers, family, employer, church and civic

organizations must all work together for one definite purpose, namely, the rehabilitation of the disabled soldier. He must go through a biological process; sort of a re-birth from being a disabled soldier to that of an independent workman. As it takes a year or more to make a civilian into an effective soldier, ready to go "over the top" and help win a battle, so it takes a year or more to return a disabled soldier from the battlefields, through a sympathetic process, to independent civilian life. Indeed, time is required for the reverse processes for soldiers and sailors who are not disabled and it is to be expected that considerably more time will be required for those who have been disabled. This fundamental fact needs to be borne in mind when our boys return from Europe. Few of them will be ready at once to take up their former occupations; all who have been through battles and the terrific experience of this war will need time for recuperation and readjustment. The most vivid imagination can not give to one who has not been "over the top" and through the battle scarred regions of Europe, any adequate conception of the frightful experiences through which men are passing in this War.

WISDOM, SYMPATHY AND PATIENCE NECESSARY

We look upon our fine soldier lads as they march through the streets en route to the seaboard and are thrilled with pride by their alert, strong and determined bearing, trained to the moment, imbued with the highest ideals that any soldiers have ever possessed. Well may we be proud of them, but a fearful ordeal awaits them on the battle scarred fields of Europe. I have talked with young men in Montreal and Toronto, university graduates, officers who fought at Vimy Ridge, Ypres and elsewhere, who are now engaged in rehabilitation work, and they say that what they passed through was beyond their imagination. Modern science is being used in the most frightful ways in this war and human endurance tested to the uttermost. If men simply suffered from clean-cut wounds, surgeons could easily overcome most of them. In addition to wounds, there is the strain upon the vigor of mind and body, shock of the nervous system which places men in a condition that makes it exceedingly difficult to bring them back into normal life. All the wisdom, sympathy, patience and practical knowledge which our country possesses must be enlisted in their behalf.

The work, therefore, of the Surgeon-General and the Federal board is of tremendous importance. Because this war places a greater strain upon men than any other war that has ever been fought, the rehabilitation schemes must be larger and more comprehensive. The Federal authorities need, therefore, the intelligent co-operation of all citizens, particularly of business men, in order that the best results may be accomplished. It was most impressive, the sympathy, intelligence and practical skill which Canada is bringing to bear upon this problem. Her hospitals, technical schools, industries, churches and civic organizations are all working together under capable leadership to restore her disabled soldiers as far as possible to economic usefulness. Great manufacturing plants gladly find places for the soldier lads who have been partly trained in the technical schools, and make their plants finishing schools in their

behalf. Superintendents and foremen manifest a keen interest in the soldier's welfare. They plan for him, make opportunities for him, teach him, are patient with him, and give him a job when he is ready for it.

EMPHASIZE TRAINING RATHER THAN PRODUCTION

It has been found, by experience, unwise to pay a soldier a wage during this process of re-education in the industry, as the government is paying his way, but when he has finished his course the management of an industry often does give him a bonus in recognition of his service. The reason why wages are not paid is apparent. The emphasis must be placed upon his training rather than production. When the training is completed then wages are paid. The better industries of Canada say to the government officials: "Yes, we will take these men just as soon as you can send them to us and our plants will be their second schooling."

They have succeeded in Canada in re-educating and placing in the industries several thousand men, and, of course, a great many of the returned soldiers have found jobs and are at work without feeling the need of re-education. They are also educating many of their soldiers to go back to the land. An interesting experiment is being worked out by the Dominion government in Northern Ontario. A large tract of timber land has been divided into ten-acre plots, each plot partly cleared, a house, barn and some equipment provided, and these plots made available for the returned soldiers on easy terms which they can meet. A church and schoolhouse was established by the government in their behalf, and they will be given every assistance to make good in agriculture. At Toronto we saw wounded soldiers learning to use tractors, machinery and other implements.

ADEQUATE PROVISION MADE FOR CRIPPLED SOLDIERS

Our rehabilitation work will be much like that in Canada. The Federal board will send its representatives into the hospitals which are under the control of the Surgeon-General. They will talk with the men during the convalescent period and advise with them about their future career. When they are ready to be discharged from the Army and Navy they will be directed to the office of the Federal board at Washington or any one of the large centres and if they need re-educating in order to follow a gainful occupation they will be placed by the Federal board in a technical school, business college, etc., and then in industry to complete their training.

The Federal board will not create new schools for this purpose, but rather make arrangements with existing technical schools as far as possible. Only a small per cent of those who go over seas and are wounded will need to avail themselves of these opportunities, the number, no man knows or can know, but whatever the number may be, adequate provision is to be made in their behalf.

The rehabilitation bill provides that a discharged soldier or sailor who is wounded in the service and who needs to take a course in re-training shall have from the Federal government during the period of his re-educa-

tion the same amount of money as the last month of active service. If he is a man with a family this will mean $60 to $70 per month. If this is not sufficient other arrangements will be made to supplement this pay, in order that it may be practicable for him to take the training and, at the same time, have something for his wife and children.

RE-EDUCATION FOR INDUSTRIAL CRIPPLES

It is to be hoped that the rehabilitation work for the soldiers and sailors will show us the way to provide rehabilitation for the victims of industry, which far outnumber every year the victims of the war. There are more than 2,000,000 lost time accidents in the industries of our country every year and of these more than 750,000 lose more than four weeks from work. More than 22,500 men and women are killed in the industries of our country each year and about 12,000 suffer the loss of eyes, hands, arms, feet and limbs. At present, conservatively estimating, there are 100,000 industrial cripples in our country who need re-education and assistance to follow gainful occupations. We have been scrapping too many people in our industries, the waste is enormous, the injustice is a rebuke to the humanity of our national life.

A bill has been introduced in Congress (H. R. 12880) which provides a scheme for rehabilitation for the victims of industry and it is to be hoped that every citizen who is concerned for the economic and social welfare of our country will earnestly support this bill and do his part to help carry out the scheme.

DISCUSSION

CHAIRMAN SHOUDY: I do not know how we are going to thank you for your address. Mr. Little, you have been so concise and helpful that, on behalf of the Section, I want to offer you our vote.

JAMES A. MAYER (Industrial Board of Education, Boston): I should like to ask Mr. Little how he would handle a situation like this: A man came into my office, a discharged sailor, just from the hospital. His trade was that of making rubber tires for automobiles and he had been earning $35.00 a week before he went into the service. He wanted a job, but all I could see for him to do was to accept a position as a guard or watchman, something of that kind, as he could not do heavy lifting—he had been hurt in the side. I think he was suffering from an operation, not from a wound on the battlefield.

MR. LITTLE: Did you verify the statement that he had been a sailor?

MR. MAYER: He had his discharge papers.

MR. LITTLE: He had left the hospital and was looking for a job?

MR. MAYER: Yes, sir.

MR. LITTLE: Was he getting any money from Washington?

MR. MAYER: He said he was receiving no money.

REHABILITATION WORK SLOW TO FUNCTION

MR. LITTLE: The gentleman's question brings out what I am afraid we are up against, slowness in forming the organizations and going ahead.

This will cause a great many men to go out and try to find their own way, which, perhaps, some of them will do very well. But the first thing to ascertain is whether their discharge papers are in proper order: there will be a lot of bogus soldiers this coming winter; it will be a most lucrative following. Do not do anything before you verify the fact to your satisfaction that the man is what he represents himself to be. The ordinary soldier does not know anything about his rights at Washington—not that there is any difficulty in getting them, but the whole system is so cumbersome that he does not know where to go. That man, if he was really in the hospital as a patient and was discharged as physically incapable—assuming that the difficulty for which the operation had to be performed was the result of military service—he is entitled to compensation and ought to receive help from the government, but the War Risk Insurance Bureau is not caught up on this phase of its work—it is more than three months back. The Treasury Department is so swamped with work that they cannot keep up with the current work.

The new selective draft will add two or three million more men, the larger majority of whom will take insurance and it will take eight or nine months of superhuman effort to get the machinery in shape so that they will not be behind. I am not answering your question, perhaps, but I am giving you information which will enable you to understand the situation.

Getting down to your point: If I were in Boston and that case came to my attention I would try to get him in touch with the proper Representative from his district or in touch with the office of the Surgeon-General and get him busy on the case. This man, judging from what you say, is not quite able to make his own way back into industry.

MR. MAYER: He thought he could go back to his trade but he was not strong enough.

MR. LITTLE: That is the trouble. one man can get back where another cannot. He needs the help of the Federal board—and the War Risk Insurance Bureau.

WHO WILL PAY COSTS OF SUBSEQUENT ACCIDENTS?

MR. A. H. YOUNG (International Harvester Company, Chicago): I should like to ask Mr. Little a practical question which it seems to me is going to come up and that is with regard to the natural competitive discrimination between the injured and uninjured. We will say that the injured soldier comes back and is put into competition in the industries with the fully capable man: the point is, what is the company to do? What is the plan, in general, that the government has in view to take care of the company as regards his compensation and to keep up the interest of the injured sailor or soldier when he is trying to produce in competition with the uninjured, able-bodied workman? I have in mind just such similar cases in the company in industrial injuries. Their capacity is less and we naturally look to them for a smaller production than from a man that has not been injured; they can't see quite as well, they can't work quite as rapidly. What is the plan for taking care of them?

MR. LITTLE: You have touched one of the most difficult points in the whole problem. I presume your point has to do with compensation in the compensation States. In the industries, the workmen who are injured are being absorbed, one here and one there, men who are below standard. Crippled men are scattered over the country and the effect is not appreciably noticeable, but when we face the question of the war cripple the situation is different on account of the number of these men that will be among us and to whom we owe this responsibility. Industries, therefore, will be asked to take a few in each shop or mill and try to make them effective. They simply have to be re-absorbed by the industrial life of the country, but not very many in any one place. Second, the men who return and by re-education are made effective as far as possible, must be about 90 or 95 per cent standard, or efficient, in order that they may hold jobs. This has been done, I believe, to a very considerable extent with the men in France, England and in Canada. They are never placed on the same standard as are the industrial workmen until they are able to do their work properly and are up to the standard of efficiency. On the other hand a great many avail themselves of the advantages which the government has to offer who will go way beyond what they were before. But getting back to your question, what are you going to do with this matter of compensation? What are the employers to do with these men? They have the idea that if they take a man without an eye, using the old illustration, and he loses the other eye that will be a permanent disability which they will have to pay for and they cannot stand it. I hold the view that the Federal government should provide compensation for the second injury. This has been considered at Washington, but action has not been taken.

WORK MUST BE SYSTEMATIZED

A great many people consider the loss of a leg or an arm or an eye a permanent disability; true, it is permanent, but not total. It is to be conceded that their efficiency is impaired, but it is for these that we are providing. A few will be totally blind, but the mass of the men who come back will have such injuries as nerve shock or shell shock, and it will take a longer or shorter period of time for them to recover themselves and get back into the swing of civilian life, according to the degree of their injuries, and according to the surroundings in which they are placed. It will be comparatively easy at the present time, while we are in the flush of patriotic sentiment, because everybody wants to do something for the soldier. That will be true for some time, but when the let down comes and the war is over and readjustment is taking place, and industries are necessarily obliged to operate along economic lines, then is when we will face the gravest danger in this problem. It seems to me that the Federal government must stand back of the re-educated war cripple as regards compensation for subsequent injuries in industry.

CHAIRMAN SHOUDY: In the next speaker you have a man who sees questions in the big, broad sense that is lifting our movement to true humanitarianism.

THE RESPONSIBILITY OF THE STATE TO THE INDUSTRIAL CRIPPLE

HARRY A. MACKEY, CHAIRMAN, WORKMEN'S COMPENSATION BOARD OF PENNSYLVANIA, HARRISBURG, PA.

Mr. Chairman and Members of the National Safety Council: About twenty-five years ago, one of our present-day public officials of Pennsylvania stood beside an operating table and witnessed the amputation of both legs and an arm of a small boy. This was before the conscience of society had been awakened and the public mind had formulated the modern thought respecting the obligation of organized society to the unfortunate individual. Then the common law ruled with its strict canons and it would have been considered legal as well as social heresy to have advanced the thought that the obligation of the employer extended beyond the pay envelope.

Subsequently, when this boy eventually recovered, he was ushered out into a world of unsympathetic atmosphere; no one was ready to undertake the reconstruction of this shattered body—"vocational re-education" was a term then unknown. No one interested himself in this human derelict in order that as much productiveness as might be left in him should be utilized to his personal advantage and for the public gain; therefore, like thousands of others, both before and after his misfortune, this boy drifted from pillar to post, always close to the line of mendicancy; never an independent wage earner, with no field of occupation that he could call his own or in which he could specialize, but always dependent upon the whim or temper of those who might offer him some meager occupation.

It was only one day last week when this same public official found this boy, long since grown to manhood after twenty-five years of misfortune, hardship, privation and misery, sitting on a bench in a public park, without funds, friends or occupation up to date—a life wasted and with very few possibilities in store for him, because the day of ready acquisition of new knowledge had really passed.

In contrast, I have another case illustrative of the modern conception of the responsibility of society toward the unfortunate. One day last week I visited the Red Cross Institute for Crippled and Disabled Men in New York City, which represents the genius and humanity of our friend, Douglas C. McMurtrie, who has just preceded me. There I found a boy of 18, who three years before had been injured in one of our Pennsylvania cities. The result of his accident was exactly the same as in the first case I mentioned. Both feet and his left arm were amputated.

His suit had failed in a common law court—his accident had happened one year before the advent of a compensation law in Pennsylvania. His only recollection of a court of justice was the denial of a money verdict for his injuries by a judge who was compelled to send him penniless from the court by way of the nonsuit route. And so, before the boy had fairly trod the threshold of life, he became embittered because of his fate, angered at society and filled with the thought that there was no law for the unfortunate.

Here is where Pennsylvania missed her opportunity and failed in her duty. The boy drifted away from a little home where only a widowed mother was left to provide for a large family and was finally found begging upon the streets of New York City. Here is where New York won a victory over Pennsylvania: He was not driven from the street as one stricken with leprosy, he was not arrested for mendicancy, neither was he shunned as one to be dreaded. His way was shown to a great modern vocational school. Sympathetic diagnosticians studied his possibilities. There was a brain and one hand—these are now being co-ordinated so that the boy is developing a talent for mechanical drawing and thus the possibilities of the future are opening up to him and it is dawning upon him that, after all, the world is not such a bad place to live in and its people are not all against him. Hope and ambition are now enthroned, displacing discouragement and fear. This latter picture epitomizes the duty of the State toward her citizens, crippled in the prosecution of their intensive employment.

No one, at this time, would even venture to controvert the proposition that when our men who are now at the front shall have been returned to us, crippled and wounded to that extent that they are unable to engage in their former occupations, it becomes our duty as a whole people to provide ways and means of re-educating and equipping them so that they may be rehabilitated as far as possible and given an efficiency that will make them producing members of society.

This, of course, is not only a patriotic duty, it is an economic necessity. No citizen in all this country could be found so parsimonious that he would deny the expenditure of any sum necessary to accomplish this great result. Who then will withhold this service from the men who are now sticking to their tasks on this side, denying themselves the glamour and honor of wearing the uniform of our country, and of fighting our battles in the trenches or on the seas, but who instead are patriotically riveting, sawing, driving nails, cultivating the soil and performing the various duties that are necessary in order that we may maintain the men who have gone over?

We are constantly urging upon these, our workmen, the importance and the patriotism of their efforts. We are promising them the gratitude of the country. We are extolling the loyalty of labor upon every platform and by means of every press. What possible argument could there be then to distinguish between the rights of those injured in the army of industrial workers from those of the military army across the sea? Every state is absolutely and indisputably interested, both from the standpoint of humanity and economy, in the productive ability of each one of its individual citizens. To curtail the opportunity of production lessens the assets of each state.

The soldier situation, however, presents an acute condition, while casualty in industry is chronic. I would be last to minimize the claim of our crippled soldiers for vocational re-education, but important as is this phase of the subject the re-education of those crippled in industry is the larger and more important problem. In two and a half years of

compensation law in Pennsylvania there have been reported to us 610,878 accidents, varying in degree, suffered in our industries and these include 5,124 fatal cases. This war will probably not cost Pennsylvania that many injuries nor an equal number of deaths.

One of the hidden blessings of this war, however, has been the fact that the subject of the re-education of the crippled men has been brought home to the hearts, consciences and intellects of our citizens and has projected into the public conviction the possibility of vocational therapy and the efficiency that can be acquired by prosthetic equipment. The establishment of permanent schools for vocational re-education is a State duty, the cost of which should be met entirely by legislative appropriation. The idea of absorbing the cost of personal injuries by the industry in which it is suffered, by adding it to the value of its production, provides neither in principle nor practice for the future of the maimed man. I entirely agree with the statement recently made by the chief of the compensation department of one of our great railroads that "Beyond certain pecuniary benefits running for a short period of time there is no obligation on the employer in this respect", and unless the State interposes with its own institutions and with its own funds "in the course of time the unfortunate person will be turned out upon the charity of the community and a self-respecting fellow citizen will be changed into a hopeless indigent."

I would have each State work out this problem through its Department of Labor and Industry or its Workmen's Compensation Commission, aided and directed by an advisory board representing the State, the employer, organized labor and the medical fraternity. I would make the acceptance of vocational re-education a necessary condition to the receipt of compensation; in other words, compensation ought to run in favor of the injured man and his family during the period of rehabilitation with free re-education added thereto. The crippled workingman should surrender himself to his State and, during the period of training, should live in its institution, so as to be under the constant study and guidance of those who are seeking his vocational reinstatement.

Artificial legs and arms, optical and mechanical aids, including all prosthetic equipment, should be furnished the injured workman at the expense of the State, so that when he shall have finished his course his family will have had the full advantage of every dollar of his compensation, or, if he is a single man, this money will be accumulating in the meantime into a small working capital or bank account as an asset.

The State, through its properly constituted authorities, should have the power of the replacement of these men and here great care should be exercised in order that the workingman, having suffered a permanent partial disability, shall not again be exposed to those dangers of industry that are most likely to cause this partial disability to subsequently develop into total. I mean by this that the man who has lost an eye in an industry ought to be placed in some work where the danger of injury to the remaining member is negligible and this rule should apply to injuries of every character.

It is more fortunate for the various States that the subject of the re-education of crippled soldiers is now under such an intensive study by the recognized authorities of our country. It will be an easy matter to further develop this system so that it can be perpetuated for the reclamation of crippled workers for all time to come. I presume that the experience of every compensation board in the United States has been similar to that of Pennsylvania. We have regretted the almost universal thought that seems to have seized a man who has been crippled in industry, that now that misfortune has overtaken him his day of usefulness has passed.

In those States where boards have the power of commuting continuing payments of compensation into present value and to order a lump sum payment forthwith there are always applications pending where injured workmen are seeking to secure this money in this manner in order that they may invest it in some nonessential and nonproductive undertaking. I take it that this presents an everyday opportunity for our boards to divert the minds of those injured men from such channels by denying the payment of money for such purposes and by dispelling the idea that misfortune licenses inactivity. We can inspire such men with the thought that there are left in every unfortunate man some possibilities and that when overtaken by some untoward event in occupation the real supreme test of a man's life is presented to him. We can teach him the lesson that victory over his handicap is as great a conquest as any man can win.

It can readily be seen that, by intelligent and sympathetic service, a workman, though injured and permanently crippled, may be re-educated so that he shall acquire in a new field of labor a greater efficiency than he had theretofore enjoyed, for most of our workmen do not select their work because of their peculiar fitness for the undertaking. As a rule, they are opportunists—they are miners because they drifted into that work, they are steel workers because they were raised in that neighborhood, or they are farmers because their fathers were such before them. We are just scratching the surface of this problem and the possibilities of achievement are just dawning upon our awakening intellects. A visit to the Red Cross Institution of New York City will visualize this thought. I am sure you all will join me in the belief that our country today owes a debt of gratitude to those, like Director McMurtrie, whose foresight and interest in humanity initiated this great undertaking making for the rehabilitation of the injured man.

CHAIRMAN SHOUDY: Before we proceed with the discussion we will have the paper prepared by Dr. Patterson. Unfortunately he is unable to be with us today.

INDUSTRY'S RESPONSIBILITY FOR THE INDUSTRIAL CRIPPLE

DR. FRANCIS D. PATTERSON, CHIEF, DIVISION OF INDUSTRIAL HYGIENE AND ENGINEERING, PENNSYLVANIA DEPARTMENT OF LABOR AND INDUSTRY

Mr. Chairman and Members of the National Safety Council: When an honorable peace has come to our arms the great gods who sit on high

will look down upon a world that is sadly and strangely changed. Intermingled with those who have borne the brunt of war, either in the front line trench or in the second line of defense, in the workshops of our land, will be some who are strong and full-limbed and untouched by either the casualties of war or industry, but there will be many hobbling along on artificial limbs or crutches; others with an empty sleeve, some will walk with halting steps, to whose eyes will never again come the sight of loved ones or the blue ether of the heavenly vault; again there will be others to whom physical exertion will be difficult by reason of impaired lungs, the result of that fiendish substance known as poisonous gas.

To these unfortunate by-products of war and industry we owe a responsibility which cannot be met merely by the payment of compensation in the form of a government pension to those maimed by war, or by an employer or insurance company in accordance with the laws of the State for those who are maimed in factories or workshops.

A PROBLEM OF MANPOWER

We are face to face with a problem and a responsibility which cannot be shirked, for we cannot abate it by relying upon immigration to make up the deficiency in manpower, for immigration has ceased and probably will not be permitted by alien and allied governments within our lifetime; neither can the solution be found by an unlimited employment of women, for while it is undoubtedly true that women can and are replacing men in some positions, by reason of their sex there are limitations upon the work they can be expected to accomplish. It needs no words of mine to emphasize the importance of the conservation of the health of those who are to be the mothers of our future race.

MUST STRIVE FOR EXTRAORDINARY CARE

The responsibility of industry for the industrial cripple must be borne, in the last analysis, by both employer and employe. The ever-increasing scrapheap of those fallen by the industrial wayside, by reason of industrial accidents and vocational diseases, in a measure, is an indication of our so-called industrial progress. The responsibility for accidents and for vocational disease, in some cases, is upon the employer; in others, it is upon the employe. Accidents caused by unguarded machinery or diseases due to defective exhausts are not faults of the men and women who toil; on the other hand, accidents happen even in the best guarded plants, and disease occurs in the best ventilated locations, due to carelessness of the employes in not using those safeguards which have been provided for their protection. What we must strive for is for the taking of extraordinary care, upon the part of both employer and employe, to the end that the employe shall not be injured and the employer shall have the benefit of his or her services.

REHABILITATION OF INJURED WORKERS

In the past, in my judgment, industry has been responsible for what I term the perpetuation of the industrial cripple. There has been too great

a tendency upon the part of industry not to provide the disabled employe with vocational training, not with an education, not with a better job, not with the opportunity for securing a better position, but to turn the man into either a watchman or a pensioner. In my judgment, industry has not met its responsibility in this matter. I do not know of industries that have grouped together to provide a school of vocational training for those employes who became crippled.

All honor to the Workmen's Compensation Board of the Commonwealth of Pennsylvania for the wise, broad stand taken by Chairman Mackey in emphasizing, in his recent decisions, the needs of the man who receives a compensable injury and desires to return to industry and does not wish to set himself up as a small store keeper. Were I to write the compensation laws of the various States I would incorporate in them a provision whereby vocational training should become a part and parcel of the compensation award. This, to my mind, is the solution of the problem—to enforce by law the vocational training of those who are injured.

DISCUSSION

CHAIRMAN SHOUDY: Dr. Geyer of the Cincinnati Milling Machine Company will open the discussion. Dr. Geyer was the chairman of the first Health Sectional meeting.

DR. GEYER: I would prefer very much to ask questions rather than to attempt to discuss the papers just presented. In Mr. Mackey you see the type of man who is giving inspiration to the State of Pennsylvania and to industrial enterprises in every State in the Union. I am rather proud of the work we are doing in Ohio: we are always among the leaders in the work and are planning for the future: we are anticipating the needs of industrial employes as well as of sailors and soldiers. Dr. Patterson and Mr. Mackey have inventoried the industries of Pennsylvania. They found 42,000 jobs for returning soldiers. Mr. Little's discussion raises this question: What is the estimate of the number of cripples that it is thought will come back from the war out of our million soldiers?

MR. LITTLE: No one can know. Up in the Dominion they have made an estimate. Mr. Maclachlan, do you recall the figures? Out of 400,000 men overseas how many, approximately, came back disabled?

MR. MACLACHLAN: I think about 20,000. About 5 percent of the men who actually take part in the fighting will require vocational training.

DR. GEYER: Are the men who are doing work for the government, and therefore entitled to the consideration of the United States Compensation Commission, excluded from vocational educational training?

AID BY FEDERAL COMPENSATION COMMISSION

MR. LITTLE: We expect them to come under the special provisions of the new act: we anticipate that the Federal Compensation Commission will make arrangements with the Federal Board, just the same as the State of Pennsylvania and the State of Ohio would make arrangements with the government, with a stipulation that the employes of the Federal government are not classified with military man.

We are facing a shortage of about 30 percent of physicians in this country. Before the final draft is completed it will probably be 45 percent, while only 5 percent of the community has been taken away. So you will have 95 percent of population and a 45 percent shortage in medical service. The second line of defense cannot uphold the front line unless something definite is done to protect the health and efficiency of the industrial population. In other words, the government must devise some method by which 55 percent of our medical forces may be able to equal the services normally performed by the medical profession. It will be a man-sized job to devise such a method, yet it must be accomplished. Possibly the solution will be found in giving him a unit, a clinic or a dispensary, or a group of medical diagnostic clinics, so that he may serve a hundred where he formerly served a dozen.

Mr. A. G. Ward (American Car & Foundry Company, New York City): I would like to ask Dr. Geyer what, in his opinion, would be the effect of asking the State Legislatures to repeal some of the laws restricting the duties of registered nurses in our plant dispensaries? I know, from my experience of ten years, that in the nine plants of our company we are working short-handed through not permitting our registered nurses to treat injuries, unless it is done under the supervision of a surgeon for that particular plant. Our physicians are going abroad, leaving a vacancy here, so why can't we permit our registered nurses a wider latitude in caring for our industrial cases? This situation is confronting us all over the country, and we have been trying to formulate a scheme whereby we can take care of our employes properly.

HOPE FOR THE BLIND AND UNFORTUNATE

A Delegate: Speaking of soldiers and referring again to experiences in base hospitals, the first question the soldiers usually ask is: What can I do now? The question is directed at the nurse or the doctor. To be able to answer the question is to save the injured man much anxiety and perplexity of mind. He is looking for guidance and if you cannot tell him something definite a state of depression results. If the question is met, a different aspect in the psychology of the man will assist his recovery. Let me illustrate: A young man, an engineer, 26 years old, was shot so that both eyes were destroyed. He was in a hospital in Hungary and I had occasion to visit him several times as he was in a building which had previously been a school for vocational training of the blind. No one wanted to tell this young man that he would never see again. I tried to interest him in the building, told him about the school and its purpose, and the good that it was doing. Finally, I told him that he would not see again. He attempted to look up and his first question was: "Do you think you could arrange for me to stay in a place like this and become a teacher of the blind? I want to be of service." I assured him that such an arrangement could very probably be made. It relieved his mind greatly and he was a very much better patient thereafter.

The psychology of the soldiers going over, if they are allowed to see returning wounded soldiers on the streets who have not been provided

for, will be depressing. Let me give my experience in Russia: Going through that country you see all over the streets men who were wounded in the Russo-Japanese war. No compensation has ever been provided for them; no training ever given—they are begging on the street corners. Russian soldiers, when called to duty, would often remark about these beggars—that was what they were coming to. As the war went on and no provision made for the returning cripples they were simply forced to go out on the street. This had a very depressing effect upon the men who had not been wounded, but who would be called on and forced to go into the service.

I should like to ask Mr. Little if any effort is being made to meet this problem of giving the soldiers some sort of satisfactory answer as to what is to become of them in the hospitals in France and on the transports as they return to our country; in other words, to foster that mental stimulation which is so essential; to impress upon them that they have something to live for? We must give them something definite as to what we are going to do for them after they are released if they are disabled.

GOVERNMENTAL AGENCIES NOW AT WORK

MR. LITTLE: That is a question that the Surgeon General's office has been working upon. It is a scheme which has been studied very carefully. It is proposed to give the men, from the very first, words of hope and cheer as to their future—what they will be able to do for themselves. The scheme of cooperation will have to be worked out between the Federal board, the Surgeon General's office and the Treasury department. Representatives of the Federal board will have their education in charge in the hospital and on the transports, will meet them even in the hospitals in France. It is highly desirable that they should do that but you know it is difficult at times for a civilian governmental organization to get this right of way, even in a military organization. Dr. Frank Billings, formerly of Chicago, is at the head of the division under General Gorgas who has charge of working out this plan. If America fails in doing this work, it will not be because we do not read enough, it will not be because we do not know enough, it will be because we allowed a lot of knots to be tied that must be untied and because we were not at work at the proper time. Some work has been done and more is under way. I think we will succeed.

MRS. MICHAELS (St. Louis Woman's Committee, Council of National Defense): Has the government schools for training women to become instructors of disabled soldiers and sailors?

MR. LITTLE: General Gorgas has the matter in charge. I think such schools are contemplated and will be located in many of the large cities.

COMPENSATION FOR SUBSEQUENT INJURIES

MR. ROGERS (Baltimore & Ohio Southwestern): What is to be done with a man that is disabled in the war, is found a place in industry and

later on is injured there? What about his compensation? Would compensation be paid for the disability and how would it be computed?

MR. LITTLE: If a soldier is injured overseas, comes back and gets a job he will get his compensation so long as that disability lasts, if he was disabled in military service. If he lost an arm or a leg he will draw compensation, so long as he lives, according to the Federal board's award. If he is again injured in industry—that is the problem the gentleman from the Harvester Company raised—what compensation he should receive for his injury in industry is something that has not been worked out. It is one of the most baffling points in the whole plan, because we have to take into consideraton that a man who has been once injured is not in a position to care for his own safety as well as a man who has not.

MR. MACKEY: At the present time, under the law, a man who has been previously injured and returns to his occupation, and then received an injury which would constitute a total or permanent disability, his status would depend upon the compensation law of his particular State. The laws vary in amount of compensation and regarding provisions for payments, but under the existing rules in several States, at least, there will be no hesitancy on the part of employers to re-employ one-armed or one-eyed men. Should such a man lose the other arm or the other eye the employer is only responsible for the injury to the eye affected we will say, namely an amount equivalent to 125 weeks' pay, where, if the law were to the contrary, he would be responsible for 500 weeks. That is the reason why, in some States, there is no disposition on the part of employers to re-employ disabled men.

COOPERATION BY INDUSTRY

DR. HOURIGAN: Some of our industries are already solving their own problems. The man who is back from the army—we have a half-dozen in our factory—naturally looks to the industrial surgeon for care and advice. The employment department goes over the case, to find where we are to place him, and in doing so we are already solving the problem. During the Spanish war we had the same experience. These boys should have our highest consideration; of course, we are all naturally sympathetic, but the army surgeon, in his anxiety to protect the government, has a leaning a little toward that side, the same as we find the examining physician on the draft board leaning a little to the side of the government in sending men along, often feeling that he is doing right in sending a man who should not go.

DR. TUCKER: Speaking as a man who has been engaged in public health work and in preventive medicine, we must first be concerned in prenatal cases. Every mother is willing to give birth to a baby and that child has a right to live under favorable conditions and amid surroundings that make for the betterment of growth and health. Ninety per cent of all sickness and disease occurs among people who do not know or do not care—who do not recognize the necessity of preventive measures. As Safety First people we must introduce systems for teaching the prevention of accidents. Safety should be taught in the primary and inter-

mediate grades and on up through our high schools. The next step is vocational education, which naturally carries forward education in the prevention of accidents. The next step in our final solution, the importance of which I cannot overemphasize, is plant education in the prevention of accidents.

MR. A. H. YOUNG (International Harvester Company): I do not think we have studied industrial responsibility sufficiently to analyze properly the situation. Industry is made up of individuals, grouped in various ways, and each of these individuals, most of the time, wants things his own way. We have boys "over there" who are taking long chances, some are getting the ultimate result they know they must receive if they enter the service—they are coming back wounded. Opportunity for rehabilitation must be occupationally and steps must be taken to place them in our industries, in the proper surroundings and under proper conditions.

TOO MUCH TALK AND TOO LITTLE WORK

I do not think it is proper for me to analyze the position of our industries, as organized, or as related to various social and medical establishments. It is our duty, as individuals, to recognize the only patriotic thing to do—to receive them generously and work with them. I think we are inclined, occasionally, to be a little hysterical; we talk of too many things and do not give enough well-directed attention to one or two of the most important problems. The boys who are coming back will need our care for a time in the matter of rehabilitation and getting them back into industry. We are going to extremes in some cases. I just attempted to answer a questionnaire sent out by a national organization on the subject of the rehabilitation of wounded soldiers and one of the first questions asked was: "What is your central office and what are your branch offices?" Then they wanted to know about how much raw material we had, whether the output was periodic or irregular, and so on. It seems to me they are preparing a little bit hastily; we do not need all that to have the information of how to care for the men properly. When we get the men back, calculating from what Mr. Little has stated, we shall have formulated a plan, studied from all the various angles, by which we shall be able to present all our boys, when they are physically able, with places in industry. That situation will be met and then, when we have a chance to study these cases, we can find what is best adapted to them. I think we might well pause, for just a moment, as we have in this subject the question of women in industry. All of our lives we have lived with women; we have ridden on street cars and worked with them and gone to school with them, and to have them in the shops is just one step further in the proposition which we will work out to an ultimate solution. Of course, she is going to help in the rehabilitation of our wounded soldiers. One fine thing this is going to do is to bring us machinery for the rehabilitation of all cripples. The statistics of the experience in Canada shows that our problem of wounded soldiers is not going to be so great in volume as the problem of cripples in industry.

CHAIRMAN SHOUDY: If at any time anyone has material he thinks might be of advantage to the Health Service Section in the drafting of bulletins or pamphlets, don't hesitate, send it in. Read the bulletins carefully and profit by the experience of others.

The Section then adjourned.

THURSDAY AFTERNOON SESSION

CHAIRMAN SHOUDY: I have messages from Dr. Harvey and Dr. Cousins saying they are unable to be here and from Dr. Farnum saying that he is better. So many surgeons have joined the colors and the ones left are so busy that the speakers of this Section deserve a great deal of credit for their efforts in our behalf.

We will open the meeting with a paper by Dr. E. L. Pettibone of Cleveland. Dr. Tucker has kindly consented to read it in the unavoidable absence of the author.

THE DENTAL CLINIC AS AN EFFICIENCY FACTOR IN INCREASING PRODUCTION

DR. E. L. PETTIBONE, CLEVELAND, OHIO

Mr. Chairman and Members of the National Safety Council: Industry in the past fifty years, in its effort to increase production, has spent its greatest efforts in perfecting machinery and mechanical appliances and now its efforts must be extended to perfecting the human machine. Many interesting developments have been brought out at this meeting of what is being done to improve the human factors in industry, but my object is to induce you to pay more attention to that most vital, but still more commonly neglected part of the human machine—the mouth. It is most important because through it must pass all the food, water and most of the air which enter the body and which are important factors in the efficiency of the human machine.

You would not care to have men working for you whom you knew ate from a garbage can, nor would you furnish them water to drink that filtered through a swill barrel, but many of them are in reality doing worse than this. Parts of the food they eat are allowed to remain in decayed, pus-infected teeth in the mouth, which becomes an ideal bacterial media, and the water they drink, which you may have spent much money to purify, is filtered through this bacteria and filth and reaches the human system in a much less pure state than if taken from a swamp. Many of you have lunchrooms for your employes. Why bother about clean food, clean dishes, etc., if the food is contaminated as soon as it enters the mouth of those whom you are trying to protect?

INCREASED EFFICIENCY THROUGH DENTAL SERVICE

That bad mouth conditions do seriously hamper their efficiency I can prove to you by many cases of increased efficiency after the mouth has been

put in condition. I could cite many cases from the various industries which have dental clinics, as for example: Sadie J——, 22 years old, working in a ——— factory, made $47.85 in September; after the establishment of a dental clinic and she had had her mouth put in satisfactory condition she made $65.00 in July.

This, or many similar cases, would not convince you of the efficacy of a dental clinic for you might justly say: We do not make similar products, we do not employ women, we have increased our employes' wages more between September and July than the difference between $47.85 and $65.00, also there would always remain in your mind the doubt but that other factors had entered into the obtaining of these results. So in order to convince you, I am calling your attention to an experiment we conducted in Cleveland known—as the Marion School experiment—which is covered in a report issued by the Cleveland Board of Education: "A class was made up of twenty-seven children from Marion school, which is in the heart of the ghetto district of Cleveland. They were examined by Professor J. E. W. Wallin and given his indisputable scientific psychological test. They were taught to clean their teeth, how to chew their food, and were given the necessary dental treatment. They did this for ten months. In ascertaining the working efficiency of these children the following tests were prescribed: The memory test, the spontaneous association test, the addition test and, finally, the association of opposites and accuracy of perception tests. These tests were made before the work was started and after its completion and they showed an increase in efficiency ranging from 32 per cent to 918 per cent, an average of $98\frac{2}{10}$ per cent for the class.

"Six of these children were able to do in twenty-four weeks the work usually done in thirty-eight weeks and were graduated for high school in February, instead of in June. One girl was in a weak, nervous condition and suffered from nervous headaches: she not only grew robust but the headaches entirely disappeared. One lad who was in the sixth grade in May, 1910, was graduated a year later from the eighth grade, finishing the two grades in one year. One boy made first place in the athletic meet and secured two-thirds of the points won by the school: the year previous he was unable to win one point.

"The work of this class and its effect on the rest of the school took this building out of the group of these buildings wherein the failures exceeded the extra promotions and put it in a group occupied by very few schools in the city, wherein extra promotions, those who skipped a grade, exceeded the failures."

Now, what did the experiment accomplish? It was the means of establishing hundreds of school dental clinics throughout the country, because the hardheaded old fellows on the school boards found it was cheaper to fix a child's teeth so he could study than it was to carry him over, a failure, year after year. In fact, they could fix ten children's teeth for what it cost to carry over one failure. And now the school dental clinic is a universal thing—they are even going so far as to send dentists through the rural districts to fix up the children's teeth.

DENTAL WORK NEEDED IN FACTORIES

Twenty-five per cent of the men in the factories today can have their efficiency increased by having their mouths fixed. How do I know? Because we examined the mouths of hundreds of the 21-31 year old men of the draft and what did we find? Twenty per cent of their mouths in a terrible condition—foul, neglected, nothing ever done to keep them healthy. Ten per cent more needed fillings to keep them comfortable. So my 25 per cent is very conservative, because you have all the men working for you that Uncle Sam turned down because they did not have at least twelve teeth—three in front above that struck three below and three at the back above that struck three below. In addition to these you have all the older men and their teeth would not be as good.

Uncle Sam thinks so much of the dental clinic that he has one for each 1,000 enlisted men and he thinks so much of good teeth that he has asked the dentists to help the army dentists until he can equip his clinics. The dentists have done over 700,000 free operations for the selective service men before they went to camp.

There are four different kinds of industrial dental clinics: *First*, those wherein only examinations and prophylaxis are done; *second*, wherein examination, prophylaxis and fillings are done and a small charge made to the employes; *third*, wherein all types of dentistry are done for employes entirely at the company's expense; *fourth* those wherein work is done only for the employe's children—this is building for the future employes. Many industrial clinics have been started since the war. If Uncle Sam needs dentists for his soldiers why should we not have them for our industrial army?

If your firm cannot be influenced to spend the money on a dental clinic ask your employes to vote on whether they would support a dental clinic if installed and make it self-sustaining. The firm would be ahead then in just the time saved by employes laying off to go to dentists. In one plant the time saved from Jan. 1, 1918, to Aug. 1, 1918, by men who had work done by the clinic was 25,300 hours. It took a minimum of four hours to get down town to a dentist and back. The minimum wage in the plant is $1.00 per hour. If it saved the men $25,300.00 I leave it to you to figure what it saved the firm.

I believe as Richard Feiss of the Josephs & Feiss Company does. He said, in speaking of the dental clinic: "We do not call this welfare but 'efficiency work.'" A dental clinic will cost about as much as a medical dispensary—$1,000—and can be run for about the same amount. In other words, it will cost about as much as a cheap automobile, but will bring better results and run longer.

WHERE DENTAL CLINICS ARE SUCCESSFUL

The stockholders of the following firms have found dental clinics paying investments:

The Alameda Company, Oakland, Cal.; Amoskeag Manufacturing Company, Manchester, N. H.; Armstrong Cork Company, Pittsburgh, Pa.;

Avery Company, Peoria, Ill.; Bailey Company, Cleveland, Ohio; Bausch & Lomb Optical Company, Rochester, N. Y.; Bloomingdale Brothers, New York; Cincinnati Milling Machine Company, Cincinnati, Ohio; Colgate Company, Jersey City, N. J.; Colorado Fuel and Iron Company, Pueblo, Colo; The Crane Company, Chicago; Dress and Waist Makers' Union (International Carment Workers), New York; The Emporium, San Francisco, Cal.; Filene Co-operative Association, Boston; Firestone Tire and Rubber Company, B. F. Goodrich Company, Akron, Ohio; H. J. Heinz Company, Pittsburgh, Pa.; D. H. Holmes Company, New Orleans, La.; J. Hood Rubber Company, Watertown, Mass.; Inland Steel Company, Indiana Harbor, Ind.; Josephs & Feiss Company, Cleveland, Ohio; Kimberly, Clark Company, Neenah, Wis.; Larkin Company, Buffalo, N. Y.; Lord & Taylor Company, New York; Macy Mutual Aid Association, James McCreery, Metropolitan Life Insurance Company, New York; Morris & Company, Chicago; New York Telephone Company, New York; Pocahontas Fuel Company, West Virginia and Virginia; Schrader & Sons, Brooklyn, N. Y.; Sears-Roebuck Company, Chicago; Tennessee Coal, Iron and R. R. Company, Birmingham, Ala.; DuPont Powder Company, Wilmington, Del.; John Wanamaker Company, New York City, Hart, Schaffner & Marx Company, International Harvester Company, McCormick plant, Deering plant; Armour & Co., Chicago; National Cash Register Company, Dayton, Ohio; Ford Motor Company, Detroit; Dayton Wright Aeroplane Company, Dayton, Ohio; National Lamp Company, St. Louis; Kaynee Company, National Lamp Company, Cleveland, Ohio; Erie Forge and Manufacturing Company, Erie, Pa.; National Lamp Company, Cleveland, Ohio; National Lamp Company, Warren, Ohio; National Lamp Company, Youngstown, Ohio; Montgomery Ward & Company, Chicago; Washburn-Crosby Company, Minneapolis, Minn.; Kabo Corset Company, Chicago; LaBlond Machine and Tool Company, Cincinnati, Ohio.

In conclusion I want to offer you the assistance of the members of the National Association of Industrial Dental Surgeons. We stand ready to help and advise you about the establishment of dental clinics. We can tell you about methods, costs, operations and records; in fact, call on us for anything that will help you in any way to get a dental clinic in your plant.

DISCUSSION

DR. SCHRAM (Fairbanks-Morse & Co.): What is the best method of apportioning actual expenses for dental work? Has experience proved that work should be done free of charge; or, where not actually free, what proportion should the employe pay?

DR. ELLIOTT (National Lamp Company, Cleveland): We have five or six dental clinics and our work, as established, is for the medical clinics, physical examination work and dental clinics to function under one head. Ours is prophylactic work, in connection with the medical staff who send the subjects to us; the actual dentistry is usually referred to the dentist—the amount of work is left to his judgment. He puts in the simplest kind of temporary fillings—that is, we take care of the teeth until permanent work can be done. We take care of small cavities

and, of course, there is a loss of time, probably twenty minutes, but nothing compared to the time it would take to send the patient to an outside dentist. Much of this work is done without charge. If you want to make a clinic self-sustaining you can charge for service, but I think that corporations who have charged for such work have been rather disappointed in the results achieved. If you charge for the work you will immediately have the profession after you, they don't like to have you take their work away. If you diagnose a case of appendicitis in your surgical clinic and your surgeon operates, the profession, especially in a small town, will probably object. There is danger of stirring up antagonisms in the community which may reflect upon the general business of your plant.

DENTAL WORK IN A SMALL PLANT

MR. CHANDLER: I would like to see this matter discussed from the angle of the smaller plant. I am impressed with the fact that we are divided into two groups, those who have plants large enough to spread the overhead of a dental clinic so that the cost per employe would not be prohibitive, but in smaller plants it is out of the question to provide some of the things we feel may be advantageous. Is this practicable: Suppose a small plant with a trained nurse examines the teeth and detects the need for dental work. She has no facilities for taking care of the teeth and confines her instructions to tooth brush operations and things of that kind; where filling or mechanical cleaning is necessary she refers the patients to their own dentists. She follows up the work from time to time, to see that necessary work has been performed. Is that a practical suggestion for a small plant?

CAPTAIN BLACK: We have just tried a plan of that kind: our dentist looks over the girls' teeth and treats them if they wish it. So far we have been quite successful. The dentist suggests what is necessary to put their teeth in good condition and the girls are pretty good about going to their own dentists and getting their teeth fixed up. Our plan is confined to our day force, as it interferes too much with production to have the night force come down during the day. Besides, it scares the girls into thinking they have diseases of the mouth, if we call them in at what are to them unusual hours. To meet this we hit upon the scheme of having our dentist go over the work on the teeth by outside dentists. As we only charge our employes the actual cost of the doctor's time—material is free—a girl can get two or three fillings for less than the usual price for one. We have found the plan to work admirably.

DR. ELLIOTT: Our plants run over 500 people and it costs us, to have a dentist do this class of work, in one factory, about one day per year per employe: that means only about $2.50 in a factory of 500 employes. I think it could be kept down to that sum in factories of that size.

DENTAL EXAMINATIONS FOR EMPLOYES HANDLING CHEMICALS

J. O. MYERS (National Lamp Company, Niagara Falls): In our work we use certain chemical compounds which may cause deterioration to

the tissues of the gums, consequently there is a necessity for dental inspection. We have arranged for a dentist to spend one day each week with our force of about 250. He picks out a number of men each day and examines them. He gives their gums a course of treatment and they have the choice of having any actual work on their teeth done free or of going to whatever dentist they wish and paying a stipulated sum. The company insists upon the men's teeth being looked after, and through our methods and propaganda we have so trained the men that they are perfectly willing to undergo the examination. A good many of them prefer paying their own bills but we have had great success in getting the necessary work done.

CHAIRMAN SHOUDY: Our next speaker has a very interesting subject. I take great pleasure in introducing to you Dr. C. D. Selby.

PHYSICIANS IN INDUSTRY

C. D. SELBY, M. D., INDUSTRIAL HYGIENIST, UNITED STATES PUBLIC HEALTH SERVICE

Mr. Chairman and Members of the National Safety Council: For the purpose of studying their medical departments, 170 industrial establishments, variously located in the Eastern and Middle Western States, were visited during the first six months of 1918. This paper is based upon certain impressions, opinions and data secured during these visits, and its theme relates to the industrial physicians themselves and their activities.

In its beginning, industrial medicine was limited to the treatment of emergency cases. Injured employes were referred to physicians selected because of their availability, their reputation for competency in the care of emergency cases, or their willingness to enter into satisfactory agreements as to compensation. In the event of serious injuries, or questions as to where injured employes should be sent for treatment, physicians were summoned to the industries. The patients received their treatments or were taken to their homes or to hospitals. It occasionally happened that doubtful cases proved such as could be treated at the plants and the employes returned to work. Because of this the idea was conceived of reducing loss of time from work by having physicians and facilities for the treatment of injuries permanently within the establishments. Dispensaries or hospitals were improvised or built and equipped. Physicians were invited to establish themselves in the industries and they responded.

INDUSTRIAL PHYSICIANS ARE SELF MADE

A few of these pioneers became interested in the problems of production and saw opportunities to conserve the health of the employes and to increase their efficiency, both of which, of course, are essential to production and, realizing the industrial value of the sound human body, probably more than employers, their first efforts were to secure sound working forces and to maintain them as such. Their programs in the

development of these functions consisted in the physical examination of applicants for employment, in order that they might be assigned to work for which they seemed to be qualified, the inspection and supervision of conditions of employment and the treatment or alleviation of minor ailments that occurred during the working hours. The results to the employes and the indirect benefits to industry were such as to draw favorable attention. Other physicians were attracted and industrial medicine gradually developed until now it is recognized as being very necessary.

This growth of industrial medicine and the value of the industrial physician has come with considerable rapidity in the past few years; in fact, with so much rapidity that the practice of medicine, generally speaking, has not been able to keep up with the progress which has been characterized mostly by advancements in individual instances rather than by a gradual general advance of all of the industrial physicians. For instance, the use of dental service in the industries is of comparatively recent origin. It was found in only thirteen of 155 establishments whose medical organizations lend themselves to analyses. This is 8 per cent of the whole number. The thirteen who are availing themselves of dental service are passing through a more or less experimental stage, and when they have proven the value of the service to the complete satisfaction of industry, the physicians of other establishments will doubtless add dentists to their organizations.

The same is more or less true of the physical examination. Of the 155 medical departments analyzed, 44 per cent have the examination of applicants for employment as one of their activities. The value of the examination is also being tried out and, if proven to the complete satisfaction of industry, it will eventually become an accepted function of all industrial medical departments. In these and similar ways, the pioneers of industrial medicine are blazing the trail for medicine in general and for industrial medicine in particular. The industrial physicians then are developing themselves as well as the science of medicine applied to industrial needs.

COURSE OF TRAINING IN INDUSTRIAL MEDICINE

There is a rapidly increasing demand for industrial physicians and, in justice to both the medical profession and industry, men who desire to practice this branch should have facilities for training. Educational institutions should recognize industrial medicine as a very definite branch of practice, definite in its application of all branches of medicine rather than in the pursuit of any one particular line. Harvard University has recently inaugurated a course of instruction and research in industrial hygiene which will undoubtedly prove an effective start toward this end. In this connection there are now many well-organized industrial medical departments which may very well serve as institutions for training of recent graduates in lieu of or in association with their internship in hospitals.

Several classes of men were found actively engaged in industrial work.

They are those who have drifted in, those who have taken up industrial work by choice and those who have accepted it as an expedient. The drifters are usually those physicians who have had emergency cases referred to them and were subsequently invited to assume charge of dispensaries when they were organized. Some of these men are making good and others, as is usually true with drifters, merely follow lines of least resistance. They are apt to become what is known as finger wrappers—merely routine workers. The men who have gone into industrial service because of choice are, almost without exception, men who have determined to make it their careers. They have studied the problems of industry and have sought to adapt their skill and knowledge to industrial needs. These are the men who are proving the worth of industrial medicine and are doing much at the present time to conserve the industrial man power; they are living up to the ideals of the practice of medicine and are decided credits to its traditions.

The men who have accepted industrial service as expedients are of three classes: The recent graduates who have seen in it opportunities for a ready cash return, elderly physicians who have seen in it opportunities for semi-retirement and a regular income and others who have seen in it opportunities to establish clienteles from which might subsequently be derived patients for general practice or surgical work. As a rule these men retire from industrial service as soon as their ultimate objects have been attained.

Industrial physicians may also be classified according to their personal qualifications, referring particularly to their abilities to direct medical departments or their limitations to the details of ordinary routine. The practice of medicine is fundamentally detail work and a clever practitioner is ordinarily one who is trained to observe and attend to details. There are instances among physicians, of course, where administrative capacities have refused to be stifled by medical training and experiences. By surrounding themselves with capable assistants, and directing their efforts intelligently, these physicians usually become very successful and leaders in their profession. Such men make very good industrial medical department executives. Unfortunately, except in isolated instances, men of this type cannot be attracted to industry or are already engaged with the department they have developed.

If possible, employers should secure physicians who have already served as assistants in well-established industrial medical departments, otherwise they must select average physicians and, remembering that medical education and experience do not necessarily qualify doctors for industrial service, provide means for training them. The doctors should be sent, for example, to visit well-known medical departments where they may become imbued with the ideals and may learn recognized methods. It is suggested further that they be given opportunities to study their own industries before being placed actively in charge of their medical departments.

WHOLE-TIME, PART-TIME OR DETAILED MEDICAL SERVICE

There seems to be considerable difference of opinion as to whether

whole-time or part-time service is the better. The principal argument for the part-time service is that it permits the physicians to remain in contact with the practice of medicine and, therefore, to be better physicians. The principal argument against part-time service is that so long as doctors remain such they are not wholly industrial physicians. Observation has shown that the part-time men are more inclined to devote the majority of their thoughts and energies to that portion of their practices which pays best which is, of course, their general work. Arguments against and for part-time service are arguments for and against whole-time service. It was noted that whole-time physicians, as a rule, render more varieties of service for employes and are, consequently, more valuable to their employers. Detached physicians, or those who render services only on call, are almost without exception surgeons, and their work is limited to the care of injuries.

Of the 155 medical departments which were analyzed, 43 per cent rendered whole-time service, 33 per cent part-time service and 24 per cent rendered service only on call.

INDUSTRIAL MEDICINE IS THE CORRELATION OF MANY SPECIALTIES

The care of injured workmen is to employers the most evident and convincing reason for medical service and is, therefore, the predominating function of industrial medical departments. An interesting observation was made in this connection and it is that only 51 per cent of the physicians in whole-time medical departments attend serious injuries while 82 per cent of the physicians in part-time departments and 100 per cent of the physicians who render service only on call take care of their major cases. The fact that practically one-half of the physicians on whole-time service refer their major surgical cases may be accounted for in two ways. It may be that those who do so are not trained in surgical work, and this is true, and it may also mean that industrial physicians who take up the work seriously realize the value of specialization, which is also true.

Industrial medicine has become so comprehensive in its scope that it is obviously impossible for one man to practice all of its branches. This is indicated further by the tendency of industrial physicians to refer other lines of work to the specialists as, for instance, patients who require X-rays, eye work, laboratory diagnoses, etc. Another evidence of this tendency toward specialization was found in the medical department of the B. F. Goodrich Company, where obscure medical cases are referred for diagnosis. Undoubtedly, as demands warrant, a fair proportion of the large industrial medical staffs will include specialists; in fact, in some instances, eye men are now attached to medical departments as at, for example, the Ford Motor Company, the Midvale Steel and Ordnance Company, the William Cramp & Sons Ship and Engine Building Company and others. The Ford Motor Company has a surgeon in connection with its medical organization, and he is employed on a full-time basis. Many of those who make physical examinations are specialists in the sense that they do nothing else.

TREATMENT OF MINOR ILLNESS

Minor illnesses are treated in 94 per cent of the whole-time departments, 82 per cent of the part-time, and 8 per cent of those in which medical service is obtained by summons. A few industrial physicians refuse to care for minor illnesses, on the ground that they should be attended by private physicians, and some hesitate in the fear that treatments may imply obligation for payment of compensation in cases of serious illness or death. Major illnesses are treated by a trifle more than 4 per cent of the whole-time departments and somwhat less than 4 per cent of the part-time departments, usually as a function of beneficial associations. One physician was found to be treating serious cases of illness in order to build a clientele from which he might eventually derive a private practice, his intention being to withdraw from industrial service when that end is attained.

Thirty-two per cent of the whole-time departments take their own X-ray pictures and 8 per cent of the part-time departments. This disparity again illustrates the wider range of activities among whole-time departments.

Although many dispensaries have limited facilities for laboratory work, only 15 per cent of the whole-time departments are provided with means for a wide range of laboratory service, while those facilities under part-time service are usually limited to the making of urinalyses. Inasmuch as industrial medicine has just as much need for laboratory work as the practice of medicine elsewhere, it must be assumed that industrial physicians are not availing themselves to the utmost of this aid to the scientific practice of medicine. This neglect may be attributed to insufficient funds and, possibly, insufficient time; even so, neither funds nor help will be forthcoming until the need for laboratory facilities and service has been clearly demonstrated to the employers. Industrial physicians must realize that the best way to demonstrate effectively this need is to do their work thoroughly, and their work cannot be done thoroughly without the necessary aids. It is a very poor policy on the part of industrial physicians to do their work poorly, either because of lack of funds or the lack of assistance.

PHYSICAL EXAMINATIONS ENHANCED BY SUBSEQUENT SUPERVISION

Physical examinations of applicants for employment are being made in 76 per cent of the whole-time departments, 33 per cent of the part-time and 3 per cent of the detached; for the most part they are poorly made, amounting to little more than inspections. The real value of the physical examination is in the information which is obtained and the supervision which is subsequently exercised over those who are accepted for employment, though defective. As the examination is usually made, there is no subsequent supervision except in the instance of those who become ill and seek treatment at the dispensaries. The result of this superficial work, and the failure subsequently to supervise, is that some employers have come to believe that the sole function of the examination is to

exclude the defectives and, acting on this belief, they have recently ceased to require it.

At a time like the present, when there is a material shortage of labor and when people who are not used to being employed in factories, mills and other industrial establishments are accepting employment, the physical examination as a means for determining fitness for labor and its maintenance would seem to be more necessary then ever before. Physicians, therefore, are admonished to make the examinations thorough and to familiarize themselves with working conditions, or job requirements, in order that they may intelligently recommend lines of work for those who happen to be physically defective; they are also urged to supervise all employes carefully after their acceptance and assignment to work. It is only by such duties that physicians can demonstrate to the employers, and employes as well, the real value of physical examinations.

Repeatedly the thought comes up that industrial physicians do not devote themselves thoroughly to their work and, although this is repetition, they are advised that anything which is important enough to be done is sufficiently important to be done well. Of course, there are some industrial physicians whose work is a credit to the profession; they are the leaders and are convincing industry of the value of medical service, but satisfactory progress cannot be made unless all industrial physicians do their work well. It is exceedingly difficult, for instance, to convince an employer who has tried the physical examination as a requirement for employment, and has seemingly found it to be a failure, to attempt it again. In some establishments, process workers only are examined; in others food handlers only, and, in a few, examination is a requirement for entrance to employes' benefit associations.

FACTORY INSPECTION A FUNCTION OF INDUSTRIAL MEDICINE

It would seem that the presence of insanitary conditions in manufacturing establishments might prove inimical to the health of employes, but in spite of this comparatively few industrial physicians make inspections of their establishments, except upon special occasions and then usually only on request. The percentage who do are as follows: Whole-time, 36 per cent; part-time, 6 per cent; detached physicians, none. As a rule, safety engineers make sanitary inspections in connection with their safety work. They have probably taken over this function, which very properly belongs to the medical departments, because of the fact that they have seen the need and because of a realization that it would not otherwise be done.

Next to the physical examination, health instruction is probably the most important activity of industrial medicine in the prevention of diseases, yet this is an activity which receives but little consideration. It is true that many of the medical departments assume care of trivial ailments and at the time of treatments give more or less advice and, while this is a valuable line of educational work, it does not cover the whole field. Personal talks, especially in connection with the findings of physical examinations, are well received by working people and tend

more to impress them than lectures or health bulletins, but again physicians do not take the time carefully to instruct employes when they find defects.

Thirty-two per cent of the whole-time medical departments, 20 per cent of the part-time and 3 per cent of those establishments which obtain medical service by summons, use health bulletins, and for the most part these are the bulletins prepared by the National Safety Council. Health talks are given in 18 per cent of the whole-time departments and 9 per cent of the part-time.

FIRST AID NECESSARY UNDER CERTAIN CONDITIONS

There is a well-established feeling among industrial physicians that first aid by fellow workmen begets unsatisfactory results, in that the recipients of trivial injuries are inclined to consider the first-aid treatments sufficient and do not, therefore, visit the dispensaries for subsequent attentions. Yet there is a real need for first-aid service. This has been evidenced by Dr. Lauffer, of the Westinghouse Electric and Manufacturing Company. Theirs is a large establishment and, being devoted to the manufacture of electrical appliances, employes occasionally receive electrical shocks. The distance from the dispensary makes resuscitation by fellow workmen quite necessary. Dr. Lauffer has trained certain of the employes to administer artificial respiration by the prone-pressure method and he finds that restoration by them is prompt and effective, filling in the interim between the receipt of the shock and the presence of the physician. The Bethlehem Steel Company also covers a considerable amount of ground and injuries occasionally happen at a distance from dressing stations. Dr. Shoudy has trained some of the employes to apply protective dressings and to convey the injured employes to the dressing stations. This is very good, in that injured workmen are handled intelligently during the period lapsing between the receipt of the injury and the arrival at the dispensary. Eighteen per cent of the physicians in whole-time and 4 per cent of those in part-time departments teach first aid under circumstances similar to those which have been mentioned.

SAFETY WORK NOT A FUNCTION OF MEDICINE

Although the prevention of accidents is not, properly speaking, a duty of industrial physicians, it was observed that 32 per cent of the whole-time medical departments and 9 per cent of the part-time departments assist in accident prevention by sitting with safety committees or by accompanying safety inspectors in their tours of inspection. Three of the whole-time physicians are in charge of safety work. In view of the fact that safety work is not recognized as a medical problem, it would appear that physicians who assist in accident prevention are using time which could be devoted to better advantage in work that is more closely allied to industrial medicine, and it would seem that when the physicians report to safety departments the data obtained from patients they have ful-

filled their obligations. The great demands which the purely medical work make upon the time of industrial physicians certainly seems to support the contention that they should limit their activities to those which very properly belong to them.

In times past there has been a tendency on the part of industrial managements to send nurses upon tours of inspection to ascertain the causes of absence of employes, but experience has proven this policy to be fallacious, as the value of the nurse as such has been depreciated by the resentment which such investigations seemed apt to arouse. There is, however, no objection to nurses calling upon sick and injured absentees for the purpose of assisting in their treatments or pursuing educational work. This is being done in connection with 18 per cent of the whole-time medical departments, 9 per cent of the part-time medical departments and 3 per cent of the detached medical departments.

Two physicians on whole-time and one on part-time service supervised cafeterias. The remarks applied to first aid applies equally, of course, to the supervision of cafeterias. This hardly appears to be a function of medicine, although industrial physicians may very properly supervise the menus of restaurants, cafeterias and refreshment stations, may safeguard the sources of food, milk and water, and may examine physically the handlers of foodstuffs.

The keeping of records seems to be one of the most difficult phases of industrial medical work which physicians have to contend with. Being notoriously neglectful of records and reports, they have difficulty in measuring up to the requirements of industrial establishments in this respect—a difficulty which is of considerable annoyance to employers, inasmuch as records and reports, principally of accidental injuries, are of prime importance. About the only logical way out seems to be the employment of clerks or the use of nurses or other attendants as clerical aids. In any event, it is advisable for physicians to delegate this function to others who take the matter of record keeping and report making seriously.

DOCTORS MUST PROVE THEIR WORTH

It is evident that the basis of compensation of industrial physicians is more or less arrived at by individual bargaining, physicians obtaining as much as possible and employers paying as little as possible. This has resulted in a wide range of compensation and some very peculiar agreements. There is, for example, the part-time physician who obtains 13 cents per month per employe from the management of a concern which hires 900 employes. There is the physician on call who is paid fees by the underwriter for services rendered; he attends the employes of an establishment which hires approximately 4,000 men and his annual compensation amounts to about $15,000, out of which he employs assistants. Then again, there is the whole-time man who receives $1,200 a year from a concern employing about 500 employes and the part-time man who receives $1,800 a year from an establishment of similiar size.

Considerable dissatisfaction was expressed in some quarters because

of the relatively small remuneration which is being received. It was observed usually in such instances that the physicians limited their activities to the care of trivial injuries. Inasmuch as employers are able to secure attendants, either nurses or men who from experience have learned to apply dressings, at a monthly cost of say $100, they are naturally reluctant to pay physicians any more when they render only the same service.

If doctors are to command salaries which they consider in proportion to their talents they must use all of their abilities in the interest of the employes and it is incumbent upon them to prove their value. This they may do by gradually extending the usefulness of their departments and demonstrating to both employers and workmen the value of the added activities. In other words, industry must be convinced that physicians have services which are worth more than that which is rendered in connection with injuries.

Accidental injuries are sources of expense and they are tolerated by industry only because they cannot be completely avoided. Physicians who take care of injuries only, bear the same relation as the injuries and are, therefore, regarded merely as sources of expense. On the other hand, if they are able to direct their efforts toward the conservation of the health and the maintenance of the efficiency of the employes, in order that they may become better producers, they are doing something which facilitates production and is of real value to industry. Physicians who have approached their work with this in mind command very satisfactory salaries, varying from $3,000 to $7,500 a year.

INDUSTRIAL MEDICINE IN DEVELOPMENT STAGE

In conclusion it might be said that:

1. Industrial physicians are blazing new trails in medicine and in industry. They should have the help of the medical colleges and they should exert themselves to instruct the profession generally in the ways of industrial medicine by frequent publication of their observations and experiences.

2. Although there are now physicians of high attainments in industry, others of equally good training and qualifications should be attracted. This may be done if those now engaged in industrial service demonstrate that it is a field worthy of the ideals and traditions of medicine and possessing opportunities for scientific practice and research.

3. Industrial medicine is still in the development stage and more or less on trial by industry. The principles are right, the theories are sound. Industrial physicians have but to do their work thoroughly and to apply all of their talents wholeheartedly to prove their case.

4. And when industrial physicians have demonstrated their full value, have shown that they are able to assist in the stabilization and the maintenance of efficiency in the working forces, their remuneration will be commensurate and satisfactory.

This paper should not be construed as a criticism of industrial physicians—it is not so intended. If they have appeared to be remiss it is be-

cause of the tremendous handicaps they are compelled to labor under. Industrial medicine is still new to industry and is yet regarded somewhat in the light of a reform movement, but firm in the conviction that they have a real mission to fulfill in the service of the working people and the productive trades, the doctors are striving unceasingly. Recognition and high commendation is accruing to them and will eventually be given. In the meantime, it is their privilege to labor on, seeking always the fruition of their beliefs.

The only saddening thought is that industry and the nation at large do not now, in this time of tremendous industrial effort when so much depends upon the productivity of the working people, come to a realization in full measure of the value of industrial medical service. As it is, not only must the doctors labor on with insufficiency of help, quarters and equipment, but they must also justify the fact that industrial service is a patriotic endeavor, prompted by motives of love for our country and affection for our people.

CHAIRMAN SHOUDY: We will postpone discussion of this very excellent paper until we hear a paper from Dr. A. P. Hourigan.

HEALTH WORK IN THE SMALL PLANT

DR. A. P. HOURIGAN, PLANT PHYSICIAN, LARKIN COMPANY, BUFFALO, N. Y.

(Illustrated with many photographs)

Mr. Chairman and Members of the National Safety Council: In our plant men marked for promotion have a record kept of their abilities along certain lines and their adaptability to do certain lines of work. They are marked for intelligence, application, good memory, etc., and they are also marked for their good health. These are called "construction qualities," and good health is considered one of them, so it is up to the men and women of the plant to take care of themselves and it is up to the plant to do what it can to further and uphold them in doing so. We carry out all our lines thoroughly and endeavor to follow all the recommendations just made by Dr. Selby.

Our factory dispensary is well lighted. The room is large and nicely appointed. It has a French grating ceiling, nicely decorated; the floor is of cement formation and the furniture is enameled white. Our attendants are three registered nurses—in the state of New York this means one who is a high school graduate and who has passed, I think, three years in the hospitals and a certain required State examination. In our factory we have three of these nurses and in the administration building four. We also have a woman doctor and a physician and surgeon. We care for every injury, even a break in the skin, and are insistent on more serious injuries being sent to the dispensary. No matter how trifling the injury, it is taken care of at once; even a bruise or a small cut is properly treated to prevent infection. Any kind of sickness that comes up

in the plant we take care of in the plant, although we sometimes find it advisable to call in an outside physician for consultation.

SPECIAL EXAMINATIONS AND CARE OF PATIENTS

We have, in connection with our dispensary, an X-ray apparatus, used in making diagnosis for the benefit of those who work in the plant. We have a laboratory for blood and urine analysis, used in connection with new men: they have to undergo a physical examination, also a urine examination, and sometimes a blood examination. We have a restroom in connection with the dispensary, where employes are sent to recover from trifling injuries or ailments—they are kept there after treatment until they are ready to go home. We have an isolation room for cases of contagious diseases, such as scarlet fever, diphtheria or mumps, that appear at the plant.

Instruction is almost continually going on in first aid work by one or both of the doctors or the nurses. After the students pass the Red Cross course they are given a Red Cross diploma.

We have one dentist but we should have several. His duties are largely absorbed by people who want to economize on time—officials who want to leave their desks at 11 o'clock and be back at 11:30. A good deal of work is done and a great deal of educational work is carried on.

We have ten restrooms throughout the factory. In order to keep the health of our girls in the best possible condition (we have found that girls coming to the city to work in our plant are scattered all over the city and live in all sorts of boarding houses, and are liable to be neglectful of regular hours of sleep and regular eating hours) and to help them overcome unhealthful home surroundings, we have established what we call a "girls' dormitory"—several large buildings located near the plant. The girls are cared for there and the matron, a motherly old lady, who has charge of them, is not too severe, but keeps close to their problems: she has their interest at heart as much as a mother might. The dormitories are complete in their appointments and the living rooms and sitting rooms are pleasant and comfortable. The bedrooms are nicely furnished and compare favorably with similar rooms found in the homes of well-paid mechanics. The gymnasium is also used for stereopticon lectures and is under the care of a director. Christmas celebrations for the children of the neighborhood are popular features. We also have war gardens and patriotic activities of all sorts. In addition to all this we have established what we call a country club about five miles out of the city. It is located on Lake Erie and has about 100 feet of beach front. It is a beautiful place; with comfortable houses and well-kept lawns and playgrounds and the girls get a great deal of pleasure out of it. We are actually doing things, not talking about what should be done and advancing a lot of theories—that is my reason for showing you the photographs and dwelling so long on the subject. Besides, it is a purely business proposition and a good investment, and the employes are accepting it in that spirit. No charges of any nature are made for the several activities.

INTERMISSIONS DURING WORK PERIODS

We have also installed the practice of having ten and fifteen minute intermissions during the morning and afternoon work periods. The girls and men at the desks go through certain calisthenic movements while men engaged in the heavier occupations are allowed to drift about and take their fifteen minutes as they see fit. We are located in a city of about 45,000 inhabitants, and we pay approximately 2 per cent of the taxes, so we find that the problems of the city are also interesting to us, especially on the point of health problems. A movement was started for an incipient tuberculosis hospital and we immediately realized that would be a benefit to us as well as a benefit to the city, so we got behind the movement. Everyone, high and low in the plant, took an interest in it and helped build the institution. It is thirty miles from Buffalo and all incipient cases of tuberculosis are taken there. We also started a clinic in our plant for the same purpose. When the matter of looking after the health of the men and the caring for cases of genito-urinary diseases, gonorrhoea, syphilis and the like was called to our attention the welfare department was ready to assist a movement for the care of that problem, so we got behind that, too, as a public institution rather than for any service it might render our employes.

We are strongly in favor of prohibition and keep in touch with the people who work with us. One of the most serious injuries to health is caused by alcohol and we are firmly convinced that this work will amply justify itself; prohibition will bring about a healthy, clean, moral condition in any community.

We keep in close touch with the local health department and they aid us in making blood examinations, sputum examinations and veedol examinations; they aid us by giving information as to their contact of people who work with us, of tuberculosis cases, of contagious diseases and such things. We also keep in touch with the State and national health departments, especially in the line of so-called industrial diseases. We feel there is a big gap which should be bridged in some way between national health service and the industries in the gathering of data and the doing of constructive work in the line of prevention. We have from 4,500 to 6,000 employes and our problem is no small one.

DISCUSSION

CHAIRMAN SHOUDY: I wish the officers of the National Safety Council were here to see this audience and hear the splendid papers. We need a lot of work in this Section and the co-operation of every executive and doctor in every industry to perfect our work.

DUTIES OF INDUSTRIAL PHYSICIANS

DR. GEIER: In approaching a standard idea of what constitutes industrial medicine and surgery we have to go back to the agencies upon whom responsibility rests. One man can only do one job, and to eliminate lost time he must have a broad conception of his work. Dr.

Selby is right and has our ideas pretty well crystallized as to what constitutes a first-class doctor in industry. He must have standardized ideas of his duties from a medical standpoint. The doctor who goes as a weakling into an industry will be of no great value to the industry itself, but if he goes in with the idea that he can give service beyond the average along health lines and all that goes with it and have a broad conception of his responsibility to society and to the industry, he will have a definite understanding that industrial relations are of primary consideration and will be able to make a real contribution to medicine and surgery. Dr. Selby suggests that the idea is one to be worked out through industrial relationship and that one of the ways is through commissaries, dining-rooms, etc. My firm position is this: That to take hold of the welfare situation the director must first be a scientific man, he must have a feeling of kindly regard for others and he must have proper social concepts as between employes and between the employer and employes. We all recognize that commissaries are good things and that men should be taught health principles and that clean teeth and a clean mouth are the beginning of good health. In the course of time this begins to be the rule in the plant, through the teaching of the medical man; all these things will be facilitated as we get a broader view of human relationship. However, we are getting to a position where we recognize the value of lost time in dollars and cents, what we can contribute to the employe and thereby add to his or her earning capacity. Lost time and absenteeism are things in which both the management and employes are interested and in providing proper health facilities and surroundings the industry can enhance the value of service both to the employe and itself.

EDUCATION THROUGH PREVENTIVE INSTRUCTION

In the industries, as in all mercantile life, I believe the man will get what he is worth, but he cannot be worth much to the industry unless he has a broad concept of his responsibility to his fellow workmen as well as to his employer. The doctor, in truth, can be a social engineer as well as a physician. He can help the employe meet conditions, he can see where the employer can wisely spend his money, help eliminate difficulties, and help keep the right men in the right jobs, for, after all, industrial medicine teaches the men, through preventive instruction, to fit themselves to fit their jobs. Through their wider knowledge of the economic relationships between health, industry and the man, they have a much wider responsibility than is generally conceded when we discuss industrial medicine. The industrial physician should be primarily a clearing-house on the subject of health. He cannot be a specialist on every disease or for every condition, but he should have sufficient intelligence to know what to leave alone. Yesterday the question was asked: "Shall we not let down the bars so that nurses may treat cases that usually are assigned to doctors—cases requiring simple treatments of wounds, bandaging, and such things as that?" My answer is that it would be a very wrong thing to do. As I listened to Dr. Selby's remarks I was impressed with this primary necessity: Every doctor who goes into industrial work

should have a proper social concept of his calling. He must recognize, for instance, that mutual aid is his right hand in helping a man recover his health. He must recognize that the dentist has a definite part in the work; that the workman should have a clean mouth and teeth, a clean place to work in and that proper sanitation is necessary.

What can we do to instill in the workman an interest in the self-preservation of his health, to the end that he may know that good health pays him the biggest dividends in actual dollars and cents? Teach him that medical service is for his own good: teach him to discriminate in the choice of physician or doctor to get the best results; teach him the difference between a man who actually examines him and the man who asks a few questions and writes a prescription without even feeling his pulse! Teach him to help get himself in line, so he will do better service. Arouse employer and employe alike to the value of preventive medicine to keep men in good physical condition, that it is a matter of dollars and cents to both. Arouse the profession to the necessity of reorganization and extension of social work so that it may become more efficient; the necessity of establishing hospitals and clinics and to clear up the debris that exists even in our own profession.

In Cincinnati we are forever calling on the hospitals and clinics to examine and treat men for such things as rheumatism and pyorrhea. The first thing to do is to remove all the old snags and get their mouths in shape, because no one thing has more effect on good health and efficiency than a dirty mouth, full of decayed teeth and disease. Industrial physicians can and must bring home emphatically to the institutions that they are producing more today than they ever did for the money that is allowed their department. When this course is followed and these activities emphasized the industrial physician will really and truly be benefiting society.

MUTUAL OBLIGATIONS OF EMPLOYER AND EMPLOYE

DR. LEWIS J. DANIELS: It is often the small things that are overlooked as non-essential: For instance, the proper treatment of small cuts and bruises, removing a splinter from the finger, or from the foot in order to avoid infection: removing all foreign substance from any wound, even ever so small, to prevent infection, and possible, yes, probable complications that follow. Many of these things can be alleviated by reporting the case to the company, in order that there may be no after-complications, resulting, naturally, in loss to both employer and employe. The obligation that the injured party owes to the employer is to be considered; also the obligation that the employer owes to the injured party, such as prevention of a repetition of the same sort of injury and preventing infection in case of injury. The first-aid cabinet, I think, causes an unnecessary loss of time in many cases in the small plant. Indeed the first-aid cabinet should remain closed after the first-aid service is rendered; subsequent treatment should be given by a competent surgeon (whoever the firm chooses) but not by the first-aid man.

DR. SCHRAM (Fairbanks-Morse): As soon as a man is injured the

nurse takes his name and the date, sees that the injury is attended to, and he is told to come back for further treatment or for an examination. If he is gone two or three days a visiting nurse goes out and finds him and gets him back to the office. If he is physically fit to do something around the shop he is put to work. I have been with my firm fifteen months and I have always found something a man can do if he is only trivially injured. He can earn part wages unless he is really seriously injured. Sometimes we find a man is drawing too much insurance and he stays off altogether too long.

CHAIRMAN SHOUDY: How much lost time can be eliminated by quick service? When a man is injured he should not have to take a seat in a so-called waiting-room and wait an hour or two for the doctor to take care of him. We have no waiting-room in our plant; the doctor treats him immediately and gets him back on the job.

PROMPT DOCKETING OF ACCIDENTS

MR. FILLMORE (Safety Engineer, W. H. Markham & Co.): One of the most important things, next to treating the accident itself, is the quick reporting of injuries. While a physician or surgeon is best able to judge the length of time a man may be laid up or incapacitated from a given injury, he should remember the insurance question, generally involving the provisions of the compensation law, and an early report will save much trouble.

MR. EVANS (Briar Hill Steel Company): The question of the extension of the registered nurses' work was brought up as a suggested effort to bridge the gap caused by the calling of so many doctors and surgeons into military service and was not a question of trying to take duties away from the medical profession. While I am on the floor I want to characterize as entirely wrong the practice of returning a man to work simply to make a record of no lost-time accidents. Some classes of our workmen are looking for that kind of a snap; they are satisfied to do nothing and draw full pay, because their foreman or the management is willing, but the conscientious, willing employe should not be rushed back to a job just to make a record.

MALINGERING RARE AMONG WORKMEN

MR. R. M. LITTLE: If I am able to contribute anything to the topic under discussion it will be from the point of view of administration and compensation as regards lost time from sickness. Let us omit attempting to define the difference between injury and sickness as it is often very difficult to distinguish clearly between accident and sickness, because they are readily blended together. There is, of course, considerable less difficulty in sickness as against accident, because duration will be materially shortened by proper medical attention. One of the first points, it seems to me, gradually to make progress in this country in this problem, is that all the State compensation laws should be amended, in so far as is necessary, to give adequate medical attention to all who are sick in industry. Our observation in the Federal Commission was this: That the

choice of a physician and the going to the home physician will oftentimes prolong disability and absence from work on account of sickness. This has been brought forcibly to our attention by the fact that even in Federal plants there are physicians, or groups of physicians, who would give certificates for disability and continued illness when it did not exist. On the whole, however, that is a minor consideration.

I want to say on behalf of our American working men that malingering has been greatly overemphasized, and only an occasional malingerer is discovered to be drawing too much insurance: the average man would rather be fair and be back at work. If we are to make progress along this line we will have to perk up a little on the value of health to the community and to the State as a whole. Every person should visit a physician twice each year and be examined if sickness is to be prevented. If I were to call on those in this audience, in apparent good health, who have, in the last twelve months, visited his or her physician and been examined, how many do you think would so indicate? Many of us, enjoying apparent good health, grow careless and indifferent in little things. We say: "What is the use? I am in good health, what is the need for an examination by a physician? Reports of health insurance companies show that nine days each year are lost by each wage earner of this county on account of sickness. If that figure is even approximately correct it is staggering to think of the time and efficiency lost to our industries on account of sickness—sickness which could be avoided by proper teaching and preventive methods. If those figures are correct, then, with 30,000,000 of workers, it would mean that we have lost 270,000,000 hours or 740,000 years each twelve months on account of sickness. Think of it! In the advancement of the medical profession and surgery, certainly the understanding of disease in this great profession has advanced to the place where, if that wisdom could be focused upon the problem of caring for the health of our communities—taking these teachings to the family and to the individual—there should be a tremendous shortening in the loss of time on account of sickness. The American people do not need to be sick on an average of nine days each year—it is a terrific loss, serious indeed to the workingman. When it comes to teaching the workingman in the plant it is the duty of the industrial surgeon to instruct his men in the proper care of their bodies, teaching them proper hygiene and right ways of living—what to do and what not to do to preserve their health and prevent sickness.

CHAIRMAN SHOUDY: Thank you, Mr. Little. I will ask Dr. Eugene Lyman Fisk to open the discussion on our next topic.

ELIMINATING UNNECESSARY TIME LOST BY SICKNESS

EUGENE LYMAN FISK, M. D., MEDICAL DIRECTOR LIFE EXTENSION INSTITUTE, NEW YORK

Mr. Chairman and Members of the National Safety Council: An intense interest has been aroused in the subject of physical examination

by the result of the draft. The fact that 38 per cent of men called for examination in the first draft were found physically unfit, even for training at the camps, has in a few months focused public attention which otherwise might have taken years to concentrate on this subject. The actual degree of impairment was, of course, far higher, but many of the impairments were corrected at the camps.

The lessons that we derive from these figures are: *First*, the degree of impairment of youth; *second*, the opportunity for prevention and correction. Why wait fifty or a hundred years for a great war to inform us of the actual physical condition of the Nation? Why limit the benefits to a few millions of draft age? Why not periodically survey the Nation at frequent intervals from childhood on? Why tolerate conditions which compel us to place the burden of actual warfare largely upon boys? There is at the present time a peculiar need to reclaim those found defective by the draft examination, to examine those outside of draft age and to correct their defects as far as possible. With the withdrawal of so many able-bodied men between the ages of 18 and 45 a heavy industrial burden was placed on the elderly, the defective and upon women. Old age begins to accumulate early in life and at 40 the death rate is double what it is at 20: this is a reflection of physical insufficiencies as revealed by the draft and by systematic medical examinations. Loss of vitality before half the span of life has been run is largely preventable or postponable. It is not due to the passage of time, but to what happens in the course of time. The things that happen are as follows: Infection, poison, physical strain, mental strain, physical apathy, mental apathy, food excess, food deficiency, accident and injury.

Chauncey Depew was close to the truth when he said that death before 70 was the result of suicide or accident. It is all important to standardize the work of physical examination. However brief the examination, the aim should be to ascertain the fundamental organic condition, especially any condition that is a menace to organic integrity.

TEACHING OF PERSONAL HYGIENE

The teaching of personal hygiene to the worker should be carried along two lines. *First*, general, by means of articles in plant papers, special bulletins, posters, lantern talks and lectures. *Second*, by special and applied health instruction. This should be based on the ascertained physical condition of the individual. Many people do not appreciate the proper scope and purpose of such work—their minds are fixed principally on the physical examination: they fail to appreciate that it is not enough to separate a few cases needing immediate medical or surgical attention, but that every individual examined will be found to have some defect or show some error in living which requires correction. It is necessary, therefore, systematically to provide for conveying instruction to each individual, based upon the results of these examinations—a hasty verbal warning by the examiner is not sufficient. All the facts in the case should be carefully reviewed and the results of the examination and

the needs for hygiene and medical attention explained. Special leaflets on such subjects as eye strain, constipation, overweight, underweight, prevention of colds, proper diet, etc., should be frequently distributed to employes by the management. Even though many individuals will disregard these leaflets they are apt to carry them home merely as a curiosity and the seed of knowledge will be sown in that family. This method has been productive of much good in public safety educational work.

TYPES TRANSFORMED BY SIMPLE METHODS

It is not uncommon to find the physical type and condition wholly transformed, even without any actual medical supervision or interference, by correcting such conditions as constipation, overweight, and high blood pressure through a simple regulation of diet. Astonishing results are often obtained through proper medical or dental supervision. What appeals to me most strongly in this work is that it teaches self-help, yet warns against self-medication and patent medicine indulgence.

There is a limit to what the employer can do in the matter of plant sanitation and hygiene and the co-operation of the employes must be secured if healthful living habits are to be established outside of the plant. Much good can be accomplished by a very simple modification in living conditions, so we must never be discouraged because of the difficulty in putting over the complete message. The immense stimulation accorded to this work by the example of the army should prompt us to prosecute it vigorously and not miss this golden opportunity of teaching a patriotic as well as an industrial lesson of the significance.

CHAIRMAN SHOUDY: Our next paper deals with the proper care of the employe's family, adequate housing and recreational facilities.

ELIMINATING OTHER UNNECESSARY TIME LOST

(A) CARE OF EMPLOYES' FAMILIES.
(B) ADEQUATE HOUSING.
(C) RECREATIONAL FACILITIES.

J. A. COUSINS, M. D., MEDICAL DIRECTOR, UNION BAG & PAPER CO.

Mr. Chairman and Members of the National Safety Council: The subject, "Eliminating Other Unnecessary Time Lost," excluding time lost by injury and sickness, brings up the whole question of industrial unrest, strikes, lockouts, boycotts and that form of sabotage which is called "striking on the job," or, in other words, loafing at work. Anyone who has anything to do with either war or peace work knows that industrial unrest is deep and all pervading. We read constantly of strikes, sometimes attaining the proportions of industrial war. Within the past few years strikes have many times become actual bloody combats between groups of armed men. On the side of the strikers guns and munitions appears, as in the case of the Colorado mine strike. On the side of the employing corporations, militia and those privately armed guards the Secretary of Labor called "thugs."

So important had this question of industrial unrest become in 1913 that President Wilson appointed a commission to investigate the causes of industrial unrest which had caused so much unnecessary loss of time. This commission, after hearing testimony in all parts of the Union—testimony now printed in eleven thick volumes of more than 1,000 pages each—announced that there were four principal causes for unrest, as follows:

1. Unjust distribution of wealth and income.
2. Unemployment and denial of opportunity to earn a living.
3. Denial of justice in the creation, adjudication and administration of law.
4. Denial of the right and opportunity to form effective organizations.

HEALTHIER CONDITIONS MUST PREVAIL

Any discussion of the main causes of unnecessary time lost, therefore, must include the knowledge of the four main causes set forth by authority of the United States government. But since this analysis was published we have entered the world war and radical changes have occurred, yet it will be found that the same general causes remain. For example, the chief cause of complaint against labor employed in the manufacture of necessary products and commodities is the persistent tendency to cut down production in order to increase the volume of work at the higher rate of pay which is steadily being awarded. Those who speak for labor in our government have again and again announced that the thing which lies at the root of labor unrest is the outrageous profiteering which goes on by the companies for which they toil. President Wilson is authority for the statement that there has been such outrageous profiteering. When we seek to investigate the amount that such enterprises as the Hog Island navyyard, the copper and steel and coal industries have pocketed we are astounded by the figures disclosed. Not millions, but billions have been wrung from the Nation's necessity by those who control the things found to be essential. Seeing these huge profits labor demands its share, and in order to force a division, either outright striking or the cutting down of labor efficiency is resorted to. However, strikes appear to be the cause of less than 2 per cent of the loss in working time.

This question is for the economist to deal with. As physicians, we are concerned with the human side of the problem. When, however, it comes to such a question as the first topic assigned me, namely, "Care of employes' families," we are compelled to say that the principal subject in such a discussion must be the high cost of living. The government announced that $1.00 would buy, on September 1, of this year, only as much as 54 cents would buy one year ago: one year ago prices were far higher than they were in previous years. Clothes, books and housing cost proportionately more. It is evident that unless some sure and certain effort is being made by the Nation to remedy this evil labor is going to be pervaded with a deep discontent, which more than any other thing or combination of things is going to mean time lost. Much may be said

about the many ideas advanced relative to what extent the employe's family should be cared for. Employes, in many instances, resent any attempt on the part of an employer to dominate their mode of living or dictate arbitrarily what care should be given their families, and by whom. In some instances, in an enlightened community, the statement has been made, "Give us sufficient wages and we will care for our own families."

The advance of sanitation in homes has been in part the result of continued attempts to educate the employe's family in cleanliness, ventilation and disease prevention. A man worried, a man sullen and discontended, a man nervous with apprehension, a man ill-fed, ill-housed and unable to care for his family as he feels that they should and must be cared for, is not a good employe. An investigation made by an employer as to why an employe is less efficient than usual or is late to work or is less active while at his post of duty will ofttimes reveal the fact that a financial obligation is worrying him or sickness at home has caused him to lose many hours of needed rest. If, after learning the cause of the trouble, the employer aids in correcting the situation, he will soon note that the work is proceeding as before. So long as employes feel that their employer's sole interest is to get out of them all that can be gained, and that only, so long will this discontent prevail.

A TIME FOR PLAIN SPEAKING

The time has come for plain speaking. More than any other man, perhaps, it devolves upon the physician to speak for the human side of the labor problem—the human side of labor discontent and curtailment of production, whether deliberate as in the case of the willful slowing down, or unpremeditated as in the case of lack of interest in the work through preoccupation with home worries or industrial fears.

This human side has been neglected and still is either ignored or opposed by many of those in control of our great industries. The fundamental cause lies in the fact that the owners of most of our great industries are stockholders in corporations whose shares are widely distributed. These stockholders, therefore, have no direct connection with and no close interest in the industry except as to the amount of the dividends they receive. Under such circumstances the pressure upon the administrative officials is always for more and still more, irrespective of what happens to those whose labor alone can produce the commodities which must be exchanged in the market for the money which the stockholders desire.

This is not a humane method of organizing industry. It is the *cash nexus* of which Carlyle spoke: it is the "profit system" of our modern economist. The physician must speak for the human side, regarding his industrial patients not merely as cogs in a great machine which is to grind out profits for stockholders but as human beings entitled to be considered as such. Until this point of view pervades all industry the "unnecessary time lost" through strikes, lockouts, labor wars and curtailment of production will continue. What is required is a new conception of industry—a new conception of the social organism as a human society, not as a money-making machine.

Gentlemen, let us speak frankly, the President of the United States has warned the people of this country that when the young men who are now in France return from the war they will be impatient of old phases, old methods, old systems. They have not risked their lives for their country in order to come back and again settle down into an economic serfdom from which war has released so many of them. The changes which will be wrought in this country during the years that follow the successful conclusion of the war, the years that will come after victory, are going to be fundamental and all-pervading. Let us prepare for them.

MACHINES OR MEN

There are two ways in which employes may be regarded and only two: One is as machines; the other as men. They are no longer content to be regarded as machines; they are going to insist, with ever increasing firmness and decision, on being regarded not only as men—as fellowmen—but as fellow-creators of the industries in which they toil. They are going to insist that a man who invests his life in a business, who puts his toil in it, is to be considered *before* the man who merely puts his money into it.

Adequate housing, care of families and recreational facilities must be provided, not by any beneficial or paternal directorate but by the employes themselves. They must have a voice and a vote in the control of their own lives, both while at work and at play.

Present provisions for the housing of workmen are generally bad, not only in large cities, but in industrial communities of every size, and even in rural districts. Not only are the houses and tenements available for workers largely insanitary and unfit for habitation, they are inadequate; the result is overcrowding and congestion. Such conditions make not only for discomfort and unhappiness, but for disease and degeneration.

The ordinary method of supplying houses through erection by private capitalists for investment and speculation has rarely, if ever, been adequate. Excellent plans for the housing of workmen have been put into effect by a number of firms and corporations, but such measures have not at all affected the general situation, and, being dependent upon the volition of individuals, cannot be regarded as likely to greatly influence progress. The tenement house acts, as well as the health ordinances and building regulations of municipalities, while generally productive of good results, are at best surface remedies, and can never cure the evils of the present housing situation. In every important European country governmental aid and direct intervention have proven necessary for the promotion of any real progress. Serfdom is doomed by this war; military serfdom and industrial serfdom alike are grappling with the forces of a true democracy.

WHEN OUR BOYS RETURN

From a physician's viewpoint this is the only way to avoid unnecessary loss of time and unnecessary waste of energy and product. The "human element" must not merely be recognized, it must be predominant. Business exists to provide food, clothing, shelter and amusement for all who

toil and for all who consume. This is their primary warrant and the principal reason for existance.

What new methods will be devised I cannot say, for I do not know, but I do know that the governments of Great Britain and of France, like the government of the United States, unite in warning employers and business men that the old order is passing in the flame and wreck of the world war. While our boys are carrying democracy into Germany at the point of the bayonet let us not neglect our task of making America ready for them when they return.

DISCUSSION

CHAIRMAN SHOUDY: Mr. Chandler will discuss questions of team work and the elimination of lost time by getting doctors, service workers, foremen and employes to work in harmony.

MR. W. L. CHANDLER (Dodge Sales and Engineering Company): "Relations of Various Activities" was undoubtedly designed to cover meetings, publications, employers' organizations, co-operation by trade unions and so forth and I have in mind one meeting in our plant that was a rouser—others have had the same experiece and know that as a general thing our young men have the right spirit of co-operation and advancement. We are co-operating with the government, or, rather the Shipping Board is co-operating with us, in increasing production, and naturally we tied up very intimately in getting the men on the job, as well as increasing their output. We have been sent a number of speakers—these speakers are available to employes doing almost any kind of war work—and on the night I speak of we did not have tickets enough to go around, because the employes came and brought their families. On that occasion the Shipping Board sent us Major John Swinton, designer of the fighting "tanks," and with him came Dr. Moore, formerly of Detroit, but now giving all his time to war work. They had our employes and their wives and children shouting louder than any of us shouted last night, and that is going some. Our men were asked if they wanted to do so-and-so to help win the war and the answering shout "You bet!" carried a conviction that could not be mistaken. Meetings of that kind do a great deal in injecting pep into the spirit of the employe and when he is disabled he is not inclined to malinger, as he appreciates the need of getting back to work.

EMPLOYES' PUBLICATIONS AND EMPLOYES' ORGANIZATIONS

Many of us have publications for our employes, and with us the employes are tickled to death when an outsider asks for a copy. These publications can be made of inestimable help as a medium for messages which will incite employes to an appreciation of the importance of their work. We print stories about the war and about other employes who are in the service; every letter from a man at the front goes into our publication and you ought to see the smile on those fellows' faces. They say: "By George, that fellow is over there and it is up to me to do all I can

to get this stuff out to him." The same publication, of course, carries messages regarding Liberty Loans; I do not know how much is due to the publication, but of the first loan 38 per cent of our employes bought: of the second, 72, and of the third 100 per cent bought. Something was responsible for that, and I think we must give credit to the employes' publication for a part of the enthusiasm. If it can do that for the Liberty Loans it can do it in getting men back on the job.

"Employers' Organizations"—the title is just a little misleading, because that would have to be promoted by employers, many of whom are themselves employes. They would take into account employers' benefit associations, thrift clubs, social clubs, and many similar activities. I do not know whether a social club would help get men back on the job or not, but an employe's benefit society surely would. Those of us who have seen the work of such organizations know that visiting committees and the interest shown by different departments in their particular workers who are disabled impress sick and injured men with the necessity of getting back on the job. The thrift club is a hobby of mine and I like to advance this theory: If an expert comes into your plant and tells your men how much he can save them, they are pretty apt to believe him: if he can do what he says, he makes a booster out of every man he is able to convince—some of the men do not know, until the proposition is put up to them, how much they can cut their expenses. If the man has a bank account he is saving some of his money at least. If a man comes into your plant and tells the men that you are "starving them" he has a lot harder time convincing them, because the employe knows in his heart that he is putting away a little of his money. One of our fellows suggested that it would be a good plan if we could get together and induce some of our people to save a part of their money. Mr. Jenkins saw the point immediately, so we organized a thrift club and elected as officers the directors of our employes' benefit association, so they could conduct both organizations at the same time; that is, while they are meeting every Monday night for the benefit association the work of the thrift club could be done at that time. While they are separate organizations the same man is secretary of both; their books are kept separately, so that no one can claim that the relief association is "monkeying with the buzz saw." Under our plan the saving of every man is based on 25 cents—a man may save any multiple of 25.

Shortly after we organized the thrift club we often heard the remark: "Well, Bill, do you think this is a good thing?" "Sure!" "Will you join?" "Sure!" If you go to a man and tell him that you want him to join he will ask if you are in and if you say "No" he isn't likely to join either, but if you want him to come in join yourself. Our rules provide that he has to be in fourteen weeks before he can draw anything out, but as a general thing once the men get in they are there to stay.

PATIENCE REQUIRED TO TEACH HEALTH SAFETY

CHAIRMAN SHOUDY: Dr. Selby referred to some work done by Dr. Elliott. May we have a few words on that matter?

DR. ELLIOTT: I entered industrial work after little talks that I had with the managers of the different divisions. We have a meeting every June at which there are present about 100 managers of our departments from all over the county and at these meetings we had informal talks on health matters. Finally our managers became interested to such a degree that the advisory board asked me to repeat these talks to the employes. I did not believe they would be interested because the average person in sufficient good health to "get by" usually is not interested in such things; they are of the belief that they do not need such instruction. We are so accustomed to health that we forget all about it until we are ill. To start the work I took groups from the various branches of the industry; here a group of electrical engineers, another group of stenographers, a third group consisted of salesmen—believe me, that group of salesmen was some job. We also had a group of factory people. I gave a talk to each in turn, in an effort to find out whether they were interested or not.

They were interested to such an extent that it is now the first thing discussed in our factory organization. We do not start with physical examinations, we do not start with medical or dental service—we start with education. Take the proper care of the teeth: If they are in bad condition they should be cleaned, have a lot of fillings, possibly bridge and crown work. That is the idea we had in mind—the teaching of these things—so we started with the physical wellbeing of our employes. We started the various groups—I remember the group of electrical engineers ripped my talk up and down the back. One of them said: "What good are these talks to me? I am well and I do not see any use spending my time in this way?" But after a good deal of effort I got them into line. We did not try to force things on our employes, saying: "You have got to have it!" The managers said: "We want you to give your talk; we want you to give it to them for such a length of time that every one will hear it, so that they may decide for themselves, so that everyone will know these things about caring for themselves in the home and in the factory." It was through the co-operation of the managers in arranging the groups that I met with so much success.

REPORT OF NOMINATING COMMITTEE

CHAIRMAN SHORBY: We will now hear the report of the nominating committee.

MR. WALTZ: It was a difficult matter to come to a decision. However, we present for your action the following names:

Dr. Charles A. Lauffer of the Westinghouse Electrical and Manufacturing Company, East Pittsburgh, Chairman.

F. H. Elam of the American Steel Foundries, Chicago, Illinois, Vice Chairman.

Dr. C. D. Shelby, Public Health Service, Toledo, Secretary. (The recommendations of the Committee were concurred in by the Section.)

The Section then adjourned.

Dangers of Crossing the Street

Nine-tenths of all accidents to pedestrians on our streets would never happen if every person would observe this one perfectly simple rule: "When you start across the street, look to the left—and when you reach the middle of the street, look to the right." WHY? Because when you start, all traffic is coming from your left—and after you pass the center, it is coming from your right.

Why do people violate this rule? Because they take a chance. Because their minds are on something else. Because they are too young and not responsible. Because they don't know. Because they don't care.

Public Safety Division

St. Louis, Mo.

Sept. 17, 18 and 19, 1918

CHARLES M. TALBERT, Chairman
Director, Department Streets and Sewers, St. Louis, Mo.

R. W. CAMPBELL, Vice Chairman
Illinois Steel Company, Chicago, Ill.

WILLIAM BURGESS, Secretary
Executive Secretary, Public Safety Commission of Chicago, Chicago, Ill.

TUESDAY AFTERNOON SESSION

CHAIRMAN TALBERT: A few words of the history of the Section may be of interest. Last year those of us who were interested in public safety were asked to see if we could form an organization which would carry out the idea. The meeting was called together hurriedly and there were about the number present that are here this morning. We were not able to effect more than the bare outline of an organization, and as a result the work during the year has not been very systematic. What has been accomplished is the result of individual effort and through the assistance of the General Manager of the Council rather than through any organized action of the Section's membership. It is our hope, before we adjourn, to put the entire public safety movement on a much more businesslike basis, with a definite organization, with definite work to do and definite people to do the work. Just what that will be remains for this assembly to determine.

INFORMAL REPORT BY CHAIRMAN

What the organization shall be, what work it shall undertake and the manner in which it shall be undertaken, are questions to be discussed by the Section. A few of us held an informal meeting yesterday

morning and outlined certain general policies to be undertaken during the coming twelve months. At the proper time we will explain them in detail and ask for your criticism and suggestions.

During the past year your committee, in co-operating with Field Secretary Price and General Manager Cameron, has issued a pamphlet on "Suggestive Methods for Inaugurating a Public Safety Campaign." In it are a number of suggested practical methods for handling traffic in public streets and for other public activities. We also inaugurated, through the General Manager's office, the issuance of what we call public safety bulletins, but no definite policy has been established as to the character or scope of this work. Twenty or more public service bulletins have been printed and sent to those we believed to be interested. We hope to greatly enlarge our mailing list at this Congress and trust that every delegate present will co-operate in the work.

Considerable time will be taken up during this meeting with what is called the Rochester public safety campaign. You are all familiar with the main features of that movement and the special printed report will give you detailed information on the subject. The report will form the basis of one of our sessions and should prove a valuable contribution to safety literature.

It is my idea that we should consider a few subjects at this Congress and instruct our officers along such broad lines that they will be able to show definite results at the end of the year, rather than to generalize and endeavor to cover the entire field. Informally your officers have discussed forms for the standardization of statistics and it is our ambition to formulate a universal report card on accidents, one which will enable us to compare all manner of accidental injuries and deaths.

Another subject is a standard traffic code. A great deal of work has been done by various bodies in the past six or eight years on the formulation of such a code and some of this information has been published and definite work accomplished. A committee of this Section could perform valuable service in compiling the data available and formulating rules and regulations rather than to attempt the compilation of an entirely new traffic code.

Another subject contemplates a uniform sign and signal system. This is obviously too important to need further comment.

A General Plan and Scope Committee has been suggested. It would lay out for us, with your approval, a general scheme of work, covering practically all phases which this particular Section of the National Safety Council should endeavor to incorporate into its permanent work. Just how we shall correlate with the Educational Section of the Council will require careful study on our part. That Section is interested in education on all lines of accident prevention, while the Public Safety Section will specialize on education along public safety lines. We must think out a program that will dovetail into the other activities of the Council. Before we adjourn we should have a definite policy and a comprehensive committee list. Up to this time our work has been largely of a tentative and individual nature. It is the hope of your officers to place it on a permanent basis at this Congress.

INFORMAL REPORT BY SECRETARY

SECRETARY BURGESS: I have no formal report to offer. The problem of the Section is how best to organize the public safety movement throughout the country along the lines so collectively successful in advancing industrial safety. So far conditions have been such that the National Safety Council has not fully covered public safety as a practical issue. The experiment made in Rochester, under the auspices of the National Safety Council, has been very successful and has attracted wide attention. Similar work has been done in other places by local interests. For example, the Public Safety Commission of Chicago, of which I am Secretary, has devoted its efforts to public safety work and our office has become a clearing-house for complaints of dangers of so many kinds that it is almost impossible to review them all. We are working out plans for a safety week, beginning Oct. 27, and our program contemplates safety sermons in the churches, addresses in the public and parochial schools and the placing of a booklet on safety in the hands of each child in our city. A copy of our program and booklet will be sent to attendants at this Congress who may be interested in our method of approaching the question.

CHAIRMAN TALBERT: There are no formal reports of committees. I wish the delegates would give careful consideration to the question of officers for the new year and assist the Nominating Committee with advice and suggestions. Before proceeding to the first subject on our program, "City Planning as Related to Public Safety," are there any general remarks? May we not have your suggestions on the general subject of outlining the work of the Section before we proceed with the formal part of our program?

INTEREST OF MEMBERS

MR. CHARLES B. SCOTT (Bureau of Safety, Chicago): My particular interest in public safety is from the viewpoint of the public utility company. Public service companies are recognizing the importance of safety work more than heretofore, and my especial interest in this Section is because of my interest in public service.

MR. H. B. HARMER (Philadelphia Electric Company): My interest is identical to that of Mr. Scott. We are on the same committee of the National Electric Light Association.

MR. F. B. VAN DOREN (Safety Engineer, Utilities Mutual Insurance Company, Albany, N. Y.): We have nothing but public utilities and I stand with Mr. Scott and Mr. Harmer.

MR. CHARLES E. MORRISON (New York): I am identified exclusively with public utilities and for that reason interested in public liability matters.

MR. ALBERT W. WHITNEY (General Manager, National Workmen's Compensation Insurance Bureau, New York): My organization is engaged in workmen's compensation insurance and in liability business and I am particularly interested in this matter from an insurance and public safety standpoint.

MR. J. H. HARVEY (Rochester): I will take some of your time tomorrow afternoon in telling what has been accomplished in Rochester.

MR. CLIFF R. CRONINGER (Chairman Safety Committee, St. Louis Chamber of Commerce): Public safety interest.

MR. R. A. HAMILTON (Commissioner of Public Safety, Rochester, N. Y.): I believe in the protection of life and property and I am naturally interested in the public safety movement.

MR. CHARLES A. PRESTON (Safety Inspector, Youngstown Sheet and Tube Company, Youngstown, Ohio): I am interested in public safety, particularly during the war, from the standpoint of conservation.

MR. F. N. LEONARD (Fire and Safety Inspector, Public Service Company of Northern Illinois, Chicago): I am interested from the viewpoint of a public utility company.

MR. W. N. FITCH (B. F. Goodrich Company): I am directly interested in this movement: *first* because it affects our employes, *second*, as Chairman of the Safety Committee of the Chamber of Commerce.

MR. JOSEPH A. SCHLECHT (President, St. Louis Auto Manufacturers and Dealers' Association and Mound City Buggy and Auto Company): I am naturally interested as it affects the automobile line.

MR. J. C. BARCUS (St. Louis): I am interested in it from the automobile standpoint.

(Representatives of the De Luxe Automobile Company and the Kardell Motor Car Company make similar answers).

SAFETY WORK IN PUBLIC SCHOOLS

CHAIRMAN TALBERT: Mr. Knox, Assistant Superintendent of the Public Schools of St. Louis, is doing a great work for safety in the public schools. Will you tell us something of your work, Mr. Knox?

MR. GEORGE P. KNOX: We have about 100,000 school children in this city and we are very anxious to reach every child and interest him in the work of making St. Louis safe. We are teaching lessons of safety in the school rooms and seeking to apply these lessons by interesting the older children; these, in turn, are teaching safety to the little ones. We want not only the older boys and girls to help make St. Louis safe, we also want the younger ones to get the safety habit. Our effort is to get every child interested.

CHAIRMAN TALBERT: Miss Jones, principal of the new Cupples School, is Chairman of the Public Safety Committee of the St. Louis Public Schools. We would be pleased to have a few words from her.

MISS CLARA F. JONES: As Chairman of the Publicity Safety Committee I am very greatly interested in the safety movement as applied to the schools.

MR. D. E. PARSONS (General Manager, East St. Louis & Suburban Railway Company, East St. Louis): I am interested from the standpoint of a public utility company.

MR. W. L. PATTERSON (Henry Motor Service Company, St. Louis): My company was selected by the Automobile Manufacturers' Association to assist in the conservation of manpower for the government. We handle all the emergency work for the City of St. Louis and St. Louis County.

MR. H. B. ADAMS (Safety Supervisor, Aurora, Elgin & Chicago Railroad Company, Aurora, Ill.): I am interested in the conservation of human life and limb in any way that it is possible to do it. From the standpoint of a railroad we feel that we have done all that we can reasonably be asked to do when we adopt every precaution for public safety all along our line. I hope as a result of this session to be able to go back home and start something new in Aurora, the city of life.

MR. W. R. RASMUSSEN (Secretary, Western Pennsylvania Division, Pittsburg): We have inaugurated a safety campaign in Pittsburg and vicinity that has been very successful. I want to get all the information I can on public safety.

CHAIRMAN TALBERT: Allow me to introduce Field Secretary of the National Safety Council.

SAFETY WORK INDISPENSABLE TO COMMUNITY LIFE

MR. C. W. PRICE (Field Secretary, National Safety Council, Chicago): Up till now the work of the National Safety Council has consisted largely of developing safety in individual plants. I am obsessed with the idea that we are not moving fast enough. I believe that we should incorporate the public safety idea into the community, reaching every child in the school, reaching the home; that we accept the safety idea just as we do the anti-tuberculosis movement, the Red Cross or anything else, as something indispensable to the preservation of community life. When we do that we shall serve our industrial life as we have never served it before. I am told every day by manufacturers that when we reach the school children and interest them in public safety work we shall accomplish wonderful results for safety and for our country.

MR. W. E. KIMBERLING (Pittsburgh Construction Company, Pittsburgh): I am interested in safety work as it affects the child in his play and when in public places; also in protecting him from the dangers incident to construction work along public highways.

MISS BIERMAN (Public Safety Commission, Wisconsin): I am interested in public safety work from the standpoint of spreading the idea to the widest possible extent.

MR. F. A. POST (Elmira, N. Y.): I represent not only the workmen in our plants at Elmira but also the Chamber of Commerce. We are carrying on a Safety First campaign and I am here to get all the information possible.

MR. H. W. MOWERY (Safety Engineer, American Abrasive Metals Company, New York): I have been a specialist for nine years in making walking places safe.

MR. PETER M. HOFFMAN (Chicago): Having acted as coroner of the village of Chicago for fourteen years, and having held over 84,000 coroner's cases, I feel somewhat interested in public safety.

MR. ROBERT E. LEE (Secretary St. Louis Auto Review and Secretary of the Sales Managers Bureau, St. Louis Chamber of Commerce): My duty for the last eleven years has been to try to make life safe for pedestrians in St. Louis. This we find very difficult, because a pedestrian is

almost incorrigible. We are trying to educate him not to step in front of a moving automobile.

MR. BARNEY F. VERHEYEN (St. Louis Police Department): Our good citizens cannot ask anything that the police department is not willing and ready to do. We want the public to know that if there is anything in the police department that they are interested in, and they will kindly let us know, I assure you that we are here and expect to do our full duty.

ERADICATION OF PREVENTABLE DISEASE

DR. THOMAS DARLINGTON (American Iron and Steel Institute, New York): I try to make the army safe for recruits and incidentally the world safe for democracy. My department also tries to keep down disease, for just as many or more people are injured in that way as by accidents. In the war of 1861 to 1865, 250,000 men were killed by bullets or died from wounds and 1,400,000 died from dysentery and typhoid, absolutely preventable diseases today. The particular work I am engaged in just now is trying to prevent typhoid, dysentry, measles, mumps, pneumonia and all the contagious diseases to which the body of man is liable, so that our mortality at the end of his war will not be like that of other wars, where the greater proportion died from disease.

CHAIRMAN TALBERT: May I ask what is the percentage of deaths from bullet wounds in the present war?

DR. DARLINGTON: A man's chance of being killed in the army is 1 to 30.

CHAIRMAN TALBERT: We have a clock on the Washington avenue face of the Statler Hotel and on this we are comparing the deaths from accidents in St. Louis with the corresponding day of last year. A year ago yesterday there were ten deaths in St. Louis from accidents. Yesterday there were none.

A DELEGATE: What is the Chairman's interest?

CHAIRMAN TALBERT: As director of streets and sewers I have jurisdiction of the streets of the city of St. Louis. My first interest was largely in the study of street traffic conditions. The study of traffic statistics naturally led to the study of traffic accidents and it was purely by that evolution that I became interested in the subject of public safety. That led to the preparation of traffic charts, accident charts, showing the movement of vehicles in the downtown district. It was purely by that process, extending over three or four years, that led me to the point of being interested in the prevention of accidents on public highways—the expediting of traffic or the movement of vehicles on the streets and the prevention of accidents go hand in hand. Should they happen to cross each other's lines both problems will be very much more difficult, but nine times out of ten the thing that helps one will help the other.

SECRETARY BURGESS: I am here because of my earnest interest in this movement. I was a safety man and studied the question before the present movement was organized. When the first public safety body was promoted in Chicago by Coroner Hoffman I took a keen interest in it and became Executive Secretary of the Public Safety Commission of Chicago. It has been my duty to prepare the statistics and to edit the

book known as "Things You Must Know for Safety," of which we have a second edition. This book is almost an encyclopedia on the subject and a copy will be sent to any one who will give me his name and address.

CHAIRMAN TALBERT: I believe all of us feel more at home and know our ground better by having ascertained each one's particular interest. It has taken a little time, but I believe it has been well spent. We will take up the first paper on our program.

CITY PLANNING AS RELATED TO PUBLIC SAFETY

THOMAS ADAMS AND HARLAND BARTHOLOMEW

Mr. Chairman and Members of the National Safety Council: The constant increase of population in large cities has been accompanied by an ever increasing danger to human life and health. This danger is not caused by the growth of the large cities, but by the haphazard and unregulated manner in which the growth takes place. Few cities in America, if any, are not provided with ample space in their streets and surrounding their buildings. As a whole, they are amply provided with street space and air space, but in spots they have bad congestion, both in respect to population and traffic. The fault lies in the lack of proper distribution and control of the density of building, on the one hand, and the lack of scientific planning of the street system to secure the best means of circulation of the traffic, on the other hand. For instance, St. Louis is far from being a congested city, but it has badly congested spots; its streets are more than adequate in their total capacity for traffic circulation, but they are not of adequate width in the right places.

In a properly planned city consideration has to be given not only to the needs of through circulation of traffic between its different parts, but also to the building density on the lots fronting on the streets, and both these things have to be regulated together or planning will prove ineffective as a means of preventing congestion. Many European cities, with comparatively narrow streets, have better and safer means of circulation for traffic than some American cities, because of the lower density and height of buildings. City planning is needed to govern, among other things, the relation between the width of street and the height of buildings, and the ideal to aim at, however difficult of attainment it may appear to be, is that the height of a building should correspond to the width between its front wall and the front wall of the building facing it. Until we can reach that seemingly difficult standard we shall not be able to obtain space in our streets to enable us to get rid of congestion of traffic and its consequent dangers to life and loss of valuable time to its citizens.

Accidents by street cars and automobiles and untimely deaths from disease which result from unplanned street systems and congestion of population form a respectable proportion of any city's death rate. The admirable and extensive methods of handling traffic and the various

public health campaigns are responsible for the conservation of many thousands of lives each year, and the unabated continuance of these methods and campaigns is highly essential, for even though we had been permitted to foresee present conditions, we could scarcely have been able to entirely forestall their attendant dangers. In the light of present conditions, however, we can at least remedy for future generations some of the fundamental defects of our present city growth. This is the task of the city planner.

THREE PROBLEMS OF CITY PLANNING

There are three distinct but related problems, all having a bearing on public safety, which have to be dealt with in our city planning schemes. These are:

1. *Regional Planning*—The problem of regulating new development in open or partially built upon lands within and surrounding the city, including the control of all new forms of growth and the planning of a comprehensive arterial highway system for the purpose of securing adequate means of access and egress for traffic to and from the city and the surrounding country.

2. *City Replanning*—The problem of replanning areas already built upon within the city, where changes in the character of buildings or in the use to which they are put, are taking or are likely to take place, including adjustment, as far as practicable, of this change of character to the existing street system.

3. *Reconstruction*—The problem of remodeling of the street system to suit the existing building densities and traffic where these have already become congested and where buildings are permanent in character or unlikely to be reconstructed in the near future.

THE REGIONAL PLANNING OF OPEN OR PARTIALLY DEVELOPED LANDS

The regional planning of open or partially developed lands is easiest and least expensive to deal with. It is in connection with this problem that consideration has to be given to the arterial highway system as a whole. A scheme relating to such lands can prevent what is so difficult and expensive to cure in more central areas which are already developed. A city can prepare a plan for such lands by co-operation with the owners of real estate and—subject to having adequate statutory powers—at a cost of a few dollars per acre, whereas the widening of a street in the central area of a city may cost many millions of dollars per mile. There is, however, less inducement to the citizens to prepare a plan for the suburban lands, because most of the benefit of such a plan will accrue to posterity and not to the generation doing the work. But surely, having regard to the lessons we have learned, and to our experience of the cost of removing evils of congestion already created, it is our simple duty as patriotic citizens to prevent the recurrence and perpetuation of these evils in the future, even if we only gain a small share of the benefit ourselves.

PLANNING TO LESSEN STREET CONGESTION

The improvement of the outer extremities of the street system of a city, if properly planned, should lessen the congestion in the heart of the city and thereby reduce the dangers to public safety. The improvement should be made in respect to both the radiating routes and the circumferential or circular routes connecting the radial lines. The planning of wide radial arteries of communication round the city should be carried out so as to attract traffic along the route leading most directly to its destination, and so as to encourage the widest possible distribution from the center outward. Good circular connecting highways are equally important so as to distribute incoming traffic before it reaches, instead of at, the center. When the main radial and circular system of highways is planned it is next essential to have good construction of the roads included in this system. Congestion is often due to the fact that too few of our arterial roads have good surfaces, causing undue concentration on the well-constructed roads. While all this seems to be evident, we are giving less attention to this problem than to that of removing evils in the center itself. We are too prone to confine attention to the removal of the glaring effects in congested areas, instead of at the same time dealing with the less-evident causes at the city extremeties, which form the sources of much of the congestion. To deal adequately with this problem of regional planning of the arterial road systems of cities requires the preparation of comprehensive surveys and plans of large areas, and St. Louis may be credited with having sufficient vision and common sense to be one of the great American cities which is facing the difficulties incident to finding a solution of this problem.

This problem of regulating suburban growth is becoming of increasing importance as a result of the industrial penetration of the rural districts round large cities, causing the creation of satellite towns outside their boundaries, and because of the increasing tendency to use the commercial automobile as means of transport for industrial purposes. Taking the long view of the question of city planning in relation to public safety, the most important if not the most urgent of our problems is the preparation of comprehensive schemes for large regions embracing the large city, its adjacent satellite towns, and the whole of the intervening lands which make up the metropolitan area.

REPLANNING OF AREAS LIKELY TO UNDERGO CHANGE IN BUILDING CHARACTER

In addition to the new growth in the suburban areas of cities there is another form of growth in the central areas which can be regulated by building codes and readjustment of the street system without resorting to the expensive process of reconstruction schemes, alluded to later, which are rendered necessary where buildings are permanent. The term reconstruction is used, in the classification given in this paper, as relating to schemes which involve the compulsory acquisition and demolition of buildings and not to voluntary reconstruction or replanning, which can be dealt with by regulation under replanning schemes.

Land fronting on streets in central areas is usually occupied by two classes of building, one more or less of a permanent character, and representing the full economic use of the land for many years to come, and the other more or less of a temporary character and representing a very inadequate economic use of the land. In some streets there are examples of the former in a modern fireproof office building side by side with an example of the latter in a two or three story frame building that has a rental value insufficient to pay more than the taxes on the value of the site.

The second class comprise what are virtually temporary structures and the land they occupy is likely to be redeveloped, and can, therefore, be dealt with by preventive measures, since these measures can be taken to regulate changes in development as well as new development. St. Louis and other cities have "blighted" districts and streets, and also large areas where buildings are only fulfilling a temporary purpose during a period of transition. Residential districts are constantly changing into business districts, or one class of residence is giving way to another. In areas where these obsolete or temporary buildings are situated plans should be prepared to determine the street lines in relation to the building density and traffic requirements. A city planning scheme should take into consideration the replanning of such areas with a view to securing the width of street and density and height of the new buildings to be erected, so as to secure *inter alia* the safety of the public. Areas occupied by obsolete structures can be easily dealt with, as compared with areas occupied by more permanent buildings, for purposes of fixing zones in which the future use and character of buildings can be regulated according to prescribed standards.

In connection with such replanning schemes we have to deal with an attitude of the average legislator and the owner of property which has hitherto created a difficulty in carrying out these schemes at reasonable cost. This attitude takes the form of overestimating the value of obsolete or badly depreciated buildings and the unwillingness to allow the value of the appreciation to be set off against the value of depreciation caused by public improvements. Buildings should be depreciated on the books of the owners in the same way as the machinery of manufacturers. We should "scrap" old buildings more rapidly than we do, and our building codes should encourage this process by enforcing higher standards for health and safety and enforcing the demolition of decayed structures which are a menace to the safety of adjacent property. At Galveston (Texas), Dayton (Ohio) and Halifax (Canada) the enforced replacement of old structures and the replanning of the devastated areas has resulted in improvements which have to a large extent offset the material losses incurred and has given these cities an increased taxable value which has compensated them for large public expenditures. Much larger sums could be spent by cities than has hitherto been expended in replanning schemes, but compensation to owners must be limited to the actual value of the injury caused. To arrive at this value the city should have power to deduct from the compensation to be paid for injury or for property

acquired a reasonable amount for any benefit which may accrue to the property as a result of the improvement. This principle of setting off betterment against decrement has been recognized in the law of some countries, and it should be legalized in the States, so as to encourage more enterprise in making public improvements. The difficulties in practical application are not insuperable and until they are overcome we will not be able to effect many much-needed improvements.

RECONSTRUCTION SCHEMES IN AREAS OCCUPIED BY PERMANENT BUILDINGS

The replanning of streets where more or less permanent buildings are erected on their frontage is the most expensive and difficult of the problems to be dealt with by the city planner. In such cases the solution is in expropriation of expensive buildings for the purpose of widening the streets, or the construction of subways, at a cost which in either case is almost prohibitive. We have here to deal with structures that have a high revenue-producing value, and compensation must be ample to cover prospective as well as immediate injury. But here again the amount of the compensation to be paid should be discounted by the value of the appreciation given to the property. There are innumerable cases where the improved value given to private property by the carrying out of public works has been greater than the injury, and it hardly seems equitable that in such cases no allowance should be made for the betterment given. To enable us to get the improvements we require for public safety some modification is needed in the law dealing with this question of compensation.

Most of the city planning schemes which have been prepared in the United States have in large part been reconstruction schemes, and the fact that few of them have been carried out to any large extent is due to the fear of incurring the cost of compensating private interests, and to the fact that the cities have no power to collect a special assessment on property directly benefited.

The fixing of zones in which height, character, density and use of buildings in areas occupied by permanent structures, has to be governed by existing conditions to such an extent that only very imperfect results are attainable. Even if certain things have been allowed in the past which are undesirable from the point of view of public safety and health we can only, in a very limited degree, place restrictions on new buildings to improve established and customary standards previously sanctioned by law. In undeveloped areas and in areas occupied for the greater part with temporary buildings we can, however, establish new standards for new buildings, and these should conform to the requirements needed to be enforced for securing the safety and convenience of the citizens as a whole.

SOME OF THE OBJECTS TO BE SOUGHT IN SCHEMES

In planning, replanning and reconstructing cities an effort should be made, as far as practicable, to carry out the following, among other objects, in regard to streets, buildings and open spaces for recreation:

Streets—Heavy traffic streets should be wide, and those which carry street railways should not be less than 100 feet in width. Directness of route should be sought for main highways, free from the right-angled turnings, abrupt endings, irregular crossings and collision points caused by rectangular planning. On hilly sites reasonable curves, with a clear vision of a hundred yards at all points, should be substituted for straight steep grades. Sharp curves should be avoided and those existing should be done away with. Bad grades should be avoided, particularly at intersections. More than four streets should not be made to converge at one point unless large traffic space is provided at the point of convergence. Frequently the rounding of sharp angular corners at street junctions will do more to relieve congestion than widening of the interior of the street. The street railway systems of cities should be planned or replanned with the object of securing general convenience and not for the interest of a few property owners. New by-pass streets should be created, in many cases, rather than the widening of existing streets, so as to distribute traffic rather than concentrate it. Main radiating routes should be supplemented by wide circular routes at the inner and outer circumference of the city, so as to cause traffic distribution before it reaches the center. In residential areas narrow streets should be designed and restrictions made limiting the height of the residences to two or three stories and preventing change in character of buildings. The narrow streets should be so planned as to discourage through traffic. The whole street system should be planned of various widths in relation to building use and density and prospective traffic requirements. Intersections should be so planned that all traffic may move either at right angles or in a gyratory form in a circle of ample radius (not less than 100 feet).

Building set-back lines should be fixed on all streets, but particularly where streets of comparatively narrow width cross, so as to permit of a better view of the intersections and all approaching vehicles.

Streets up to fifty feet in width should be constructed at the expense of the owners of the frontage land on the following principles: When any land is subdivided for building purposes the owners at the time of subdivision should be made to construct the street and sewer, as well as to grade the street, up to certain minimum standards, but not to include a finished surface. This is customary in many American cities, and is the British practice in all cities. It secures good access to all buildings when erected, prevents the scattered development and long mileage of vacant lots to be seen in many suburbs (which is a source of great expense to the city) and gets rid of the dangerous and unhealthy mudways which constitute a great part of our suburban thoroughfares. In proportion as we improve the construction of our secondary streets we will lessen the concentration of traffic on the main thoroughfares. The foundation and a partial surface construction of the street having been made prior to or simultaneous with building, a finished surface should be provided by the city when a half or two-thirds of the street frontage is built upon, and this should be assessed against the lot owners. When, for purposes of general traffic, streets have to be wider than fifty feet

the extra cost should be met by the city and be a charge on the inhabitants at large.

LIMITING OF HEIGHTS AND DENSITIES

Buildings—The ideal to be aimed at in regard to height of buildings should be to limit the height to the width of the street in the front and to the width of the space between the rear walls of buildings. Only thus can we give effect to our measures to prevent congestion and secure the benefit of street improvements. The amount of superficial area of a lot to be built upon should not exceed 75 per cent in business areas and 50 per cent in residential areas, except on corner lots.

These standards may seem to be so much in advance of present-day practices that they are not likely to receive the sanction of public opinion, but the time is approaching when they will be adopted and enforced. Cities should be zoned for purposes of limiting different heights and densities in different districts and prescribing manufacturing, business, residential and other uses of property—the street system having been simultaneously planned to suit these different uses. This has been done in New York and other cities, but the standards so far attainable are not yet adequate to reduce possible congestion. The spreading out of cities on a more even basis, less congested in some parts and less blighted or scattered in other parts, is not only essential to relieve congestion and secure safety, but is needed to secure a more equitable distribution of property values in the interest of owners.

In regard to most of the details regarding building regulation by city planning schemes no definite rules can be laid down. It is of the essence of city planning that consideration be given in schemes to the variety of local conditions and circumstances that expert judgment should be used to deal with these, instead of the present rule-of-thumb method. In connection with the regulations needed to secure better safeguards for public safety, we have still much to learn and more encouragement needs to be given to the pursuit of scientific investigation into the whole subject. Past experience will not necessarily guide us as to what we should do in the future. City planning has to deal with growth and growth means change. Our schemes will only be successful if they are elastic enough to permit adjustment to new conditions as these occur. This means that every city should have, as St. Louis has, a permanent organization to give undivided attention to the development of its plan as a means of securing among other things the safety of its citizens.

Open Spaces—American cities, generally speaking, are adequately provided with open space for recreation, but in those rare instances where these spaces are in the right place and are properly distributed to be accessible to the population, it has been the result of accident and not of design. The reduction of street space in residential areas and the lessening of building density on lots should be made more practicable and beneficial if it is accompanied by the provision of playgrounds in every district. Such provision is necessary to lessen the usage of the street

for purposes of play. Large parks are of great value to a city, but they do not lessen the need for recreation spaces in close proximity to the homes of the people. City-planning schemes should not only have regard to the placing and designing of playgrounds and parks, but should lay down some principle under which the provision of a percentage of all land to be subdivided in future should be set apart for recreation. In some provinces in Canada and in certain schemes in England it is provided that one-tenth of any area subdivided for building purposes shall be left as a public open space. This is required in the same way as street space is required to be left free of building, as a condition on which land is subdivided for building purposes. Land which is least adaptable for building is often best suited for playgrounds, and the giving of such land to the public by the owner does not necessarily mean that he loses its value. The fact of its being given as an open space adds to the value of the surrounding land for business purposes and makes it practicable to have less space devoted to streets. It is well known that one of the chief causes of loss of life on public streets is due to the fact that many city children have no other place on which to play.

WHAT IS BEING DONE IN ST. LOUIS

A few illustrations of what St. Louis is doing in city planning may serve to show what can be done to increase public safety. There has recently been adopted a zone plan for regulating the height, area and use of all buildings. While the regulations apply principally to new structures, except where a change of use in an existing building occurs, it is confidently believed that in a very few years there will become well-defined lines of demarcation between the residential, commercial and industrial districts. As a result, industries and stores will be eliminated from the residential districts, and, particularly in the congested sections, children will be more free to play without the danger of accident from the teams and trucks which serve the industry or store. Furthermore, the separation of residential from commercial and industrial districts will produce more desirable homes, free from the noises, smoke, dust and odors of the commercial or industrial institutions and the danger to public health thus greatly diminished. Today the industries are spread promiscuously throughout the whole city. Eventually, under the zone plan, it is believed that industries will group themselves into certain natural locations which will simplify their own methods of transportation and prevent much of the present intermingling of commercial and pleasure traffic. This should serve to increase greatly the safety of both kinds of traffic.

St. Louis is gradually developing a system of major streets, so located and of such width as to accommodate the greater proportion of all traffic throughout the city. This system will considerably simplify the traffic movement and hence greatly increase the public safety. Congestion of traffic at any one place, in any one locality, or on any one street will be eliminated—thus avoiding one of the greatest contributing causes of frequent accidents. The major streets will be so planned as to avoid

sharp curves, irregular intersections and bad grades. Where feasible, a separation of different kinds of traffic will be made. By this development of major streets it becomes possible to reduce traffic on the minor residential streets, decrease the roadway width, lay less expensive pavement and thus discourage anything except local traffic, all of which is to increase the public safety.

In the matter of public recreation, the new playgrounds, so far as practicable, are being located on minor streets, and in accordance with the distribution of children who will use them, thus reducing the distance children must travel to the playgrounds and the consequent danger of accident.

Considerable attention to questions of public safety has been given by the police department of St. Louis, the department of streets and sewers, and the Chamber of Commerce. The police department has a traffic squad of forty-two men. Where traffic is densest, certain "congested zones" have been designated by ordinance, in which the parking of vehicles is regulated, traffic lights placed, traffic police stationed and all street intersections marked off for vehicular and pedestrian movement.

GRAPHIC LESSONS TAUGHT BY "ACCIDENT MAP"

An interesting study was made in the form of an "accident map," which shows by black circles of proportionate size the number of accidents which occurred at various points in the city throughout an entire year, as reported by the police department and street railway company. This map has been quite useful in determining particularly dangerous points, acquainting the motormen and police with them, determining the location of traffic lights and traffic police, placing of signs, etc. In several cases the cause of accidents has been determined by special study and a change of curb radius, a different pavement, change in crown of the street, or improved lighting has served to reduce the danger.

From a city-planning standpoint, however, this map teaches one of the most graphic lessons possible. It shows, for instance, that more accidents occur within a short distance on Grand avenue than any other street in the city. This is not because certain other streets do not carry more traffic, but because, within a comparatively short distance, five out of seven streets cross Grand avenue irregularly and Grand avenue is an unusually busy street of only eighty feet in width, carrying a well-used street car line. More accidents occur at Grand avenue and Washington avenue, in this district, than at any other point in the city. Unquestionaly this is due to a collision point created by the jog of about 200 feet which Washington avenue makes at this point, forcing all of its great volume of through traffic to traverse Grand avenue for that short distance. Fortunately this irregular set-off is now being remedied by the removal of the northeast corner of the intersection, making possible a direct crossing of Grand avenue for all Washington avenue traffic. The cost of correcting this intersection is about $200,000, which is a part of the Washington avenue widening project, the total cost of which is $552,000.

Another interesting illustration from the "accident map" is Locust

street, the most intensively used traffic thoroughfare, which carries about 1,700 vehicles per hour during the rush hours. East of Jefferson avenue to Twelfth street, a distance of slightly less than one mile, it has a width of seventy-two feet, west of Jefferson avenue it is sixty feet wide for about an equal distance. Where the street is narrow there were accidents at every street intersection—there being ninety-three in all. Where the street is wide there were accidents at only two points—at Eighteenth street—a car line crossing—and at Thirteenth street, where there is a bad curve about the Public Library. This is more or less conclusive proof of the desirability of wide streets for heavy traffic thoroughfares if accidents are to be avoided. A further example in proof of this statement is Lindell boulevard, a 100-foot street with forty-foot building lines, which carries very nearly half as much traffic as Locust street.

DEVELOPMENT OF INTERURBAN TRANSPORTATION

There are other problems connected with public safety which are incidental to the planning of streets and regulation of buildings, which can only be touched upon in this paper. The relation between the plan of the city and the plan of the interurban tramway tracks is an important problem. The proper development of interurban transportation helps to relieve congestion in the center, but it adds new dangers to life because of the careless disposition of tracks and crossings. The city planner has to consider the desirability of separating the space used by these tracks on existing highways, how to avoid dangerous crossings, and how to plan routes on private rights-of-way to secure high speed. The mixture of fast-moving and slow-moving traffic in central areas is a cause of serious difficulty. This prevents free movement for fast traffic and thereby is one of the chief causes of congestion and danger. It cannot be entirely obviated, but may be greatly lessened by proper planning of the street system.

The whole question of reservation of rights-of-way for street cars and interurban tramways, separation of slow and fast moving traffic, needs to be more carefully studied and investigated. Indeed, every aspect of the problem needs more investigation, and this can only be made by a permanent city planning organization in each city engaged in a continuous study of city growth and helping by plans and schemes to create cities of the future that shall be worthy of Western civilization.

CHAIRMAN TALBERT: We will postpone discussion on this paper until later in our session. Our next paper will be presented by Coroner Hoffman of Chicago. He has evolved a system of tabulation of accidents, their causes and results that I believe will be of very material assistance in planning our future work.

PUBLIC SAFETY

PETER L. HOFFMAN, CORONER OF COOK COUNTY, ILLINOIS

Mr. Chairman and Members of the National Safety Council: It affords me great pleasure to be with you today because of the splendid work in

which you are engaged. From the beginning of time man never engaged in nobler service than that of protecting and prolonging the lives of his fellows. It is the most divine function of which the human race is capable. It is a duty that you owe to your family, to your country, to yourselves, to make life safer and its enjoyment more secure.

I have served in the capacity of Coroner of the city of Chicago for the past fourteen years and during that time we have held over 84,000 coroner's cases. If any official is interested in public safety it is the Coroner of each of the large cities, because he sees more of the dark side of life than any other public official. I have seen thousands of homes where the breadwinner was taken away by an accident, leaving the widow with numerous little children, not knowing where the next crust of bread was coming from. These children are often brought up upon the streets of our large cities because of the conditions I speak of, without proper care, food or education. They often become bad men and bad women.

Of the 84,000 cases during my tenure of office there were included the high, the low, the rich, the poor, the prominent and the obscure. Among that number were many a father, mother, sister or brother, who left their homes in the prime of life and were brought home cold in death because of the worst enemy of all mankind—carelessness.

The American people have become a thoughtless, a careless and a reckless people; we are constantly and unnecessarily placing our lives in danger, and in this day of commercialism and greed for the almighty dollar we often fail to extend to one another the kind of courtesy and consideration that should exist among all mankind. We must check the pace at which we are traveling in the pursuit of unnecessary pleasure.

SCOPE OF WORK DONE BY CORONER'S OFFICE

We have not confined ourselves, in the Coroner's office of Chicago, to holding inquests and making a record of every case, placing those records in vaults to mold and waste, but we have made a thorough investigation of every premature death and have compiled those records into statistics—the records of the dead for the benefit of the living. We have established a chemical laboratory in connection with the Coroner's office —six high-class college graduates are now making chemical examinations.

During a period of four or five years we made over 2,000 recommendations. I am going to state to you the results of one or two, showing by the scientific study of these matters that 75 per cent of lives can be saved. During my first three years as Coroner there was an average loss of 100 lives each year in the city of Chicago by bathroom asphyxiation —men, women and children. A water heater is a splendid thing when properly installed, otherwise they may become absolutely deadly weapons. These bathrooms were equipped with water heaters that were not connected with the open air. A result of such improper connection is that when the heater is lighted carbon monoxide gas is formed, which is a very deadly poison. I shall never forget, Mr. Chairman, eight years ago when a very dear friend of mine, on a Saturday evening, called me up from his residence on Sheridan road in Chicago. Knowing me well

he said: "Peter, I want you to come to my house at once. My son Henry is dead." I went to that home, taking with me a physician—a deputy coroner. When I arrived I saw the father and two sons sitting at the library table with their faces buried in their hands, weeping. I said: "Charles, what's the matter?" He said, "Mr. Coroner, look in that bathroom and you will find out." I looked and saw, lying in the tub of water, the beautiful form of a 21-year-old boy cold in death. I asked: "Charles, how did this happen?" He said: "My wife and two daughters are spending the week's end across the lake. When my boys came home this evening from work I said to them: 'I will prepare the evening's meal.' The younger son said: 'While you are doing that, dad, I will take a bath.'" He lit the gas and took a bath. About twenty minutes the father rapped upon the door. He said: "Henry, come on; dinner is ready." There was no response. He looked through the transom and saw the boy, dead in the bathtub. That boy died from carbon monoxide gas.

I received the father's permission to conduct a little experiment in that bathroom, to demonstrate the deadly effect of the gas. I went out and purchased two rabbits, two kittens and two guinea pigs. We placed that bathroom in the same condition it was in when this young man lost his life. We placed there a guinea pig, a kitten and a rabbit. The result was that in seventeen minutes the rabbit began to twist from one side to the other. it began to breathe heavily and in nineteen minutes it was dead. In twenty-two minutes the guinea pig died and in twenty-seven minutes the kitten died. I secured a quantity of air from that room for chemical analysis and it showed that it contained the small proportion of one-half of 1 per cent of carbon monoxide gas. We examined the blood of these animals, it was devoid of red color, indicating that the blood corpuscles had been destroyed and that they had died from gas poisoning. We decided to experiment further with the other three animals after ventilating the room. We connected a little two-inch tin pipe to the head of the gas stove with an elbow and ran it out through the window into the open air. We placed the other three animals in the room, after this connection was made, and left them for three hours and a half—they were just as hale and hearty when we took them out as they were when we put them in. The jury afterward caused an ordinance to be drafted providing that all bathroom-water heaters must be connected with the open air. After the passage of that ordinance, the following year, in place of having about 100 deaths due to that cause, we had seven; last year we only had three.

GUARDING AGAINST POISONOUS FUMES

Another recommendation that I may speak of briefly is this: In the Union Stock Yards in Chicago, where they use the ammonia system for cooling purposes, there was an average of about seventy deaths a year from poisonous fumes. The pipes were suspended from the ceiling and under high pressure would break and distribute the ammonia fumes through the refrigerating plant. We had an ordinance drafted that all pipes containing poisonous fumes must be inspected by the city boiler

inspector and the highest number of deaths, due to that cause, since the passage of that ordinance has been four in one year.

As I stated before, I coped with this situation for three or four years and I thought if I organized a commission for the purpose of conducting a campaign of education and publicity among the railroads, the factories, the schools, the theatres and the clubs, to make life safer and to render it more secure, much could be accomplished, so I called twelve public men and women into my office and showed them the results of some of the recommendations and I showed them how our manufacturing industries had spent thousands and tens of thousands of dollars in making their factories safe and in protecting life. I suggested an organization and the Public Safety Commission of Chicago, the result of this gathering, is doing excellent work and obtaining splendid results. I believe that every community in the United States, large or small, should have a public safety committee that would co-operate with the National Safety Council.

Grade crossing accidents in Cook County have been reduced to a minimum. Why? Because of the co-operation of the railroad companies with the officials of the Public Safety Commission, the Coroner's office and other local public officials. In one week we removed eighty-one obstructions at grade crossings that could not have been removed by the railroads alone because of the prejudice of the public against railroad companies, but through co-operating we have secured excellent results.

The Public Safety Section that you have organized to-day should formulate a plan whereby every city and every town would have a public safety committee. Mr. Burgess will bear me out, that our commission receives hundreds of complaints from people who observe conditions of danger. We don't wait until death results before we remove the points of danger. We report thoughtlessness and carelessness of every kind to the Public Safety Commission and we call the careless and reckless before the commission and show them the folly of their ways and keep a record of all those who have been reported for carelessness. If they are called in a second time we deal with them more vigorously and the third time we prosecute them to the full extent of the law.

THE GREAT CRIB DISASTER

I want to speak briefly of what one careless man can bring about. Five years ago, four miles from the shore in Lake Michigan, east of the city of Chicago, there was under construction a water intake and a large tunnel to supply water for South Chicago. There were 100 men employed on that work. One evening a thoughtless and careless man stepped into a room with a torch in his hand, the room containing 1,000 pounds of dynamite. The dynamite exploded and it blew 100 men into eternity—twelve were never found and seventy-nine never identified. I chartered a tug and with a number of deputies, physicians and firemen, repaired to the scene of that accident. It was in the month of February and we had not gone far before our clothes were frozen into solid masses of ice. When we arrived at the crib we saw, lying there, the bodies of seventy-nine

men. They were laid out upon the deck of the tug and we started for South Chicago. When we arrived in the harbor there were in waiting 10,000 men, women and children to identify their relatives, but not one of the seventy-nine was identified. I conferred with the good people of South Chicago, including a number of clergymen, and at 2 o'clock the next day the church bells of South Chicago tolled their funeral chimes, while seventy-nine hearses were standing upon the street containing seventy-nine unidentified bodies. When the services were over we repaired to the cemetery, where a grave had been dug in the shape of a letter L, and we placed in that grave seventy-nine caskets containing the bodies. There were present at that funeral 7,000 men, women and children. Sometimes I hear ringing in my ears the cry to heaven of the widows and the orphans, "Father, father! Brother, brother! Are you here, are you here!"

As it is our duty in the present crisis to stand by our country and our flag in one united phalanx, to stand by a million or more of our boys "over there" and a like number in the cantonments, so it is our duty to stand by the public safety movement—public safety on the railroads, on the high seas, on the streets, in the schools and the home—public safety everywhere.

There is nothing too good for your boy who is fighting—not for the almighty dollar, but to make this land a safe land to live in and a fit place to raise our children. God bless the mothers and fathers who have a boy or boys "over there!" Let us hope that we may soon see a sign in the heavens that all men may read: "The allies have won. The war is over. Freedom and independence for all nations. Peace on earth. Good will for all mankind!"

PREVENTION OF PUBLIC ACCIDENTS

CHAIRMAN TALBERT: Coroner Hoffman brings an altogether different phase of life before us. We hope to utilize his statistics in outlining our work. I am sure we shall have his assistance and the assistance of his office. I should like to ask the representatives of automobile associations if they deem it feasible to include their organizations in the group of associations we hope to interest in the securing of statistical information.

MR. JOSEPH A. SCHLECHT: We have realized for some time that a great many people are too reckless in driving automobiles. The average man who works in a bank or in an office suddenly becomes an automobile owner and does not always drive carefully. The Automobile Dealers' Association is doing everything possible to impress upon them the importance of careful driving. We have also established in St. Louis, under the auspices of the Automobile Manufacturers' Association, an automobile crew that is affiliated with the Central Y. M. C. A. for the purpose of teaching people how to handle automobiles. The expense is nominal and a good many people have been supplied with instructors or demonstrators. A lot of good work has been accomplished. The Automobile Manufacturers' Association and the Automobile Club will be very glad to

co-operate in every way in your work for public safety. Your reports will be of wonderful value to every member of our association.

CHAIRMAN TALBERT: Do you believe that we will get their active co-operation?

MR. SCHLECHT: I think about 60 per cent would co-operate. We have engaged the services of the Henry Motor Company to look after the night work and on Sundays and holidays. Mr. Henry, I am sure, will be pleased to give us accounts of all accidents that occur after 7 o'clock. During the day at least 60 per cent of the automobile men in St. Louis will be very glad to co-operate in the safety movement.

CHAIRMAN TALBERT: For instance, the cause of the accident, whether due to a defective street or otherwise—statistics that are very valuable for accident prevention.

MR. SCHLECHT: We could get that from the owner of the car.

MR. W. L. PATTERSON: We keep a record of all machine accidents reported—they are a good deal heavier than the average person imagines. From fifteen to seventeen accidents occur between the hours of 7 o'clock in the evening and 4 o'clock in the morning—the greater number after 12 o'clock at night. I spend from about 7 o'clock in the morning until about 2 o'clock the next morning on duty and investigate the more serious accidents. I have been watching very closely and I find that the majority of accidents are due to fast driving, drinking and bad lights on the machines. We keep a record of every accident and why it occurred. I will make a report to anyone designated as to the nature of the accident, the license number of the car, the name of the driver, the number of occupants, the extent of damage to the car and to the people, if any, and the hour of the accident. Quite frequently I call up the chief of police or the motorcycle squad and notify them that there is a car passing our place without lights and that there is danger of a collision.

MR. L. G. DE ARMAND: We have one automobile to about every ten people and our ordinance compels every vehicle owner to report, either to the officer on the ground or to the police station, every accident within twenty-four hours. We are availing ourselves of a vigilance committee of eighty-five members of the Automobile Club, who report all accidents of any nature. I will forward a copy of the ordinance.

I am looking for information to assist in the prevention of accidents before they happen. There are many reckless drivers on the streets who ought to be reported before they cause death or serious injury.

MR. PETER M. HOFFMAN: The Public Safety Committee of Chicago, through its officers, arrested forty-eight automobile owners on one evening fourteen miles out on Sheridan road—they were driving their cars fifty miles an hour on that congested street. We fined them $1 and costs after a lecture and a reprimand. We invited them to join our Public Safety Committee, and thirty-one did so. We receive daily from ten to fifty reports of men driving automobiles or horses at a high rate of speed, placing themselves and others in unnecessary danger. We send for those men and have them come to the office of the commission and Dr. Burgess

keeps track of them. If a man is called in a second time we deal severely with him. We have very materially reduced the number of automobile fatalities.

GUARDING AGAINST GRADE CROSSING ACCIDENTS

MR. CHARLES B. SCOTT: The Chicago, North Shore & Milwaukee road traverses the district referred to by the Coroner. Gradecrossing accidents have been very frequent and resulted in a great many deaths, due largely to the fact that so many out of town motorists traverse that highway, particularly on visiting days at the Great Lakes Training Station. Just a few weeks ago an automobile truck loaded with people endeavored to cross the track before an approaching electric car going sixty miles an hour. They waved to the car to stop and started to cross the tracks—four people were killed and about thirty injured. Because of the frequency of accidents the road has inaugurated a rather novel plan. They prepared 40,000 circulars; on the front page was an illustration of an automobile which had been crushed by a car with a statement of the number of deaths caused by people going across grade crossings without stopping, looking and listening; the succeeding three pages contained other brief information. We stationed two men on that highway, on visiting days to the Great Lakes Training Station, and instructed them to stop all automobiles and hand them one of the circulars. On the first day, a Sunday, we gave out 20,000 circulars, and it was the first Sunday for some time that we had no fatal accident on that road. We continued the plan, with the result that there has been a marked reduction in fatal accidents on the North Shore Road at grade crossings.

MR. C. B. HARDEN: Was the accident on the crossing where you stopped the 20,000 automobiles in one day?

MR. SCOTT: No; I do not want to leave that impression. The accident occurred on one of the crossings of a highway over which 20,000 people traveled in one day. They may have taken some other side street into that highway, but the main highway—Sheridan road—runs north from the northern limits of Chicago to the Great Lakes Training Station and on up to Milwaukee and it is, perhaps, one of the most frequently traveled roads in the country.

Last year I made a report for Major Harry Bullock, who was asked to make a study of grade crossing automobile accidents and report to the Council. The report is contained in last year's proceedings of the National Safety Council and deals with some 32,000 accidents, divided geographically, Middle West, East, Pacific States and South. It shows that the largest proportion of grade crossing accidents occurred in the Middle West. The report was analyzed as to the probable cause, whether of the driver, the trainman or some other cause, or doubtful, and showed a very large proportion was due to the carelessness of the driver of the auto. A thing automobile men would be interested in looking over that report.

CHAIRMAN TALBERT: We will now proceed with the third and last paper of the afternoon.

MAKING WALKING PLACES SAFE

H. WEAVER MOWERY, SAFETY ENGINEER, AMERICAN ABRASIVE METALS COMPANY, NEW YORK CITY

Mr. Chairman and Members of the National Safety Council: A general realization of the necessity for some concerted activity for the common good finds expression in the creation and spontaneous acceptance of a slogan or catchy phrase. Twenty years ago "Remember the Maine!" came into being and continued to thrive until the enemy against whom it united our national thought and action was vanquished. Today we hear on every side, "Can the Kaiser!" This phrase, in typical American slang, is the slogan by which national expression again is given to our underlying feelings in affairs of world interest and it will flourish with increasing vigor until its purpose has been accomplished.

In the realm of our internal life, as well, certain slogans have come into being, spread like a flood over the land and subsided; increasing with a growing realization of the need for some activity for public good and dying out as the good has been accomplished. A decade ago was heard "Don't monkey with the buzz saw." Large numbers of injuries resulting from too great familiarity with that instrument of industry was sufficient reason for this warning being so common—the buzz saw *was* notoriously unsafe. Now it is so guarded that the old injuries are almost impossible, and that slogan, having served its purpose, has become obsolete.

Today, in city, village and country, from the old barn loft to the towering skyscraper; in hotel, factory, office and amusement place—everywhere—we hear and see another slogan, "*Watch Your Step!*" This slogan is the expression, the outward sign of a public realization of the prevalence of *unsafe walking places*. Noting it, safety organizations, engineering societies and even legislative bodies are making rulings, passing resolutions and enacting laws designed to prevent those conditions which were the cause of its creation and spontaneous acceptance.

MAKING WALKING PLACES SAFE

A hazard which ranks highest in the number and severity of its casualties is usually the point of attack by safety engineers. As that hazard is reduced or eliminated another takes its place and in turn is attacked until brought into submission. At present the hazards of unsafe walking places have superseded all others and occupy first place. Considerable sporadic effort already has been expended with more or less success toward removing and preventing these hazards. To wipe them out there must be concerted activities, based on a clear knowledge of their nature and a full realization of their extreme seriousness as a most prolific cause of casualties of more than usual severity entailing untold suffering and a great economic loss. Therefore, it is indeed fitting that the National Safety Council now should consider this problem, one of the most important and difficult in accident prevention, so that intelligent concerted action may be directed to making walking places safe.

"CARELESSNESS" IS NOT A CAUSE OF CASUALTY

It is amazing how many people have incorrect ideas of the various causes of casualties. Repeatedly it has been stated that over 70 per cent of all casualties are caused by the "carelessness" of the injured. A most striking example of such erroneous mental attitude toward the causes of casualties was given in a table published widely as follows:

	Per cent.
Carelessness of the injured	71
Miscellaneous	24
Carelessness of others	3
Lack of mechanical guards	2

If it is desirable to charge all casualties to "carelessness" the 2 per cent due to lack of mechanical guards also might be charged to "carelessness," since it is a form of "carelessness" not to have a needed mechanical guard: then, with all casualties charged to "carelessness," the goal toward which some seem to be striving would be reached. But this is a grossly wrong attitude to take. There is considerable similarity between the "safety" man who charges accidents to "carelessness" and the ostrich that sticks its head in the sand to hide. It is absurd. It is an outgrowth or survival of the spirit created by the archaic common law defenses. Blaming casualties on "carelessness" does not remove the hazard which causes them! "Carelessness" is an excuse, it is not a cause! If the term "carelessness" must be used it might well be applied to supervision which permits hazards to exist, but surely not to the injured themselves, for self-preservation is the first law of nature and it is inconceivable that any one, with rare exceptions, should wilfully cause or permit injury to self.

CAUSES OF CASUALTIES IN WALKING PLACES

There is needed not something to blame but accurate knowledge of the real causes of casualties, so that they may be studied and a way found to remove them. It is difficult to get data that is conclusive, since casualties often are erroneously charged to other than *promoting* causes, yet there are sufficient facts to show that the casualties of unsafe walking places are greater in number and severity than from any other public or industrial hazard: that they are primarily due to underfoot and collision hazards. Underfoot hazards include slipping, tripping and unsafe stair treads, unguarded openings and weak structures causing casualties usually classified under "falls." They also include such hazards as projecting nails, broken glass, etc. Collision hazards result in casualties from persons colliding with each other or with objects stationary or moving within the walking place.

It should be noted, however, that many casualties having slipping and tripping as their promoting cause are frequently classified under other headings. In a certain instance, out of thirty-five serious "electrical shocks" casualties, four were caused by "slipping against live parts" and of these two were fatal. *If all the casualties whose promoting cause is slipping or tripping were subtracted from the classes in which they are*

erroneously recorded and added to their own kind the necessity for active concerted effort toward eliminating these and the related hazards of walking places would be even more apparent.

FROM UNDER-FOOT HAZARDS—SLIPPING, TRIPPING, UNSAFE STAIR TREADS, ETC., CAUSING "FALLS"

Approximately one-fifth of all fatal casualties in the United States are caused through "falls." About 10,000 deaths per year, or nearly double the number from any other class, are classified as "falls" in government mortality statistics—these are the records for the registration district, including about two-thirds of continental United States. The statistical department of the Prudential Insurance Company of America places "falls" as the leading cause of casualty, with 14,855 charged to it of a total of 76,500 fatal accidents for continental United States for the year 1915.

Seeking for the causes of "falls" in the realm of industrial safety it is noted that nearly one-half of them occur on stairs, floor level and over obstructions. Reports from sixty-five companies in twenty-two different States, tabulated by the Accident Prevention Committee of the National Electric Light Association, show that of all their falls for a year, amounting to 963, over 45 per cent occurred on stairs, on floor level and over obstructions. These may be considered as being caused through the hazards of unsafe walking places. Only 1.2 per cent were from scaffolds, 8.2 per cent from poles and 13.5 per cent from ladders. Lost time through "falls" was nearly twice as great as from any other class excepting "handling tools," which showed a greater number of casualties, but apparently not so severe, since the lost time from this class also was considerably less than from "falls."

In public safety it may seem impossible for any hazard to be more serious than falls are in the industrial field, but such is the case, and the fact is confirmed by the annual report of the Coroner of Chicago and Cook County for the year ending Dec. 31, 1916. It should be noted that the law there requires that "In all fatal casualties the body cannot be buried without a certificate from the Coroner." Hence the returns from such a large center of population are a sound basis for studied conclusions. There were reported 461 deaths by "falls." Among the classifications which were less numerous were: Automobile fatalities, 301; septicæmia or blood poisoning, 51; elevators, 36; burning buildings, 24, and electrocution, 21.

Analyzing the 461 deaths by falls it should be noted that the fatal industrial falls were 152, which is only about one-third the total number. Among the causes of the falls 166 resulted from *slipping and tripping*, 53 losing balance, 49 intoxicated, 30 feeble or weak, 13 moving cars, 11 icy streets, 7 unlighted stairways, etc. More than one-third of the falls occurred through slipping and tripping. There were 83 fatalities from falls on stairs, 70 on street and 36 on floors. There were 51 fatalities of females and 410 males, which seems to disprove the generally accepted idea that women suffer most from falls on account of high heels and tight skirts.

ECONOMIC WASTE FROM "FALLS"

The economic waste through "falls" is a large item. No other class of casualties is so costly. The greater number of casualties involved and their extreme severity is the reason for the much greater loss from this source, and "falls" are only one of the many classes of accidents from unsafe walking places. In Ohio, during the year 1915, approximately $153,000 was paid in compensation, hospital and medical expenses on 3,595 casualties from slipping, tripping and falling. Ladder casualties cost $49,574; planers and jointers, $33,640.56; belts and pulleys, $36,662.34; cranes, $88.329.00, etc. These were industrial casualties and for the most part to workers of the lower paid classes. Casualties in public places to persons in all grades of life may be assumed to be much more costly. An accident insurance company reports that of 128,326 accidents happening "to careful people," namely, people who are careful enough to appreciate the advantages of accident insurance, there was a total of 34,191 accidents due to falls, of which number 15,329 occurred on inclines, steps and other walking places. The amount paid for them was approximately $1.100,000, which was an average amount of $72.42 per fall. Assuming the ratio of injuries to fatalities at 120 to 1—although in New York State it is about 140 to 1 and in Ohio 150 to 1—the total accidents from "falls" in continental United States may be estimated, and, applying the average cost of $70.00 per accident, the actual direct waste from this source may be computed at about $128,000,000 per year. Therefore, from the viewpoint of economy, in addition to humanitarian motives, it is indeed evident that earnest effort should be directed to removing the hazards which cause falls.

CASUALTIES FROM PROJECTING NAILS, BROKEN GLASS, ETC.

In addition to those underfoot hazards, such as slipping and tripping. unguarded openings, etc., causing casualties usually classified under "falls," there are other hazards such as projecting nails, broken glass. etc. It is even more difficult to obtain satisfactory data showing the real seriousness of these hazards, but it is a reasonable conclusion to draw from available industrial reports that nail injuries constitute from 3 to 6 per cent of the total casualties. In a certain instance an analysis of 5,944 reported accidents shows 2.6 per cent nail injuries. Cuts from broken glass, tin pieces, metal, etc., are very similar in nature and add somewhat to the number of casualties from underfoot hazards. The Pacific Gas & Electric Company, for 1914, reported forty-one casualties from "Stepping on or caught by projecting nails, glass, etc.," which was 5.9 per cent of their total. Of 750 casualties analyzed by the Committee on Accident Prevention of the American Gas Institute, "nails. wire. etc.," caused 47 casualties, or 6.27 per cent of the total. Of 4,189 street accidents on which the Travelers' Insurance Company paid claims 3.4 per cent were from stepping on nails, glass and other sharp objects, which shows that the hazard is about the same in public places as in industrial plants.

CASUALTIES FROM COLLISION HAZARDS

Collision hazards which result in casualties from persons colliding with each other or with objects stationary or moving within or into the walking places are seldom classified as an industrial hazard. The most serious of this type of hazard is commonly classified as "automobile."

For Manhattan, one of the five boroughs of New York City, for the year ending Dec. 31, 1917, the following is a list of fatal casualties from the causes shown:

Automobiles	280	Horse-drawn vehicles	52
Rails on stairs and sidewalks	144	Conflagration	27
Surface cars	69	Subway trains	19
Elevators	64	Elevated railroads	11

In passing, the number of fatalities from falls on stairs and sidewalks should be noted in comparison with those from conflagration and other causes, although this table is presented primarily to show the relative seriousness of the automobile hazard. It is scarcely necessary to emphasize the seriousness of this form of collision hazard which heads the list not only in New York but in almost every city.

Other forms of collision hazards are those due to objects projecting within the walking places, such as fire plugs and other obstructions on the sidewalks, steps projecting beyond the building line, carelessly piled material, etc. In public places, accidents while walking, due to colliding of persons with each other are frequent. This is particularly true around passenger stations, theatres, schools, etc., as well as on sidewalks and other crowded places in cities. Not only must safeguards be thrown about the individual who is in haste or panic, but due consideration must be given to the safety in crowds of the aged and infirm, the small children, the mother with baby or packages in arms, or the foreigner who perhaps cannot read.

REMOVING THE HAZARDS

From the foregoing consideration of some of the many hazards of walking places and their relative seriousness as casualty producers and sources of economic waste, it is apparent that there is a pressing need for concerted action to remove them.

Million of dollars are spent in making buildings firesafe with wired glass, kalamein doors, fire escapes, sprinkler systems, reinforced concrete, terra cotta fireproofing, etc. Codes and laws by the tome are promulgated to lessen the fire hazard. Columns are printed in the daily press about the heroism or martyrdom of some one who has perished in a conflagration. There is no objection to such activities. It all helps to lessen the fire hazard. But in Chicago, for instance, there were only twenty-four people killed in burning buildings in 1916, while during the same period 461; or nineteen times as many, were killed by falls. When one of the leading business men of that city was killed last winter by a fall on an elevated stairway, when on the way to his office, his obituary was announced in just five lines.

The terrors of septicæmia or blood poisoning receive much attention. There are gruesome bulletins showing the terrible effects of not giving proper attention to a trivial scratch. This also is effective in promoting a safety idea. But there were only 51 fatalities from blood poisoning recorded by the Chicago Coroner's office during 1916, while there were 166 fatalities from slipping and tripping.

Why have the insidious hazards of unsafe walking places been neglected in accident prevention work? There is nothing spectacular about the turning of an ankle or breaking of a neck by falling. Such conditions cannot be shown in pictures and about them it is impossible to write wonderful word pictures. The resultant casualties do not have the dramatic interest of a tragic death in a railroad collision, where the victim, pinned under the overturned burning car, awaits the end in terrible agony and with heart piercing shrieks; nor do they compare with the tense moments when a factory girl in the seventh story of a crowded loft building, framed against the background of roaring flames and shrieking for help, finally is driven in desperation to jump for the only possible chance of life. On the contrary, it brings a laugh every time you see a person stumble, or slip and fall, but in spite of its lack of spectacular interest the every-day common occurrence of slipping, tripping and falling takes its toll of human life more than ten times greater than that from fires. The bereaved ones at home are just as sad and the economic loss is greater by far than from some of the more spectacular sources of fatalities on which infinite effort is lavished. Therefore, let us consider means of removing these hazards of walking places.

PREVENTING COLLISION HAZARDS

The method of preventing collision hazards in large railway terminals is considered very thoroughly in a report of the Building Committee of the American Railway Engineering Association, approved at their December, 1917, meeting, part of which, with their permission, is given here, as follows:

"*The colliding of persons with objects or with each other is the direct result of cross currents of travel* which can be either partially or wholly avoided by proper arrangement and layout of stations, and by proper safeguards for handling crowds. This assumes that the character of the future traffic and needs of the people to be handled are well known and anticipated at the time plans are made. Fortunately, all those arrangements which make for convenience and speed in handling crowds also tend to safety, so that with few exceptions, a study of means to handle people rapidly will also be a study to handle them safely.

"At large terminal stations, where density of traffic justifies such arrangements, avoidance of cross currents of travel and separation of the hustling, bustling traveler from the person at leisure can be largely accomplished as follows: *First*, By separating inbound and outbound traffic as much as possible so far as main currents of travel are concerned. *Second*. By separating through traffic from local, or suburban traffic. *Third*. By furnishing for inbound traffic as direct exits as possi-

ble to carriage ways and stands, to sidewalks of main thoroughfares, and to electric cars. Similar arrangements can be made for outbound traffic, so that most of the crowds will not have occasion to pass through the main waiting room, or even traverse any great length of concourse. *Fourth*, By locating the waiting rooms for men and women, lavatories, ticket offices, baggage checking windows and parcel windows so as to be readily accessible from all main lines of travel, with particular attention to locating entrances to such conveniences away from corridors and walkways which are crowded in rush hours. *Fifth*, By separating and grouping people by signs or bulletins, and doing this as early as possible, particularly in concourses and in handling people gathering about gates leading to the trains. There should be large signs to guide a person's travel as soon as he enters a concourse, particularly to keep him from passing through crowds gathered near train gates. The use of small signs to convey information in concourses is the cause of much confusion and unnecessary hurried travel.

SIGNS, LIGHTS AND BULLETINS

"To guide crowds of people by information given verbally or audibly is not very satisfactory, even when such information is given simultaneously by annunciators in many parts of a station. The intelligence of people should be utilized by signs, lights and bulletins. The giving of information audibly will be improved if proper attention be given in station design to acoustics. Many concourses are needlessly crowded by people waiting for delayed trains, often grouped where they interfere with inbound passengers, when the same people would prefer to sit in main waiting rooms or stand around scattered instead of in dense groups if suitable bulletin notices were furnished and prominently displayed.

"At most large stations, colliding of passengers with baggage and express trucks could have been either wholly or largely avoided at a reasonable expense if, at the time the original plans were made, this matter had been deemed of sufficient importance. At one depot alternate platforms are used for trucking purposes only and at a few other depots there is practically full separation of passenger travel and trucking. However, most of the union depots recently built are planned merely to reduce interference to as great an extent as possible. This is generally accomplished by the use of elevators located at each end of the regular passenger platforms, so that baggage, mail and express can be taken to subways or overhead passageways not used by passengers. These matters are so self-evident and of such general convenience that it would seem that suitable arrangements would have been incorporated in the plans of any large station building during the last ten or fifteen years. Yet, it is easy to find many instances where apparently these provisions for safety and convenience have not been given very serious consideration.

"In choosing locations and making plans for small, or way stations, especially where there are two or more tracks, the following safety features should not be ignored: *First*, Stations should be located, if possi-

ble, on that side of the railroad from which the greater number of passengers will arrive and depart, if there are crossings at grade for either vehicles or pedestrians. *Second*, A location is desirable where it is possible to provide nearby a subway or overhead structure, either at the time of construction or later as traffic becomes heavier. *Third*, Intertrack fences can be used, extending far enough to make it more inconvenient to cross the tracks than to use provided avenues of travel. *Fourth*. Overhead structures for subways for the use of passengers should preferably be provided in connection with intertrack fences. *Fifth*. Island platforms can be used. *Sixth*, Dead lines on platforms can be used. *Seventh*. Fences, or gates, should be connected to station buildings so as to keep people off of platforms, except when trains are due to arrive or depart.

"When way stations must be located in the vicinity of grade crossings, as much clear distance as possible should be left between the street and the station. The arrangement of buildings and tracks should be considered with the object of providing a clear view of approaching trains, and also of giving an engineer a reasonable outlook. The location of a station abutting directly upon a street crossing tracks at grade, constitutes a death trap alike to people in vehicles and to pedestrians, even though gates are provided. The separation of traffic at way stations on double track roads and the observance of many of the safety provisions above mentioned are illustrated at many of the modern stations built by such roads as the Delaware, Lackawanna & Western Railroad, Pennsylvania Railroad, and New York Central Lines, especially on four-track lines. Some of these safety provisions have been used in connection with very attractive architectural and landscape gardening features."

The same general principles for avoiding collisions between people, and with objects carried by people apply in a great measure to other walking places, whether public or in large industrial plants.

PREVENTING COLLISIONS WITH AUTOMOBILES AND OTHER VEHICLES

Guarding the pedestrian crossing streets from the hazard of automobiles and other vehicles is a problem that has received considerable attention. It is the usually accepted idea that so many collisions between automobiles and pedestrians occur on account of cars being driven by drivers under the influence of strong drink. Here also the term "carelessness" is frequently used. Again it is simply an excuse—not a cause. *You cannot prevent a drunken man from driving automobiles carelessly, but you can prevent drunken men from driving automobiles.* Further, it might be suggested that the recent tendency to make round the street corners, while a convenience for the automobile driver, increases the hazard for the pedestrian. A reversion to the old square corner might be advisable because it prevents drivers from rounding the corners so closely and rapidly and allows a certain safety space for the pedestrian.

Additional safety practices also will tend to reduce the vehicular collision hazard. Through publicity people may develop a habit of looking to left when stepping to street crossing and then to the right when ap-

proaching opposite side. This is preferable to instructing people to "look to the right and then to the left." It is desirable to have people cross streets only at crossings and not between them. In some cities fines are imposed for crossing street at other places than the designated crossings. In the more congested districts traffic policemen must be stationed to control the flow of traffic so that there are no conflicing cross currents. Uniform stopping rules for surface cars should be enforced. The near-side stop is preferable.

PREVENTING COLLISION HAZARDS—MISCELLANEOUS

Within and projecting into walking places are many stationary objects which constitute troublesome collision hazards or perhaps tripping hazards. Fire plugs and Siamese sprinkler connections in exposed places on sidewalks are frequent and are decidedly dangerous. They may be placed on the curb, preferably in a box flush with the surface. The sprinkler connections usually projecting from the side of a building or from the sidewalk considerably removed from the building line should not be permitted. In the wall of the building a recess should be utilized for containing this device. Usually there are irregularities in the facade, adjoining columns, etc., which are available for this purpose.

Steps projecting beyond the building line to the sidewalk and many kindred hazards can be eliminated readily and prevented by proper supervision of new building designs. Such matters may be controlled through city ordinances.

SLIPPING AND TRIPPING PREVENTION

In the data given previously it is noticeable that falls which are the result of underfoot hazards contribute by far the most numerous and severe casualties and that they are largely from slipping, tripping, unsafe stair treads and unguarded openings. The elimination of these hazards is a most important consideration in making walking places safe, and unfortunately there has been a rather decided difference of expression as to the means whereby it may be accomplished. In those quarters which usually attribute accidents to "carelessness" it seems to be the opinion that education is a cure-all that will prevent accidents without removing the hazard. It is common practice, for instance, to display signs such as "Watch Your Step!" "Be Careful!" etc., and permit the hazard to remain. Such practices have not prevented or materially reduced the casualties resulting from unsafe walking places, and particularly from slipping and tripping. *Whether or not an individual is educated in safety practice and whether or not he plays safe at least he will not be injured by a hazard removed.* It is folly simply to educate or caution a person not to slip and permit the hazard to remain. The wise and sensible thing is to remove the hazard.

Considering, first, *tripping hazards*, there are projecting switch throws, not only on steam railroad properties and in yards of industrial plants, but even on electric lines in the streets of large cities. In Chicago a very good type of safe switch throw is utilized to overcome this hazard. It

consists of a metal box flush with the street surface and containing the lever. Tripping on it is impossible. Other tripping hazards in street, sidewalk and walkways in general are too numerous to consider separately. Manhole covers, coal hole covers, sidewalk cellar entrance doors, etc., should be flush with the walkway surface. No projecting hinges should be permitted; they may be countersunk or placed on under side. Tools, implements and materials of all kinds should not be where they may cause tripping. Gas and water valve plugs projecting above the surface of walkways are a common hazard readily prevented through periodical inspection and filling of sunken places if the plug is of the correct height. If it is not, it should be corrected.

Then there are unguarded areaways, sidewalk cellar entrances and similar unguarded openings in or adjoining walking places which should be either removed or guarded by railings or other means. In New York City all areaways and sidewalk entrances to buildings in the more congested districts have been removed by filling in or covering with a grating, thereby increasing the sidewalk area; elsewhere a substantial rail guard is permissible. Sidewalk elevator lifts with automatic doors opening with guards in places have successfully overcome the hazard of open sidewalk cellar entrances. Where the old-fashioned entrances are still in service, and it is undesirable to use a lift, safe practice dictates that a bar and interior screen door shall be used.

SIDEWALK CASUALTIES

Coal hole covers are probably the most prolific source of sidewalk casualties. From one cover nine casualties were reported in a single day to one casualty insurance company. These accidents were from slipping, but tripping and even falling into the coal hole when the cover is removed for unloading coal are also a common occurrence. The best modern practice now requires that coal hole covers shall be flush with the surface, without any projections or depressions, with an anti-slip surface and hooded so that when open the hole is entirely surrounded, leaving only sufficient space in the vertical face toward the curb into which the chute is inserted. Such a type of coal hole cover is required by the rulings of the New York City bureau of highways. Where old covers are in use a rail guard similar to that used by lighting companies around their manholes in streets should be employed while coal is being unloaded and such a guard should be as important a feature of the coal wagon equipment as the shovel and chute. Some method of eliminating this hazard certainly should be compulsory. In over 80 per cent of several hundred cases noted where coal was being unloaded no guard whatever was being used to prevent pedestrians from stepping into the open hole. Sometimes covers of a steel bar construction are employed. In such cases the distance between bars should never be greater than one inch and they should be so constructed or of sufficient strength to prevent spreading; however, this type of cover usually is unsatisfactory from a safety viewpoint because it constitutes both a slipping and tripping hazard.

Metal borders around vault lights are vicious slipping hazards. Efforts

have been made to remove the hazard by inserting small rivet heads, holes being drilled into the iron in which they are set. In some cities a heavy coat of asphalt is placed on such surfaces. None of these methods is satisfactory in preventing the hazard, because the rivet heads cause tripping and very frequently are so far apart that even the slipping is not prevented, while the asphalt, particularly in summer time, soon flows or is worn from the slippery metal. The best practice is to use for sidewalk lights one of the numerous reinforced concrete systems with which no exposed metal borders are necessary. To prevent slipping on the surface in which the glass is located an abrasive grit is floated into the cement when setting or small anti-slip devices such as buttons or crosses are embedded in the cement between the glasses.

Great care should be taken to have ramps or inclines surfaced with some anti-slip material. If a cement finish is used it should never be troweled, but should be simply floated lightly with a wood float. If the traffic is light this provides a sufficiently durable rough surface to prevent slipping. Never under any circumstances should iron fillings or other hardeners be used in granolithic inclines. If the traffic is somewhat heavier and of a type that greater protection is desired one and one-half pounds per square foot of No. 20 abrasive grit, such as alundum or carborundum, should be floated into the granolithic surface when setting. If the traffic is still heavier and it is desirable to have an anti-slip wearing surface of considerable thickness, there should be one and one-half pounds per square foot of No. 20 abrasive grit incorporated in the finished coat *before laying*, in addition to the surface sprinkling when setting.

ABRASIVE SURFACES AND CARE OF FLOORS

There is still some question, however, as to the durability of even such a surface. It seems that the cement is not sufficiently strong to hold the abrasive firmly. It breaks loose and acts as an abrading agent, wearing out the surface in about one-half the time that it would take to wear it out if the abrasive were not present. Those who have this idea or who have had such an experience prefer to use four-inch wide strips of anti-slip tread set six inches to ten inches on centers at right angles to the line of travel and anchored in the cement flush with the surface. On sidewalks and, in fact, in all places, an incline at the head or foot of a run of stairs should never be permitted.

Floor finishes of small tile, mosaic or terrazzo should not be used for sidewalks or in corridors where people with wet or muddy shoes must traverse them. The slightest film of grease or mud on such surfaces makes them dangerously slippery. This condition is sometimes partially guarded against by the use of sawdust, but only in certain locations where such floors can be maintained in a clean condition at all times should they be permitted. The cleansing of such surfaces is a matter that should receive the careful attention of those responsible for building maintenance. In one of the large New York office buildings there was an average of two falls per day for a period extending over several months, due to slipping in corridors which were of a highly polished ter-

razzo. The architect, upon completion of the building, instructed the owner not to permit the use of soap powder for cleansing the floors, but they were used and the casualties were the result. Such powders contain an element of grease that clings to the floor surface and is not removed merely by water and rubbing. The remedy is to use cleansing materials of an abrasive nature in which there is a minimum of soap. Such a cleaner shows best results by first slightly dampening the floors, so as to hold the dry powder, and then thoroughly scrubbing with a brush, finally wiping with a rag or mop and clean warm water. This will leave the floor thoroughly cleansed and in a non-slippery condition.

Rubber, cork, asphalt mastics, travertine and various other materials are desirable for flooring use under proper conditions. Sometimes an insulator is necessary, as around high tension switch boards, or an asphalt mastic as a heavy duty trucking floor, but for all purposes in almost any sort of walking place some material is available and may be used satisfactorily, giving not only requisite durability but providing anti-slip quality as well.

Drainage and ventilation gratings, door saddles (particularly at fire doors and elevator shafts), gutter covers and similar forms of inserts in walking surfaces should be avoided as much as possible, but where it is essential or desirable to use them they should be of some anti-slip material. The new Federal Safety Standards for Building Construction require that all such surfaces should be of an anti-slip material.

METALLIC ANTI-SLIP SURFACES—SAFETY TREADS

For door saddles, cover plates and walkway inserts of many kinds the use of steel and iron, even though the surface may be corrugated or otherwise broken by designed variations, is a distinct menace, because mud, oil or even light traffic makes them dangerously slippery. An effective anti-slip tread should be used. At other places where there is a distinct danger zone, such as on car steps, sidewalks, stair treads, etc., an effective anti-slip surface of great durability should be provided.

The false notion that an anti-slip tread is obtained by corrugating or otherwise making irregular the surface of cast iron or steel should be abandoned. Some years ago the supervising architect of the United States government called for treads for postoffices to be of anti-slip material. Contractors insisted that corrugated cast iron or checkered steel fulfilled the specification, whereupon the architect revised his specifications to read "Treads shall be of an anti-slip material. By this it is not intended that corrugations or other irregularities of the surfaces of cast iron or steel shall be considered as constituting an anti-slip tread."

Several types of manufactured combinations of metal and abrasive, known as "safety treads," have been adopted extensively as a means of preventing slipping hazards and they have become a necessity in accident prevention. However, care should be exercised to select a good type for there are some forms which are "safety" in name only. To prevent slipping, frictional resistance must be provided. Lead without abrasive will not do that, for it is used as machine bearings because it reduces

friction. The presence of an abrasive is essential to prevent slipping. Sand and ashes are thrown on ice or oil covered places and temporarily are effective, but such a method is undesirable for permanent use, particularly in factories where the loose grit would be a nuisance. By permanently embedding an abrasive grit of the finest quality, such as alundum or carborundum, into a metallic matrix, incorporating it throughout the entire wearing surface while the metal is molten, an anti-slip surface of great durability and effectiveness is obtained. There are two excellent examples of such safety treads in the iron-abrasive and lead-abrasive types.

STAIR AND STAIRWAY SAFETY

About 15 per cent of all falls occur on stairs and almost invariably they cause severe injury, disability and fatality often resulting. The number of fatal and disability casualties from falls on stairs is much higher in proportion to the total number of such casualties than in almost any other class. "Safe Practices on Stairs and Stairways," published by the National Safety Council, fully narrates the most approved methods of obtaining stair safety, but a few of the essential features well may be considered here.

If a grade between two levels is greater than 20 degrees and less than 50 degrees from horizontal, stairs should be used. (For grades over 50 degrees, fixed ladders should be used.) Doorways or other entrances opening directly to stairs should be avoided. Landings sufficiently large enough to provide standing room outside of space covered by swing of door, and glass panels in the doors, are requisite for safety. Single runs of stairs or ladders should never exceed 12 feet in the vertical. Treads on steps should be of sufficient strength to bear the maximum number of people which can stand upon them and the factor safety of six should be used to take care of any sudden shocks. The width of treads and height of rise must be constant for each run of stairs. It is essential to have treads wide enough to allow ample space on which to place full width of foot when descending without danger of striking heel against riser above. The best formula for determining the tread and riser width and height in inches is $\frac{25-\text{tread width}}{2}=\text{riser height}$. The angle of the stair, which is determined by the tread width and riser eight, is preferably between 30 and 36 degrees from the horizontal. No tread should exceed 11½ inches in width, including nosing overhang which should be from ⅞ inch to 1¼ inches and is designed as a further safeguard to prevent the back of a shoe coming in contact with the riser. This additional space is particularly desirable in stairs for use by women to prevent skirt from being pinned between heel and riser.

SAFE STAIR TREADS

The material of which stair treads should be composed is very important. In a certain large railway terminal 141 accidents occurred in less than two months on stairs well lighted, equipped with hand rails and

having the proper tread and riser dimensions, but with treads of an unsafe type, namely: With a slippery metal nosing edge and grooves parallel to that nosing edge. Accidents were eliminated simply by changing the treads; there was no change in the lighting. The hand rails and traffic remained the same, but after the change in treads there was not a single reported fall in the following three months during which records were kept. No better example is needed to show the necessity of exercising care in the selection of the tread materials. Various materials of an anti-slip nature may be used when service conditions permit, but in connection with them a slippery metal strip along the nosing as a preventative of wear or as a reinforcement should not be allowed, because it constitutes a dangerous hazard, being the contact point of the foot when descending a stair and permitting it to slide forward and heel to catch.

There are three classes of stair tread materials—the unsafe, normal and safe. Unsafe materials are such as iron and steel, on which slipping is possible at all times. The normal type is safe under usual conditions, but becomes unsafe quickly from mud, oil or wear, and to this class belongs marble, slate, wood and a great many other materials. The safe type retains an effective anti-slip quality for long periods even under adverse conditions of atmosphere and exceptionally severe traffic. To this class belong cork, asphalt mastics, finely ribbed rubber and other materials of an anti-slip nature suitable for light service: for heavy duty, where sure effectiveness is desired, are safety treads designed and manufactured especially for this purpose.

Concrete treads should have safety tread inserts to protect nosings from chipping, prevent people from slipping and take all the wear on an easily replaceable insert.

Wooden treads call for regular inspection and careful repair. Safety treads applied over the wooden treads make them safe and more durable than when new.

This matter of stair tread materials is so important that several of our State labor laws contain provisions requiring that "In factories over one story in height stair treads should be so constructed and maintained that persons walking thereon will not slip." The courts also have recognized the menace of unsafe treads and only recently a Supreme Court confirmed the findings of a trial court, awarding $1,500 and costs to a party injured through tripping on a stair tread of the grooved type. Progressive communities, such as the States of New York and Pennsylvania, have recognized this menace of unsafe stair treads and have incorporated in their labor laws provisions requiring anti-slip construction and maintenance. New York City, in its building code, and many large industrial organizations have adopted similar provisions. The latest action and by far the most salutary along this line is the promulgation of the new Federal Safety Standards mentioned elsewhere.

HAND RAIL GUARDS

Hand rails should be provided on both sides of stairways three feet or more in width, on both sides of open stairways regardless of width, and

on both sides and in center of stairways over eight feet in width. Details of construction of hand rails are incorporated in "Safe Practices on Stairs and Stairways" published by the Council and mentioned elsewhere, but it should be emphasized that hand rails are merely a supplementary safeguard. You cannot put hand rails on a stairway and call it safe when the treads are not safe.

Attention should be called to the necessity for proper approaches and detours when it is desired to deflect traffic from a hazard and competent inspection or salutary punishment is essential to prevent encumbrances or obstructions of any kind on fire escapes or stairs and in the passageways leading to or from them.

HEADROOM

In designing stairways it is quite important that sufficient headroom be obtained either in the stair well or beneath the soffit of the flight immediately above. There should be a minimum distance or clearance of seven feet, measured from top of tread on a vertical line with face of riser. The necessity for sufficient headroom is so obvious that it is amazing so many instances of this hazard are found.

Having considered the great number and severity of casualties from unsafe walking places, and the general misapprehension among those who should know, regarding their causes and prevention, it is readily understood why the slogan "Watch Your Step!" has been accepted so spontaneously by the masses. Knowing these things and having before us the additional knowledge of the exact nature of such hazards and how they may be avoided, it is indeed fitting that we here shall take some constructive action, so that, having served its purpose, we shall hear no more "*Watch Your Step!*"

RECOMMENDATIONS FOR MAKING WALKING PLACES SAFE

A. In each city a department shall be charged with the safety supervision of all public walking places.

1. Competent inspection shall be maintained.
2. Walkway obstructions and tripping hazards shall be prohibited.
   - (*a.*) Low-hanging limbs, wires, dangerous trees, overhanging signs, outside store displays, building and other materials, projecting steps, etc., shall not be permitted.
   - (*b.*) Fire plugs and sprinkler connections shall be in recess within building line or in flush box at curb.
   - (*c.*) Switch and switch throws shall be so arranged or constructed that the tripping hazard is prevented.
   - (*d.*) Gas and water valve plugs at curb shall be installed and maintained flush with surrounding surface.
3. Openings in walkway or adjoining it shall be removed or guarded.
   - (*a.*) Areaways in congested districts should be filled in or covered over. Where light for basement is required, gratings may be used. In less congested districts substantial railings are sufficient to prevent people falling into the opening.
   - (*b.*) Sidewalk cellar openings should be covered when not in

service. Covers should be flush and of an anti-slip material. When in service, rails, automatic wings or other approved devices for preventing the falling hazard should be required.

(c.) Coal holes shall be guarded with cover flush with the surrounding surface. Cover should be of an anti-slip material. If gratings are used for ventilation, bars thereof should not be more than 1¼ inches apart and placed at right angles to line of traffic. When cover is removed for the purpose of unloading coal, the hole should be so guarded that people will not fall therein. A steel hood attached to the under side of cover and automatically locking into place when cover is raised, or a rail guard carried as an essential part of a wagon equipment, are requisites of safety.

4. Slipping hazards should be eliminated wherever possible.

(a.) Coarse salt sprinkled on sidewalks and walkways prevents snow and ice freezing smooth and slippery. It also hastens to melt it. Ashes and sand also prevent slipping from this hazard if sprinkled on the slippery surface.

(b.) Metallic inserts such as drainage gratings, coal hole covers, door saddles at elevators, fire doors and exterior doors, gutter plates, etc., in walkway surfaces should have uniformly distributed within their wearing surface an abrasive grit.

(c.) Granolithic inclines, at head or foot of stairs should not be permitted. Elsewhere such surfaces should have incorporated in them some effective anti-slip element. No. 20 abrasive grit such as alundum or carborundum sprinkled into the cement surface when setting if properly applied is one method commonly used to make such surfaces safe. However, strips or abrasive metal or anti-slip materials are more effective.

5. Careful attention should be given to safe construction and maintenance of stairs and stairways.

(a.) Reference should be made to the National Safety Council Safe Practices leaflet on "Stairs and Stairways" for specifications of safe stair construction.

6. Collision hazards may be avoided by proper direction of traffic.

(a.) Traffic policemen shall be stationed at street intersections in congested districts to guide traffic.

(b.) A uniform stopping rule for surface cars should be enforced. The near-side stop is preferable.

(c.) In public buildings such as railroad stations, theatres, etc., collisions may be avoided by proper design and large signs to direct the flow of traffic.

(A number of slides were exhibited by Mr. Mowery depicting various sidewalk and street hazards to pedestrians.)

CHAIRMAN TALBERT: Tomorrow morning we will observe traffic conditions at Olive, Twelfth and Locust streets. Criticisms and suggestions will be discussed tomorrow afternoon in conjunction with Mr. Harvey's story of the Rochester campaign.

WEDNESDAY AFTERNOON SESSION

CHAIRMAN TALBERT: Before taking up Mr. Harvey's experience in Rochester we will hear the report of the sub-committee appointed to formulate a system of organization and to detail plans for the work of the Section during the coming year. The committee has done some very definite work in conjunction with the President and General Manager of the National Safety Council. I will ask Mr. Whitney, the Chairman of the committee, to explain briefly the report of the committee. The full text will appear in the proceedings.

REPORT OF THE PROGRAM COMMITTEE

Mr. Chairman and Members of the National Safety Council: Your committee has given further consideration to the subject of a definite program for the coming year and in this it has sought the advice of Mr. Harvey. Its conclusions, along the general lines reported yesterday, are more specifically as follows: We understand what we are after is to make sure that this Section, with the support of the National Safety Council, shall, during the coming year, attack the problem of public safety in a forceful and effective way; in other words, the problem is to *start something*.

Your committee believes that the problem divides itself into three parts: *First*, ascertainment of the facts and needs of the situation in regard to public accidents, involving, therefore, the collection, tabulation and use of statistics; *second*, the formulation of a plan for dealing with the problem, going into sufficient details so that the plan may be turned over for application to the various communities; *third*, the working out of methods for interesting communities and for getting the plans into actual operation.

Your committee believes that it will probably be impossible, at these meetings, to lay down definite plans for field organizations; it believes that the problem should, by all means, be discussed fully and in all possible detail, but it believes, in spite of the great advantage that has come from the working out of the Rochester experiment, that our efforts should be directed toward the creation of an organization within the Section for study and action during the year, rather than toward immediately trying to determine just how the problem is to be attacked. In other words, the problem is still too new to admit of anything like a final solution. It is not so important to "arrive" immediately as to feel sure that we are starting something that will keep going and "arrive" as soon as is reasonably possible.

DUTIES OF PROPOSED EXECUTIVE COMMITTEE

Your committee recommends that an Executive Committee of five, consisting of the three elected officers and two others to be appointed by the Chairman, be created and during the year they should make a complete study of the subject of public safety; that so far as possible any matured

conclusions of this committee, with the approval of the Executive Committee of the National Safety Council, shall be put into action and that the committee shall report in full at the next annual meeting.

It is our idea that the Executive Committee shall be a Committee on Plans, Scope, Ways and Means; in other words, a committee on "what is it, how to do it and how to get it done." We believe the Executive Committee should be a committee of executives, so far as possible in contact with the problem as a whole, rather than technical experts. We believe the committee should meet, if possible, once a month and that it should seriously and wholeheartedly devote itself to the solution of the problem of public safety in much the same way that the Executive Committee of the Council is undertaking the solution of the problem of safety as a whole. It is, therefore, important that the members of the Executive Committee should be so situated geographically that frequent meetings will be possible.

We recommend that committees on statistics, on traffic rules and signs, on elevators, on pedestrian hazards, on education and on publicity be created and that further committees be appointed at the request of the Executive Committee. We recommend that the members of these committees be technical experts in the particular fields involved, that the membership of each be not over three and so located geographically that frequent meetings will be feasible. We further recommend that these committees report directly to the Executive Committee of the Section and that the direction of these committees be lodged entirely with the Executive Committee.

CO-OPERATION OF LOCAL COUNCILS WILL PROVE EFFECTIVE

Your committee is unwilling to go further at present in recommendations regarding field organization, except to say that it is its belief that the problem can best be attacked through the instrumentality of Local Councils. Your committee is of the opinion that it will not be necessary to create other specific forms of organization, that the Local Councils will prove flexible enough to serve for attacking the problem locally, with some possible adaptation where the problem is essentially public rather than industrial. It is understood, however, that the Executive Committee will avail itself of all possible existing organizations that can be effectively used.

Your committee recommends that the Executive Committee endeavor to start as many more campaigns like that at Rochester as possible, not only for their direct effect upon the communities but for the light they will throw upon the problem as a whole. The Section will look to the Executive Committee for a record of actual accomplishment as well as study.

A. W. Whitney, Chairman.

DISCUSSION

Mr. Weatherford (Indianapolis): I have this suggestion to offer: That where Local Councils take up this work they should thoroughly organize and pass the word along through the Chamber of Commerce or similar

organization. Eventually in every city of any importance and even in small towns, possibly, there will be some representative interested in public safety work.

CHAIRMAN TALBERT: Those are the particular points we are getting at in our organization scheme. Mr. Cameron told us this morning that if we came to the Executive Committee with a well-defined scheme, financial assistance would be assured.

MR. ARTHUR T. MOREY (Commonwealth Steel Company): I move that the report, as presented by the committee, be approved and adopted. (Motion seconded.)

EFFORT TO ACCOMPLISH RESULTS

CHAIRMAN TALBERT: Mr. Price, you have had much experience in this work, will you please start the discussion.

MR. PRICE: I heartily approve the report and its recommendations; it provides for the one point that is uppermost in my mind, *that we do something*. The older I grow the less I am interested in complete and perfected plans, all worked out in detail in advance, and the less confidence I have in anyone's ability to work out such plans. We want feasible and workable plans and we must approach our problem step by step—that is all provided for in the report. I want to emphasize one thought, that when we come back to next year's meeting we will have a report of something actually accomplished in each one of the principal departments suggested in the report. We are all alike in one thing: When a man formulates a plan, necessarily he thinks that it is the best. When we outline theory we are not moving, but there is something wonderfully convincing about a thing actually done. This morning, in Central High School, I said: "Children, do you know that last year in St. Louis 510 men, women and children were killed by accidents and this same week last year twenty-four people were killed? Do you know, children, what has happened this week—Safety Week? Monday there was not a single death, there were ten last year. Tuesday there was not a single death, there were four last year. You children helped to make this record." I got a rise out of them.

CHAIRMAN TALBERT: If there are no further remarks I will put the question on the adoption of the report. (The report was adopted.)

APPOINTMENT OF NOMINATING COMMITTEE

I will appoint as the Nominating Committee Mr. Hardin of St. Louis, Mr. Rasmussen of Pittsburgh and Mr. Weatherford of Indianapolis. The committee will report tomorrow afternoon at 2 o'clock.

MR. JULIEN H. HARVEY: I move that the committee just appointed also act as a Resolutions Committee. (Motion seconded and adopted.)

CHAIRMAN TALBERT: We have copies of Mr. Harvey's report on the Rochester campaign and the discussion should cover all its phases. It is the hope of the Council that we may be able to devote at least a part of our attention to what might be called experimental or laboratory work

and the experience in Rochester may well be regarded as a step in that direction.

[The full text of the Rochester campaign is printed in a separate volume and should be read carefully by every person interested in public safety work. For convenience a brief digest of the discussion following Mr. Harvey's presentation of his activities in Rochester is included in these proceedings.]

DISCUSSION OF ROCHESTER CAMPAIGN

MR. E. B. SAUNDER: (Boston): Five thousand dollars was the appropriation for the work. Of course, that was only a starter.

MR. HARVEY: We spent about $5,800. It is surprising how much printed matter you can buy for a few dollars—we distributed something like 200,000 pieces of literature during the campaign. We were fortunate in having men right on the spot who could make lantern slides and picture films and in securing them at a reduced price. A campaign like that made in Rochester could be carried on elsewhere for $6,000, possibly less, because in our pioneer work we probably spent some money which could be saved in a future campaign.

A DELEGATE: Street railway accidents were reduced what per cent?

MR. HARVEY: About 25 per cent. I took into consideration a 14 per cent decrease in car mileage and 5 per cent reduction in passengers carried; then I separated all the accidents.

MR. J. A. HUSTON (South Chicago): Will the next six months' work be of about the same general character?

MR. HARVEY: The program, as arranged, will also take up industrial work. They will not only have a director but they will have an additional man to handle publicity and attend to a great many details.

MR. SAUNDERS: Is he attached to the Chamber of Commerce?

MR. HARVEY: Yes. When I look back on the work I see a thousand and one things left undone that should have been attempted. There is a great deal of work to be done in such a campaign and I want to emphasize one point: Do not attempt too much, if you do you get into hot water.

SCHOOLS, POLICE, NEWSPAPERS, COMMUNITY SERVICE

MR. PRICE: Do I understand you to enumerate the four things you would recommend Local Councils to do in organizing such a campaign: *First*, schools; *second*, the police; *third*, the newspapers; *fourth*, community meetings? Do you feel that those four factors could be organized and conducted successfully by a Local Council in an average sized town without a salaried secretary?

MR. HARVEY: No, sir; as a preliminary I said you would have to secure the services of someone who could devote all his time and attention to the work.

MR. PRICE: What would you recommend to a Local Council in a town where we know that, during the next three years, we shall be unable to have a salaried secretary? Let us take Huntington, W. Va., one of the liveliest of Local Councils. What would you recommend?

MR. HARVEY: They could undertake school work, but not too much. I would say the formulation of a course of study is absolutely the first thing to be done in a public school.

MR. PRICE: Of course, that includes bulletins?

MR. HARVEY: Not necessarily.

MR. PRICE: To include bulletin material?

MR. HARVEY: By a "course of study" I mean a regular, definite course of study to go into the schools, not a course of activities. I think a great deal of our school work will be misdirected unless it be properly followed up. Where you have no permanent secretary and cannot hope for one within the next few years, you should make an effort to get the board of education and the teachers interested. In this way you can get some things started. But I want to say frankly that I think, especially if the community is of any size, that you will have a very difficult time in making headway until you have some one devote his entire time to the work. That may sound rather discouraging, in view of the fact that there may be some communities that will not have a salaried secretary for some time, especially during the war period, as it is very hard to get men to devote definite efforts to work along these lines.

CASUALTIES DURING PEACE ACTIVITIES

MR. R. N. HEMMING: I notice the statistical data in this paper gives "Deaths from all causes in registration area, 909,155." In an address which I expect to deliver before the Electric Railway Section I shall give some figures which were compiled by the Maryland Casualty Company, giving the casualties for the United States (killed and injured) as 14,000,000 in one year, or at the rate of 38,000 a day. Overseas the casualties in the last four years of all the combatants, up until July 1, 1918, were 20,762,000. It looks like we were having a war in the United States that was really worse, in a sense, than what is going on "over there." If the Maryland Casualty Company's figures are correct our ratio would be 56,000,000 in four years.

MR. PRICE: You mean "casualties" as including deaths and injuries?

MR. HEMMING: Deaths and injuries. Germany claims that 85 per cent of her injured return to activities, the allies claim 80 per cent. How many of the injured people in the United States return to activities? I was not able to obtain statistics, but it seems to me that these figures, if we can get them before a hundred million people, are good ammunition, in calling attention to our casualty lists and to compare them with those on the other side, to which they look with awe and apprehension.

MR. HARVEY: The figures for deaths, as given in my report, were taken from government statistics; the statistics compiled by the Prudential Insurance Company, which constitute an estimate for the continental United States, work up to about the same ratio. I saw a little pamphlet a while ago to the the effect that one out of every eight persons in the United States is injured every year. Based on 100,000,000, that is 12,000,000 a year. The trouble, so far as statistics are concerned, is that we haven't anything conclusive. I do not know where the Maryland Casualty Company got their figures, but 14,000,000 looks too large.

CASUALTIES BASED ON MORTALITY STATISTICS

MR. ARTHUR T. MOREY: I found a little discrepancy in Mr. Harvey's statistical chart and I asked Dr. Hoffman to set me straight in regard to the apparent discrepancy as to the mortality occurring in the United States in 1915. The figures given by the Prudential Life for the continental United States, showing something like 76,000 fatalities for the year, were based on the United States mortality statistics for the registration district—only two-thirds of the United States.

MR. A. W. WHITNEY: Most of our so-called statistics are based on conjecture.

SECRETARY BURGESS: I have in my hand an extract from a book covering the mortality statistics of the United States for 1914. It gives the number of deaths declared to be by accidents as 51,770. That is a government statement. The average for the four years, up to 1914, was 61,419, showing that something over 50,000 in general figures have been actually declared to have been killed by accidents in this country.

MR. MOREY: To make clear my point: That is only for two-thirds of the United States—the registration district.

SECRETARY BURGESS: That is correct.

MR. HARVEY: Sixty-seven and one-tenth per cent of population and 41.3 per cent of land area is included in the registration district.

CHAIRMAN TALBERT: So much has been said about the schools that I am anxious to have a word from Mr. Knox on what the public schools are doing in St. Louis.

MR. G. P. KNOX (Assistant Superintendent of Public Schools, St. Louis): We have been working somewhat along the lines of a bulletin service. We have also held meetings and organized such efforts as pupil participation and scout patrols. A dozen such efforts have been put forth, but they are all experimental in their nature—nothing of an innovation. We have been trying to find our way. And as for specific reports, I regret to say that on account of pressure of work in the schools last spring I have only a general idea of what has been accomplished. I will be glad to offer what we have to the committee appointed to handle such matters.

After a general informal discussion on a variety of topics the Section adjourned.

THURSDAY AFTERNOON SESSION

CHAIRMAN TALBERT: The first paper this afternoon is on "Automobile Headlamps" by Mr. W. F. Little of New York. We are also fortunate in having with us today the members of the St. Louis motorcycle squad. They have much to do with the headlight problem, at least one side of it. Mr. Little is connected with the Electrical Testing Laboratories of New York City and has given the automobile headlight problem a great deal of study and in conjunction with a committee of New York experts has endeavored by experiment and observation to outline certain standards.

AUTOMOBILE HEADLAMPS

W. F. Little, Electrical Testing Laboratories, New York City

Mr. Chairman and Members of the National Safety Council: The automobile headlamp problem is now a most important safety factor in motoring. It is occupying the minds of our law makers and officials and is finding its way into legislative enactments throughout the whole United States and Canada. It is being reduced to a scientific problem and the driver is beginning to look to his headlamps as one of the essentials of his car that must receive the same care and consideration as his brakes or horn. He is beginning to consult the specialists and to have adjustments made as he would have the carburetor adjusted.

Safety of automobile driving at night must be considered from several view points. The driver must have sufficient light to render visible objects in the path of the car that he may harm or that may harm him. The safety of the oncoming driver must be assured by having the level of light intensity in his eyes sufficiently low that dangerous conditions may be obviated. Therefore, the situation becomes one of enough light to drive in safety and not too much to prevent others from driving in safety, or, in other words, enough light on the road and not too much in the eyes of others.

Before a clear understanding of the situation can be had a number of questions must be considered such as: How far must a driver be able to distinguish objects of reasonable size? How much light is necessary to discern the objects at this distance? How much glare or light intensity is tolerable and what is the glare area?

FIRST SERIES OF EXPERIMENTS

The New York State law pertaining to automobile headlamps, prior to March of this year, attempted to treat this problem by stating that there should be sufficient light to render visible a person, vehicle or substantial object at a distance of 250 feet in front of the car and that there should be no reflected light projected above the 42-inch line 75 feet or more ahead of the car standing on a level surface. To the uninitiated this law seemed reasonable and safe, but to those having made a study of headlighting conditions it was wholly impracticable. To render visible at 250 feet objects of reasonable size it has been found by test to require candlepower of 1,500 and upward. Road level at 250 feet is less than 1 degree below the 42-inch line and no device at present manufactured for this purpose can cut down the light within one degree from 1,500 candlepower to the candlepower of the unreflected light. Also, should it be possible to so control the light, night driving would be more dangerous than ever, for a considerable amount of light is necessary above the horizontal in order to see curves, overhanging boughs, etc.

Realizing the impracticability of existing legislation pertaining to the problem the Illuminating Engineering Society in 1917 appointed a committee on automobile headlighting to investigate the situation, with the hope that some recommendation might be made leading up to effective specifications which might be utilized for legislative enactments.

Tests Leading to Specifications for Automobile Headlamps Adopted by New York State—Illustrated by Lantern Slides.

APPROACHING CAR 200 FEET DISTANT

Figure No. 1 shows the relative position of the two cars when 200 feet or more apart, the axes of the two cars being in line. The dimension of the picture represents 20 feet at 100, or 40 feet at 200, the horizontal line representing the level of the lamps. The driver's eye is approximately 60 inches above the roadway.

An outline was formulated in the latter part of 1917. Before the work was well under way the new New York State law pertaining to this subject was introduced. This committee in conjunction with a similar committee from the S. A. E. offered their services to the legislators who were framing the statute. Their offer was gratefully accepted and the committee began work early in March of this year. The joint committees organized a series of experiments lasting several nights. The first series of experiments brought out very consistently with a number of observers the fact that the glare from automobile headlamps was apparently proportional to the light intensity reaching the eye. That is, 4,000 candlepower will produce the same glare at 200 feet that 1,000 candlepower will produce at 100 feet.

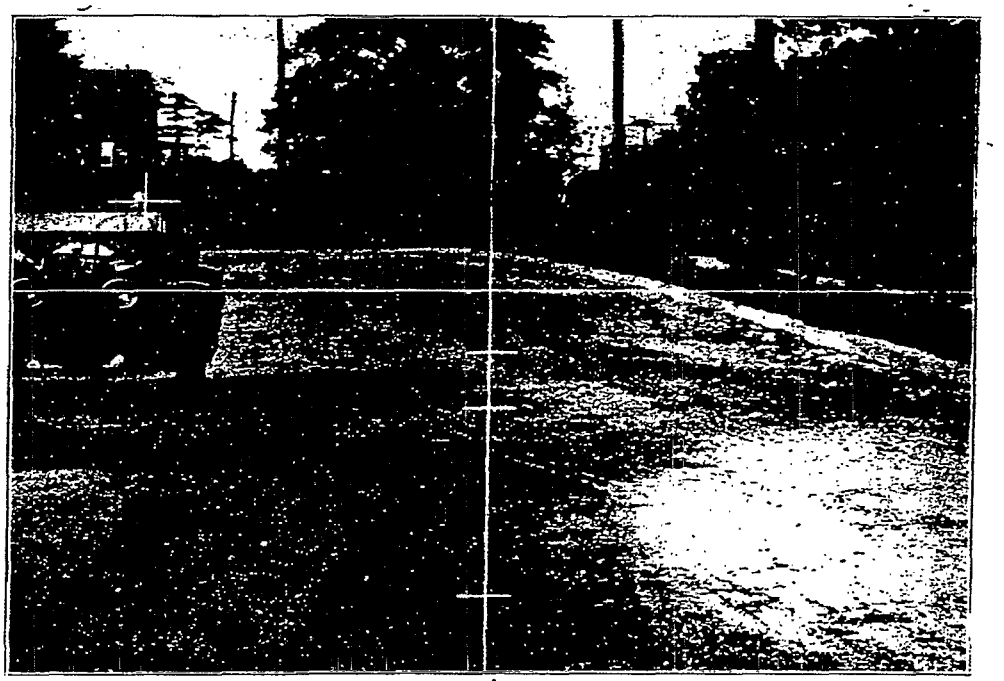
APPROACHING CAR 175 FEET DISTANT, WHEELS CUT FOR TURN OUT

Figure No. 2—The front wheels of both cars are cut to the right in order to pass, thus throwing the car axis again parallel, but separated by a distance corresponding to 7 feet at 100. The driver's eyes, therefore, immediately become at locations corresponding to 7 feet to the left at 100 and 60 inches above the roadway.

SECOND SERIES OF EXPERIMENTS

The second series of experiments was carried on to determine the amount of light which is necessary to reveal a person at 250 feet and what is the tolerance for safety. To accomplish these experiments a number of men from different walks of life were invited to participate. They represented the State officials from the Secretary of State's office, the State constabulary, the city motor cycle and mounted police, chauffers, sales agents, shop foremen, car owners, engineers, etc., some fifty-two in all.

For the experiment a pair of headlamps was placed under the control of each observer and men were located on the roadway at 150 and 250 feet. A stationary observer was asked to so adjust his headlamps that he felt he could drive with safety and see the persons walking back and forth across the roadway ahead. The necessary light to distinguish the



APPROACHING CAR 100 FEET DISTANT, CARS PARALLEL

Figure No. 3 shows the cars 100 feet apart, the driver's eye still remaining 7 feet to the left at 100 feet.

In all three photographs the overall dimensions represent 20 feet at 100.

men at 150 and 250 feet respectively was recorded, and then a second pair of headlamps were thrown on 100 feet in advance of the observer and pointing towards him. He was requested to adjust these headlamps to the glare limit and still be able to see the man at 250 feet. This adjustment was then recorded.

A summary of the results showed the following:

	Aver.	*Max.*	*Min.*
Candlepower necessary to see person at 150 feet	3,200	10,000	1,000
Candlepower necessary to see person at 250 feet	7,000	18,000	1,300
Glare limit at 100 feet	240	850	80

FINDINGS OF THE INVESTIGATION

While the tests were made with stationary lamps, and under conditions other than those found in driving practice, they did give a foundation for future work and an understanding of the situation confronting the committee.

With these facts in hand the committee was represented at the hearing before the New York State Senate and presented the findings of the investigation, with the result that the new law was passed which reads in substance: There shall be sufficient light to distinguish a person, vehicle or substantial object at a distance of 200 feet in advance of the car and there shall be no dangerous glare or dazzle above the 42-inch line.

In New York State motor highway laws and problems pertaining thereto fall under the jurisdiction of the Secretary of State. The Secretary, therefore, in seeking to promote safety requested the assistance of this joint committee and placed upon it the responsibility of a thorough investigation of the situation with the request that it report the findings at a public hearing before him to which the headlamp device manufacturers would be invited.

With this law enacted it became incumbent upon this committee to determine:

> *First*. how much light is necessary to see objects at a distance of 200 feet.
>
> *Second*. what constitutes dangerous glare or dazzle.
>
> *Third*. what is the glare area, and with these accomplished,
>
> *Fourth*. to draft specifications covering tests which will determine whether the various devices in use and those to be manufactured will comply with the law.

Appreciating the responsibility and understanding the difficulty of the problem, this committee continued its investigation.

TESTS MADE UNDER PRACTICAL DRIVING CONDITIONS

Unlike the earlier tests, which were made under static conditions, these tests were made under practical driving conditions. The members did not spend their time in consultation around a table, but camped out for two nights and two days, using four cars equipped with a number of devices and riding back and forth in the cars.

For the series of trips the headlamps of each car were equipped: *First*, with a pair of diffusing lenses with the lamp operated at a high candlepower; *second*, the same lenses with the lamps at a lower value; *third*, one high and one low; *fourth*, one car with diffusing lenses and one car with deflecting lenses, both under normal conditions; *fifth*, deflecting lenses of the same type in each car and so on until all practical conditions had been tried.

Before each series the beams were adjusted photometrically and the character of the light distributions were changed without the knowledge of the observers. Each light distribution was made characteristic of a deflecting or diffusing type of beam rather than characteristic of the particular lens in use. At the end of each series of three trips an individual analysis was recorded on a card by each of the observers.

After the completion of two nights of work the analyses were examined, comparing them with the light distributions as determined on the

road. A detailed study of the results revealed much interesting material.

The results of the first series of tests under static conditions indicated that 1,200 candlepower might be considered as sufficient light to reveal a person, vehicle or substantial object at a distance of 200 feet, provided that due care was exercised and the speed moderate. Also, a driver is likely to assure his own safety with sufficient light if it is available.

The second important point to be determined in the later investigation was what constitutes dangerous glare or dazzle. Comparing the analyses and beam characteristics, it was found that in a large majority of cases the most annoying glare was experienced between 75 and 150 feet from the headlamps, and whenever the candlepower at 100 feet distance exceeded 800 from any type of beam a distressing condition resulted. Therefore, the danger point seemed to be in the neighborhood of 100 feet and a value of 800 candlepower was decided upon as the maximum for this distance.

"WHAT CONSTITUTES THE GLARE AREA?"

The third problem before the committee was "what constitutes the glare area?" A study of this question brought out the fact that the average driver begins to turn out, in order to pass, at a distance of about 200 feet and when at a distance of 100 feet his eyes are about five feet above the roadway and at least seven feet to the left of the center line of the approaching car. On the other hand at a distance of 200 feet or more, approaching cars would be in line facing each other.

From previous tests it was found that the glare from automobile headlamp is approximately proportional to the light intensity reaching the eye.

With this established and the fact that the cars begin turning out when 150 to 200 feet apart the logical conclusion was to consider a value four times 800 candlepower or values up to 3,200 candlepower immediately in front of the car at a height of sixty inches or more above the roadway. This candlepower would produce the same amount of glare at 200 feet as would 800 candlepower at 100 feet. However, as some drivers do not begin to turn out at 200 feet it was decided to bring this value down to 2,400 candlepower.

The committee thus far has established:

> *First.* That 1,200 candlepower was necessary to distinguish objects at 200 feet.
>
> *Second.* Dangerous glare or dazzle at 100 feet is caused by 800 or more candlepower from any beam.
>
> *Third.* That the glare area at 100 feet in advance of the car is seven feet or more to the left of the car and five feet or more above the roadway.

It was now necessary to draw up specifications to cover tests of headlighting devices to determine their compliance with the law.

FORMULATION OF SPECIFICATIONS

These specifications were formulated around the conclusion as above stated, requiring tests made with a pair of headlamp reflectors of the best design, a pair of seventeen candlepower vacuum lamps and a pair of twenty candlepower gas-filled lamps, all approved for design and construction by the National Bureau of Standards. The specification requires that two pairs of devices must be submitted and tested as follows:

> *Test I*—Both pairs of devices with both pairs of lamps. The lamps to be held at seventeen candlepower and twenty candlepower respectively.
>
> *Test II*—Complete light distribution test with one device and seventeen candlepower vacuum lamp.

Test I consists of four sets of measurements at 100 feet with the following candlepower limits:

(*a*) At horizontal in a median vertical plane.
(*b*) One degree below horizontal in a median vertical plane. Some point between *a* and *b* at least 1,200 candlepower.
(*c*) One degree above horizontal in a median vertical plane, not more than 2,400 candlepower.
(*d*) One degree above horizontal seven inches to the left of median vertical plane, not more than 800 candlepower.

"The manufacturers are privileged to be present at the test and to "adjust their devices in any way which represents an ordinary and legitimate adjustment, including tilting of the lamps or reflectors, which can be carried on by purchasers of the device."

Criticisms of the specifications by the manufacturers seemed to refer in most part to the relatively high candlepower value allowed above the 42-inch line. The test, however, revealed that a large majority of devices threw a considerable amount of light above the horizontal provided they gave a reasonable amount of candlepower below. Also, most of the devices in order to comply with the specifications must be adjusted on headlamps which have their axes tilted slightly downward, and these devices were allowed higher candlepower bulbs provided that the headlamps were so tilted.

[The personnel of the committee consisted of men familiar with the optics of auto headlamp projections and no one of whom was interested in the manufacture or sale of any headlamp light controlling device. The committee consisted of one member from the Bureau of Standards, one member from the Standardization Committee, S. A. E.; two members from the Edmonds & Jones Headlamp Company, one member from the General Electric Company at Lynn, one member from the Edison Lamp Works of Harrison, one member from the Westinghouse Lamp Works, Bloomfield; an opthamologist from the National Lamp Works of the General Electric Company, a physicist from the same company, a consulting illuminating engineer from the State Architect's office and two members from the Electrical Testing Laboratories.]

DISCUSSION

CHAIRMAN TALBERT: The New York figure at 800 as a minimum at 200 feet corresponds very closely to that which we have adopted—we have taken as our minimum 500 at 150 feet. While we feel that 500 is less than it should be, we are a little low in order not to be too arbitrary in our ruling—I mean, our ruling approximates very closely the decision of the New York committee, bearing in mind that we place our arbitrary limit of 500 slightly below what in our judgment it should be.

We have representatives here from the various electric light companies, automobile dealers and accessory men, also Sergeant Mackey and the members of his motorcycle squad. All are interested in the enforcement of the law—the last named group especially interested in St. Louis. We would like to have as free a discussion of the subject as is possible. Mr. Burns is the man at the city hall who has charge of the testing of lights and we would like to have a word from him.

MR. BURNS (St. Louis): I am testing lamps every day and I will say that very few men who have automobiles know how to focus their lamps. In making my tests I often say: "You are out of focus." "How is that?" "You do not focus them right," and I do it for them. There is a screw on some of them for that purpose, but often they do not know what the screw is for. When you take the glass off the rim there is a little device just inside and when you press it there is a tendency to focus your light just right. Other lamps have a lever that you push in to give you the focus. It is all very simple, but not one out of a hundred owners knows anything about it. The accessory men often give men a different standard from the one adopted here. We want to keep everyone from getting into trouble, and if you will send owners to us we will test their lamps and put a sticker on free of charge. No policeman will bother you in the city or in the county as long as you have that sticker. I have had gentlemen going through the country from New York to California come to the city hall and ask for our stickers. Their friends tell them "Whatever you do, stop and get a sticker at the city hall. It is necessary if you make a trip to California, because every town that you go into will respect it."

CHAIRMAN TALBERT: May we have a word from some of the accessory men, the men who are selling lamps, as to what should be done? My observation is that 90 per cent of all who drive automobiles want to conform to reasonable regulations—we will have to use a club on the other 10 per cent.

HEADLIGHTS ON INTERURBAN CARS

MR. D. E. PARSONS (General Manager, East St. Louis & Suburban Railway Company): What are your rules and regulations on headlights on interurban cars?

CHAIRMAN TALBERT: There are none in this city.

MR. PARSONS: We run cars between East St. Louis and Belleville and the lights of automobiles almost blind our motormen. We tried placing the lamp on the roof, but it did not get the light down—the amount

of illumination necessary for a car running thirty-five or forty miles an hour.

CHAIRMAN TALBERT: The general rule is to get the light on the ground, that is, confine it to the ground surface.

MR. PARSONS: On our interurban cars we cannot throw the light far enough ahead. We have made all kinds of experiments and have tried the Golden Glow lamp, but we cannot center it.

MR. R. N. HEMMING (Superintendent of Transportation, Fort Wayne & Northern Indiana Traction Company): I have made quite a good many tests and the best results for all practical purposes, for the motormen and the drivers of vehicles, were obtained by placing the headlight on the roof of the car. The motorman, then, is looking under the rays instead of through them. With the headlight up above we found that we gained about 300 feet in distance of illuminating vision and I believe that is the real solution. We have tried all kinds of arc lamps, as well as those of the incandescent type, and every kind of bulb we could imagine would be of any practical use; the filament that concentrates the rays is the most useful on account of the intensity of its light.

MR. PARSONS: In the city, and especially on foggy or dark nights, I do not like them on top. We have had collisions with automobiles because they said they could not see them up there—they are used to seeing a light on the dash. On our interurban lines we use a lamp on the top, but that does not do away with the glare. We have tried but have not succeeded.

CHAIRMAN TALBERT: We hope Mr. Parsons will come to our next Congress with a paper or recommendation on this subject.

REPORT OF NOMINATING COMMITTEE

We will now hear the report of the Nominating Committee.

MR. W. R. RASMUSSEN: Your Nominating Committee offers the following nominations:

Chairman, Mr. Chas. M. Talbert, Director of Streets and Sewers, St. Louis.

Vice Chairman, Mr. Julien H. Harvey.

Secretary, Dr. William Burgess, Executive Secretary, Public Safety Commission of Chicago and Cook County.

Member of Executive Committee, Mr. A. W. Whitney, General Manager, National Workmen's Compensation Service Bureau, New York.

COMMITTEES

Pedestrian Hazard—Chairman, Mr. H. W. Mowery, American Abrasive Metals Co., New York.; Mr. Chester A. Rousch, Assistant Director, American Museum of Safety, New York; Mr. W. R. Rasmussen, Secretary, Western Pennsylvania Division, National Safety Council, Pittsburgh; and Mr. A. D. Risteen, Director of Technical Research, Travelers Insurance Company, Hartford, Conn.

Statistics—Chairman, Mr. Frederick S. Crum, Assistant Statistician, Prudential Insurance Company of America, Newark, N. J.

Education—Chairman, Mr. C. P. Knox, Assistant Superintendent of Instruction, Public Schools of St. Louis, and Mrs. J. R. Wilson, Philadelphia.

Elevators—Chairman, Mr. A. W. Whitney, New York; Members: Mr. Dana Webster, Safety Inspector, Aetna Life Insurance Company, Indianapolis, Ind; and Mr. Walker.

Publicity—Chairman, Mr. Louis G. D'Armand, Traffic Commission, Davenport, Iowa.

(On motion, duly seconded, the report was adopted and the recommendations concurred in.)

CHAIRMAN TALBERT: The Executive Committee of the National Safety Council gave us financial assistance last year and promises us more the coming twelve months. They will hold a meeting tonight and appoint subcommittees to work out a definite plan of work. A part of their plan is to assign to us the full services of a Secretary.

Our next paper will be a very interesting one by Mr. A. W. Whitney.

PUBLIC ACCIDENTS—WHAT THEY MEAN IN MONETARY VALUE

A. W. WHITNEY, GENERAL MANAGER, WORKMEN'S COMPENSATION SERVICE BUREAU, NEW YORK CITY

Mr. Chairman and Members of the National Safety Council: Let me say at the outset that there are much more significant ways of measuring accidents than in terms of money. The financial loss is a minor matter in comparison, for instance, with the unhappiness that accidents produce. Nevertheless, accidents cause a severe economic drain upon society and, in endeavoring to realize just how serious an element of inefficiency this is, we are justified in attempting to measure the loss in money.

To ascertain accurately the cost of public accidents in money is, however, a hopeless task, the available information on the subject is so fragmentary and inadequate. In a few cities statistical records of police departments are published. In some States committees interested in various related problems have prepared and published tabulations based upon newspaper clippings. There is, however, no central organization for the study of public accidents whose function it is to standardize classifications and to compile and analyze statistics upon a uniform basis.

Even where police department figures are available, they are admittedly incomplete. In the annual report of the police department of the City of New York for 1916 the statistician commented as follows upon the impossibility of following up accidents where the person had been removed to his home or to a hospital: "The precinct commanders try to follow up all hospital cases and are fairly successful, but the department has no direct source of information concerning deaths which occurred at the

homes of the victims. Through the courtesy of the Health Department this department checks up death certificates in which 'highway accident' is given as the cause of death. The articulation of these certificates with the records of the Police Department is a difficult matter. For example: The place of the accident is ordinarily of slight importance to the Health Department, but unless it is reported the case is difficult to trace. There must be many cases of non-residents injured on the streets of this city who later die outside the city limits and whose deaths are unknown to either department." If there is such difficulty in compiling an exact record of fatalities there must be still greater difficulties in compiling a record of non-fatal accidents which will reasonably approximate the actual facts. The problem then from an exact statistical point of view is at present nearly hopeless.

STANDARDIZATION OF PUBLIC ACCIDENT STATISTICS

This is a situation which should not be allowed to continue; as in the industrial field, so here, statistical information is necessary if the public is to comprehend the toll of lives and limbs which is exacted by public accidents. If we are to be in a position to combat the evil intelligently some agency should interest itself in the standardization of public accident statistics and in the conception and development of practical methods of obtaining and compiling these data for the different sections of the country.

There are, apparently, between 70,000 and 75,000 fatal accidents in the United States each year. For example, the accident mortality among policy-holders of one of the largest New York life insurance companies indicated a rate per 100,000 exposed of 68.9 in 1915 and 73.5 in 1916. Assuming a population for the continental United States of approximately 100,000,000, these ratios would be equivalent to between 68,900 and 73,500 deaths in one year. Of course, the mortality from accidents to the policy-holders of a life insurance company is not exactly representative of the fatality rate for the general population, nevertheless the figures may be taken as approximately correct.

Mr. Frederick L. Hoffman, statistician of the Prudential Insurance Company of America, estimates that during the calendar year 1916, there were approximately 75,000 fatal accidents in the continental United States. He makes this estimate after a review of the industrial insurance experience of his company, supplemented by an examination of the available official mortality statistics. He says: "The mortality rate * * * is 1.10 per 100,000 of male population and 0.4 per 100,000 of female population."

If it is assumed that the total accidental fatalities for the United States is between 70,000 and 75,000 per year, the next question is: How many of these fatalities may be assumed to be public accidents? This involves two sources of uncertainty: *First*, uncertainty as to the exact definition of a public accident; *second*, uncertainty as to the facts. On any reasonable basis, both as to definition and facts, the number of public accidents may be assumed to be at least 35,000 per year.

I hazard with reluctance a guess based on scattered evidence as to the classification of these accidents among different causes:

TABLE I.

Cause of Accidents—	*Number of Deaths.*	*Cause of Accidents—*	*Number of Deaths.*
Automobiles	7,000	Drownings	6,500
Steam railroads	7,500	Conflagrations	500
Electric railroads	2,500	All other	4,000
Vehicles and teams	3,000		
Falls	4,000	Total	35,000

Frankly, quite different results are indicated elsewhere, as, for instance, by the industrial experience of the Metropolitan Life Insurance Company. The facts are as already stated—there are no figures upon which a satisfactory estimate can be based for the population as a whole. For the purposes of this paper, however, the distribution among causes is unimportant as the conclusions are based only upon the total.

The next step in the solution of the problem involves the determination of the number of non-fatal accidents. Here again assumptions must be made. It is assumed that in the standard accident table used in computing workmen's compensation insurance rates there are approximately 100 non-fatal industrial accidents causing loss of time of more than one day for each fatality. The New York police department figures for 1917 show that there were 714 persons killed in that year and 25,435 persons reported injured. This would indicate that the number of reported non-fatal cases per fatality in public accidents is much lower than in the case of industrial accidents. This fact may be supported by general reasoning. In the case of industrial accidents there are many causes which rarely produce fatal accidents. For example, most machinery is more likely to produce non-fatal accidents than it is to produce fatal accidents. In the case of public accidents, however, there is no such condition. The same accident may either kill a person or disable him temporarily or permanently. There are comparatively few types of public accidents where death may not result and this fact makes it seem reasonable to expect a much higher death rate proportionately in these cases than in the case of industrial accidents. We may conservatively assume that for each fatality there are thirty cases of temporary and permanent injury. This will give us 1,050,000 non-fatal injuries for the United States.

How are these injuries classified: How many of them involve temporary total disability, how many permanent partial disability and how many permanent total disability? According to the standard accident table, if these non-fatal injuries were the results of industrial accidents, approximately 95 per cent would be temporary total, one-tenth of 1 per cent permanent total and 5 per cent permanent partial disability cases. If we assume the distribution substantially equivalent to this for public accidents, a complete distribution by kind of injury will be as follows:

TABLE II.

Nature of Injury—	*Number of Cases.*
Death	35,000
Permanent total disability	1,000
Permanent partial disability	51,000
Temporary total disability	998,000
Total	1,085,000

The question of the monetary cost of these accidents is next to be considered. This again requires assumptions. There are a few facts, however, which have a bearing upon the situation. Accident statistics show that of the total number of accidents approximately three-fourths occur to males and one-fourth to females. Thus, in the Prudential industrial experience for 1906-1915, inclusive, there were 37,192 fatal accidents to males and 12,974 to females. The New York police department's report for 1916 shows that of a total of 24,464 "highway accidents in which persons were killed or injured on streets, sidewalks, public highways or roads and walks in public parks in New York City during 1916," 18,166 were accidents to males and 6,298 were accidents to females. It may be taken for granted, therefore, that this proportion will hold for the general run of public accidents in the United States

The age of persons suffering injury from public accidents does not correspond to the average age of those who are injured in industry. There are a greatly disproportionate number of accidents to very young and very old persons. Thus, to quote again from the annual report of the New York police department for 1916: "The age distribution of the persons killed or injured shows clearly that the streets are not safe places for children and old persons. Of the 644 deaths known to the police, 267 were to children under 16 and 139 were to adults of 50 or over. Of the 496 deaths due to a vehicle striking pedestrians, 362 were children or old people as limited above." The experience of the Prudential Insurance Company for 1906-1915 offers confirmatory evidence. Of the total number of fatalities to males during that period, 22.4 per cent were to males under 15, 47.6 per cent to males between the ages of 15 and 44 and 30 per cent to males of 45 and over. The corresponding percentages for females were 30.5 per cent, 25.7 per cent and 43.8 per cent.

The average time loss in weeks for the different types of accidents viewed from an industrial point of view has been assumed to be as follows:

TABLE III.

Accidents Resulting In—	*Time Loss in Weeks.*
Death	400
Permanent total disability	650
Permanent partial disability	225
Temporary total disability	5

In obtaining these figures account was taken of the age distribution. It was assumed that children up to 18 years of age were not only non-

producing but involved an average annual net expense per capita of $200. Life expectancies were figured not by an ordinary table involving actual life but by a table giving duration of working life. Permanent total disability was rated higher than death because in the latter case the support of the person injured is made unnecessary, while in the former case there is not only a complete loss of earning power but the injured person must be supported as well.

If we carry out the multiplication of the figures in Table II by the corresponding time loss in weeks given in Table III and assume that the average week's wages are $20.00 and if we add the cost of medical aid figured at $15.00 per case, we arrive at a total monetary value for the 35,000 public accidents per year of something in excess of $638,000,000. In view of the fact that the process of arriving at this result has been so inexact I suggest, however, the more general statement that the cost of public accidents represents a monetary drain upon the country of at least one-half billion dollars a year.

DISCUSSION

MR. JULIEN H. HARVEY: Any attempt to give figures on this subject is more or less speculation. In the Rochester campaign I tried to secure data on this particular subject but found little authentic information.

CHAIRMAN TALBERT: We will now hear Mr. Patterson's report. A good many local men are present and I want them to hear what he has to say.

MR. W. L. PATTERSON: What I will say is abstracted from my records. For several years I have been taking care of the accident returns of the automobile business in large cities. We keep an absolute record of all that occurs in this connection, how and when it happens, as the automobile manufacturers and dealers are anxious to do all we can for public safety. I find that the most serious accidents happen between the hours of 7 p. m. and 7 a. m. and from my investigation I am of the opinion that there was not one single unavoidable accident—they were all due to carelessness on somebody's part, many of them due to recklessness. One of the causes of accidents would seem to be narrow streets, but I want to show you one case where, on July 6, at 11:55 p. m., a machine was smashed by a drunken chauffeur at 4255 Lindell boulevard, one of our widest streets—in that case it was not a narrow street that caused the accident. Here is another: A lady ran into a lagoon at Jones' Park while driving along a boulevard. There was plenty of room to have gotten around the lake.

CARELESS AND RECKLESS DRIVING

Here is another: A car ran off the Free Bridge on Aug. 21, it was about as complete a wreck as ever I saw. On Grand avenue, from Olive street almost to Walton avenue, every evening from about 6:30 until about 12 o'clock, it is almost impossible to drive on that street on account of the cars parked at the theatre. It is not always a person's fault for running into someone's car from the rear, because it is only about three feet from the street car rail to the front of the machine—it is a congested

district simply because of conditions; people do not seem to have any business on that street after 7 o'clock in the evening.

I am willing to help the National Safety Council in any way I can and will make an additional report whenever you desire. I can only say that I think we are very lucky in having so few serious personal automobile accidents, although I should like to see even less than there are. I go over the reports every day and I have not yet found a case where I could not see a reasonable excuse why they did not keep out of accident. Of course, that does not take in all accidents as many are caused by people stopping suddenly or running into others. My statement only takes into account those cases where we have to use our wrecking apparatus.

A DELEGATE: I would like to know what percentage of those wrecks was due to the absence of lights on automobiles?

MR. PATTERSON: Quite often there isn't any light on the car. In one accident three men and two women were in the car and there wasn't a piece of the body of the car but what one man could have lifted easily—it was smashed completely.

A DELEGATE: Are not a lot of accidents due to people driving with dim lights?

MR. PATTERSON: I would say that there are more accidents when driving with one headlight out than with dim lights. Last Saturday morning, a week ago, I counted ninety-three machines and there were thirty-one that did not have any tail lights; some had only an oil lamp in front. Many of these were hucksters driving to market, from 4 to 6 o'clock in the morning.

CHAIRMAN TALBERT: The information furnished by Mr. Patterson, with what we can get from the police department and the utilities companies should prove very valuable.

MR. PATTERSON: We also have a record of 15,000 owners of cars, their names, their car numbers, their type of car, their license and telephone numbers. Whenever a car is turned in to us we can usually locate the owner at once.

ACCIDENTS AT CROSSINGS

SERGEANT MACKEY: A good many accidents are due to carelessness, some are caused by liquor. If everyone would be careful at the street crossings I think there would be very few accidents. It is my experience, that very nearly all accidents occur at crossings.

MR. WHITNEY: Are there not a good many accidents from people trying to pass a car going in the same direction?

SERGEANT MACKEY: You will find some from that cause, but about 90 per cent are at street crossings.

MR. JOSEPH A. SCHLECHT: Many people drive with one headlight and this causes a good many accidents, especially in the country. Here is another source of accident in St. Louis: In certain districts the city is turning out the lights, often in the wrong places; this winter, when the bad weather comes, I think we are going to have a lot of accidents because of this. On Washington avenue and on Delmar avenue from Taylor west we find, on dark nights, every other street lamp is on either side of the

street. I do not think they are economizing by doing this as it makes it almost impossible to see a tail light.

MR. R. N. HEMMING: Why should not we have a red marker light on the rear of every vehicle, automobiles or otherwise? In the case of automobiles, I think a green light on the front in addition to a red light on the rear would be a good thing.

ACCIDENTS AT GRADE CROSSINGS

CHAIRMAN TALBERT: Mr. Hemming's suggestion on lights is one that might be studied by the Traffic Committee between now and our next meeting and we will give that suggestion to them. A resolution has been presented by Mr. Adams of the Aurora, Elgin & Chicago Railroad. If there is no objection it will be considered at this time.

Whereas: It is a well-known fact that there are many persons killed and injured at railroad and highway grade crossings, and believing that the present laws of the several States, governing the use of said grade crossings, are insufficient: therefore, be it

Resolved: That the Public Safety Section of the National Safety Council hereby approves the enactment by the Legislatures of the various States of the Union of a law in substance, as follows: "Any and all persons approaching a grade crossing of a railroad under Federal control, or any electric interurban railroad, must stop, look and listen at such place, and in such manner as shall be effective to prevent accident before entering upon such crossing. If any person shall omit such precautions he shall be deemed to have contributed to the injury or death sustained and there shall be no recovery of damages therefor. The burden of proving a compliance with this order shall be on the traveler on the highway;" be it also,

Resolved: That this action of the Public Safety Section shall be referred to the Executive Committee of the National Safety Council, asking for their approval and their assistance in having such laws passed.

MR. ADAMS: The Electric Railway Association of Illinois asked their committee to prepare a law covering grade crossings. They prepared this amendment to the present Illinois law and asked me to advocate its passage.

MR. PARSONS: I am president of the Illinois Electric Railway Association and favor the passage of such a measure, but the resolution provides for a very drastic measure and I think we should secure more publicity before we attempt its passage.

MR. MOREY: I move that we refer the resolution to the Traffic Committee for study and recommendation, they to report to the Executive Committee before final action is taken on it. (The recommendation was concurred in.)

The Section then adjourned.

Round Table Discussion—"The Employes' Publication"

St. Louis, Mo.

Sept. 17, 1918

J. R. de la TORRE BUENO, Chairman

THE MEETING was called to order by Mr. J. R. de la Torre Bueno, Chairman, at 10:00 o'clock.

CHAIRMAN DE LA TORRE BUENO: We are here to consider company publications and to see what each of us can give to help the others. Collective experience is, perhaps, the best guide in doing our work. A man who does not profit by the experience of others is incapable of thought. The most important thing before our country today is the instilling of the American spirit into every citizen and every resident within its borders. We can see by newspaper reports how necessary it is and how cold the fire under the melting pot must have been, since so many seem not to have become really imbued with the spirit of sterling Americanism.

The power of the press is perhaps the greatest thing we have; the only way we can make men Americans is by showing our own Americanism. And in the employes' publication we have one of the best and most efficient means of imbuing men with this spirit. As a man thinketh, so he is. Our thoughts are subjective and frequently intuitive, but the vast bulk of our ideas are founded on the mass of the thoughts of others we are able to assimilate, which we absorb more often than not subconsciously, and equally subconsciously are they combined and recombined in our minds into a philosophy of life. Here is the field of the press. By a constant reiteration of ideas these become a part of the mental furniture of the individual, hence the value of the catch word in advertising and of advertising in itself. I have a theory that words in themselves have power entirely apart from their meaning. And the evidence of that is most strikingly brought out, perhaps, by our present slogan in this war, "To Make the World Safe for Democracy." If you take a few minutes off and think over the underlying facts, you will find, in the first place, there is not as much democracy in the world as a good many people would like us to think, because, after all, if we have abolished a landed aristocracy—an aristocracy of inheritance—we still have an aris-

tocracy of intellect and there always will be an aristocracy of intellect. Men are not on a par intellectually; they would like to be, but all the education in the world will not make a sage of an idiot, and a man with good brain power, even without education, will rise higher and go further than one without it.

GOVERNMENT SUPERVISION IN TIME OF WAR

So far as the governments engaging in the war are concerned we have had to throw democracy by the board and every one of them has become practically an autocracy dominated by the military idea. I am not saying that we will not come out of it nor am I saying anything political. I am simply facing facts. We are today, in this country, where we pride ourselves on being the freest and most democratic country in the world, supervised in practically every activity of life by the government. We are supervised just as autocratically as in the greatest of autocracies; the difference being, of course, that this supervision is exercised with our full knowledge and consent and is submitted to in an effort to gain the vastly greater end of living our own lives in our own way. As we make the government in this country, we, the citizens, so we can unmake it. We delegate our powers to this party and when the day comes we can take them back, but you can see that making the world safe for democracy entails a tremendous amount of autocracy. We like to think it does not, but it does.

I was born in South America and I know what a dictatorship is and you cannot distinguish between our present government activities and a good, fine-crusted old South American dictatorship where the President says what shall be ordained, the Legislature enacts it into law, and the courts interpret it according to the President's wish. That is the way with us, but this is not to be taken as a criticism of the government or of anything else—it is simply facing facts.

MOLDING OF PUBLIC OPINION

The function of the employes' publication, like the function of any other organ, is to mold public opinion by the power of the printed word. This function is essentially psychological and pre-eminently educational. When I first went into editorial work I had certain ideas and I put them into practice. I had been in it about six or eight months when I attended a meeting in New York of editors of company organs: subsequently we tried to form a little association and we had one or two other meetings, at one of which the editor of the *Telephone Review* made a brief address. I do not remember any part of the address except this and I leave the idea with you because it is the keynote of the company publication: He said that the company publication was journalism in the highest sense; that modern journalism, our newspapers and our magazines, was always more or less controlled by special interests, by the advertising pages and in many other ways were not independent; therefore people had lost the implicit reliance on publications that they once had, but that in the company organ, sanely conducted, the power of the press—real journalism—survived.

We have an educational function and it is up to us, in everything a company publication thinks and publishes, to mold the opinion of its readers. I will not take your time with an extended disquisition but I thought you gentlemen would like to know some of my opinions on the subject. *Safety*, the bulletin of the American Museum of Safety for November, 1917, had a little article by me on this subject.

WHAT SHOULD GO INTO THE HOUSE ORGAN

Our program deals with the importance of the employes' publication and its function, this I have already covered. The question of "The Material to Go in It" is very complex. The employes' publication is really a vehicle to convey to the mass of workers, from the president of the corporation down to the lowest water carrier and the pick and shovel man, the ideals and the spirit of the organization. To do that you must have a carrier or vehicle, as it were, and that vehicle is furnished by all the plant stories and all the short notes or the reports of doings of all kinds and essentially, wherever possible, these should be made to carry a message. Beyond that you have what might be termed "filler," and in that question of "filler" is one of the problems of the editor. If you have the office boy take a pair of scissors and a paste pot and cut out anything he likes, without reference to anything else except that the office boy likes it, you are going to get a very messy thing. This "filler" should always be of such nature as to carry also the messages of Americanism, loyalty, co-operation, industry, sobriety, truth and honesty. At least, I try to carry out this idea even in the very jokes. I never put in a joke that does not have some underlying lesson. The same is true of the little squibs that you use to fill pages where you have a little over space. Another problem is to get the material. Then we have the question of editing, make-up and distribution. I think that these four last problems had best be treated by first getting the opinion of everyone in the room and their practice and experience.

We are asked to discuss one thing and I don't think we have time to do it, but I would like to have you think about it. That is the topic of Sectional *Safe Practices* pamphlets and bulletins. The bulletin question in the Council is rather a vexed one; hence, there are so many of them and we seem to repeat the same idea over and over and not always in the best and strongest fashion.

Gentlemen, we should like to hear from all of you; each is invited to add his mite or to give his opinions on what he thinks makes the ideal company publications.

FORTY THOUSAND READERS AT HOG ISLAND

C. D. Dyer, Jr. (Superintendent of Service, American International Shipbuilding Corporation, Hog Island): We are serving 40,000 employes weekly and we print eight pages. I think we have to use the scissors on the publication itself—we have been using too much of the paper which the government needs in these days. We planned at one time to extend

our paper to sixteen pages, but we were afraid that we would weaken the purpose of the paper by so doing. At the present time we are considering two issues a week. We are getting about fifty pages of material for an eight-page paper and it gives us a chance to sort out the good stuff and use that only. We are using the paper to create an *esprit de corps* among the men—rather a big proposition. We have 40,000 employes and they were selected from the 200,000 we have hired in the last year so it is very essential that a family spirit be created among our men.

MAKE THE PUBLICATION DESIRABLE

I have never seen one of our papers thrown away. We have 57,000 names on our mailing list and the men, after they have read the papers, send them to their homes and families and we find it is quite a recruiting agency for labor. We ran an item some three weeks ago about the girls in our shop; in the course of a week we heard from 1,100 people in three days as the result of the editorial. *The Emergency Fleet News* has cut their sixteen-page publication down to twelve pages as a result of the government's paper regulation.

We do not publish news items unless our men do something constructive. We do not say that John Jones is the father of triplets or John Brown went on a tennis campaign. A man has to do something to further the shipping program: if he breaks a record his name is mentioned. Originally we had men in each department sending in material, but we had to cut that out—one man sent in eight pages. We have forty or fifty requests a day to take pictures of certain groups—material just flows in. We have quite a bit of illustrating and a lot of cartoon work is done by employes. We have some very fine artists. If we publish a picture of a group of, say, three or four hundred men, we have applications for three or four thousand. We pass the papers out at the gate as the men go out, so there is no time lost reading the papers on the job.

ROBERT ALTMAN (Marathon Paper Mills Company): I disagree with the speaker in the statement that if John Jones is the father of triplets that it should not be published or mentioned in the publication, although in his case that may be all right, because he has thirty to forty thousand employes. Where plants have five or six hundred employes that is a very interesting item and it makes the plant spirit all the more permanent by having friends come to John Jones with congratulations.

CHAIRMAN BUENO: The employes publication is essentially a matter of propaganda and Mr. Dyer properly characterized it as an instrument to bring about an *esprit de corps*. Mr. Dyer's proposition is entirely different from that of the rest of us. In the first place he is running a weekly newspaper and in the second place he has over 30,000 men from whom to draw news. There is many a city of 30,000 people—but 30,000 men, figuring the average family at five persons, means 150,000 people and that number can easily support two or three daily newspapers of eight or more pages. It is readily to be seen that the mass of material that flows in to Mr. Dyer is something enormous and he must exercise a careful selection.

METHODS OF EDITING A COMPANY MAGAZINE

He is doing government work and whatever he says editorially, gentlemen, is an official government utterance. When I want to put official government utterances in the *General Chemical Bulletin* I take it from the official government papers—from the weekly sent out by the Committee on Public Information, from the Department of Agriculture publications or from some of the many official government agencies.

There is another thing to be said: If your paper gets a sufficiency of material you really do not need scissors matter, except where, as I find, one is not a universal genius. There are one or two things in this world that some other man knows vastly better than we do and if such men say things that carry messages of patriotism or loyalty or any of the high characteristics that make men it is incumbent upon me to use them. In other words, if you have a large staff of men with aptitudes of all degrees and knowledge, who can write the things you feel you need, you need no quotations, but if you are only assisted, perhaps, by a stenographer or two you cannot do everything.

In the General Chemical Company we have this problem: We have twenty plants in the United States and Canada and some are extremely isolated. Our publication is practically the only source of reading matter they get—their only magazine—and for that reason, it seems to me, if you put anything in that will broaden the horizon of the men, whether it is your own or whether you get it from somebody else, you are doing that much good.

A MESSAGE OF PATRIOTISM

At the head of the editorial page we try to have a particularly good patriotic poem; it may be new, it may be old, but it is always there because patriotism is the message—first, last and all the time. Our publication is aimed to make better workmen, but you cannot make a better workman unless you make a better American. That is what we all have to think of all the time. If we were so fortunately situated as Mr. Dyer, where, when we speak, we speak with the force of the United States government behind us, we could do almost anything. As to these publications being recruiting organs for labor I think that point ought to be developed. Of course, the idea of a company publication in general is to restrict it to the employes of that company. As a matter of fact, our publication, while ostensibly restricted to the employes of the company, has a much wider circulation—it goes to our employes and they read it and pass it along to their friends. We are also sending it to all our men at the front, we have over 600 men in the army. It keeps them in touch with home and, incidentally, if we are sending this to the men who are serving the government in our armies, such homely touches as that John Jones is the father of triplets helps to keep them in touch with home conditions. In our Virginia mines two sets of triplets and three sets of twins were born last summer. That was quite remarkable and, of course, all fathers like to see their names in the paper. It makes no difference how trivial the cause, men like to see their names in the company publication; it pleases and tickles them. We feel it is very important that

these people should be happy and contented and to feel that they are recognized.

DEVELOPING THE PERSONAL RELATION

A. S. Ross (Milwaukee Coke and Gas Company): The idea of using the scissors is one thing that we guard against as much as possible. Those of you who have seen our publication, *The Conveyor*, have noticed that on the cover pages are poems or sayings of a patriotic nature—clippings. We do not feel that we can surpass some of the writers and authors in that line. The idea of getting in touch with our men by means of personal items is one thing that has been developed in the last two years. We tried the experiment, first, of getting little items about the men, covering the plant as far as possible. We have only about 800 men but after the second or third number, when the men received their copies, it was amusing to watch where they turned first. We found them going through the yard, turning page after page, until they reached the personal item section, "The Escaping Gas," as we call it. They read that first and glanced down to see if their names were there. If they found a joke on themselves we would soon hear some of the other men talking about it. If Bill Smith saw his name in *The Conveyor* he thought it was a good joke.

We conduct our magazine as a means of educating the men. It is not an advertising medium for the company, except secondarily. It was started with the idea of boosting safety and we work in that education along different lines, as well as matters of general interest and for the uplift of our employes. That course has been continued and we try to fill the publication with articles and items which will bring the truth very strongly before them. I think, in the smaller corporations, that the closer we can get into personal touch with our men through our publications the more interest they will take in the company and good will and loyalty will be encouraged.

Mr. Lefevre (The Texas Company): The official journal for our employes is called *The Texaco Star*. I try to keep the ideas rolling and I am often able to say a few words that will interest our men. There is a vast difference, as has been pointed out, between a new, high-pressure organization, suddenly gathered to enormous size like the shipbuilding yards at Hog Island, and the permanent organizations such as many of us represent.

The mere question of size, of course, modifies expediency. There are general principles, however, which apply in common, and a few ideas in relation thereto may be worth considering. The Texas Company has about 16,000 regular employes, scattered all over the world. *The Texaco Star* started in full-fledged and with every possible advantage and encouragement and was not limited as to size. It is in the last number of its fifth volume and is four years and eleven months old. About six years ago, before I was connected with the company the president, who was much interested in the subject, suggested the development of the *esprit de corps* and talked the matter over with me. I agreed that if it was well done nothing would be more efficacious than a company journal. The following year (I had no idea of attempting such work) I was asked

to become a member of the efficiency committee of the Texas Company and to take charge of the paper.

Only 5,000 copies were printed of the two first issues of the *Texaco Star*. It has improved considerably since that time and now is a handsomely printed twenty-four-page monthly, occasionally long articles and illustrations require thirty-two pages. We use process-colored covers—these are designed by artists in the advertising department in New York city. The first issues were distributed through the district offices, with an editorial explanation and a card—nothing in the way of red tape. A card was used for convenience, saying that the first two issues would be thus distributed, but thereafter the paper would go only to those who sent in their names, their position in the company and postoffice address. The home address was preferred, though not required, and this applied to everyone, from managers to bellboys. This was in December, 1913, and Mr. Lathman had that day been elected president of the company. He came to my office (I had not met him previously) and said something nice about the first two issues. I thanked him and asked: "Don't you want to receive it regularly?" He looked rather astonished, but answered: "I understand: I will send you my card." I received it the next day; it was filled out just as though he were a tankwagon driver asking for the paper.

Today we have 13,000 names on our mailing list and I think every permanent employe is getting it. We have shipbuilding plants in Bath, Maine, and I suppose a thousand men there have not asked for it. We have pipe line gangs and ditch diggers, here today and gone tomorrow, who do not receive it, but I think all employes who really feel themselves to be Texas Company men and who stay a month or more, no matter if they are paid by the week or by the month—everyone who is at all permanent—receives a copy.

GOOD ENGLISH AND CLEAN WRITING

Such a thing as throwing the publication away, of not prizing it, is practically unknown. I know that through various ways. Frequently some one will write that they find they have somehow misplaced volume three, number eight, and that they want the file intact; can the missing number possibly be procured? We try to accommodate such requests, because it encourages the men to realize the value of the publication. If you restrain the desire to just throw something out, everyone trying to reach everyone else on the instant, possibly we overreach ourselves, but if we sit steady in the boat and do our best to make the publication worth while it will be desired and asked for, and is our idea in its issuance and management.

In regard to the editorial management and the editing of the *Texaco Star*, I will say this: I think the idea of ginger, as it is called, is a mistake—writing to make men sit up and take notice I consider a mistake. As well I know that men, even roughnecks, do not like to be looked down upon; the roughest man appreciates the fact that he is being written to as well as the editor knows how to do so.

I do not write any differently in our paper than I would if I were writing for the *North American Review* and I think the simplest man appreciates that style of approach. If I want to discuss a question in mechanics I do not write down—I say it just as well as I know how.

In the matter of scissors, the principal point is to make your selections worth while. It is undoubtedly true that the experience and wisdom of the ages may be preserved by quotation. I run a live "wisdom column" every issue. The quotations should work in together and have reference, perhaps, to the leading article, the foreword, or to some idea featured in that issue; that is, the column for one issue would not do just as well in another.

It is necessary in a large organization to cut out trifling items. For instance. I have found it necessary to stop the mention of changes or promotions that are not significant but we have a departmental news section. generally the last eight or ten pages. Frequently we print several handsomely illustrated valued articles, so our men have variety. They read the whole paper; perhaps they read it backwards, but they read it all. Our outposts in this country and in others are dependent on it for news, and our men appreciate our publication to the fullest extent.

For the trade we run a journal called *Lubrication*. It is always well not to confuse the two publication ideas—it is not practical to edit an efficient journal for employes in the same manner as one intended for the trade. There has never been a word of advertising in the *Texaco Star* except what we call "Selling." This is advertising—there is much instruction about our product, what some one did and might do and could do. Our magazines are for employes and for the trade and this idea is strictly adhered to. We have more than a regiment represented on our service flag and we get more than 100 letters a week from the boys at the front. Our paper goes to each of them.

HOUSE ORGAN A PSYCHOLOGICAL MESSAGE

CHAIRMAN BUENO: It is a psychological principle that a thing to be valued should be made desirable. Whether you like it or not, whether you realize it or not, a company publication is a psychological document; you are dealing with ideas and with their influence on the minds and conduct of men. It is not what we say in the publication, it is the way we say it. You can get away with almost anything if you couch it in proper language. You can get a man to jump off a building if you put it to him the right way, whereas, if you take him to the top floor of a building and try to coerce him into jumping off he'll fight, he will not do it because you are in the wrong.

I have read a good many company publications and if I were an employe and received some of them, I would say: "I don't want it; it is too full of so-called 'ginger.'" You cannot eat ginger all the time, after a while you get a badly irritated stomach and you cannot eat anything. When you eat three square meals a day you stick to solid food. I think it was David Harum who said: "There is just as much human nature in some folks as there is in others, and sometimes more." There is just as much

human nature in the illiterate Austrian or Pole or Irishman as there is in our more or less intellectuals; more so, I think. It is a piece of subtle flattery, if you want to put it that way, to treat a man as though he had a brain. You may know in your heart of hearts he is a poor dumb ass, but act toward him as though he were a man of sense and he will respond. If you treat him like an ass you will get nothing out of him but kicks. I do not see any reason why our publications should be couched in slang. I think straight, plain English is the best; I believe in using the word that best fits, even if it is a polysyllable. If you do the man looks at it and says: "Gee, that fellow must think I know something or he would not be getting off this," and so you get by with it.

All we can do with any publication is to put into it the spirit that is in us. If we have higher ideals, if we have a human. American spirit, it will go into the publication in every word that is said, because we will put our thoughts into such form as to bring that out. Mr. Lefevre has a "live wisdom column." I do not because I think a column of wisdom is a pretty stiff dose, but I try to put wisdom through in another form. It is the experience of every one that makes up a paper that when you reach the bottom of a column you often find a stray line or two of space that you do not know just what to do with. Of course, you can tell the printer to lead it out and make it fill, but that is poor printing. I always put in a little squib, pertinent to the preceding matter. I am very particular about that. If I run a death notice and I have two or three lines of space left I do not follow it with a joke; I put something that would apply, "Well done, thou good and faithful servant," for instance—something that goes with the preceding text and harmonizes with it.

SHORT, PITHY ARTICLES ARE BEST

Speaking in a general way, the shorter your articles the better off you are. If you have a short article and you are trying to put something across, you can often compress the thought into twenty lines and your men will read it. A man can be interested in a particular thought and before he knows what is happening he has reached the end of that article; he has read it and has grasped your thought. If it disagrees with him he will think about it; if he agrees with it, he will think about it, too—at any rate he has read it and he is through before he realizes it and he has got the message before he realizes that anyone was giving him a message. That is one point I always look at very carefully.

There is another question which I think we ought to discuss. Many of our publications contain matter in a foreign language. I am an American citizen although I was born 4,000 miles from this country and English is not my native language—this may explain why, sometimes, I do not speak clearly, and I tell you that the only way to Americanize people that come to this country is by insisting upon their using and understanding our language.

Language is the vehicle through which we convey our thoughts; it is the vehicle by means of which we get into touch with other men. We must give our message all the time and we must do away with foreign languages in America. The foreign language press in this country ought

to be suppressed; whether it is Polish, Italian or anything else, cut it out. The ideals they interpret and the language in which they interpret the ideals are not American. I can read more than one foreign language and I have read more than one foreign language publication in this country; it makes no difference what they are saying they will always get a peculiar twist—they will give it their own peculiar psychology and the psychologies of that language.

I speak Spanish as fluently as I do English. When I speak Spanish I talk with my hands and frequently I do not say anything—I move my finger and that is a whole sentence. When I talk Spanish I think Spanish. I think one of the greatest objects of our publications is to extend the use of the English language.

Getting back to the distribution, to which this leads us; we have many plants and we have men who speak practically every European language. We could not have a column for each language—that would be impracticable. In one of our plants in New Jersey, where most of our men are Polish and Italians, we have something like 400 men and 350 of them go to the office and ask for our *Bulletin*—if a man in our company wants a *Bulletin* he has to go to the office and ask for it. Now, 350 of these men ask for it and many of them cannot read English; they take it home and have someone who understands English put it into their native language for them. You can readily see if there is anything really worth while, if they want it, they are going to want the English language. We are educating them all the time to new wants; into the desire to be Americans. That, after all, I think is the deepest function of these publications. We cannot call the office boy and give him a pair of scissors and let him run the publication. We have to give time and thought to the presentation, to the matter and to everything else.

SPECIAL ARTICLES SHOULD BE OF GENERAL INTEREST

Again, referring to the question of scissors, I have here the July number of the *General Chemical Bulletin*. It contained sixty-four pages and I went over it with the idea of economizing on paper. For two numbers everything that was not absolutely germane to the matter in hand has been cut out, with the result that I took all the life right out of it. In the July number, for example, we have an article on "Sales Policy and Salesmanship" by our manager of sales. That took three pages and while it is on salesmanship it is a plea, an absolute plea, for square dealing at all times. There is also the roll of honor of the men from our plants at the front—that filled three pages. We had a letter from a man in Canada who was in a hospital in England and we have Red Cross matter all the time. We had a special poem written for us on the Fourth of July by a well-known poet. We have a food department that carries more or less "ginger" stuff, but it also carries matter that goes outside of that. Our medical director writes many articles; for instance, every year 300,000 children under 5 years of age die in the United States. Now that, in a sense, is not germane to a company publication, but most married people have children; sometimes they have twins and triplets; it ought to interest them.

In June we had a Red Cross celebration. This carried several illustrations and we ran a number of accounts of different activities. We had eight or ten pages of accounts of Flag Day exercises—patriotic matter. Also, I personally conduct a page of reading matter and I try to make it as interesting and patriotic as possible—I try to point out things that people can read to their benefit. From the Committee on Public Information we took an article on "American Tanks." Very few people know anything about such things and it is pertinent information; it relates to the war and brings the war home to the people. That is our largest, or one of our largest problems, to-day—to bring home to every person in this country the fact that we are at war. We are sitting here, having a perfectly good time, perfectly happy, and very well fed. I think it is very, very necessary to bring home to people the fact that we are at war. Let them think war all the time.

Our editorial column has borne for about two years Stephen Decatur's maxim: "Our country; in her intercourse with foreign nations, may she always be right; but our country, right or wrong!" In this number is a little joke on one of the boys, but the rough-house proposition does not appeal to me. I am opposed to it. I think if a man talks to another face to face and Bill knows Tom he knows Tom does not mean what he says, but if Tom's joke gets into cold print everybody harasses Bill, and Bill gets sore. We have as many pictures as we possibly can. We have been running pictures of our men in service ever since our first men enlisted.

CONSERVATION A NATIONAL TOPIC

We have an accident prevention competition which we run straight along and we fill the remaining third of a page with something referring to accident prevention. Then the editor takes a page on "Conservation." In what I have set forth there is very little clipped matter, except squibs. If you can write pungent paragraphs you can make a lot of money writing them for a newspaper or a magazine, much more than you can editing a company publication.

ROBERT ALTMAN (Marathon Paper Mills Company): How many of us here are representatives of publications that cover plants of more than, say, a thousand to fifteen hundred men? I have listened closely and I think the majority of us are editing or publishing little pamphlets for plants employing anywhere from 500 to 1,500 men and while all the advice given is splendid we must remember that we have to write on conditions that are pertinent to our own plants and for that reason those things that are barred in the larger publications really find a place in our smaller ones. News items, births and arrivals and departures and so on of people in the plant or in the vicinity are absolutely necessary in our smaller publications. The Marathon Mills paper originally started as the *Conveyor*, a publication on safety, and gradually developed into a plant newspaper. We have to go to publications like Mr. Dyer's and Mr. Lefevre's in order to get our main articles, these we surround and fill in with things that pertain to our plant.

At the time of publication of the current number our county was making a drive for a war chest fund and all the employes of the manufac-

turing concerns in the county were invited to contribute. We have only sixteen to twenty pages and we had to cut our articles rather short and drive the points home with fewer words than are available in the larger publications. When you have 500 or 600 men and maybe only 35 per cent can read and understand English you must use simple language and make the publication attractive enough to be carried into the home. I agree with our Chairman that we ought to use English, good English, but we are not writing for the general public. We have to confine ourselves, say, to 100 Polish people, 300 Germans and 200 Russians, so we have to try to hit the nail on the head. We think that pointed remarks and pointed paragraphs are the things that really catch the eye.

On the first page of this issue we have the poem by S. C. Kaiser "When You Sit Down to Eat." This is about the boys at the front and what they are doing; it hits the head of the nail we are driving—our war chest campaign. We have one page on the war chest and what it is, then a column of village gossip and little things that are happening about the plant. Remember, we are a number of miles from any large community and we have to print the village gossip to induce our people to take an interest in the publication and carry it home.

THE PATRIOTISM OF AMERICAN WORKMEN

Then we devote a little space to the boys who go to the front, printing the names of seventy-five or eighty in each issue. Our next item is that of "arrivals"—six new arrivals occurred to employes of one plant in one week, one on each day—a very important item. Of course, we mention departures and so on. Then it just happened that we struck an article in a paper describing an American soldier in France reading in an American paper about the men at Glen Falls (the paper mills where he used to work) going on a strike—some of the war industries plants are offering so much more money than we can pay that we have to put something in our paper to show our men how necessary it is for them to stay at work in order to keep our industries going.

Then follows a little editorial, in this case it is nothing more than two verses of a poem. Practically half of the booklet is devoted to letters from the boys at the front and one of the points I have been very much in favor of is this: No matter how the boy writes, no matter whether it is grammatical or not, or if the spelling is correct or otherwise, the boys in the mill want to hear from him and for that reason we publish all of the letters that come from the boys at the front. With big companies this would be impossible but in our case the nine or ten letters we get during the month is a simple proposition and the boys write that they are enjoying the *Bulletin*, because they keep in touch with their friends. They write: "I knew John was going but I didn't know where he was until I read in the *Bulletin* that he was located a short distance from here. I will go over and see him the next time I have a chance," and so on.

CAPTAIN CHARLES C. BLACK (Frankford Arsenal, Bridesburg, Pa.): I came here not as a publisher but to get data with which to convince the management we need a publication. I want to ask the delegates to give

me a little education. We are practically in the center of the city, and I am at a loss whether to recommend the bulletin, magazine or newspaper form. Our people get all the newspapers and we cannot write articles of the village gossip type. We are only starting in and have little money to devote to the work.

GOOD PRINTING IS ALWAYS ECONOMICAL

CHAIRMAN BUENO: One of the first points to be considered is the outward appearance of the publication. Many a man will not see what is in it if it lacks good looks. If it looks good outside, it probably has something good inside. The difference in the price of good printing and poor printing is comparatively slight. Answering Captain Black's question regarding the kind of a publication suitable for his needs: We have that problem and when people from the city plant or the city office send us material we read it very carefully and censor very carefully indeed, but when people from an outlying place like Gossan—which is forty miles from Pulaski, Va.—send me local gossip, no two ways about it, in it goes; because, practically, our publication is the news organ for that particular plant, and that particular plant, or rather mine, happens to furnish important raw material. We want to keep these people happy and we want to make them feel that the company takes an interest in them. When it comes to the city people the problem is more difficult.

Someone mentioned cartoons and jokes. Well, I slip a joke in wherever it will do the most good, but when it comes to alleged comic cartoons, out they go where I am concerned. If any one wants comic cartoons let him pay 2 cents for an evening paper, but comic cartoons are generally rather pointless.

A publication such as Captain Black has in mind would largely be made up of plant items, together with whatever matter the management and commanding officer wants to convey in an unofficial manner to the employes. The editing is a very important aspect in these publications, the editor writes a squib or a word or so, and the thought is put across. Be sure you select a good man for editor, some one who knows his business and have the material carefully censored as to policy by some person in authority. That is very important, because you frequently get a bit of information from a plant or from a department and the editor, who cannot be a technical man, looks at it and does not see anything wrong, but the technical man spies something immediately that is not for general publication. You cannot put the company publications into a regular box where there is a set of rules that will govern in every case. We are discussing general principles only and my thought is that psychology is the foundation of the whole subject.

CAPTAIN BLACK: Is it customary to refer departmental matters to the head of a department before publication?

CHAIRMAN BUENO: Yes, if the editor is wise.

THE EDITOR SHOULD BE MAN OF ABILITY

MR. LEFEVRE: Do not burden your man with instructions about referring everything to the executive. Get someone for editor that has dis-

cretion enough to understand common business problems. The manager has piles of matter on his desk and he cannot stop to read everything. Do not attempt to make your editor a mere clerk.

Your editor must not make too many mistakes. In five years I never let but one thing get by and that was a very technical point which critical observer entirely overlooked. And I never had but one real criticism. To try to save $100 a month in the pay of your editor would be very wrong. You want to teach wisdom and good judgment and to do it well, but you cannot get judgment, say, out of an enthusiastic boy. Our chairman has well said that it is the executive's business to learn from the company journal a whole lot about business as well as life. If you want a teacher get one that you think is able to teach.

CHAIRMAN BUENO: If you have an editor give him full authority and make him independent of departments, because every department has a crank in it that will gum up the rolls if he gets a chance.

You cannot make your various works departments contribute as much to the paper, because each department has an axe to grind and if it is allowed to do so you will hurt the running of the grindstone. You do not want that, nor can you always find men that are sympathetic to your publication.

C. D. DYER, JR.: A successful editor is a keen student of human nature. I should like to bring up two principles that we follow very closely in our publication: The first is that we try to show the men that though their jobs may appear insignificant their cumulative efforts produce something and we show them what they produce. The second point is that we try to create style.

ESPRIT DE CORPS IN MANUFACTURING PLANTS

CHAIRMAN BUENO: The burden of our discussion here has been that the employes' publication, properly conducted, results in *esprit de corps*, co-operation, and a feeling of solidarity from the superintendent down. That it shows the men the importance of their individuality and of their individual effort and that is what we are driving at all the time. I have to take the noon train and I am going to ask Mr. Lefevre to take the chair. It has been an honor and a privilege to serve as your Chairman and I thank you for your courtesy and attention. (Mr. Lefevre took the chair.)

MR. POPE (International Shoe Company, St. Louis): I want to thank you for coming to our city of St. Louis and for your help in our work to advance Safety First in our city. Our problem is that we have twenty-one shoe factories within a radius of 200 miles, and 500 to 1,000 employes, shoemakers, in each factory. We have decided to get out a publication and we have received a good many pointers this morning. Our problem is this: Shall we have a separate publication in each factory or can we issue one publication for a group of factories and devote a portion of our space to neighborhood interests? Is it possible to have, say, five zones and devote several pages of the publication to each, or would it be better to have a separate paper for each zone or district?

CHAIRMAN LEFEVRE: The chair will say one paper, by all means, as

you are really one organization. It is highly important for all of your twenty-one factories to feel that each is a part of this higher unit. When the *Texaco Star* first started we had superintendents and managers—men receiving $5,000 salaries—who did not know the name of their departments on the organization sheet. They had used department when its correct name was division. Now every man knows where he belongs. By all means have one journal and make it good from cover to cover—no wooden stuff. Your material will vary but your editor ought to be resourceful enough to make the journal interesting and profitable to your whole organization.

DEPARTMENT ITEMS HOLD INTEREST OF MEN

A. S. Ross (Milwaukee Coke and Gas Company): You deal entirely with shoes, whereas our company has a variety of plants, covering iron ore blast furnaces, coke ovens, chemicals, farms, turpentine plants and even a flour mill. We do not devote our paper to any one organization. General information or general teaching is such that it can be applied to men in any other line of work; when we have personal items we divide them to cover the different plants. Each plant is regarded as a separate department, but the general teachings and principles of the paper are such that men at the gasworks or blast furnace read and learn something. I think one publication will cover your entire force.

Mr. Rolle (United States Smelting and Refining Company). We have eight plants in the United States and Mexico and we have the same problem as the gentleman in the shoe business. We have been running about two years and the greatest criticism we have is that the fellows in one plant are not interested in what goes on in the other. We have articles of general interest, but the interest we are getting from the men is so slight that we are on the point of having each plant run its own publication.

Chairman Lefevre: I do not know of any publication that is always able to make its pages clearly interesting to everyone. You can cover your departments until all are fully represented whenever there is news of interest. It is difficult to meet the needs of a department where the men change often and you have the problem of heavy labor turnover. Items of interest to the sales or purchasing department or the transportation department are difficult of analysis, yet if we give the matter sufficient attention there is an answer even to this problem.

EMPHASIS PLACED ON SAFETY PROPAGANDA

F. X. Wells (Packard Motor Car Company, Detroit, Mich.): I am a safety engineer not an editor, but I have space allotted me in the company's paper and I would like to hear an expression from the members present as to how much space should be devoted to safety work. In all the discussion this morning I have not heard the safety proposition brought out very strongly. Our paper started as a sixteen-page booklet, three columns, and the first year we gave the entire back page to safety work; we did not mention safety on any of the other pages. Lately, to conserve paper, the publication was cut down to twelve pages and space devoted

to safety from three to two columns. I felt rather hurt as I was expected to furnish the material for this page. I wrote a very strong letter, trying to impress the editor with the importance of bringing safety ideas to the men and asked to have the full page reinstated. He took the matter up with his superior and they decided that, owing to the amount of material, they could not give me more than two columns.

The question I would like answered is this: Should the safety propaganda be put into one condensed page or column or should it be distributed in little sayings and pictures throughout the entire paper. Don't you think that the men, reading one page after another and running across a little safety slogan here and there, would be more apt to catch it than. after reading the entire paper, to reach the last page and see a big caption, "Safety First!" Is he not apt to say, "That won't interest me" and lay the paper aside. We all know they look for personal items first and after a gleaning through the paper the rest of the way they merely lay it down and forget to pick it up again.

MR. JACKSON (Consolidated Water Power and Paper Company): I am not an editor, I merely print a plant paper—we do not call ourselves editors in our part of the county. I think that in getting out a plant paper you cannot ignore the safety idea; you cannot lay out two papers or any stipulated space—everything you print should carry the idea of protection to the men. You may think in some articles you are writing that you have other ideas than safety, but in some way it is going to help us preserve the lives of ourselves or of those we care for. Our first idea in printing a bulletin or a plant magazine is to protect the welfare. the interest and the well-being of the men we employ.

I am reminded of the story of the Catholic priest who was walking down the street when he met one of his parishioners. "Patrick, I am very sorry to hear that your mother-in-law is dead," he said, "I sympathize with you: what was the complaint?" Pat said: "Sure, father, there was no complaint: we are all perfectly satisfied."

FIRST DUTY IS TO SATISFY YOUR READERS

The success of a plant magazine depends upon whether or not every one is satisfied: if the men are satisfied, it shows we are putting it across in the right way and are doing things right. I do not mean that the men are entertained, I mean satisfied in the greater, broader sense that they are pleased and profit by reading it. We have such a variety of interests and lines of production represented here that it seems impossible to standardize our methods in the getting out of a paper. Some of our companies are employing 40,000 men and some are employing forty and the number of men is a great factor in determining just the kind of paper that is practicable. Much that has been said here appears logical to me, but I cannot agree with other statements. I believe in taking conditions as we find them and I believe in studying our men. I am in the paper business and I have found a peculiar vernacular in the industry. I think this is true in every industry and if we can express ourselves in the vernacular peculiar to our readers we will get results quicker than in any other way. You do not have to be vulgar, but you can use slang.

I believe in pep and I believe in comic cartoons, put them in when you can.

We print almost anything we like in our paper—almost any idea if it puts over exactly what we want to say in the right way. I do not think we would care to give a discourse on the classics, but perhaps we would do so if we got it into the right line and started in the right direction. Personally, I would not trust most editors with my paper; I do not think it would be a success. The editor should know the spirit of the men and just what they want.

I took a short course in public speaking at one time. The professor dwelt strongly on the thought that every speaker must use a principle —that he must suit his audience; find what they wanted and speak, perhaps, in their terminology; he must study the conditions of that community if he was to make a success of his talk. That explains why a man with a written speech often goes into a community and does not meet with success—he does not know the people to whom he is speaking. I do not believe in saying to the men "Be loyal." I say: "You are loyal." I do not believe in saying, "Be patriotic," I always say "You are patriotic." These are principles and exist everywhere.

SAFETY ENGINEER WRITES WHAT HE THINKS BEST

J. C. SMITH (Indiana Steel Company, Indiana Harbor): I am the editor of our bulletin as well as the safety engineer, so I can put in any safety matter I desire. In fact, I can make it all safety if I want to. When we started our bulletin about five years ago, it was all safety but we did not put it across in the right way. It did some good, but when we went around the plant and talked to the different fellows we found many of the pamphlets were dropped just outside the gate, so we decided that something was radically wrong and began an analysis of the situation. We found out the trouble—we were giving them safety in too big doses, so we cut it down and worked it in when it could be done to advantage. Our bulletin is 6x9 and usually twenty-four pages, something a man can easily slip into his pocket. We utilize every bit of space and put safety slogans at the top and bottom of every page —probably we have used 800 of these slogans. Right now we are featuring an analysis of the accidents that occurred last year and showing that 25 per cent were due to certain causes. In one bulletin we run a synopsis of the number of accidents, with illustrations; we give the date, a short description, and tell the men how to avoid a recurrence. In this way we are covering our accident experience for the year. This, in my opinion, is a practical use of the bulletin and a valuable way of teaching safety lessons.

The cover is printed in the national colors, red, white and blue, and this month the front page is dedicated to the Treasury Department of the United States. This is a new departure. Last month we featured the Shipping Board and the Emergency Fleet Corporation and the cover page carried a photo of Mr. Hurley. An article by the same gentleman was carried on the first page. We get them from our different plants

and publish them in departments of our bulletin. I agree with our chairman that one publication is much better than a lot of small ones. The plan of plant bulletins has been tried in the steel industry but I believe a publication covering one entire company is preferable.

PATRIOTISM CLOSELY AKIN TO EFFICIENCY

We put in Liberty Loan posters. In this issue we are featuring this strongly. We are also running articles by big men, like Mr. Schwab's "Succeed on What You Have." This occupied eight pages in our bulletin. I heard any number of our men say that they were especially glad we printed that article. This month we are printing one on Judge Gary.

In connection with my experience in planning for safety meetings I found that if we had a headliner to address the meeting we usually got a larger audience. It is the same in our bulletin; if we have a headliner and a really good article, an explanatory article which will develop manpower. it helps our publication. We have a home page and we run cartoons, we have a page on efficiency and different methods of doing work. We print all promotions and last month we had a page by the foremen of one of our departments, telling how he succeeded in getting through last year and the first half of this year without a single lost-time accident. That encourages the foremen and the men and accentuates their desire for success. We illustrated the story with a photo of the foreman and fifty or sixty of his men. Those fellows were especially interested in the bulletin because they saw their pictures and read their excellent record. Then we run two pages on conditions at the plant, wages, new machinery, automobiles—everything that goes with it.

"Our Boys at the Front" is always popular. In this issue we have three pages and twenty-four cuts devoted to this department. In all we will have forty cuts this month; we believe in pictures. Of course, it costs money; our last issue cost $400 for 8,000 copies, but we believe it is a good proposition and it actually does a lot of good. Our men like the paper. One man told the superintendent, "My wife wants it every month" and the wife of our general superintendent asked to be put on the mailing list. One man asks for two copies, one he takes home—that goes to his wife—and the other he sends to his brother. Copies are mailed to our men in war service; it keeps them in touch with us and and it will help to bring them back to the plant when the war is over.

SLANG AND SMUT NOT WANTED

MR. ROSEBUSCH: My plea for good English. I decry slangy "pep" writing —I think it is a mistake. I am not an editor, but I am trying to edit a paper, and if I cannot give our men good, clean stuff I would rather they had nothing. The first time you look at a dirty or comic picture it may appeal to you as being very funny, but the oftener you look at it the less it appeals to you and the same thing is true of slangy writing. Your men soon tire of it. Our former Chairman was right when he said to write in clean, simple, straight-forward English. It is our duty, we who

are trying to edit papers—to educate the masses and I would like to bring to your attention the status of the American church. It has been following, it has not been a leader, and we will occupy the same position unless those of us who carry these burdens become leaders. The best is not any too good for our men.

We are fighting to make the world safe for democracy but it is just as essential in principle to prove that democracy is the safest thing in the world after the war is over. America's opportunity is coming—the biggest opportunity she has ever had—and we shall be called upon to settle the greatest problems of all time. America must stand in the foreground and show to the nations of the world the principles of democracy. It devolves upon us as true Americans to put our best foot forward and to give our very best. It is our duty, in our publications, to use only the cleanest, highest type of English language of which we are capable.

CHAIRMAN LEFEVRE: I do not wish to give the idea that I do not believe in "pep", I do; but a great many publications that come to my desk are filled with slang expressions and I am frank to confess that I do not like to read that kind of a publication. I do not think they are uplifting.

A DEPARTMENT DEVOTED TO HOUSE ORGANS

FRANK E. GOODING (Department Editor of *Factory*): I agree that a general paper has to be put across. If the policy is insufficient and below the general grade, they will have to change the policy, that is all. I am editing a house organ—I am connected with magazines and with a very general magazine—because we go to over a hundred different industries. The editorial writer of *Hearst's Magazine*, in his article on "The American," said that the paper that would be read with the widest interest would be the one with every reader's name in it. In a general magazine that is impossible, but in smaller magazines I think several of you gentlemen have that view. In the general magazine, instead of having specific notes about different people, you have production details—what has been turned out; some thousand pieces, so many pieces per man this last month.

If your men are illiterate and cannot read text, they can read pictures and cartoons. No one page that gets as much attention as the cartoon or timely illustration. The *Goodrich Circle*, I believe, devotes one-fourth of their paper to illustrations and cartoons. If you get the *Circle*, study that feature and I think you will agree that it is very effective.

We started a department, our shop paper, and we exchange with seventy house organs. It is some job to go through them each month, but if I can be of any assistance to you at any time, remember that is our work—to correlate the best methods, to mold and analyze them. If I have a dollar and you have a dollar and we trade with each other we each have a dollar, but if I have an idea and you have one and we trade we each have two ideas. That is why men came here, to get two ideas where one grew before.

MR. REESE: We are contemplating starting an organ in our company:

we have none as yet and I came here to learn what I could. I have received a lot of good instruction and I enjoyed Mr. Rosebusch's talk very much; in fact, if I am not mistaken, you have several concerns that have considered their methods. Do you edit your paper just for the Fort Edwards plant or for your other plants?

MR. ROSEBUSCH: Just for the plants at Fort Edwards.

MR. REESE: In a small locality like that, do you edit it as you would a nice, clean organ to reach men of the world and not try to make it a kind of funny paper with sketches and things like that?

MONTHLY PUBLICATION IS BEST MEDIUM

MR. ROSEBUSCH: We try to give items of interest that concern people in the locality and always some article that is educational, uplifting or instructive. Safety reports and slogans and things of that kind are also used.

MR. REESE: Some of these papers are of sixty pages and all seem to be monthlies: which is best, to get out a paper once a month or make it very small and get it out once a week? What is the opinion of the chair and the gentlemen present?

CHAIRMAN LEFEVRE: Once a month, I would say, but never forget that circumstances alter cases. I can readily imagine a need where once a week would be the best thing. The general purpose of these house organs, as they are called, is best served by a monthly. It is very hard to get them out once a week as the editor does not have the time necessary.

For those who have the general purpose of consolidating, enlightening, instructing and holding men together, once a month is better than once a week.

MR. JUDD (American Smelting and Refining Company, Omaha): The discussion is very interesting. We had a little publication called the *Bell Drive*. It carried some plant items and I used the shears, taking things I thought were uplifting, safety as well as patriotic articles. Our company now has a publication called the *Safety Review*, edited in New York, as we have plants all over the United States and Mexico. Our monthly was devoted largely to local items and as we run up to 1,200 men the paper was popular. The cartoons were by one of our boys in the plant and we devoted a lot of space to accident prevention work. The men would come in and say: "Judd, give me one of them; I want to take it." Those that could not read—a majority of our people are foreigners—took it home and they would have their children read it to them. The larger publication is not so interesting to the men, they want to read of things nearer home. The men often tear out the pages on which the local news is printed and throw the magazine away.

CHAIRMAN LEFEVRE: Our friend has brought up a very important matter and I wanted to hear it answered.

GOOD ILLUSTRATIONS TEACH VALUABLE LESSONS

C. H. WILSON (Utah Copper Company, Bingham, Utah): We get out a periodical and are placed in much the same position as is Mr. Smith of

the Inland Steel Company. The safety engineer puts in what he wants and there is no censorship of his matter. Our periodical is 8x11, thirty-two pages, 6,000 copies. For the month of August it cost us $932. We have especially fine illustrations. We run a page of "Who's Who—and Why," with a picture of a particular department. A special writer covers this feature. There are a number of men of importance around the plant and we are gradually taking in all the various department heads—no danger of running out of material; we have enough for many years. Another page is devoted to "Chips and Filings" from the castings department and this illustration shows a man in the machine shop working on a casting, filing; another shows a man in the foundry, getting out a casting. The Safety First Association notes contain matters that seem of interest and occupy a page or more. During April we gave a big Red Cross benefit dance on the first anniversary of our country's entrance into the war. Our plants are only two or three miles apart and the company has a large number of automobiles and vehicles. On the night of the dance we gathered all our men together and had a splendid time. We had an exhibit of safety views and other matters and it was well received. Our receipts were about $2,500 and all of it went to the Red Cross fund.

In our publication we run a lot of things that are of interest to the community as a whole, something that will make a man take the magazine home. We will have an article on typhoid fever, an article on the teeth and another on sanitary conditions in our next issue. Recipes for cooking and matters of that sort are popular with the wives of our men. Again, we have the largest concentrating mill in the world and we refer to the notes for this department as "Tailings and Concentrates"—this, as in other departments, is handsomely illustrated. The name of our periodical is *The Porphyry*.

DO NOT ADOPT CUT-AND-DRIED METHODS

CHAIRMAN LEFEVRE: I think an editor makes a mistakes when he cuts safety work down to a few columns. A man ought not to write just so many inches, sometimes an idea requires two pages and the story should not be confined to cut and dried limits.

I open my page with the heading "Safety and Sanitation." I think that is better than "Safety First" on that particular page. This department is run by Mr. V. R. Currie, one of the Directors of the National Safety Council. He is chairman of our central committee on safety. In this issue he has a column and two-thirds and the page is filled with appropriate matter. Last month one of our men wrote a very good article on "Accounting," but he started off with a lot of complaints that most people did not think the accounting department of real importance. The rest of the article was very good and helpful to our station agents, so I did not hesitate to cut the article to a page and a half, striking out the parts I thought could be best omitted.

I would not attempt to standardize our house organs just now, gentle-

men. There are places for standardizing, as when you are building ships. You can apply bridge building methods to ships, that is standardizing, but to advocate that all house organs should have the same table of contents or to fix and define how many columns you are to have every month on a specified topic would be a mistake and nothing would be gained by it. It is not desirable and it would not be right. You can have copies of the *Texaco Star* and we will be glad to exchange with you if you will write to us at Houston, Texas.

As there is no further debate the Section will now adjourn.

Women's Session

St. Louis, Mo.

Sept. 18, 1918

MRS. NEILL A. McMILLIAN, Chairman
Chairman of Women's Committee, Council of National Defense, St. Louis.

WEDNESDAY MORNING SESSION

THE meeting was called to order by Mr. David Van Schaack, President of the National Safety Council.

INTRODUCTION OF CHAIRMAN OF WOMEN'S MEETING

Ladies and Gentlemen: It is a privilege of which I am deeply sensible to have this opportunity of extending to you, on behalf of the National Safety Council, a most cordial welcome to our Congress. Someone has said, and very truly, that no man accomplishes much of anything except under the influence of a good woman. He might well have gone further and told the whole truth, attributing the real achievements of a man to women, for however much of a start in the right direction a man may get in his early childhood, he needs the stimulus of that more subtle—usually intangible and often imperceptible—influence which later manifests itself in his life. What is true of a man will, I am sure, be equally true of the National Safety Council, and perhaps in a more closely concentrated manner. As the Council is now at the tender age of six, you women can certainly mother it, and I hope you will like the Council so well that you will decide, as woman always does decide such a matter, to marry it, too.

It is peculiarly fitting that women should take a lively interest in the National Safety Council's purposes and activities. Woman had the original priority order as regards safety. After she made that one mistake of eating the apple she constituted herself the first safety committee, and she has never yet gone on strike. Woman naturally has the strongest apprehension of accident and the keenest appreciation of what an accident means, not only because of her instinctive caution and tender

sympathy, but also for the reason that she has a clearer vision, and often more intimate knowledge of an accident's consequences. It is the woman who is always looking after the others of the family, who warns her husband, and says "Be careful!" to her children. It is the woman who, when an accident happens to one of the family, experiences the shock the most and best knows the economic effect upon the household.

IMPROVEMENT IN SAFETY RECORDS

The instinctive caution of woman has been forcefully indicated to me lately by some accident frequency figures developing from the experience in workmen's compensation of the insurance company with which I have the honor to be connected. These figures compare the first six months of 1918 with the first six months of 1917, and they show that despite nearly 50 per cent increase in premiums, of which I think two-fifths can fairly be attributed to increase in number of employes, the number of accidents occurring this year was 20 per cent less than last year; this, too, in the face of more crowded working places, more overtime work and greater speeding up, all of which ordinarily help to raise the accident ratio. Making all due allowances for the company's exceptional care, on account of the conditions just named, in the selection of risks, for the larger measure of accident prevention effort due to the imperative need of conserving manpower and for the natural influence of high wage rates in making men work more safely than usual, so as to keep on the job, I am inclined to believe that a considerable part of this accident reduction is attributable to women, who are now so extensively employed in industry, being safer workers than men.

I am especially glad to note woman's fast-growing interest in the national movement in accident prevention and kindred fields, because now even more than ever there is a general appreciation of what she can accomplish in any work to which she sets her hand. The manner in which she is doing her part in the winning of the war is conclusive testimony to her effectiveness.

Woman's sphere of active influence in safety work covers the whole field, but certain parts of that field are in a sense her peculiar province. These are safety in the home and safety instruction in the school. In these branches of safety work she can accomplish far more than would be possible through any other agency—in fact, all other agencies combined would be relatively ineffective without her aid. With that aid, with safety taught in every home and every home equipped for safety, with every one of the thousands of women school teachers making the teaching of safety a part of her daily work, and, as the result of all this, with the future workman and the future citizen fully imbued with the spirit and thoroughly trained in the principles and practice of safety, the problem of accident prevention in this country will largely be solved.

It is, therefore, with the utmost pleasure I present—she needs no introduction—Mrs. Neill A. McMillian, Chairman of the Women's Committee of the National Council of Defense, who will act as the Chairman of your meeting.

ADDRESS OF CHAIRMAN

Ladies and Gentlemen: When asked by the Women's Committee of the Council of National Defense of Missouri to take charge of a women's meeting I did not dream that it was to be an all-day session. I have never before attended a Congress of the National Safety Council, so I did not realize just what the responsibilities were. The Council of Defense was created by an act of our government to do war work and because so many of our women have been called upon to man the trenches at home, left vacant by the men, we have felt it extremely necessary that every woman who is interested in the war, and in the results of the war, and in the welfare of her own sex should be glad to know everything that the National Safety Council had to teach us.

I do not believe the good Lord made a mistake when he created both men and women—neither one of us could get along without the other. The trouble has been that in our home life the woman, principally, has been doing the work. Now, when we have had to go out into the world and work with the men, many of the men have realized their absolute dependence on the home life as we have conducted it, and this Safety Congress, it seems to me, marks an epoch in the history of the country. I am not going to make a speech. I am merely the Chairman of the day, therefore, I will call upon Mrs. B. F. Bush, who will, in turn, introduce Miss Copp, who will read a paper which I am sure will be of interest.

WOMEN IN WAR INDUSTRIES

WOMEN IN AMMUNITION FACTORIES

Mrs. B. F. Bush (Chairman Women's State Committee, Council of National Defense): We have been thrilled this past week by reading and hearing the discussions of the Safety Congress. There is no question more vital than that of "Woman in Industry"—our splendid women and the wonderful industrial army that has taken its part in the world's war and added to it a new dignity. Since the big guns fired into Paris, March 21, our women have been helping to fire big guns into Berlin through the part they play in making ammunition here in America. And in the making of those guns, you know how a large part of it has been in the hands of women. Women are standing shoulder to shoulder, hand to hand, with our splendid men over there. This big part of the army, the women in industry, is doing its part in America in a manner never felt before. We know how the women are playing their part in England and in France. The men acknowledge, and are proud to say, that they could not win the war without their women. We know that and we know that all American people must stand together and that a great part in the winning of the war must be done by the women in industry. It is our great joy and our great privilege to help this great industrial army of ours in every way we can.

We are here to talk on questions of safety. We know how important it is. We are trying in every way to make conditions safe for our army

over there and it is the women in industry here who are doing a large part of that work. They will be called on to do more and more to make our army safe and strong and well and to win the struggle. It is our duty to see that all of the things that make a woman in industry safe are put into effect. I cannot tell you how it is to be done, you have splendid speakers who will tell us how to safeguard and protect and keep our women well and strong and safe in their splendid work.

The Director of the Woman's Department of the Industrial Commission of Wisconsin is going to tell you about the "Physical Conditions of Workshops Where Women Are Employed." It is a pleasure to introduce Miss Copp to the Congress.

THE PHYSICAL CONDITION OF WORKSHOPS WHERE WOMEN ARE EMPLOYED

MISS TRACY COPP, DIRECTOR, WOMAN'S DEPARTMENT, INDUSTRIAL COMMISSION OF WISCONSIN, MILWAUKEE, WIS.

Madam Chairman and Members of the National Safety Council: Public interest in this country is centered on the army in France. America has two armies—one, the soldiers on the European battlefields; the other, the men and women in American industry. In order that our army of uniformed men in France be equipped properly to carry on we are investing our money and are drafting the most capable men in this country as consultants and advisers. The program for making a fit army for the defense of liberty begins with the physical examination of registrants, through which men are placed at jobs for which they are physically fit, and by which men who are physically unfit may take steps to become physically fit, thus making them eligible for service. Then follows the placement, and the medical aid and counsel follows them all through the period of service.

Our soldiers are trained by experts and sent on their mission to France, ready to do their work because they know what it is and how to do it. All of this makes possible a reasonable system of promoting. Proper housing and food are included in our scientific program. We provide recreation in the camps and near the battle front, because we believe that this is a part of humane activity and essentially a part of soldier life. It is our intention and purpose to provide these boys with tools and equipment of such quality that the thing to be accomplished will not be hindered one moment. It is also our intention to have the soldier's entire field equipment manufactured in quantity, built perfectly, transported to him hastily, without the suspicion of awkwardness. Death on the battlefield, due to lack of munitions or imperfectly made equipment, is avoidable and a crime. and it is with this army of munition-equipment makers that we are employed.

Questions involving the problems of munition-equipment production are increasingly women's problems. More and more will these problems involve the welfare of women and the citizenship of the future, as will the

solving of them call for the best experience of well-informed women who have studied industrial problems from this angle. What our government has done to prepare the American army for the highest grade of service at the front, the manufacturing interests in this country can well imitate for the army of war-equipment workers at home. Where quantity production and high human efficiency are requirements we will find a program similar to our national army program. The factory program will include physical examination of workers for special placement, training and promotion, with medical supervision, good housing, good food, and recreation.

DECENT HOURS AND FAIR WAGES ESSENTIAL

There is a conspicuous similarity in the things that make work desirable for women and the things that make work desirable for men. It is no longer a matter of doubt that the length of the work day and the earning possibility of it are as vital to women as to men. We are not engaged here in a discussion of the extent of opportunities for women in industry, or what eventually shall be determined as a decent workday and a fair wage. Let it be said, however, that no special factory equipment or supervision can ever be given in lieu of decent hours and fair wages, but should always be looked upon as an obligation in addition to them.

It is admitted that the beginning of preparation of a good place for women workers is the building construction. Here it is that we plan for suitable daylight illumination, for ventilation and for heating. Even the floor plans include the elimination of the very hazardous condition brought about by vibration. The best daylight illumination is provided for the departments where fine, close work is to be done. The ventilating system is installed early and provides for constantly humidifying and changing air, and, where necessary, provision is also made whereby all windows in a room may be opened slightly. Proper ventilation is provided for rooms needing fume and dust exhausts.

Installing machinery in the workrooms is no longer a matter of economy of space and the thrifty use of motors. Formerly long rows of machines operated by one motor were placed along the windows for light and economy of space. Unfortunately, the operatives were required to work facing the light, which is now considered no small hazard. It is considered much better business to arrange machines in short rows at right angles to the windows, in order that the light may strike the working plane over the shoulders of the workers in such a way that the operatives make no shadows on their work. The machine arrangement should also be planned to reduce carrying of heavy material to a minimum, and to avoid unnecessary accident hazards.

The necessity for guarding dangerous machines is no greater in shops employing women than in shops employing men. However, we should all be unusually vigilant in our safety plans, because serious injury and accident to women will create a most unfavorable public attitude toward the entrance of women into new industries. Crowded shops, dark and untidy shops, increase the accident hazard and affect materially the desirability of work for women; therefore, the employer who encourages the en-

trance of women into new work in unwholesome surroundings is likely to increase the accident hazard, and eventually contribute to the adverse public opinion which is inevitable.

ELIMINATION OF EXCESSIVE FATIGUE

For years women have been required to stand for long hours at their work. If standing causes fatigue to the extent of hindering production it is bad business. If standing all day at work is a specific health hazard or reduces one's years of productive service then it should be entirely eliminated or a limit of hours set for it. I think we are all agreed that sitting all day at work is also hazardous and that the possibility of arranging a job so that part of the time may be spent sitting and part standing would eliminate monotony and inject variety into it to the point of actually affecting production.

The day of the ordinary wooden chair as a part of modern factory equipment is past. Factory managers and the manufacturers of factory chairs know that a chair, to have much utility, must be adjustable, so that it can be more physiologically correct. Chairs should support the part of the body receiving the greatest strain from the work. For certain operations the factory chair must be high. Under such conditions a suitable footrest should be provided. In most cases the footrest should preferably be attached to the work table, rather than to the chair. It should be large enough and placed in such a way that the operative may be seated in a normal position. When the work requires constant standing, chairs should be available for use during lulls in the day's work and the employes should be encouraged to use them.

Sanitary conveniences should be installed with the idea of having them both sanitary and convenient. They should be located conveniently for the workers and built for cleanliness and good housekeeping. Constant care and overseeing is necessary to keep toilets properly cleaned and in fit condition for use. Lavatories should be located in the same enclosure with the toilets or near them. The best type of washbowl is the long sink in which workers may wash in running water. Liquid soap, in containers, is found to be more economical than individual bars of soap. Paper towels in metal containers and a covered can for waste complete the necessary equipment in a modern washroom.

Rooms should be provided in which women may change their clothes for work and in which their street clothes may be kept properly during working hours. These rooms should not be used for any other purpose and it is not desirable to have them connected with other departments. The dressing-rooms should be located near the employes' entrance, the time clocks, or the women's department in the shop. If many women are employed it becomes desirable to have small dressing-rooms conveniently located to save time for both the employer and the employe at the beginning and the end of the day. Such rooms do not need metal lockers. A very convenient and useful equipment consists of a metal pipe on which coat hangers have been fixed, fastened near the wall, and at a convenient height for the workers. Over this metal pipe may be placed

a rack for hats. The addition of a bench or two completes the necessary furniture for such a room.

FIRST AID AND REST ROOMS

Every shop employing women should have a first aid room, properly equipped, with a competent person in charge who is capable of giving advice and counsel in matters of personal hygiene and health. It is absolutely essential that adjoining the first aid room be a quiet room with comfortable hospital beds where women may be given proper care and can rest when temporarily unable to work. They may go back to work if it is consistent with their bodily welfare and provision should be made for this in fairness to workers and employers. Hospital restrooms should be supervised by a trained person who is on duty especially during the rest period and the lunch hour of factory employes. If women are ill they need care and counsel and should rest in a supervised restroom. If they are not ill they should have recreation during their rest period.

Women should not work so long or so hard that they cannot recover normally each day. There are few lulls in the day, other than short rest periods and the noon lunch hour. Short rest periods for the purpose of changing position and ventilating the workrooms are found to be extremely beneficial.

The noon lunch period is usually sixty minutes and under most industrial conditions it should not be less. Sixty minutes is not much more than is needed for eating one's meal in a manner consistent with good health and for having some beneficial recreation or change of surroundings. Lunchrooms should be especially designed with a view to having cheery surroundings and good food. Factory employes should have the benefit of good food, properly prepared. They should be able to eat it in comfort and not hurriedly. Recreational activities can be taken care of in the lunchroom and there seems to be little reason why men and women should not use these rooms in common. The cafeteria type, as well as the regular lunchroom, is coming to be recognized as suitable for factory use.

SAFE CLOTHING AND SAFE PRACTICES

The use of uniform clothing for people doing similar work has always been looked upon with favor. It is necessary for women working near machinery to have proper clothing. Loose clothing, frills or trimmings are accident hazards. Short skirts, close fitting skirts, or bloomers are in most cases necessary. The confining of loose hair has become seriously necessary. This involves a prejudice on the part of women against heavy or tight head covering. In work at drills, women should have the loose hair confined because of the serious danger from revolving spindles. Since hair nets are expensive and fragile it becomes necessary to provide a cap. The cap, however, should be made of thin material, should not have a rubber band in it, and should be without frills. Uniforms must be of material heavy enough to stand the strain of work and laundry. They should be well made, with all of the protective features, and at the same time look well. The use of factory uniforms will not become gen-

erally popular until they have lines similar to women's clothes and until the women have a chance to assist in choosing them. It has been my observation that the manufacturers of overalls are already making better looking clothes for women.

There is an increasing need of women supervisors in factory establishments employing women. The executive who has charge of employment, training and safety should also see to the factory housekeeping. Since there is an unfailing connection between equipment and output, and since equipment depreciates quickly without care, it is entirely essential that the physical surroundings of women in shops be an engineering accomplishment and an industrial relations responsibility. Industry is presenting constantly increasing problems in relation to women. All of them are big and many very new. No matter what is eventually done about it we know this, that it takes decent surroundings to get and keep capable workers.

CHAIRMAN MCMILLIAN: I wish to introduce a fellow member of the National Council of Defense, one who has borne much of the burden and responsibility of the organization. Mrs. Fouke, will you please come forward?

ADDRESS BY MRS. FOUKE

MRS. PHILIP N. FOUKE (National Chairman, St. Louis Women's Committee, Council of National Defense): We women who have stayed behind the lines, we of the Council of Defense, the volunteer women, have felt that a great work has fallen on the women of America and it is you women, who represent the women in industry, that are doing it. You are the second line—we are only the third line. I want to bear the message to the women of the second line from the women of the third line that we stand behind you. We will do what we can and do our utmost to help our friends while they do the real work.

I do not believe there are many of us who would not be only too glad to do the real work that you are doing. In doing this work you stand behind our men with their equipment and you must bear in mind the greatness of the responsibility that is upon your shoulders. You are dealing with women, you cannot get away from the fact, and the material you are using has a great function that has to be protected—these women are the future mothers of our country. You have to bear the responsibility of seeing that, as our women sweep into the tremendous industrial army, they are adequately safeguarded. The responsibility of bringing future Americans into the world, who in turn will give us power as a Nation—that function lies in the future of the women with whom you are dealing. You must preserve and carefully safeguard that power—the basis of which, as you have expressed it, is the physical adaptability of our women to do their work. They must not be used as mere machines—you are not so using them—they must have the machinery adjusted to their physical capabilities, and the great fundamental thing you are striking at is their physical examination. Women of the non-wage-earning class have not reached that point yet, but women in industry have. It

will not be very long before we shall all have physical examinations, then we shall know when insidious diseases start. You are meeting that point and you will soon be able to explain that by having a sufficient corps of doctors you will be able to develop a type of woman that America has never had before. That is what you have to deal with in handling this tremendous army of women—you who are going to build up strong women for America, so America can take her place as the leader among nations when the time shall come.

CHAIRMAN MCMILLIAN: I would like to ask Mrs. Burdick to tell us about "The Effect of War Upon Women in Industry."

THE EFFECT OF WAR UPON WOMEN IN INDUSTRY

MRS. ANNA BURDICK, SPECIAL AGENT, INDUSTRIAL EDUCATION OF GIRLS AND WOMEN, FEDERAL BOARD OF VOCATIONAL EDUCATION, WASHINGTON, D. C.

Madam Chairman and Members of the National Safety Council: You have often heard the expression, trite and true, that "There is nothing new under the sun," and straightway we seek for the origin of the bewildering array of inventions and improvements which concern the world today. Nor do we search in vain, for, from the Scriptures, we find that Elijah was the first to go up in a chariot of fire and Jonah was the first to go down in a submarine. From that common ancestor and indisputable historian of nursery days, "Mother Goose," we learn that "Mother Hubbard," she of the bare cupboard, was the first to prevent the hoarding of victuals before the United States Food Administrator was on the job. We also learn that the "Old-Woman-Who-Lived-in-a-Shoe" Hooverized her many children by giving them broth without any bread.

The Safety First movement was launched immediately following the ignominious fall of "Humpty-Dumpty," who, before the days of protective railings and guards, did not "watch his step." The first aid department received its first patient when "Jack fell down and broke his crown" and went to bed while they wrapped his head in vinegar and brown paper—that was the origin of standardized first aid. Even "Simple Simon's" fishing expeditions were restricted to a zone of safety, if you remember, "for all the water he could find was in his mother's pail." The old woman who rode a cock-horse to Banbury Cross uplifted the white symbol of safety for traffic on the high road.

I have teased your memories of "Mother Goose's" times—a day from which you are fast receding and toward which I may be rapidly approaching in your estimation—just to recall that these embryonic safety devices have sprung out of the ingenuity of women to protect the unconscious and unguarded masculine from danger.

A TRIBUTE TO WOMEN ACROSS THE SEAS

But to my tale of women in industry, which I could not begin without some tribute to those women across the seas whose work has inspired both our failures and our successes. It is a wonderful tale, this story of

what British womanhood has done and is doing to preserve not only its own, but to contribute its help in protecting the world from a militaristic doom. The story enables us to see more clearly our way, profiting by their successes and failures, and to forecast what our women will do in the new occupations which they must fill, at least temporarily. New occupations have become more or less permanent for those women, since the war losses have been great. Their chief personal interest and their additional strength lie in their large desire to play the most helpful part possible regardless of past customs, conventions and tradition, with a fine disregard for their supposed limitations.

Eighty per cent of the work done in England at the present time is done by women. In our own country the war has caused us to revaluate education—some of the things we have been doing through tradition in the schools for the past generation—and to test it in the light of the present emergency.

There is no greater commentary on the needs for vocational education, for both men and women, than the problems which the United States faced in raising an army and in the consequent replacement of men and the expansion of women's work in industry. We might say that society has been emulsified. Through the agitation of the social strata that has resulted from this war, the lesser skilled women who are going into any and all kinds of heavy service and the college women of the country alike have found that they were not equipped for the duties which they confronted. All over our country short, intensive courses have sprung up to enable those women with the larger background of general intelligence to fit themselves for service and leadership among other women.

WHAT THE COLLEGES ARE CONTRIBUTING

A few examples will illustrate how the women's colleges have risen to the occasion. An intensive course of training for nurses was established at Vassar College to meet the shortage in our own country, in order that nurses who are equipped and experienced may go abroad. The school for library workers—at Simmons—because of the need for workers at cantonments and mobilization camps. The school for agricultural supervisors —at Wellesley—for training supervisors in the army land work. The school for training reconstruction aids at Reed College, in Portland, Ore., where a course in remedial and corrective gymnastics was worked out for the purpose of preparing aides to serve in the rehabilitation of the wounded soldiers who will return to us and who are returning to us daily. The health officers' training camp at Mount Holyoke is intended to supplement the work of the factory nurse with health workers who practice according to the methods of the Chinese physician—who is paid for keeping his patient well rather than for curing him after he is ill. It is of paramount importance that the health of women workers be kept up to standard. These emergency courses show how social and educational institutions are weighing and testing their activities and their formal training in terms of the present emergency needs to see if these prove good. If not then they must be supplemented by further education of a distinctly vocational type.

About the middle of January a survey was made of the number of women in industries which are directly or indirectly connected with the winning of the war. On Jan. 20, in the United States, 1,250,000 women were engaged in industries essential to the war. In England, in March, 1917, 1,250,000 women had directly replaced men in industry. There is a difference between expansion of women's work and direct replacement. Last week, in the Labor Commissioner's office in the City of New York, I saw a record of inspection of 171 plants. The number of women employes was about 3,000, but that 3,000 gave no adequate information as to the number of women employed in those plants due to the expansion of plant with the necessity for increased production or the number who had taken men's places—this expansion was well on its way prior to our entrance into the war. The Pennsylvania Railroad had taken on something like 3,000 women. The expansion prior to our entrance into the war was largely an expansion in commercial lines or what the census reports call "distributive agencies"—"trade and transportation"—rather than actual production. So that we see today a whole army of women are hanging up their kitchen aprons and donning another uniform for a day's work in which there is a pocket for a pay envelope.

Immediately upon our entrance into the war there was a rapid decline in luxury trades, specifically dressmaking and millinery. I have heard it said, within the last two or three years, that the automobile had knocked the millinery business literally into "a cocked hat," but I think it was almost finished, you might say, from the standpoint of the specially creative artistic construction, by the war. It may be declared a non-essential industry if the war keeps on long enough.

WOMEN ADOPT NEW OCCUPATIONS

Another of the traditional trades of women which is subject to the active whims of fashion, with its many ups and downs, has felt the effects of the war. This is the dressmaking trade.

On the twenty-fifth day of December, in the city of Boston, there were 1,500 high-class dressmakers, custom dressmakers, out of work. Boston is a hand-made city. The matter of readjusting these women workers was a labor problem. Their ultimate adjustment came about in rather an interesting way through transfer to an allied occupation. Owing to the war, embroidered insignia for uniforms are necessary. The high skill of the women workers in those trades transferred them automatically from their custom dressmaking into the embroidering of insignia. Many were tried on cartridge belts, heavy tentings and such work—you might just as well have put a watchmaker at brickmaking as to have transferred those women with their high degree of skill in the ends of their fingers to that kind of operation. One of the first things, the immediate need, that woman in industry faced in the war was the readjustment and realignment of her work from occupations in which she had been engaged into a new occupation. The next thing was the reduction of the number of women engaged in personal service occupations. I presume every housekeeper here has felt the effect of the transfer of those women

into other lines of occupations, which were more to their liking than the domestic service in the home.

Then there was a transfer of women into wholly new occupations. For instance, in the vicinity of Springfield, Mass., all the women workers in the munitions and metal industries came from the textile industries, so that they were not new workers, but were transferred from one group of workers to another group of workers in occupations more to their liking. Doubtless the high wages offered additional inducements. That our government has felt the necessity of being on its job is shown by the number of national agencies that are dealing with these problems of women in industry. The list would include about a dozen Federal departments and organizations, a few of which may be mentioned. In the Department of Labor a Division of Training and Dilution has been recently inaugurated. The Women's Division has been investigating the chemical industries in Western New York, to determine upon the advisability of employment of women in those industries and the rendering of the conditions of employment suitable for women workers. We have also the Federal, State and municipal employment service organized throughout the entire country, with its women's division and women representatives on the community labor boards. We have the Council of Defense, with its division of Women in Industry, national, state and local, making studies, reports and recommendations. From the nearest to the most remote section of the country a ready-made organization can deal with any problems which concern the safeguarding of the health of women workers, their training for an occupation or placement at work.

STIMULATION OF VOCATIONAL EDUCATION

The board with which I am connected is the Federal Board for Vocational Education, which has for its purpose the apportionment of funds set aside by the United States Government to stimulate and promote vocational education under public supervision and control for both men and women. This vocational education deals with agricultural training, training for homemaking and training for industry. One-third of the fund which is apportioned to industry must be spent for the training of boys and girls over 14 years of age who have entered employment, in order to make education a habit, to safeguard the youth in entrance to employment. so that they may not become industrial vagrants. It insures an opportunity for training to all youth along the line of their chosen occupations in trade preparation and trade extension work or in general continuation classes. The Federal Vocational Act makes absolutely no distinction between men and women and I believe firmly that any organization which is employing women will succeed best when it proceeds absolutely upon this basis. It will undoubtedly raise the standard of conditions under which men work and, I believe, it is the only safe and sane way of facing the problem of expansion of women's labor.

The problem which industry faces is increase in output. This increased output must be accomplished by inexperienced workers. I was in a plant

in Rochester the other day; prior to the war it had been manufacturing 4,000 binoculars per annum—the United States Government called for 8,000 per month. That is what increased output means today. How can the results be obtained with large numbers of green workers? It necessarily means either training prior to entrance to employment or training continued during the period of employment; it means restudying the occupation and making many jobs fool-proof, error-proof and hazard-proof.

In the making of the prisms which are used in these instruments four men had been able to inspect 800 in a given unit of time in which now one girl inspects 900. It would be absurd to attribute increased production to the superior intelligence of that one girl—it is due to the machine or device which is error-proof. The ray of light penetrates that lens, and projects on the screen every possible flaw, every irregularity, magnified many times, and she cannot but see it. I say the increased production has resulted then from the new devices which make the job error-proof, if possible. It has also resulted in changes in the process itself and it has resulted in closer adaptation of the worker to the job.

EMPLOYMENT MANAGERS IN WAR INDUSTRIES

There has been one course particularly for the workers which I omitted in the early group, and that is a course for employment managers under government supervision. Rochester University is beginning on its third division; Harvard has held two, Columbia one; the Chamber of Commerce in Cleveland has had the supervision of one course for training employment managers, in which the workers must work for eight weeks at the actual wage-earning on production work in the factory so they may know what is in the mind of the worker prior to taking up the regular course in employment management.

So I would say that the employment management end of industry has been largely done over. Why? Because women introduced into new kinds of work readily become discouraged. If they are not tided over that period of discouragement there would be a great labor turnover; if tided over that period of discouragement they become a stable factor in industry.

The government school for precision optical operators in Rochester reports that if they can keep a woman three days in their school she usually completes the six weeks' training and when transferred to work the same is true. In a Buffalo firm employing 10,000 people, 1,100 formerly were women—the number employed in July was 1,200 and in August 2,000. The number of women employed during this same period to keep the 1,100 force steady was about forty-five per month. The close adaptation of the worker to the work and the adjustment of problems that come up in the training, the placement of workers, may be very well handled by an efficient employment department, providing training prior to entrance or training on the job.

I also found the labor turnover in some factories is due largely to the fact that employers send women workers immediately to the production

floor. They are put under supervising foremen who, in their hearts, have prejudices against the use of women in industry or the advent of women in industry and who make them go through a sufficient period of discouragement to eliminate them. If you increase the number of green workers you must increase your number of supervising foremen and they must be foremen who not only know the job but know the human side of it and the teaching end of it and who can impart courage as well as instruction.

If the war continues for three years we shall have 3,500,000 green workers, or new women workers, in industry. What is our duty to these women from the standpoint of training and from the standpoint of education? When society admits that the demand for increased production and the cost of the same falls on the physical strength, intelligence or skill of women wage workers, society must offer them the same protection, the same safeguards and the same opportunities for training that is accorded other wage workers.

CHAIRMAN MCMILLIAN: Our next number is an address by Mr. R. S. Elberty.

WOMEN IN EXPLOSIVE PLANTS

R. S. ELBERTY, ORDNANCE DEPARTMENT, WASHINGTON, D. C.

Madam Chairman and Members of the National Safety Council: I am looking after the safety protection of forty-one explosive plants and I have a right to talk to you because, twelve or fourteen years ago, when I took charge of the winding-room of the Westinghouse Electric Company, I had about fifty girls, fifty boys and 125 men. I did not have anybody between me and them—I was their papa; some of them called me "Bob," some "Boss" and some called me "Daddy"—I had white hair then the same as I have now.

Women do not work like men, they do not work like boys; put twelve girls on a job and show them how to do a certain thing and go away and come back three months after and they are doing it the same way as when you left them. Show a group of boys how to do the same thing and come back in three days and they are doing it four or five different ways; come back in three or four months and you will find they are all doing it the same way—a way that is an improvement and a combination of the best ideas of the group. The reason women do not do this is because they have not been in industry long enough

IMPORTANCE OF EXPERIENCED FOREMEN

After visiting the different factories I am positive that the greatest amount of our labor trouble and accidents is due to the fact that the managers of the factories do not know how to select their foremen—a foreman should be selected not because he is the most proficient worker in the room Suppose you have a tool-making department, do not select the best tool-makers, select the fellow who gets along best with the other men, the one they will listen to. When the foreman gets hold of a group

of girls he should tell the girls what they are making. I have gone into a factory and said to a girl: "What is this for?" It may be a thingamajig; she doesn't know. How in the world can a woman or man take any interest in life when they do not know what they are doing? If I had a girl handling an article I would tell her what it was—I would explain it to her. She would then have an interest in what she was doing and stick to the job. Suppose all day she drops a little bit of solder on the end of a piece of metal, but does not know what it is for. Tell her that it is a tracer bullet and it is used only for air craft.

We have been remarkably fortunate in our loading work—we have lost very few men and fewer women. In the loading of TNT we have only lost two men and I believe six would about cover the women. If I could take a report sheet and show you the accidents in explosive loading and the other industries you would find that a woman would be safer loading explosives than she is as a conductor on street cars, running elevators, driving an automobile or working at a punch press.

I have something here I want to show you. This is an innocent-looking piece of material—it looks like a piece of beeswax or brown sugar. You see it did not hurt the Chairman, but it is TNT. If you should get that inside of you, you would not last long. You can handle it, you can light it with a match and it will burn with considerable heat. In order to set it off you must detonate it. If it went off here the Chairman, myself and the graphophone would disappear.

WOMEN MUNITION WORKERS ARE WELL PROTECTED

It was said a few moments ago that 80 per cent of the women were working in England. Fifty per cent of the explosive loading done in this country today, I am safe in saying, is done by women and those girls are going to be looked after better than many mothers nowadays look after their own daughters, because the mother has only her own experience to go on while the government is making use of all the experience available.

We have to recruit our women workers. Why? Simply because they are afraid to work in these plants. Of course, they have no business to be afraid, but some thoughtless woman writes in some irresponsible paper about "our girls facing death every day!" Of course they do, but you are in a more dangerous position with one foot in the elevator and one foot out than any girl is in an explosive plant—and you don't know it. Every time you get one foot in and one foot out of an elevator, jump, if you want to be all together when you are buried.

Our girls, as a general rule, know that explosives are dangerous, but the way some of our writers put it up to the public is almost as bad as German propaganda. We must have women in our factories. We cannot win the war if we take the women out of the plants and we will lose it quicker if we hamper the explosive loading end of it than we would in any place else. A man can fight without a uniform and he can fight without a rifle—half of our fellows who go into battle have no use for a rifle—they depend on other arms—but we cannot win the war without

artillery and artillery is not worth two whoops and a hurrah without shells to shoot—and you cannot load shells without women. You cannot get enough men to do it, no matter what you offer to pay them.

I went through a plant and saw all these operations carried on by the lowest type of male workers that you could imagine—I mean men that would not go to work until we adopted the "work or fight" rule. There were all sorts of men in that plant—street corner loafers, gun men, etc., not only colored but white. This whole plant was operated by men. Ten minutes later I visited another plant and found high school teachers doing the same character of work; these women were working during their vacation. There was a totally different atmosphere in this plant. You could note the change the moment you came inside the door.

The plant that does not have good housekeeping is not safe. You can tell that it is dangerous almost at a glance. When a new neighbor moves in next door you get an idea of the whole family by the pictures in the living-room. It is the same way when an experienced man goes into a plant, he can see the dangers at a glance.

The government is pleading with women to go to work in the explosive loading plants. We need them, we have to have them and we are going to require some of them to work at night. There is no joke about it. Night work and heavy lifting and unusual working conditions will try the patience and courage of many of our women before the war ends and our boys are home from "over there."

MUNITIONS WORK MUST CONTINUE

They are trying to pass a law in Pennsylvania—they had it before our department for review—to forbid women to work in any factory where it was necessary to handle a weight of fifteen pounds or more. I said: "Ask the woman who is responsible for that clause how much a baby weighs." My first youngster weighed fourteen pounds when he was two weeks old. My wife wasn't very husky, but she managed to wrestle that youngster around all day and she didn't have an eight-hour law set aside for her either. If the war industries are confined to eight hours the women will have to be able to lift fifteen pounds. The government is going to see to it that the women have every last ounce of care. Many plants are making war munitions and they have a right to hire their own employes, but if they are not careful the government may see fit to take the plant.

Women are subject to all the usual dangers of factory work, but they have been working in many plants for years and their accident record, compared with that of men, is commendable. I go into every magazine, every dangerous place and examine every phase of explosive loading, and I can assure you that no unnecessary risks are taken. The lives of the girls must be protected and we protect them, also, at the same time we protect the plant—shells must be loaded and we must get the work out promptly. We take no unnecessary chances, I assure you. The government is sending safety engineers into every plant and these men are doing very valuable service.

After a short informal discussion the session adjourned.

WEDNESDAY AFTERNOON SESSION

CHAIRMAN McMILLIAN: We had the pleasure this morning of hearing several women speakers. This afternoon we will start our meeting with a talk by Mr. H. W. Forster, General Manager of the Independence Bureau.

SAFETY IN THE HOME

H. W. FORSTER, GENERAL MANAGER, INDEPENDENCE BUREAU, PHILADELPHIA.

Madam Chairman, Ladies and Gentlemen: It is a particularly happy occasion to a preacher of the Safety Gospel to be able to talk accident prevention to a group of women, because it is obvious that when we can get our whole household to understand the principles of accident prevention and to follow them, the accident question will be solved.

All of you know that we have railroad accidents, steamship disasters, street accidents, and loss of life in fires, that there is risk run by men and women outside of the home, but you probably have the idea that there is no place like home for peace and security. Our songs, our poetry, our literature abound with references to the haven of safety which the home constitutes. The facts of the case are that there are more accidents in homes than in public activities, more accidents in homes than in industries, and three times as many accidents in the homes of the United States during the past year than there have been casualties in the American Army up to the present time. Home is the most dangerous place from the standpoint of accidents.

I want to call your attention to the fact that Mark Twain said that the most dangerous thing people could do was to go to bed, because so many people die in bed. I think that most of us who are attending this Congress are running very little risk in this direction because of the splendid entertainment we are being given in your hospitable city.

EQUIPMENT AND TEACHING FOR HOME SAFETY

I have been asked to talk on home safety along lines of equipment and teaching. It is recognized that the problem in the home is exactly the same as in the industries. In the industries we must first have organization. In the home this part of the problem is simple. I presume that women in St. Louis, as elsewhere, are the actual heads of their homes. If you are with us we have the necessary organization. We have mechanical accidents in industry, and we have a great many in the home, far more than you realize is the case. We also realize that as we have to make propaganda to put safety into the minds of our people, so we similarly have an educational problem in the home.

We have the same general types of accidents in our households which we have in industry. Many accidents and deaths result from falls. I think it is well established that more people are killed and injured by falling than in any other one way, and the thing that has surprised me is that you do not have to fall a long way to be hurt or killed.

We have much mechanical equipment in our homes—forty to fifty types of electrical apparatus alone. We conduct fire and heating operations in a number of ways. We have the asphyxiation problem and we have the gas problem in a number of forms in connection with our homes as in our industrial operations.

Let me talk briefly on some of the accidents which come under the heading of "Falls."

Stairs. The stair is the principal up and down method of transportation and of the many troubles that we have with stairs one is poor illumination. A suddenly encountered dark stair throws the eye adjustment out, and failure to see may mean a bad fall. There is one thing commonly overlooked about hand rails. The danger from stairs comes largely from going down. Therefore, you want the hand rail on the righthand side of the stairs as you go down. A stair, properly, should have rails on both sides.

Nothing belongs on the stairs, preferably not even a carpet, but if you prefer a carpet see that it is fastened down all along the line. A department store in Philadelphia had a series of accidents to women patrons owing to certain steps in a stairway being of different heights. A quarter of an inch will always cause you to stumble, and some people will even stumble on an eighth of an inch difference. So have stairs uniform as to height, and whatever you do see that the stairs are not worn or have pieces broken off at the front. Loose objects on stairs may be as deadly as a gun.

ACCIDENTS RESULTING FROM USE OF LADDERS

The ladder is one of the most dangerous devices invented by man. All men connected with industry know the bad record of ladders of all types. If there is any one place where you will find dangerous ladders it is in the average home. They generally have a lightness of construction which does not warrant substantial citizens standing upon them for cleaning windows, chandeliers, hanging curtains, and the like. When I bought a ladder for use in our home I paid thirty-five cents a foot for it. I could have gotten one for fourteen cents. The best ladder is none too good. You want a double metal spreader so when the ladder takes its open position it is likely to stay there. If you value your lives, do not stand on the shelf which the ordinary step ladder has. That shelf is designed to support a bucket of water—not an adult. I have seen a woman of unusual intelligence and judgment stand on a rocking chair with a cane bottom in order to hang a picture.

The other day one of my friends hurriedly came around a corner in her living room and a rug about 3 feet by 5 feet, which rested upon an unusually well waxed floor, slid under her. Fortunately she was not badly hurt. She might have been killed. I would urge you not to have any rugs, except very large ones, which are not fastened at the corners.

People frequently fall while washing windows and sitting on window sills. In the City of Chicago alone in one year over fifty people were killed by falling from windows, and it is only necessary to visualize

about fifty hearses going down Broadway in St. Louis to realize what this means.

Another thing is the falling material hazard. The home is not in the same position as the factory that has loose boards and repair parts which can fall on employes from high places, but slate, icicles, and things which are put on window sills, such as flower pots, milk bottles, and the like, constitute a menace to those below. The way in which people are injured with mechanical equipment in homes is primarily by cutting fingers on exposed gears, sprockets, belts, and chains, exactly in the same way that people are hurt in industry. It behooves you with your washing machines, wringers, ice cream freezers, etc., to see that the mechanical parts are so safeguarded as to avoid accidents. The National Safety Council is trying to get mechanical equipment safeguarded by the manufacturer, and the washing machine industry has done very good work.

BURNS AND SHOCKS FROM ELECTRICAL EQUIPMENT

The danger of electric equipment lies in two things: *First*, from burns, especially from toasters and electric irons, and, *second*, from electric shock. Acute danger often lies in shocks from 110 volts, which is the voltage used in the ordinary house circuits. We all know that 22,000 volts are dangerous, but we do not realize that 110 volts can easily and frequently does cause death. There are certain particular things of which you want to be careful. One of them is the use of an electric iron in a basement that has a damp floor or even an ordinary cement floor. It is not unfrequently the case that the iron becomes "alive" and that you form a circuit by virtue of the hand on the iron and the cement floor. Another danger lies in the presence of an ordinary key socket that you turn on above the wash bowl in the bath room. If the socket is "alive" one has a first-class chance of getting a very serious shock. Have the switch inside the bath room door, or have a pull socket with an insulator so you will not run the danger of getting a shock.

HAZARDS RESULTING FROM USE OF EDGED TOOLS

Then, of course, we have edged tools in our homes. We have axes, and cleavers for cutting meat. Edged tools should be in good condition, should be put in a certain definite place, should be hung up, and the children should be taught to leave them alone.

One of the most objectionable features in the ordinary house is the way in which sharp knives and other tools are mixed in the kitchen table drawer. The average kitchen knife is not sharp enough to cut hot butter, but if you have certain sharp knives put them somewhere so that anyone going to the kitchen drawer for a spoon is not in danger of cutting himself.

One phase of the home accident problem which always strikes me with particular force is the hazard from burns. Often fatal, there is nothing more horrible, more disfiguring for life than a bad burn. When you stop to think how many thousands of gallons of water you boil and how many teakettles of hot water or frying pans of fat you use, it is remarkable we

have not had more accidents from that source. The chief danger here lies in the burning of children. We know of the danger of children pulling things off of the stove onto themselves. Some women do not realize that they ought to exercise the precaution of turning the handles of cooking vessels away from the front of the stove so they will not be sticking out where children can catch hold of them.

Children's clothes being ignited from hot coals, and particularly from fire places and gas stoves are another hazard. A little thought will show the answer.

TREMENDOUS AND UNNECESSARY USE OF MATCHES

If there is anything on which I can talk with real enthusiasm it is the use of safety matches. Franklin H. Wentworth speaks with great feeling upon the tremendous and unnecessary use of matches by the American people. He says if the average person wakes up in the night and cannot find a match by reaching out in any direction he thinks something is wrong with his household. He says that matches are so commonly distributed that rats and mice use them as a standard method of building nests because they are always sure of a good supply. Within every match head lies the possibility of a Chicago fire, or a San Francisco conflagration, or a Baltimore holocaust. We use more matches than all the rest of the civilized world put together. Let us use safety matches only that strike on the box. I do not think it is an exaggeration to say that a thousand children have burned to death every year from playing with matches. They play with the type of match that you can strike any place, and that very commonly can be ignited when you step upon it.

What do you women wear when you do your housework? Cotton. In the afternoon you may wear silk, but it burns just as easily as cotton. You may step on one of these match heads and have a fine chance of becoming a funeral pyre. A safety match that strikes on the box costs no more and it is safer. Use a liberal number of the five-cent holders that you put on the wall in which the match box rests.

There is another household hazard, and that is the use of gasoline. The number of accidents from cleaning with gasoline is very large. Most intelligent women have learned that it is not good policy to put a piece of clothing which they want to clean in a dish pan and put it anywhere near a stove. Some women have learned that gasoline fumes will flow over the floor of a basement or a kitchen stove just as water would flow, but almost no woman knows that you can ignite gasoline by a spark of electricity, and if you are cleaning it is possible to ignite gasoline by mere friction. When you stroke Tabby or Tommy you get a distinct spark. And why shouldn't you get a spark by rubbing silk or wool? Those who have studied physics remember that we used to take an ebony rod and rub it with a silk handkerchief to get a spark.

If you have things that cannot be washed, send them to a cleaner. Do not take chances. The insurance rate on the ordinary cleaning establishments is one hundred times as high as on dwellings.

Now, something about poisons in the home. Medicine chests generally

contain poisons. One of my neighbors had a cook who had a headache. She left a box of chocolate coated pills on the kitchen table and a little sunny-haired girl ate the box of pills because she liked the chocolate coating. She died. Many children have taken poisons and have died. Many people have gone into a bath room at night and in their drowsiness have gotten the wrong thing. The only suggestion I can make is to put the poisons in a separate cabinet and lock them up. We use ammonia, bluing, lye, acids and various other chemicals, and any one taken in appreciable quantities by children is almost certain to cause death.

VALUE OF SETTING A GOOD EXAMPLE

I want to sperk very briefly on the gas hazard. It is difficult to teach children not to turn on gas. The quicker you can carry them over that danger period the better. The gas tube for the stove or table lamp is objectionable because it is easily pulled off, and the only way to have a gas tube reasonably safe is to have the tubing firmly attached and to have the shut-off at the pipe, not at the fixture. One would expect that all persons would know enough not to look for a gas leak with a match and yet we are continually having fatalities on that account.

I want to call attention to the necessity of each household having first aid equipment. For ordinary use, to prevent infection, a solution of alcoholic iodine is almost ideal. No house should be without absorbent cotton and one inch and two inch bandaging material. No house should have any person in it who does not understand the fundamental principles of taking care of cuts, abrasions, and hemorrhage produced by the cutting of an artery or a vein.

The other aspect is the educational one. Everything we know has been acquired by education. We have to educate our children to the accident hazards of the home and to the accident hazards which they will face when they go out into industrial life. The only way is to set a good example. Children follow example much more readily than they do instruction. Incidentally by setting a proper example, we would secure greater safety on the part of the adults.

In conclusion, when you go home and think over the things said in this session devoted to women and their particular interests, I want you to stop and realize that just because you have not suffered serious accidents is no reason why you may not do so soon. Whenever I feel lax about doing certain things along safety lines in my own household, I try to picture to myself what it would mean if a member of my household came to grief by reason of the fact that I had not taken every reasonable precaution for his or her safety. When I think that death might result I respond to the situation. Do you likewise realize your responsibilities and your opportunities to prolong life and to make it fuller and sweeter?

DISCUSSION

CHAS. E. OAKES (Associate Electrical Engineer, Bureau of Standards, Washington, D. C.): In 1918 a circular was printed by the government

called "Safety for the Household," No. 75. I will read the titles of the chapters, they will give you an idea of the contents and, in a measure, supplement Mr. Forster's lecture. The first is "Introduction." The next consists of some twenty pages on "Electrical Hazards." The next is "Lightning." Then follows about thirty pages on "Gas Hazards," "Fire Hazards," and "Hazards Arising from the Use of Chemicals"; then "Miscellaneous Hazards in the Home." I feel that every one would enjoy reading this pamphlet as it is not technical. It can be purchased from the Government Printing Office at 15 cents per copy.

A DELEGATE: May I ask Mr. Forster to be kind enough to talk to the architects (they are usually men) and ask them to place stairways other than in the darkest corner of the house. Also, will you please emphasize the hazard of having firearms in the homes, especially at this time when the whole world is talking so much about arms. Why should a child, 3 years old, be given a little toy pistol to play with?

MR. FORSTER: I only attempted to touch on a few of the commoner hazards in my paper. There are scores of others and I could talk an entire day without exhausting the subject. I will remember your points and use them another time. Bulletin 75 offers an excellent course for home study. The Travelers Insurance Company has also issued a bulletin on home hazards. It is in condensed form and will be found very interesting.

A DELEGATE: Is it dangerous to use energine?

GASOLINE AND CARBON MONOXIDE

MR. FORSTER: Energine is nothing but gasoline; this is also true of a great many other cleaning fluids. Metal polishes are principally composed of gasoline and whitening. Never buy a polish that is not guaranteed to be noncombustible.

A DELEGATE: In what way do we get carbon monoxide poisons in the home? Isn't it largely from defective furnaces?

MR. FORSTER: Carbon monoxide is a powerful poison. With 5 per cent, one breath may cause coma or death; even one-tenth per cent in the air may cause death. The blood has an affinity for carbonates something like 200 times as great as for oxygen. One other way of getting carbon monoxide is by illuminating gas. Water gas, so-called, which you get here in St. Louis, is made by running steam through red-hot fuel, breaking it up into hydrogen and carbon monoxide. That is why illuminating gas is extremely poisonous.

CHAIRMAN MCMILLIAN: Our next speaker is a woman, Mrs. Wilson. She will speak on a subject very close to our hearts—our children.

SAFETY INSTRUCTION IN THE SCHOOLS

MRS. JOSEPH R. WILSON, CHAIRMAN, COMMITTEE ON SAFETY EDUCATION IN PUBLIC SCHOOLS, PHILADELPHIA, PA.

Madam Chairman and Members of the National Safety Council: It hardly seems that I should attempt to justify the cause of carrying safety

instruction into the public schools, yet so difficult is it to arouse and maintain interest and enthusiasm that even the hardest workers and the strongest hearted have turned back from the cause. It has been said that "all men think all men mortal but themselves". There never was anything truer than this saying in connection with carrying safety instruction into the public schools. Let us take a bird's-eye view, for a moment. We live on a certain street and only a block away there is crepe hanging on the door; we give a passing look, feel a momentary thrill of sympathy and then it is all ended and forgotten, and most of us take the same attitude toward accidents. It is not our funeral, it is not our accident, and we straightway forget all about it, without a thought for our neighbor's sorrow or of community safety—we are not interested, that is the trouble.

I want to tell you a story of a client who came to consult my husband. I happened to be in his office at the time and found that the woman had been a maid, formerly in our employ. She told me that her little girl had been run over and killed by a trolley car. She said: "It is a strange thing, but since my little girl was killed I have read every day in the papers of Philadelphia how many little children are injured and killed by accidents." I replied: "Did you ever read such notices before your child was killed?" She answered: "No, I was not interested." Ladies and gentlemen, this is the stumbling block in the way—we are not interested.

A CHILD KILLED EVERY FIFTEEN MINUTES IN NEW JERSEY

The safety engineer of the Public Service Corporation of the State of New Jersey told me that a child was killed or injured every fifteen minutes in that State. I do not know how true these figures are and I could not believe them at the time, so I wrote him saying: "I cannot believe your statement is possible." Again he confirmed what he had to say, with this addition: "If the facts were made plain you would find the rate higher in Pennsylvania."

Before I came to St. Louis I asked our city statistician about these figures and asked him for information as to the number of children killed on the streets of Philadelphia. He replied: "I am very sorry that we have no such figures." Why? Because no one is interested.

The most important thing in carrying safety instruction into the public schools is to arouse interest and, after arousing that interest, to maintain it. If a dead or crippled child, just mangled by an accident, were to be carried into this room this minute, it would inspire us to action, but how far would that action carry us? Possibly some of us no further than the emotions aroused by the crepe on the door, because the sorrow and death has not come to our home—we are not interested. I have talked to progressive ministers, doctors and teachers and I am sorry to say that in many instances they have said to me: "Why bother little children with the history of accidents and safety matters? Haven't they enough sorrow in their lives?" I said: "Are you not interested in accidents and their prevention?" "Oh, yes; when someone we know gets

hurt we read about them." Ladies and gentlemen, this is the point at which to begin our labors. It becomes our duty at once to arouse community interest and maintain it.

What would it matter to the public, or to some of us, if I should tell you that the funerals of the appalling number of children killed and injured by accidents in a year would extend from here to New York or San Francisco, or some other remote place? I have no such figures at my command, but we have other figures, you have heard them stated, that go to prove that a civilian's life is often as dangerous as that of a soldier's in the trenches.

WHAT ARE WE DOING TO PROTECT SCHOOL CHILDREN?

What are we doing to save our school children from accidents? There is only one thing to do and that is to work, every one of us, with heart and soul in our own communities to make safety education compulsory in the public schools of the United States. Why should there be compulsory education in the fine arts and none in the conservation of life? To-day we must work to save every man, woman and child from accidents, not only for the present needs of our country but for the future; we must not fail. Again, why should we send our children into factories to work, having automatic careless habits as many of them do; and the larger percentage of them pass into the industrial world with such habits. Why should we send them there equipped with careless habits to possibly destroy not only themselves but others? Why not take the children at the beginning and give them safety training and correct habits and so do away with the larger portion of accidents?

Habit has a lot to do with accidents and I intend to touch upon this subject later; but what I want to impress upon you now is that in carrying safety instruction into schools you must first arouse interest and then maintain it by constant labor. The second thing to be done in carrying safety instruction into the schools is to educate your teachers and your communities—the teachers cannot obtain results by doing the work alone. Mr. Forster has very splendidly shown you how safety teaching and safety practices must be kept up in the home. You want your communities in this school safety work, you cannot have a careful teacher and a careless mother and father, and there are careless mothers and fathers in many places.

I gave a safety talk in a town in the State of New Jersey and a mother said to me: "Oh, if I had only heard your lecture some two months ago, my little girl would be living now! I sent her into the basement to put water into the water pan of the heater. I had never shown her how she should do it, so she went alone and opened the heater door and threw a bucket of water upon the hot coals. She was scalded to death." Another mother, at the same meeting, told me how her child wanted a shovel to put coal on the heater fire. The shovel was bought and the first day the child used it she met her death. She went into the cellar and, seeing the heater fire was low, she poured coaloil on the fire, as she had seen her mother do, with the result that she was burnt to death and the house was

destroyed. Why? Because the mother was not a safety woman and the child had received no safety instruction in her school. I could tell you one story after another of things that have come to my notice, yet we have to talk and beg and plead with community after community that they take an interest in their schools and see that safety is taught there. The bulletins of the National Safety Council have printed across the top "These bulletins are read by 6,000,000 workmen each week." I would like to ask when safety is going to be taught to the children of these 6,000,000 workmen in the public schools and when they are going to be protected.

VISUALIZING AN ACCIDENT

When I was lecturing in Rochester last May one of the schools had a volunteer accident exhibition. A boy was brought forward to be shown to his classmates as an example. He had lost his right leg at the hip through stealing a ride on a freight train. If you could have seen his face and looked into his eyes and heard his voice you would not hesitate one minute in giving all the energy of which you are possessed to carrying safety into the schools.

Near my own home a boy was living who had been going to a nearby town to see the moving pictures, and nightly he stole rides home because he wanted the fare money for sweets. He very successfully stole rides on the cowcatcher of the midnight freight for several months, but one night he fell from the train and when the engineer stopped the engine he found the boy horribly mutilated. To add to the horror of the situation he lived to be a pitiful cripple. This 16-year-old boy had never been taught safety in his school. We must educate our teachers and our community. We must give them all the knowledge possible so that they can present their subjects intelligently to children in the school and in the home. Again I want to press upon you the importance of the fact that the education of the teacher is the second important thing in carrying safety instruction into the public schools. No teacher can successfully teach what she does not clearly understand.

Let us deal with the child, the factor to be taught. In teaching safety to the school child he must be taken into the teacher's confidence and must be made a part of the safety organization. By no means must he be treated as something outside the safety cause and as one entirely ignorant of the subject of accident prevention. I believe that not a child lives, no matter of what age, that has not felt at some time the alarming sensation of a real or near accident. If you will question children you will find that they all have their opinions upon this subject. I have quizzed children on the playgrounds, in the slums, alleys and at their games and I have yet to meet a child that has not a fair knowledge of accident prevention and the causes of accidents.

I want to tell you about a little boy who did not fit into any classroom very well, so his father employed a teacher for him. As a first lesson she put him in front of her, and, shaking her finger, she said: "Now we are

going to have a lesson and that lesson is going to be about a cat. You must pay attention to what I ask you. Has a cat fur or feathers?" "Gee whillikens, teacher!" said the boy, "ain't you ever seen a cat in all your life?" His teacher was making a serious mistake; to educate a child in safety or any other art you must give him a part to play in the cause.

THE LOGIC OF LITTLE CHILDREN

This summer I found a waif in the street and after consulting his mother I asked him would he like to go to my home with me and he said "Yes" very sweetly. He was a cherub of the Raphael type, 5 years of age. One day he heard me talking about accident prevention and thereafter at bedtime, when we would have a little lovefeast, he would tell me about some accident that had happened to himself or others. My little friend told me: "Once my father he had a accident and fell downstairs." I replied: "Well, darling, what would you suggest to stop that accident from happening?" He said: "I left my elephant on the steps." He knew very well it should not have been left there.

I want to tell you that 5-year-old children can be taught accident prevention and we must begin our work in the kindergarten and carry it up to the higher schools and colleges. It is an easy thing to teach a child if you hold its interest and treat it as a part of the thing itself; in other words, let it play its own game. How many parents buy a puzzle, take it home for the child to solve, and when he is all eagerness to solve its mystery say: "Don't put your hands on it. Wait until I have solved the puzzle for you." You have stolen every thrill in the thing! Give the child a fair chance and a right to investigate such things for himself. If he is given a puzzle let him solve it himself and only step in to aid when he fails. If he is told about accidents, ask him if he has a remedy to suggest and it will be found that these little darlings are full of love for their playmates and will do many things to keep them from being hurt. We must take the children into our confidence. We have spoken of the child and have proven that quite young children can receive accident prevention training: now for our main subject, "Safety and Accident Prevention."

In industrial safety we are dealing with educated and trained minds and are able to tie up safety teaching with the machine before the operator. We do not have to go into minute details of instruction with the care that we do if we are teaching the child. We cannot carry into the school a lot of machinery or lengthy lists on accidents and their remedies and so cure the accident evils that exist. We must create a place for safety closely allied with its science. It will be an impossibility to prevent the child's mind from tiring of the subject of safety if we adhere too closely to accidents and their prevention because the different kinds of accidents are as numerous as the stars in heaven. Try to count the stars and soon the mind is lost in the maze of them. I have picked up books where accidents have been arranged, page after page, with their accompanying statistics, and I soon became lost, the same as when I tried as a child to count the stars. The children are going to get mentally lost in the ac-

cident list unless there are some special interest pages on which to fix their attention. We must give them a working definition of safety. The majority of people think that safety is an absence of danger and that danger has no right to exist anywhere. These people must be taught that there is no such thing as an absence of danger, but that safety is danger controlled.

CLARITY OF EXPLANATION ALWAYS NECESSARY

I want to tell you another thing that we must emphasize to the child and that is that usefulness is interlocked with danger and that we may control but not separate the two. I am going to illustrate my point with a safety match. I hold in my hand a match, at once the most useful and the most dangerous thing that we have to aid us every day. Now I am going to rob it of its usefulness and of its danger (lights match). Both are gone and I hold in my hands a useless stick of wood. What is true of the match is true of everything else in life. We eat but we must be careful what we eat and how we eat it. We think and we must be careful how we think and what we think; we walk, and as Mr. Forster very ably has said, our feet are accurate instruments of measurement, but we must be careful how we walk and where we walk. The ear, what a useful and dangerous thing it is! A mother brings her child up in all purity and truthfulness and through his ear there leaks into his unstained mind some insidious poison; it were better that the child were to lose an arm or a leg than to have heard what it did hear.

Now let us analyze the thing to be prevented, namely, "Accidents." What is an accident? The dictionary says it is a "casualty." What does this definition mean to a child? Absolutely nothing. Tell the child that an accident is an unplanned-for happening; not to too-young a child, of course, but to one old enough to understand; an unplanned-for happening of a useless and destructive nature. Now you have a thought for the child to work from. When you start to teach the child accident prevention do not begin by going through a long list of accidents. Accidents must be classified in a practical way, attaching them in the mind of the child to things with which it is more or less familiar. This can be done by our safety men, trained in safety work, who are fully capable of adjusting such matters. For the child we must classify accidents as happening to the body, accidents to the mind, accidents to character, accidents to happiness and accidents to property as well as the general classification already in use. It sometimes makes my audience laugh when I speak of accidents to happiness or character but I shall prove my point. Let me tell you a story.

A farmer had a sick pig and he said to his little girl: "I am going to kill this pig and sell it." She replied: "Father, will you allow me to sell part of the pig for you?" The lady to whom she sold the pig never received it and when she saw the girl she asked: "Where is the pig?" The child replied: "We didn't kill the pig; it got well." This was an accident to that child's character. If such evil training was persisted in it would mean an accident to her happiness.

ACCIDENTS TO CHARACTER

A lie is an accident to character and dishonesty is an accident to character and many an accident to the health of a man is due to defective character. The same is true of women and children; there can be no real safety teaching until we treat our safety subject in a broad manner, so that the child's mind, in its simplicity, can grasp the subject, so it can know where there has been an accident to happiness or body or property or character, and it is the only plan that is workable to maintain interest. We must begin and continue in this way.

To cite an illustration of an accident to happiness as well as to body: Take a child whose father works in a mill or glass factory, where little chips possibly may fly off and hurt his eyes and blind him for life. He is told to put on goggles but does not do so; he is injured and loses his eyesight. The home is broken up and the mother has to go to work to support the father and child. This is an accident to the man's eye, yes, but it is a more terrible accident to his happiness and to the happiness of that mother and child. Do you not think that in presenting the safety subject in this manner to a child it is going to sink in more deeply, and produce safety habits of thinking, than if we confined ourselves to specific types of street or railway accidents? I advocate teaching about accidents broadly in conjunction with the science of safety, but we must quickly build up a course of teaching in the science of safety to expedite the cause.

An important feature of safety teaching is a practical training of the five senses by special exercises carried out in the public schools. In order to have the higher cultivation of instinct, equation—balance intuition and brain and body control. We must have higher-sense training to meet the high speeds and high pressure of the present age. If any one of us were to be asked off-hand at this moment if we were familiar with the different objects in our bedrooms or reception rooms, the number or color of the different articles, we would be surprised to know that we could answer but very few questions accurately because our eyes are not well trained, and what is true of the eye is true of the ear and the sense of touch.

To train the sight I would advocate the placing of various objects upon a desk in the schoolroom and marching the children quickly by, requiring them to tell afterward what was there, omitting as few details as possible. This is what I call sense training, something we have not as yet attempted in our public schools. The training that a soldier gets develops his senses, creates higher powers of courage, sight, fortitude and the things that are worth while in a fighting man. We must have a more accurate training of the senses of hearing, sight and touch in order to acquire automatic safe habits.

SHOULD BE ABLE TO SENSE DANGER

Why is there so much terrible gossip in the world? Is it because the world is full of wicked people who desire to destroy the character of others? No; it is because they are not good listeners. Their ears are

badly trained, are inaccurate, and consequently the tongue runs wild. There is only one thing that can control the tongue and that is the correct training of the senses of sight and hearing. By such training we acquire a balance and equation that will protect us from accidents. A man should be able to sense danger approaching from any direction and while his mind may be occupied with the task before his eyes and in his hands yet he should be sub-consciously awake and ready to control danger at every point.

There is such a thing as mind-blindness and it can be deliberately produced or exist through ignorance. You may be talking to a child and telling him that he has been a naughty boy and how he may become a good one and all the time you are talking to him he deliberately looks out of a window and closes his mind to your lesson. Children have the power of resisting us, but we must realize that mind-blindness, whether from ignorance or design, is a dangerous thing, causing accidents to the mind and character and that it is very active in children. Children deliberately resist hearing or seeing when they do not want to hear or see. Make the child look at you directly and not away from you when you are speaking to it. Teach it in a loving, kind way to listen, ask it to repeat what you say and be sure it understands. Children have as much will power as adults and grown-ups often attack their wills by force.

We know what is happening in Europe today from military force in Germany. Children resist force as the Allies are resisting and conquering the foe, because will power is as strong in the infant as it is in the adult and if anyone doubts what I say let him ask the father who has carried a baby all night long because it would not go to sleep. We must realize that a child has a head which contains the greatest work of God, namely, the human brain. There is not a created thing in the whole universe or in the secret or hidden realms that God has made, wherein we shall find a more wonderful creation than the human brain. God made it to hold His word and there is nothing greater than God's word.

The training of the child's brain is a sacred trust because it was made to hold the word of God that relates to all human rights, safety and protection in every way possible. The human brain is also the strongest of all God's wonderful creations and when an idea fastens itelf upon the mind, nor death nor flame can turn it aside. Remember that Germany started out long ago to teach her people the full power of the words "The Fatherland over all!" and she has tried with might and main to put the fatherland over all the world, but she is getting those words back now with a vengeance. With her it was "The Fatherland over all!" not "God over all!" We Americans have given our sons to fight for liberty and they are fighting and bleeding and dying because certain ideals and wise words in their minds are fixed and set and they will not change them, no not for all the Germans in the world.

PLAY THE GAME SQUARELY

The child has a mind and let us fear to shock it with unjust angry words and let us learn in playing the safety game of life that it is firm-

ness and not crossness that counts. How many people there are who think they cannot do anything unless they have a cross spell over it. It is firmness that we must use with a child, making him a part of this wonderful world of ours and teaching him how to live so that others may live with him safely. This is playing the safety game squarely. If we approach the child in the right way and our work with a prayer in our hearts we are going to carry safety right into the home and the schools—we cannot fail. I have made up my mind that it is going into the school if I have to take it there alone. I have not stood at the bedside of a crippled or dying child. I have not consoled their weeping mothers to fail now. I wish Mr. Price were in the room to say in his inimitable way "It can be done!" I say it must be done in face of the world's crisis today and we need the service of every man, woman and child. Uncle Sam does not want them with their feet and hands off and their brains and characters impaired from preventable accidents.

Just a word about words. I want to see taught in the public schools the true simplified meaning of a word attached to the spelling of the word itself. This thing of taking the spelling book and cramming into the mind of a child thousands of words of which it knows absolutely nothing of the true meaning is wrong. A child's brain is a working power only when it has a vocabulary that it understands. Children would develop more safely and have less worriment in school if they knew the meaning of the words they study. This is a thing that needs rectifying. Adults constantly misuse words and it is difficult for children to understand them. To illustrate my point: A mother took a little girl for an afternoon's outing in a park to have a good time. Finally they wandered down to the rowboats to take a boat ride, but when they reached the wharf the child ran away screaming. The mother caught her and brought her back by force. The child, pointing to a sign, screamed: "Oh, mother look at that sign!" What do you think she saw on the signboard: "Boat rides; adults, 10 cents, children thrown in." Is it any wonder she ran away?

Oh, yes, words have a meaning to children and the quicker we adults awaken to a realization of how badly used these youngsters of ours are in this regard the quicker we are going to teach them to say what they mean and mean what they say, and have happier homes, free from the dangers of quarrel and gossip.

Many accidents are traceable to quarrels. There was a safety engineer who talked a great deal of his profession before his little boy. He asked some friends to dinner and he brought the little boy in very proudly and put him down to the table. The father was anxious to show that the boy was a safety boy and he said: "Johnny, I was so pleased when I came down the steps not to find any of your toys lying about." The child said: "Father, that only goes to show how safe this house is since you met me." You see children are a part of this game and we must not take them out of it.

CHARACTER TRAINING AND SAFETY INSTRUCTION

It is my belief that character training must go hand in hand with safety work and I do not see how the two can be separated, since there

can be accidents to character, morality and mentality as well as to the body and property. How are we going to handle the precious gifts of the human brain if we do not have character training in the schools in conjunction with safety teaching? But we cannot have character training until we know what character is. Character is founded upon motive. It is our motive for doing things, plus our method of doing them. A man may visit your home—wonderfully tailored, college bred, plenty of money and a charming address, and yet his motive may be execrable. His motive makes his character. Sometimes mothers and fathers awaken to a realization that their delightful boy is only a pretending Percy after all, while his honest brother, Sam, lumbering awkwardly through life turns out to have the character to be the mainstay of the family. Find out the motives of your children and prevent accidents to character; judge and correct them according to motive and not by sly or camouflaged acts. Mothers often punish their children severely for simply upsetting the jam pots and much Thanksgiving gratitude is destroyed because the pie has been knocked over. This is a sad accident to the jam pots and Thanksgiving pie, but the real thing to find out is the boy or girl's motive for the act. If the motive is bad punish for that, or, better still, train the child to overcome it. Never punish the act alone as there are many children that are very clever in shifting blame upon an innocent child.

Now for a little discussion of habit. What is habit? We must give the child a working definition of habit—it is method set and fixed. It is the set form of action acquired by doing a thing many times in the same way. The man who raises the glass of wine to his lips many times in the same way eventually becomes a drunkard and suffers an accident to his character. Watch the child who is doing a thing many times in the same way and tell that child that if it does the same thing many times it is going to form a good habit or a bad one and that the habit will eventually become automatic.

Mr. Forster told you about the accurate measurement of the feet; how scientific they were, how the slightest difference in the height of the stairsteps would cause an accident? Why? Because you have the automatic habit of walking. You may study your latest systems of typewriting and piano playing and do all things required of you by your teacher, but until you practice upon the keys and touch them many times in the same way you are not able to use either instrument accurately. Neither the piano nor the typewriter is of use to you until you have acquired the automatic habit of using them. Automatic habit is under the control of the sub-conscious mind.

BRAIN MOTION AND ITS RELATION TO SAFETY

Another point that we must bear in mind in carrying safety instruction into the public schools and that is that safety deals with brain motion as well as with all other forms of motion. Children must be taught to understand that words pass through their minds in motion and that thought produces brain motion; that they must be careful of their

thoughts so as to have clean, safe minds. Advancing into the higher grades of the school, students can be taught that safety deals with all forms of motion and danger lies always at the points of contact. Accident prevention must deal with approaching motion, and before contact is reached. Safety must control approach, always, ever. It is at the point of contact that danger lies—safety is danger controlled.

I am going to ask you, just for a moment, to bow your heads to invoke one of the greatest powers in the world—silent prayer. The truest realization of God comes to man in silence, and I am going to ask you to bow your head in silence with this prayer: That before another year is over our children will be taught not only how to conserve their own lives but the lives of others.

CHAIRMAN MCMILLIAN: After having heard Mrs. Wilson's remarks I am sure you will feel that we have a very great problem before us in conserving the child's life in the home and in the school. Our next speaker will be Mr. Isaiah Hale, an old friend of the safety movement.

TEACHING SAFETY TO 75,000 MEN

ISAIAH HALE, COMMISSIONER OF SAFETY, SANTA FE RAILROAD, TOPEKA, KAN.

Madam Chairman and Members of the National Safety Council: I beg of you to take no snap judgment or draw hasty inferences as to the reason why I may be here today. Believe me when I tell you it is a long, long step from a railroad roundhouse or a switch shanty to the platform of the Statler Hotel ballroom. The mere fact that I am here might suggest that I am a boy orator, or something of that kind, but disputing that and to show how far wide of the mark a hastily drawn conclusion may be I offer a story recently told me, but naturally with apologies to your sex.

It was told of a commuter in the suburbs of the city of New York who, to reach home, was compelled to use an electric surface line—the cars ran thirty minutes apart. He started down town one morning and just missed the car; instead of standing on the corner for thirty minutes, he thought, inasmuch as he saw so little of his family, he would give his wife a little surprise by spending that twenty-five minutes with her. He walked back home, went in the front door, through the hall and dining room and into the kitchen, where he found her busily engaged over the kitchen table. He walked quietly up behind her and put his arms about her very affectionately, whereat she partly turned her face and as he affectionately kissed her on the cheek she said: "Two quarts of milk and a bottle of cream."

Neither am I going to take advantage of you because I have you here and it might appear discourteous if you got up and walked out. I recall that once when Phillips Brooks was entertaining a brother of the cloth, in his pulpit, after the usual introduction to the congregation the gentleman turned around and asked: "How much time have I, Brother Brooks?" Mr. Brooks replied: "You may use your own judgment, but remember that no souls are ever saved after the first twenty minutes."

I had no idea until just a moment ago that I was to have this very

distinguished honor and pleasure as well, but while taking a more or less active part in the Steam Railroad Section I jotted down just one or two things I wanted to tell you. First, one or two things we are now saying to our own men—we have 75,000 men in the employment of our company—and at the same time I want to tell you of the part which I think you women ought to play in safety work. The Safety First movement is based on the none-too-well-known fact that economically the most valuable thing in this world is a man. When that fact becomes fixed in the mind one automatically becomes a convert to the wonderful gospel of safety, and kept there, one becomes a missionary in the evangelization of the industrial world. I am going to talk of war because every one else is talking it. It is not for me to remind you that war, as carried on today by the giant nations of the earth, is both a costly and fearful business. I do want to remind you, however, that too few Americans have any conception of what our war efforts mean in men and material, without which intimate knowledge there cannot be that whole-hearted co-operation and unstinted sacrifice by which and through which most Americans must radically change our mode of living, in many cases actually begin to live all over again.

PHYSICAL FITNESS ADJUNCT TO SAFETY

I am arguing with our men that physical fitness is the first requisite in the winning of the war. Following that, maximum production. Our battles are not being won by listless soldiers, and by the same token maximum production is not going to be accomplished by listlessly working men. We must have *morale* and enthusiasm to go with it and adequately back it up. In the fearfulness of the cost of this war I tell our men we have the very best reason in the world for being united in our wish and our effort to bring it to a speedy and successful conclusion. Very few people have any conception of what the war is costing. For years we Americans have talked very glibly in millions; now we are talking in billions without any thought or idea of what those billions mean; we lose all sense of proportions when we get into them.

We are told that our government, in the fiscal year ending in June, spent nineteen billions of dollars. How many know that nineteen billions of dollars represents 80 per cent of this government's expenditures—pensions, public buildings, army, navy, everything—from the day it was born until the first of last year—a period of over 140 years? How many people know that the nineteen billions of dollars spent last year exceed in value every piece of railroad property in America, our right-of-way, our equipment, our terminals, everything—yet we spent more than that last year! I might tell you that nineteen billions of dollars would make a strip of eighteen-karat gold an inch wide and a quarter of an inch thick around the earth. However, that doesn't mean anything. We are told that the allied nations have spent up to the first of June, this year, one hundred and forty billions of dollars. I think one of the best illustrations of what a billion is, is the lapse of time. I made this statement once before in the hearing of Mr. Morey. I beg his indulgence while I repeat it. The lapse of time covered by a billion minutes—not a billion

months, or days, or weeks, or hours, but minutes—how many of you know that it has been only one billion and seven million minutes since Christ was born? How many of you have ever had it brought to your mind in connection with that fact, that this war has cost the allies $140 for every minute that has passed since Christ came, nearly two thousand years ago?

PERSONAL EFFICIENCY AND WAR PRODUCTION

I often ask our men: Who is going to pay it? I ask them also if they do not reasonably think they ought frequently to ask themselves that question, for while what we know today as capital is going to pay its share, the final analysis tells us that the man we know today as the ultimate consumer is the man who is going to pay it. I remind our men, too, that every dollar of that money, down to the last penny, is going to come out of the hides of the men of this world who work for their living. If they do not care whether a man gives 100 per cent of his efficiency, if they do not care whether their rich neighbors are lending their money to the government, if they have no cencern over the number of pine stick whittlers there are standing on the corners of their home town, if they do not care how many men are playing pinochle and pitch in the convalescent wards of our hospitals, if they do not care how high we pile the war debt that will keep their children and my children and yours poor just as long as they live.—I say, God help us if we do not care! But, folks, there is a loss in this war much greater than the loss of money. These debts will all be liquidated somehow, sometime, but there is a much greater loss, one that is irreparable, one which can never be paid—the loss of manpower, and to me it is the most astounding and disheartening thing ever brought to the consciousness of man.

I might say to you that a certain number of million men have been killed and so many scores of millions have been injured. Even then it would only be in numbers. To visualize the loss of manpower let me say to you that if it were possible to gather together in New York City all the men who have been taken out of the productive ranks of the world since the war started, the men who have been killed outright, the men who have starved to death and the men who have been hopelessly and helplessly crippled, meaning men who have lost both feet, both hands or both eyes, men who will never produce anything in this big scheme of things, I say if it were possible to gather those men together in New York and march them out lockstepped, each man with his hand on the shoulder of the man ahead of him, walking in as close formation as they could walk, can you picture before your mind's eye a solid line of marching men reaching the ninety miles from New York to Philadelphia, thence to Pittsburgh, to Chicago, to Omaha, to Denver, to Salt Lake City, and down to Los Angeles—mind you, a solid line of marching men coming out of New York, on up to San Francisco, to Portland, across to Vancouver, thence back to Winnipeg, on to Montreal, down to Boston, and then, realize that when the head man got back to New York again there would still be over a thousand miles of men who had never started at all?

I tell our men that the thing we Americans ask ourselves is, are we

going to demand of everyone that they give 100 per cent of their efficiency; whether it is their muscles, their brain or their money, or, are we going to dilly-dally along until we have added a thousand miles of our boys—your brothers and mine—to that line? There are a great many wishbones in this country where there should be backbones.

In connection with safety and efficiency, one may work safely, I tell our men, without working efficiently; by the same token a man may work efficiently without working safely. What we must do is to make safety and efficiency as closely co-ordinated in fact as they are in principle.

A much greater menace to our national existence today—you will pardon me, there is nothing consecutive, no continuity in this talk of mine because of lack of your time and mine. I am dropping one subject before I am through with it to pick up another and similarly mishandle it—a much greater menace to our national existence today than the entire German army is the lukewarmness and the indifference of the American people.

Battles today are not all being fought in France. Many of our real battles are being fought in the home trenches by men and women who have never left our native shore, and if our national exhaustion ever comes it is not going to be gauged in rivers of blood or mountains of dead, it is not going to come solely through the shortage of man-power, but rather through the dying flames in our foundries, through the shortcomings of our vast railroad properties, through the inactivities of our big steel plants, it will come through the tragedy of an empty grain sack. If we want to make this land of ours safer for you women, our mothers, wives, daughters and sisters, than the women of France, Belgium, Armenia and Serbia found their homeland for them, we have got to do something besides stand up whenever we hear a band play the "Star-Spangled Banner," we must pour our money and our efficiency into France to the end that we may minimize the amount of American blood that is going to be poured out over there.

ENGLAND'S PART IN THE WORLD WAR

I am not an Englishman, but it makes my blood boil when I hear people say: "What have the English done?" Why, my friends, if England had never put a man on the soil of France, would she not have done her share—and enough? Have you ever stopped to think what the one thing was which, for over four years, stood between your home and the barbarian? The English navy! I want to remind you that history bears no record that any other one agency ever performed a service so far-reaching in its importance and its effectiveness as that which has been given by the English navy every hour since August, 1914, when hell itself broke loose in Europe.

I tell you our selfishness is our one great fault. We hear people ask: "When is this horrible war going to end?" I do not know when it is going to end any more than you do, but I know it will never end by success of German arms. If the war ends before the Germans are whipped as they are entitled to be whipped, it will end when some person in Buffalo

or Cleveland gets tired putting 3-cent stamps on his letters, when some fellow here in St. Louis gets tired eating graham bread, or some fellow in San Francisco gets to worrying about his profits—when a sufficiently large number of those fellows get together they will bring pressure enough to bear on Congress to declare the war at an end and accept a peace which would be to our everlasting shame and discredit. Why? Because of any failure of our arms? Not at all! Simply because you and I who have stayed here at home were without an intestinal investiture which would let us stick it out to the finish. By the same process of reasoning that this war is going to be won by the people at home, if it is lost, it will be lost by the people at home.

I do not know when I have ever been more shamed by the actions of my own people than I have been recently, and this harks back to my statement that we are selfish and do not appreciate our personal responsibilities. My work takes me to California two or three times a year. When I was last in Los Angeles some friends took my wife and me to some of the famous beach resorts, with which some of you are more or less familiar. While in one famous cabaret I saw a number of Americans sitting at a table, drinking wine at $8.00 a bottle and eating lobsters at $4.00 each. Actually it made me heartsick. Near us was a table at which were seated two men and two women—I speak of them only as men and women—a number of empty wine bottles in evidence and the table was filled with a lot of mussed and uneaten food; there wasn't a serious thought in the heads of one of them. Their anatomy reached from the back of the chair behind them to the edge of the table in front. They were not eating because they were hungry or drinking because they were thirsty, there was not a wrinkle in the waistline of any of them, and when the waiter gave them the check I happened to notice as I turned around that it totalled $42.00—$42.00 for four suppers. Whereat I was reminded of that association in this country that will clothe and nurture and nurse a Belgian baby a whole year for $36.00. How much do you suppose that type of people have ever given to the Belgian Relief Fund? How enthusiastic do you think they are about the Red Cross, the Y. M. C. A., the Knights of Columbus or anything else? I was ashamed of them. You have such people in St. Louis—we have them everywhere.

I so firmly believe in the influence for good along safety lines which can and should come from our home that one of my annual stunts is the taking of a picture show over our line which takes up every night for four months, my one object being to get the safety propaganda before our women folk, as I speak of them. It means a great deal more to the wives, or mothers, or children of working men than it does to the husbands or the sons or the brothers themselves whether that male member of the family is incapacitated or meets with an accidental death, because in the case of the man his hard knocks, his griefs and worries are all behind him, but those of the wife and family are all ahead of them.

We know of so many cases where disastrous wrecks and loss of life have come about which were all traced directly to an unpleasant scene just as the man left home that morning or that night, and where the

man was worrying, perhaps about his own conduct, perhaps about that of his wife! I say very plainly to the wives of our 75,000 men that no railroad man's wife has any business to live with him and quarrel with him. No man is in a condition of mind to give safe and satisfactory service who is worrying about some condition in his home, and no wife ought to let a man leave home with anything on his mind other than the work he has to do.

PERSONAL TESTIMONY

I had a lady come up to me a few months ago at one of our picture shows and say: "I want to shake hands with you. My name is Mrs. So-and-So; I am the widow of a Santa Fe engineer, and by a very strange coincidence he lost his life just seven years ago tonight. Very strangely, too, he died within an hour of this time." I told her I was very sorry to know of her loss, that the object of this picture show was to spare some other woman what had come to her. She told me she knew beyond a shadow of a doubt that her husband had lost his life because of his failure to know what he was doing. She said: "Worse than the thought that I know he might have been here today, worse than the loneliness which I have suffered during the past seven years, worse than the privations and hardships I have suffered because in those years, and I have been both cold and hungry, the most disturbing thought I have is that the man in whom I put my confidence and trust wasn't worthy of it."

I had an engineer come up to me a few weeks ago and he said: "Hale, I am glad to meet you; every time you have been here on previous trips I have been out on the line. I laid off tonight and missed a trip because I owed you something and I wanted to pay it to you." I told him it was a wonderful experience to have anybody owe me anything and much more so to have him chasing around and wanting to pay it. Do not misunderstand me; in relating this incident I do not want to appear as taking any credit personally; whatever lesson was taught was taught by my pictures. During the showing of this film I laid particular emphasis on the home influence. Continuing he said: "I just wanted to tell you that when you came here six or seven years ago with your first picture show my wife and I were not living very pleasantly together; in fact, we had talked separation several times, but our four children seemed to be the magnet that held us together. She went to the picture show with some friends and neighbors and when I came in the next morning I dropped my grip on the kitchen table and said, 'Good morning, Helen.' and she said, 'Good morning, George,' that being about as close as we ever got. I passed on into the bathroom to shave and was nearly finished and looking up into the mirror I saw her standing in the doorway behind me. I did not say anything and she stood there two or three minutes; finally she walked in, touching me on the shoulder and turning me around said: 'George, I learned something last night, something I never knew before. I want to tell you something; as long as you run a passenger train, as long as you hold in your hands, every day, the lives and destinies of scores of other people, you and I are going to live this life the way God intended we should live it. I come to you this morning very humbly

to tell you I am ready to meet you a little bit more than half way to bring that about.'" And he added: "When she said that I reached out and put my arms about her, the first time I had done such a thing for ten years. What I owe you is the very simple statement that during the years which have passed since that time neither my wife nor I have ever said a cross, hateful word to each other. It has not only made the most wonderful difference in my home, but I can see it reflected every day in the lives of my children. Sometimes I shudder when I look back to think of what my boys and girls would have become, being raised in an atmosphere of wrangling and arguing, as we started them off; they never could have come to any good in this world! Now we are raising them in an atmosphere of what a home should be, and when they have grown to young manhood and young womanhood and go out into the world, they are going to at least have a chance."

You might be interested in knowing that I have talked in the last couple of years to every school child above the third grade in every town of any size in the thirteen States traversed by the Santa Fe system; you might be interested in knowing that I have since received about 1,600 letters from boys and girls all over the country, and they are the most wonderful collection of English literature I think I ever saw.

FIGHTING FOR A GREAT PRINCIPLE

Here is the whole war proposition in a nutshell. You ladies, I feel sure, will bear with me a moment to let me tell a story which I think illustrates our personal responsibilities in the war, which so few of us seem to realize. It is a little story having to do with a meeting of the loan committee of the Bank of England. A motion had been made that the bank loan the English government a certain sum of money. One of the members got up and said: "I don't want to appear lacking in patriotism or love of country, but in view of the large sum of money we have already loaned the English government, in view of the questionable character of our security I do not think it would be a prudent or wise thing for this bank to loan the English government any more money, because, in the event the Allies should lose the war, will one of you gentlemen tell me what would happen to the Bank of England?"

It was answered by a very dignified old fellow—a high churchman—who arose (it was plainly seen he was very much agitated) and who said: "My friend, I would like to answer that question by asking you another one. I wish you would tell me, in case the Allies lose the war, what in hell would be the difference what happens to the Bank of England?"

If we know anything at all, we must know that if Germany wins the war the American people are going to be the particular objects of their spite and venom, and your imagination of the worst that could possibly happen to you is going to be a lot better than you are going to get. In conclusion, I have been telling our men of another incident: A friend of mine in Topeka who employs a large force of men told me the other day that one of his employes came up to him and said: "Mr. Mac, I want to get off to go to Kansas City." He said: "Joe, we are

very busy just now, can't you wait a little while?" "No, I have got to go tomorrow." His employer asked him if it was a matter of pleasure or business, to which the young man replied: "Well, I am going down to enlist." His employer said: "Joe, the government has put in motion machinery that will get you when they want you. Why don't you wait until you are called?" He said: "I can't wait! I've tried to, but, Mr. Mac, every boy friend I have is either in France or in some army camp getting ready to go. I know some of those fellows are 'going west,' are going to make the supreme sacrifice; I know other of those boys are going to come back with their arms or legs shot off or their eyes put out, but I am looking to the day when one of those fellows will walk up to me and say: 'Joe, tell me something. What have you been doing for the last couple of years?' and I want to be able to stand up and look that boy in the face and not be ashamed to tell him what I *have* been doing.'"

I say to our men "When your boy friends, or your neighbors' boys come back and ask you what you have been doing the last couple of years, I beg of you not to say: 'I was working in the Santa Fe shops or yards, but I did some very thoughtless thing and went to the hospital and stayed for several months and while you were going through hell for me. I quit you cold and did nothing at all for you."

Good-bye and God bless you.

LOVE AND MUTUAL UNDERSTANDING

CHAIRMAN MCMILLIAN: I am sure we will take away Mr. Hale's message of love and mutual understanding. I am sure if we can follow his example in our homes we can do it wherever our real work may take us. It is the thinking that makes it so, and if we get down into the uttermost depths of our conscience we are bound to make sacrifices.

I heard an English woman talk on conditions "over there" and she said they say to the women: "Our boys stick, so you too must stick." I am just as sure that the women "over here" will stick to the jobs that they find for themselves to do. If it is necessary for the women of this country to man the ammunition factories or mines we will do so, we are no better than our sisters across the seas.

Ladies, in the name of the Safety Congress, I am appreciative of your coming here. I am sure that we owe a debt of gratitude to the men for asking us to attend and learn the ways in which we can best serve our country. When the times comes if we are needed to man the trenches we will answer.

The meeting then adjourned.

Gasoline Explosions

Gasoline gives off vapors at an ordinary temperature which are heavier than air and therefore settle near the floor. Opening a window will not always remove such gases. When these gases, in quantities from 1¼ to 6 per cent, become mixed with the air a violent explosion may occur if a spark or flame is brought near. Therefore, the great danger of cleaning garments with gasoline in the home. If done, the rooms should be thoroughly ventilated and kept free from sparks or flames. Even the friction on the clothing may generate a spark which will cause an explosion. Gasoline should never be stored in the house even when contained in safety cans. The can should always be plainly marked "Gasoline!" The use of gasoline in stoves is so dangerous that the government in a recent report recommends kerosene and other forms of fuel as a substitute. When used the tank should never be filled while the stove is in operation. Running an engine in a garage is liable to generate a deadly gas which often causes sickness, and may cause death. Recently a prominent actor died from this cause. Handle gasoline with the same care as gunpowder; it is a dangerous explosive.

Industrial Division, Automotive Section

St. Louis, Mo.

1917-1918

Sept. 20, 1918

W. E. WILLIAMS, Chairman
Safety Engineer, United States Explosives Plant "C," Nitro, W. Va.

M. BARRATT, Secretary
Michigan Bolt and Nut Works, Detroit, Mich.

FRIDAY MORNING SESSION

CHAIRMAN WILLIAMS: The Automotive Section of the National Safety Council will please come to order. The by-laws require that your Chairman make a report of the past year's activities and with your permission this will be the first order of business.

REPORT OF CHAIRMAN

To the Members of the Automotive Section: The end of our year's organization work has arrived and I may state that very material changes have taken place during that period. In the automotive, as well as other industries, great changes have taken place and we all have had to do our level best to keep down accidents, thereby retaining the men on the job to produce the necessities that Uncle Sam requires. I trust that the officers for the coming year will carry to a successful conclusion the work that has been started.

I am no longer with the automotive industry, but am connected with an industry that is trying hard to produce the necessary material to subdue the "Beast of Berlin"—getting powder to our boys, who know what to do with it and how to get the best results with what we can supply.

After the war I shall probably again become a member of this organization and feel once more at home among the many friends I have made in this industry.

This Section must, of necessity, become a vital one in the organization of the National Safety Council, owing to the fact that the industries you

represent are very necessary ones and are required in peace times as well as at the present, when we are required to do the exceptional—and are accomplishing it.

May we all go away from this Congress knowing that our plans for the future extension of safety work will receive due attention and that next year will be a time of wonderful accomplishments along safety lines.

REPORT OF SECRETARY

SECRETARY R. R. RAY: Throughout the year the work of this Section has been followed closely, the result being that this Section shall, with your approval, be required to embrace the following industries: Automobile manufacturing, airplane manufacturing, airplane engine manufacturing, gas engine manufacturing, gas engine parts manufacturing, and tractor manufacturing; in fact, all self-propelled vehicle manufacturing.

Your Chairman corresponded with a number of automobile manufacturing establishments throughout the country and as a result a few have decided to attend this Congress and others have signified their intention to become members of the National Safety Council.

General Manager Cameron has been furnished with a number of photographs which will be utilized in the bulletin service, due credit being given our Section. Two hundred bulletins have been sent to prospective members and a list of prospects forwarded to Council headquarters.

The Automotive and Car Builders' Sections have been grouped as one body, as you will see by your program, but, as you no doubt know, each Section will retain its own committees.

REPORT OF STANDARDIZING COMMITTEE

Gentlemen: Your committee has given serious thought to the matter of standardizing accidents, so that the data collected could be used for comparison purposes. The primary idea of standardization is assumed to give the following information:

(1) Where industries working along the same lines, and manufacturing the same product in detail, have access to records of other companies, suggestions could be given by the various companies as to how they reduced accidents along certain lines.

(2) By classifying accidents under various headings. This data could be furnished by all members of the Automotive Section, stating just how certain types of accidents had been prevented, thereby giving the other companies the benefit of their experience.

(3) Comparative methods would be exchanged, to the benefit of all concerned, as to the reduction of premiums paid to insurance companies and also reductions in state compensation paid.

(4) Would it not be advisable, at this time, to take up the matter of standardizing and make a definite basis upon which lost-time accidents could be prepared; two or three companies co-operating along these lines could, no doubt, furnish very valuable data.

Your committee has, as a starting point, put forth this tentative plan,

that all accidents shall be classified as follows: (*a*) Serious; (*b*) semi-serious, and (*c*) minor.

(*a*) Serious accidents shall be known and classified as such when the injured person receives compensation after the ten-day period.

(*b*) Semi-serious accidents shall be known and classified as such when the injured person does not lose less than twenty-four hours and extending over a period of ten days.

(*c*) Minor accidents shall be known and classified as such when the injured person does not lose more than a standard working day or a period covering not more than twenty-four hours.

If this plan, with modifications, can be carried into effect it will mean the standardization of data to such an extent that all automotive plants can secure reliable comparative data and ascertain whether or not their plant is being run on an efficient basis from a safety standpoint.

At present there is considerable controversy over comparative accident statistics and nothing definite accomplished toward getting a real standard basis on which to work. It is idle to say that one plant has a low record and another one that is considerably higher. This condition will exist until we arrive at some definite basis upon which our work must be standardized; therefore, you can readily see the necessity of putting this data on a thorough business basis. Respectfully,

W. E. Williams
R. R. Ray
F. F. Wells

APPOINTMENT OF NOMINATING COMMITTEE

Chairman Williams: The Nominating Committee will consist of the following members. They will report to the Section later:

Mr. J. R. Anderson, Michigan Mutual Liability Insurance Company, Detroit, Mich.; Mr. E. F. Blank, Safety Engineer, Buick Motor Car Company, Flint, Mich., and Mr. Wm. V. Urquhart, Michigan Bolt and Nut Works, Detroit, Mich.

The first subject on our program, a paper by Mr. Briggs, will now be presented.

MACHINE SHOP LAYOUTS AND THEIR RELATION TO SAFETY

C. A. Briggs, Safety Engineer, Willys-Overland Company, Toledo, Ohio

Mr. Chairman and Members of the National Safety Council: In the preparation of the paper we have had in mind machine shops used in plant production, rather than those used for ordinary plant repairs. In keeping within the time limit we will not be able to discuss in detail the many phases of this subject—for those wishing a more complete study of the question, a short bibliography is attached.

A safe machine shop layout must be preceded by a safe room or building. The modern machine shop is of the one-story, saw-tooth-roof type,

of fireproof construction, adequately ventilated and heated, with complete sanitary toilet facilities and hot and cold water for washing purposes. It has much natural illumination and provisions for proper artificial illumination, pleasant plant surroundings and a safe approach for employes.

Some of us are fortunate in having this ideal equipment, others have far different conditions to contend with, but all are able to press toward the mark and hope to finally make our machine shops "ideally safe for safe men."

In every type of building or room used we should provide safe exits with respect to machines, groups of employes and acute fire hazards. Windows should be so arranged as to be easily cleaned, both inside and and out—the outside should not be left entirely to the elements. Some serious accidents have occurred through allowing latch rods of first-story windows to obstruct outside passageways, and the hinging devices of metal windows should be of such construction as to prevent danger of the frames falling out when carelessly closed or opened by employes. Window frames of the second story should be of a safe height or protected, in case employes use the window sills for seats or on which to place objects which may fall and injure those below. Window glass should be chosen with reference to the fire hazards surrounding; wire glass is preferable; the upper sashes may be of ribbed or opaque glass with clear glass on the line of vision.

DOORS, STAIRS AND FLOORS

Safe floors are as important in the machine shop as safe machines. A broken, slippery, obstructed or uneven floor is an accident maker. Efficiency in trucking and handling materials demands sound floors. Modern machine shop managers will give careful attention to State safety laws requiring safe floors. The National Safety Council in its "Safe Practices—Floors," gives the following requirements:

"(*a*) It should be smooth and free from nails, bolts and other projections; also from holes and splinters. (*b*) It should be dry, of low heat conductivity, durable and easily cleaned. (*c*) It should be constructed strongly enough to bear safely at least four times the static load, and six times the moving load which may be placed on it. (*d*) It should be as nearly noiseless as possible; a noisy floor may wear well, but the noise of feet, trucks and machinery has an irritating effect on workmen. (*e*) It should not be slippery, nor made of material which will wear slippery."

To prevent accidents all floors should be kept in good repair. A small hole in a floor, a board allowed to project above another, a weak manhole cover, oil on the floor—particularly near dangerous machines—are all hazards that may cause serious injury to workmen. The maintenance of floors, where heavy duty and continuous service is required is a serious problem. In one of the International Harvester Company's plants an excellent idea for repairing a worn floor has been worked out. A strip wide enough for two trucks to pass is cut from the old floor; a strip is laid down through the center and then diagonal flooring is laid on either side, forming a herring-bone aisle. A diagram of this plan is given in the April (1916) number of *Factory*.

CONCRETE FLOORS

Concrete floors are growing in popularity for factory use. As a rule, little objection is found. In basements, where dampness is liable to occur, it is said that if a petroleum residuum oil is mixed with the concrete, the floor will remain dry. If a concrete floor "dusts," one or more coats of one of the several preparations now on the market will bind the surface.

Men standing for long hours at machines or benches sometimes complain that concrete floors are hard on their feet. This condition can be corrected by providing mats or low wooden platforms for the workmen to stand on. These, however, may provide a tripping hazard and, where possible, these platforms should be made flush with the floor. There are a number of composition flooring surfaces now on the market which provide an easy walking base.

ILLUMINATION

We naturally approach the subject of illumination with some timidity. We quite recently attended a two-day session of the Industrial Commission of Ohio on "Factory Illumination," where experts from far and near were called to formulate a set of rules governing lighting. They failed to agree, notwithstanding the fact that they were handling "a light subject."

There are, however, general rules which we may safely follow and leave the more technical side to lighting experts. The first necessity in lighting, whether natural or artificial, is that it be sufficient. We should first adopt all possible means to use every bit of daylight available, and sunshine too, where it is not objectionable, for as the proverb reads: "Where the sunshine does not enter, the doctor does." Window shades should be placed where the sunshine would strike moving parts of machines and cause discomfort to workmen by reflection or glare. If practical, machines upon which particularly careful or dangerous work is done should be placed where there is good natural light. Walls and ceilings should be painted and maintained white, in order that they may reflect, rather than absorb the light.

Work benches will be found vastly more convenient and workable, if, instead of being placed parallel to the windows, as is usual, they are placed at right angles to them, so the light will reach the men from the shoulder in preference to directly in the face. In placing the benches at right angles to the windows, the danger from collision with passing trucks will be avoided and more working space assured.

In selecting the type of illumination some consideration should be given to the ease with which lights, globes, etc., may be kept clean or renewed. Individual drop lights should be shaded, as well as protected by a wire cage against breakage. The proper degree of light should be scientifically determined and maintained through careful inspection by a lighting expert. This will correct conditions recently noted. A workman was discovered using a light globe of immense proportion and wattage, suspended directly in front of his eyes. When questioned he tried to justify his possession of the light by saying "he had so many

small ones stolen that he finally succeeded in finding one that was so large that it could not be taken away."

HEAT AND VENTILATION

The heating and ventilating of a machine shop is a problem that should be carefully considered. This much can be said, in general: A system should be installed that guarantees an even temperature, with freedom from vitiated air and an avoidance of drafts. Steam heat has been found practical; place the radiators next the outside walls, and where the room is extra wide or in case of a saw-tooth roof, overhead to avoid obstructing floor space.

GUARDS FOR NEW MACHINERY

A long step toward making the machine shop a safe place to work will have been taken when we have brought the makers and designers of machinery into the safety camp. They are the outlaws of today. Machine builders say: "Why should we spend money to place guards on our machines when we can sell our products without guards faster than we can make them." It is very significant, then, that we must compel them to conform to safety requirements. The open door for the safety engineer is right here; if he has not entered and placed himself on record as strenuously opposed to the manufacture or sale of dangerous, unguarded machinery, he is not living up to the ideals of his profession.

The National Safety Council recently sent out a questionnaire seeking data on this interesting subject and we trust that ere long manufacturers will have brought themselves to the point where they will *think safety* when constructing dangerous machines.

It seems unnecessary to state here that exposed gears should be guarded "wherever located" and if there should be any priority rule as regards location we would say from recent accident experiences "That exposed gears and set screws that are up and out of the way where nobody ever goes" should be guarded first.

The old types of lathe dogs should be replaced with the safe ones that are coming into general use. Milling machines are responsible for a great many painful and serious accidents, but there are guards now on the market that protect the cutters. A larger part of the hazard peculiar to these machines may be eliminated by setting up the job so there will be a safe clearance between the cutters and the table or bed of the machine.

Particularly dangerous machines or those from which dust, fumes or vapors may arise should be isolated, if possible. Grinding wheels should be located with respect to the plane of rotation and employe or groups of employes.

When locating machines, care should be exercised to have production and routing worked out so as to reduce the handling of material, both the raw and finished product.

POWER

In the matter of power transmission more can be said on the side of safety for individual motor drive equipment than can be credited to

methods of using overhead shafting and belting. The first cost is higher for the former method, but in the long run the added cost is an asset, as the dangers from oiling and caring for overhead shafting are eliminated, as are belts and pulleys for individual machines. Another asset is the reduced cost of maintenance, as any machine may be stopped or started irrespective of another, whereas, in the large-group system of control, the same amount of power is required, regardless of the fact that but a few machines in the room or department may be in operation. In our own plant, during the past year of rapid change to a war basis, when many departments were created and some depleted, we presume that the saving in electric current alone would have gone far toward making up the difference in cost between these two systems.

With the transmission of power by overhead shafting and belts, considerable can be accomplished for safe operation in the method of installation. Driving and other swiftly moving belts should be guarded and motor platforms should have safe access, with room enough, so the electrician will not be compelled to hurdle motors or belts as he pursues his dangerous calling.

Self-oiling bearings so equipped that they may be maintained from the floor by use of long-necked oil cans is another good practice. Of the different kinds of bearings—ball, brush, ring or roller—we find a decided difference in opinion among shop men as to service. It is best, however, to have standard equipment, so the oiler's hazards will be minimized.

If the group method of control is used, the units should be as small as possible in order to keep the control within easy reach in case of an accident. It is possible, with this arrangement, to shut down a small group for any purpose, thus saving wear and tear on the main shafting and belting. Where a whole system is under one control, employes are prone to take long chances in doing emergency work, such as repairing belts, etc.

GENERAL

In the transportation of material we find a very difficult situation in the ordinary machine shop. Careless loading and overloading seem to be the most frequent accident sources, and constant oversight is necessary to correct this. Plenty of trucks should be provided, so that men will not be tempted to overload, and in order that stock may be moved from aisles and passageways. Aisles should be laid out with generous width, so trucks may pass without danger of collision or foot passengers endangered. A good plan is to paint a safety line on the floor to insure plenty of aisle clearance.

Where extra heavy work must be transported some distance through a department, traveling cranes are of great value; where this expense would not be justified, a monorail system might be employed. Small jibs with chain hoists at individual machines are desirable and necessary for the safe and ready handling of heavy work and a conveyor system is often used between machine groups on continuous operations—this is a safety asset as well as a production booster.

From the standpoint of good housekeeping, maintenance storage racks,

properly placed are of value, and a large, orderly toolroom, centrally located, is one of the necessities of any machine shop.

Finally, when we have gone the second mile in our observation of every known safety law, no matter how stringent they may be, we have still with us the largest, most complex accident provoker of them all—one that no state or local law has been able to curb and no mechanical guard can ever cover. We refer to the careless workman—the man who wagers his finger against a movement of time—and loses.

The essentials, then, for a safe machine shop layout are these: Practical education of employes, well-guarded machinery, careful inspection and maintenance of all safety devices, and *eternal vigilance* as the working motto of every man.

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DISCUSSION

MR. CASE: In the installation of machinery the safe floor load should be adhered to and the architect be required to furnish the necessary data.

CHAIRMAN WILLIAMS: Would it not be advisable to have a competent safety engineer check up the floor section, material, etc., and determine —*before* the plans are accepted as final—what the safe floor load shall be. The safety engineer is not going about his business thoroughly when he allows plans to pass him, and allows changes to be made, especially when these changes are necessary to the safety of the plant and its employes. Conditions which can be made safe before the plant is put into operation should by all means be taken care of.

MR. WELLS: Machinery installation, stock piling, etc., should be given special consideration when buildings are designed, owing to the excessive strains set up in the various members of the building. Aisles should be planned and consideration should be given for sufficient room for employes to pile their stock so that they will not have to encroach on the aisles.

CHAIRMAN WILLIAMS: Our next topic is very important. I am sure it will be carefully followed.

SAFE PUNCH PRESS OPERATION

W. W. ROACH, AMERICAN BRASS COMPANY, BUFFALO, NEW YORK

Mr. Chairman and Members of the National Safety Council: The working and shaping of metals by means of dies and presses has become one of the leading industries of the United States. Indeed, many industries not entirely devoted to the output of pressed steel parts have certain processes performed by presses in the output of their products. Shell cases, hardware supplies, cooking utensils and parts of automobiles, sewing machines and typewriters, as well as numberless other articles, are productions of press work.

The forming and shaping of automobile parts by the aid of presses and dies is an operation with which the members of this Section are familiar. The economy and practicability of substituting light and strong pressed steel products for heavier castings and forgings has been recognized by motor vehicle manufacturers and the uniform, rapid and cheap production afforded by the use of presses will be utilized to the limit in our business of making munitions.

As the importance of presswork in industry grew, so did the recognition of the hazards involved in the operation of presses and the efforts to remove or lessen them. In the modern pressroom severe injuries have been well nigh eliminated, at the same time demonstrating the fallaciousness

of the theory that safety methods slow up production. In this connection can be mentioned a press department which increased its products 40 per cent and during the same period reduced its accident severity 75 per cent.

ELIMINATING CUTS AND LACERATIONS

To consider properly the subject of safety in the operation of presses, it may be well to mention first the general arrangement of the pressroom. Good lighting conditions are of primary importance and should always be considered when locating presses. If artificial illumination is used the lamps should be so placed that the light will strike upon the dies. The layout of presses, so that each operation can be performed progressively, will make for safe operation as well as for greater production. Mechanical and gravity conveyors for moving material, parts and scrap eliminate one of the chief hazards in the pressroom, namely: Cuts and lacerations due to handling sheet metal and stampings.

How shall presses be operated so as to insure safety to the operators? The answer can be found in (1) The installation and use of mechanical guards: (2) The introduction of safe practices in the operation of presses, and (3) The education of press operators in the safe way of doing their work.

MECHANICAL GUARDS

The first safety efforts in the pressroom should be directed towards providing every possible safeguard for each press. The drive pulley, clutch and fly-wheel should be completely guarded, together with all gearing. The treadle rod, treadle or tripping lever should be enclosed or guarded in such manner as to prevent the press being operated by any other than the operator's foot or hand. On large toggle presses runways with railings should be provided, so that necessary oiling may be done in safety; counterweights should be guarded.

With the working parts of the press properly guarded, attention should next be given to the guarding of the danger zone in which the operator's hands are placed when inserting or removing work. Such a guard must be: (1) A positive safety device; (2) capable of keeping up the usual production, and (3) operated without unusual exertion on the part of the operator.

Patented guards have been placed on the market with claims of accomplishing these things; no doubt you are familiar with many of them. It may be well, however, to mention one or two features of automatic guards. An automatic guard to be positive in its action should be operated by the downward movement of the ram. Guards which operate by the action of the clutch or tripping lever are not always positive, as it is possible for a loose brake to allow the press to repeat or the ram to drop down. Electrically controlled presses, which are operated by push buttons—a connection having been made before the press is tripped—give satisfactory results on larger presses or on toggle presses, especially where a helper works at the back of the press. Mechanical tripping devices are advantageous if the work can be adapted to their use.

On jobs where dies do not have to be changed frequently (where the

output of the press is standardized), it is possible to construct fences of expanded metal, lath or wire mesh around the dies, allowing just enough opening for placing the work. On presses which can be inclined for removing pieces, such guards make the press fool proof and absolutely safe.

An important safety device is a cam or ratchet, keyed to the shaft at the side of the brake. A dog fastened to the frame of the press operates over this cam in such a manner as positively to prevent reversing or "dropping back" of the ram. Such an occurrence may be illustrated by the case of a die setter who was wiping a die which had just been set. Although the belt had been thrown off, the pulley and the treadle properly blocked, the ram dropped down, catching the die setter's hand between the two dies. Even though rare, such happenings must be guarded against.

SAFE PRACTICES

Closely following the mechanical guarding of the presses should come the introduction of safe practices and in a number of instances safeguarding and safe practices may be carried on simultaneously.

Dies should be so constructed as to give the maximum amount of safety to the operator. This is an important factor, for it is often possible, with a few minor die changes, to transform a dangerous operation into a safe one. All unnecessary metal on dies, strippers and punches should be cut away, thus affording clearance for the operator's hands and fingers. A collapsible guard should be installed for all dies which have guide pins, so that the pins will be entirely enclosed

One of the greatest agents in keeping the operator's hands out of the danger zone is the revolving or dial feed. Instead of placing the work on the die with the fingers, the work is dropped into receptacles in a dial. At each stroke of the ram the dial is automatically revolved, placing the work in proper position on the die. Not only does such a device insure safety to the operator, it increases production. Another safe method of feeding presses and increasing production as well, is by the use of chutes. The piece is placed in the chute, and is moved toward the die by the piece following it until the end of the chute is reached, when it falls onto the die as the chute is inclined, which facilitates the feeding of the pieces. The piece is either drawn through the die after the operation or is ejected by some other means.

In a pressroom doing a great variety of work, there are many operations for which no safety devices may be efficiently used. Where such conditions prevail and the operator's hands or fingers would otherwise be placed within the danger zone, especially constructed pliers or tongs should be used for inserting or removing work. Here, again, one may hear the old complaint—such a practice would cut down production. Experience shows, however, that after a brief period of readjustment, production will be as great if the work is placed on dies with pliers instead of using the fingers or hand. By contructing the handles of pliers after the fashion of scissors, their operation will be facilitated, and, by bending and forming them, tongs and pliers may be adapted to a wide variety of jobs.

USE OF VACUUM CUPS

Another safe way of placing and removing work is by means of a vacuum cup arrangement. The cup is made of rubber and is attached to a small piece of pipe, the pipe being connected with a hose to a suction system. This method, however, is best adapted to the feeding of flat pieces. A somewhat similar method is the use of compressed air for removing light work, the air blast being timed with the operation of the press.

Presses operated by foot treadles should have wooden blocks of proper height which can be placed beside the treadle. These blocks afford convenient places for the operators to rest their feet, and can also be used for blocking treadles when dies are changed. For convenience these blocks may be attached to the bottoms of presses with small chains.

The handling of sheet metal, while not a press hazard, yet is so closely associated with the operation of presses, and is such a frequent cause of injury that it is worthy of attention. The wearing of gloves should be made compulsory for operators, helpers and all employes whose duties require the handling of sheet metal, stamping or scrap. Under such a rule gloves should be furnished at cost price—an equitable and popular method would be to charge the employes 50 per cent of cost price, the company and the employes thus sharing equally in the cost of the protection they both receive. A leather-faced glove can be purchased at the present time for 30 cents per pair; gloves of this type are cheapest in the long run.

When women are employed in pressrooms they should be required to wear approved types of protective clothing: caps which will cover and retain the hair should be worn by them at all times while at work. The wearing of bracelets, wrist watches and rings by women employes while at work should be discouraged if not prohibited.

SAFETY EDUCATION

After guards have been installed and safe practices introduced there still remains a task which is at once most necessary and difficult—education of the employes. Unless proper educational methods are undertaken, guards will be unused and safe practices discarded. Out of a mass of ways and means of education and safety propaganda, five things which seem indispensable in the education of a press operator in the safe way of doing his work stand out:

1. The employment of a capable safety inspector, who shall devote his entire attention to the press department. This inspector should thoroughly understand presses and press operations and possess qualities which a former training as foreman in a pressroom would give him. The duties of the inspector should be to see that all guards and devices are in good working order, and that they are used wherever possible; to inspect presses for defective working parts, to instruct all operators in safe ways of operating presses, and to devise and suggest new safety methods.

2. The co-operation and support of the superintendent and foreman of the press department must be obtained. In rare cases pressure must be applied by the management to a recalcitrant foreman, but it may be that this method is too frequently used. Outside of humanitarianism, several effective appeals can be made to the foreman—one is that a desirable quality of foremanship looked for by the management is ability to present a low accident rate; another is to translate days lost on account of accidents into item of production. In a department where there are several foremen, competition properly stimulated for low accident rates among their men often works well.

DISCIPLINE

3. Discipline is indispensable. Press operators who will not follow the safety directions of the safety inspector or foreman should be disciplined either by layoff or discharge. As a matter of fact, one or two examples of proper discipline are usually sufficient. If, at the beginning of their employment, press operators are impressed with the fact that safety is a fixed policy—that work shall be done in no other than the safe way—there will be little need for discipline. In this connection a plant employing 200 press operators can be called to mind; during two years of enforced safety and safe practices in press operation only one case of discipline (a five-day layoff) was needed.

4. Bulletin boards, with special bulletins picturing the hazards of the pressroom and how they may be avoided, are necessary. Bulletins on other subjects should be used, but the feature which should be played upon is the safe operation of presses—the right and the wrong ways of doing pressroom work.

5. The last, but not the least important, thing which seems to be indispensable in the education of press operators is a training school. In a room separate from the press department could be placed several different types of presses, on which all new employes could be given instruction. Such instruction would necessarily be simple and rudimentary—the purposes of dies and presses, the practices involved in blanking, stamping and drawing, and, of course, actual operation of the presses. In such a school the importance of safety in press operation could be properly impressed, for it is at the beginning of the term of employment that an employe is in a most receptive state of mind and can easily be taught the right way to do his work—which is always the safe way.

DISCUSSION

MR. CASE: Mr. Roach has opened up a question of real importance. I would like a little more detailed information regarding the nature, the control and the material of these guards.

MR. ROACH: The guard I refer to is one that is manufactured in Great Bend by the Koehler Brass Company. It is a little better than is required for our type of press.

MR. CASE: Do you mean that it is necessary for the operator to keep his hands on this piece all the time?

MR. ROACH: Yes, all the time the operation is being performed. When we started the blanking operation we found that by a certain construction of dies we could do the job in a certain way. Three or four of our men then got busy trying to devise ways for performing the operation with safety. There are, of course, some hazards that cannot be guarded against. However, we have had no accidents in three years. Our safety inspectors are on the job all the time.

MR. SHAW: It seems to me that by supplying the operator with gloves with the tips of the fingers cut off, we could cut down the number of accidents. In one plant where this has been tried out, the following figures show the results: In the six months previous to the adoption of this plan press accidents cost $5,000; during the six months following the cost was $3,000; in the next six months this was reduced to $1,100. This record of eighteen months' work speaks for itself.

CHAIRMAN WILLIAMS: Have you had actual experience in press work where you have had to use hot metal in drawing operations?

MR. BRIGGS: It has been proved that gloves are a necessity; when used in connection with hot metal they should be fireproof.

FIREPROOFING COTTON GLOVES, APRONS, ETC.

CHAIRMAN WILLIAMS: I have a formula for fireproofing gloves. It is as follows:

"Prepare a solution of sodium stannate having a density of 45 degrees TW. Immerse gloves, aprons, etc., until they are absolutely impregnated; when removing same from the solution, loose wring them, and then let dry. When thoroughly dry immerse them in a solution of ammonium sulphate having a density of 15 degrees TW. Wring and dry."

This method of treatment will hold its fireproofing qualities for a considerable length of time and gloves, aprons, etc., may be washed two or three times before receiving another treatment. The cost, you will find, will be comparatively small.

The next subject will afford you a real chance to unburden yourselves of a favorite bugbear. I shall ask Mr. Livingstone of the Reo Motor Car Company to address you.

NECESSITY OF INSPECTION FOR OVERLOADED FLOORS

D. R. LIVINGSTON, SUPERINTENDENT, SAFETY DIVISION, REO MOTOR COMPANY, LANSING, MICH.

Mr. Chairman and Members of the National Safety Council: So much could be said in regard to the necessity of inspection for overloaded floors that it would not be practical to go into the subject in detail; rather I will confine myself to a description of what I think is the most practical way to inspect for overloading.

Architects differ as to what makes the safest and best floors. Some

say reinforced concrete, others steel construction, etc., but all of us do not have the latest types of buildings; therefore, our inspections differ somewhat. Also the necessity of inspection varies and we have local conditions to contend with.

In my case I have adopted this method of inspection for keeping the floors from being overloaded: The time to inspect for overloaded floors is before they become overloaded. I find that this system works very satisfactorily by giving each foreman a chart telling him the safety factor of the strength of the floor, so that he knows what each floor under him can hold. Then have signs suspended from the ceiling by wires, or some other convenient method, placing upon them the strength of the floor in that particular room, so that anyone placing stock or machines will know at a glance the capacity of the floor. I follow this up by safety inspections and if we find a floor loaded beyond the weight designated the man in charge of the stock, or whatever the case might be, receives a written notice to remove the stock at once. He is given a time limit to do so. We stay right with him until he obeys the order.

NECESSITY FOR CONSTANT INSPECTION

In these pressing and abnormal times the necessity of inspection not only for overloading floors, but on everything, becomes greater, and should be more frequent. With our machines taxed beyond their capacity they give us greater risks than ever and the men that run the machines are putting every drop of energy into their work. They are doing their share to win the war and the work of the safety man becomes greater because of the risks. Things we thought in normal times were within our control have gotten beyond us and we have to put forth every effort to cope with the situation. Therefore, I say the necessity for inspection for overloaded floors becomes greater. The necessity of inspection of everything becomes a big job.

I thank you for your attention and I hope that we will all go home from this convention bigger individuals, because we have big jobs to do and because it is behind the industrial lines that the big work needs to be carried on. It is up to us as safety engineers and safety inspectors to protect and help those splendid fellows who are giving their lives to make the world safe for democracy.

DISCUSSION

MR. SANFORD: The General Electric Company uses a system whereby the company architects checks the floors and notices are posted giving the safe loads for each.

MR. ANDERSON: Why not make the assistant foreman responsible for floor loading?

MR. SNYDER: By having it understood that the assistant foreman is to be held responsible for the floor loading, the general foreman is able to attend to his other duties. Since it is necessary to place the responsibility somewhere, my idea is to drill it into the assistant foreman that he is to be held responsible.

MR. LYNCH: It is not possible to reach every man in some plants and you could not teach some of the foreign element what you mean by overloading floors: in fact, if you want to keep them from overloading floors you will have to build barriers so that they can only pile material the proper height or else place some one over them so that they are properly looked after.

CHAIRMAN WILLIAMS: The next subject is one I have often thought over. It will be presented, I am sure, in a manner that will reach each and every one of us so that we can put into practice some of the vital points.

SELLING SAFETY TO EMPLOYES

J. J. LYNCH, CHEVROLET MOTOR COMPANY, NEW YORK CITY

Mr. Chairman and Members of the National Safety Council: There is not a man, woman or child in this country who has not heard at some time or other the slogan Safety First. They've heard it or read it time and time again in the factories, schools and in the newspapers. The slogan has done its work and now seems to be losing its effectiveness. The mind of the average worker is in a state of apathy—as far as safety is concerned—it seems to have reached the point of saturation. Our ordinary methods of pushing this work are not giving the results which at this time are so necessary.

The worker knows that you have a safety organization, he sees (not preceives) your bulletins, he will admit that safety is a good thing, he looks on your industrial statistics with the same cold, non-reacting spirit he regarded the casualties of European nations and great national catastrophies here in his own country. He continues to act, plan and scheme as if he was going to be here as long as this earth exists. He admits safety work is good; he'll help you in a passive way, but safety is not for him, that's for the other fellow.

The safety engineer today has a harder proposition to interest the employe and arouse enthusiasm than he had some years ago, because of the large influx of new men and girls and because the old-timers on the job have too often seen safety campaigns fail. Our safety teachings must be taken as a commodity and sold, not from the tail of a cart, not with brass bands, not with large and indiscriminate doses of bulletins and talks, but with carefully planned, up-to-date, selling methods.

SAFETY ENGINEER MUST BELIEVE ABSOLUTELY IN HIS WORK

When the manufacturer, who for years had personally conducted his own advertising and sales campaigns, increased his production through modern methods, he found that he could not increase his sales. He was, therefore, obliged to call in business experts who had made a study of selling and advertising. In most cases, and in the face of bitter opposition, the business was entirely overhauled. The sales force was shaken up—old-time salesmen, who were merely average, were discharged, and

inexperienced men took their places. These inexperienced men were taught the principles of salesmanship, which had been gathered by the business experts in analyzing the methods of successful salesmen. Sales managers and advertising managers came into being, and, as the result of the innovations, goods were sold in far greater quantities than it was thought possible.

The safety engineer is a combination of sales and advertising manager, the organization is his sales force and the bulletins and plant papers his advertising medium. A sales manager, of necessity, must be of the optimistic, enthusiastic type—capable of transmitting his enthusiasm to others. *He must believe absolutely* in his work and have the originality and initiative to handle every-changing conditions. Forgetting himself—striving with all his might for the reduction of accidents and believing that he is rendering his country a service—the safety engineer is doing not his "bit," he's doing his utmost.

There is one point which stands out clearly regarding modern salesmanship and advertising: Its development is due to analysis and synthesis, the tearing apart and the reconstructing of conditions affecting buying and selling. This method is also used to ascertain the capabilities of salesmen, and we can start right in on ourselves to discover in what respect we are lacking. Gentlemen, self-satisfaction never accomplished anything. It might be that a course in industrial hygiene, public speaking, advertising, or English would supply certain knowledge and qualities which we are lacking and which stand in the way of our making a success. *You* know your subject. *You* know it better than anyone at your plant, but, remember that you are the instructor—that it is up to you to teach others, and one of the most difficult things in the world, and a fact which has caused considerable strife, is to instill in the mind of another person an idea which you have in your mind.

At your meetings, in order to do effective talking, you must have your argument prepared, the facts arranged in logical order, and only one idea must be driven home at a time. Probably you have found it hard to hold the attention of your entire audience at times. You can see by looking into the faces that some of the minds are far away. There is a little trick in speaking that will overcome this lack of attention. The speaker will purposely state a fact which is not true. He'll then say, "Well, that's right, isn't it?" and before his audience has quite made up its mind, he'll answer: "No, it's all wrong, such and such is the case." The audience, of course, comes back to earth with a bump.

A lot of men, when asked how they plan their work, say that they just use common sense. Now, what I would call common sense *you* would probably call nonsense. Common sense, if there is such a thing, gets an awful deal in this world. To plan your work for the future you must be governed by the experience of the past. And here we call again on analysis. Keep accurate accident records—your analysis should show where they happen, how they happen, and why they happen. (Charts of such information will suggest the direction of your activities.)

How an accident happens will not always show in a report. Therefore,

be personally acquainted with your men. Talk to them individually concerning the accidents in their departments. Get their point of view—it's valuable. Their ideas may not always be sound, but they give you material on which to work. Your plans *must* be based on the conditions existing in your plant. *Canned safety is not at all effective.*

MUST APPEAL TO EMOTIONS AS WELL AS TO REASON

The salesman is taught and keeps constantly in mind the truth that the most important thing in this world is *you*—your family, your business, your goods, yourself—not me or mine. You have, no doubt, noticed this: That when you talked to a man of himself his interest was genuine and you had his entire attention, but when you talked to him of yourself his interest was forced and he merely made an effort to be polite.

It is a proven fact that people are more easily convinced by an appeal to the emotions than by an appeal to reason. Put plenty of the human appeal in your talks and bulletins—those things which interest men the most—self-preservation, home, health, happiness, children, patriotism. If you don't think this is true look at your empty museums, where no charge of admission is made, and then at crowded moving picture houses that charge you 15 cents, plus the war tax. Why the difference in attendance? The moving pictures appeal to the emotions, don't they?

It is not so much what you say as how you say it; many clever speeches have sounded commonplace until they were reported later in the press. Men with wonderful intellects sit by and let others receive applause, just because they cannot deliver an address and the others can. On the other hand, really poor material has been made attractive through the speaker's ability to talk, to express his meaning through the inflections of his voice. A demonstration of this was given last year at a salesmen's convention in the Waldorf-Astoria. The vice president of the Pyrene Fire Extinguisher Company told a story similar to the following:

"A boy ran away from home, probably on account of a disagreement with his dad, and after being treated rather harshly by the world for a few months, and after he had lost his job and skipped a few meals, he wrote home for money. The father received the letter, and one night, while the mother was preparing supper, he read the letter aloud to her—something like this [curt]:

" 'Friends gone, job gone, money gone; everything is gone. Send me some money.' The father made some remark about a young cub and threw the letter on the table. But, after the supper dishes were washed, the mother picked up the letter and read aloud, something like this [emotion]:

" 'Friends gone, job gone, money gone; everything is gone. Send me some money.'

"The father was kind of uneasy after that, and finally said: 'Well, mom, I guess we'd better send the boy his fare to come home.' "

GET THE FOREMEN WITH YOU

Much has been said of the foreman in this work, and I think we are all agreed that he should be handled diplomatically. It will not do to

instruct him—not directly. His instruction must be done indirectly and through suggestion. Discuss his problem and lead him away, gently, from any ideas which are wrong. Later on, when he learns in his dealings with you that you have considerable knowledge of his work, you will have his respect and friendship. You begin on him with matters interesting him most and end up on the matter which interests you most. In other words, you have to sell him, too.

The hospital is a very good field for your work. You will generally find men there in a receptive mood, and, again, it is an excellent place to get material for talks and bulletins. Be intensely interested in the work of your medical man. The interest you have in his work will act on you as a stimulant and your material must be ever new.

Encourage articles on safety by your employes for the plant paper. There is nothing which makes a man's mind so orderly as trying to put his ideas on paper, and in order to have what he puts there absolutely correct he is compelled to look up the subject as it is treated by recognized authorities. And right at this point he comes out of the rut and his education commences. Make all the physical demonstrations you can in this work. Exhibit a defective tool and tell the story of how John Jones received a bad injury and that he had been warned several times. Or show a bunch of grinders a much-pitted pair of goggles with a star-shaped fracture right in the center of one of the lenses. These things strike home.

Here's something else you might try: You know how hard it is to get men to wear goggles—did it ever occur to you to bring into your grinding-room or to your meetings or have around your plant a blind man with a sign on his chest: "I did not believe in wearing goggles?"

Letters of commendation should be written foremen on the improvement in their accident experience. Suggestions from them and from the men must receive due consideration. Publish comparative records showing each department's standing in the number of accidents, the severity of the accidents, etc., and use every effort to arouse a sense of rivalry between departments on their percentage of improvement.

WHAT THE BULLETIN MUST ACCOMPLISH

Now for another phase of this selling proposition—*advertising*.

Advertising, too, has developed. Have you noticed that you read only some "ads" and others you completely ignore? There's a reason. The eye rests on those objects to which it is attracted. The mind will grasp quickest facts which are apparent. The eye is not attracted by jumbled-up matter with a picture here and there and different sized type scattered through. The eye abhors discord. Your bulletins should have one good photo or one good drawing, with plenty of contrast between the figure and its background—show life and action. We are more attracted to a picture which shows action than to one which shows repose. Broken and bent lines denote action—perpendicular or horizontal denote repose. The action in your picture should be directed toward the reading matter—you always look at the point where it is going to hit. Bulletins need not be-

uniform in size—as a matter of fact, different sizes lend interest. Some pictures need very little printed matter.

You may or may not have seen the "ad" of the Hole-Proof Hosiery people. You know its hole-proof hosiery, because the name is there in big letters. The article, in this case being a stocking, is shown very attractively. Whether there is any reading matter in this "ad" I can't recollect —if there is, it is not at all necessary.

Your bulletins must do four things. *First*, attract attention; *second*, hold interest; *third*, create a desire, and, *fourth*, compel action. It is not always possible to wrap all of these up in one bulletin—a series of bulletins can be run, but in this order and with these points in mind. A short, spirited talk at the end of the fourth issue will have the effect of driving home your point. Supplement this work with lively articles in your plant paper along the lines of the particular campaign you have in mind.

The placing of the bulletins are important—if they are not read they are of no use. The bulletin with a long story can be placed where men gather, but where men pass by a long story is useless. Look at the advertising along an automobile road—it drives home one point, one idea, a suggestion.

"Desire" is created in the minds of technical and professional men by giving reasons, but an appeal to the emotions is much more effective in the case of the mechanic or laborer. Compelling action is brought about by suggestion and positive commands. "Do this and do that" are much more effective than "Don't do this and don't do that." The mind seems to rebel against a negative command, but with a positive command the impulse is to obey.

WORK ACCORDING TO A DEFINITE PLAN

Interest in bulletins can be stimulated by using, from time to time, health slogans and talks on industrial hygiene. Encourage your employes in the use of washrooms. Encourage them to wash their hands before eating lunch. If you did not have the pleasure of hearing Dr. Darlington on this subject last Monday your loss is considerable. He most thoroughly went into the subject of the relation of health to efficiency. That a workman's efficiency depends absolutely on the state of his health: that dirt from the hands put into the mouth with food caused fermentation, chemically breaking up the sugar, so necessary to generate energy, into lactic acid, which is a poison and the cause of fatigue. Following this logic, when a man is fatigued, he can't think or concentrate on his work, and this lack of concentration will cause him to violate safety rules by omission or commission.

You don't remember, of course, what has been said by every speaker you have heard this week—you don't even remember every important point. Then why do we have these meetings, these conventions? To enliven our interest, to give us strength in the knowledge that thousands of others are working and striving with us to obtain the same results.

Here and there, of course, we have been impressed with ideas, consciously and subconsciously, which ideas we will use at some future time.

But the main purpose is to give strength to your convictions, and what is true of this convention is true of your plant meetings. Your men, at meetings, can't get everything that you and others tell them, but their interest is stimulated, which will soon develop into enthusiasm.

However, regarding what I have said, remember these six points: Develop yourself, know your people, work according to a definite plan, keep accurate records, make use of analysis, and keep on pounding until they get the safety habit.

DISCUSSION

Mr. A. R. Hause: In organizing our safety movement we decided to give the men an opportunity to organize themselves, figuring that if safety men in the ranks would take an active interest we would attain better results. We held a general election, establishing a rule, however, that neither the general foreman nor the assistant foreman would be eligible. The man who was popular with the other men—the one who had the best influence—in each department was elected. In this way safety was worked from the inside out instead of by having a few men preaching safety. It has been my idea, too, to have one man oversee a certain operation. Then, by getting the opinions of other men working along the same line, we can perhaps, devise a safer way of doing a particular job. A department having 100 employes may contain only five safety men, but these men, being of good education and thoroughly drilled in their work and being of the same class as the men with whom they are working, are able to accomplish a great deal.

Mr. Sanford: The General Electric plants employ from twelve to fifteen thousand men and we have a mutual benefit association which has been running for ten years. This is not handled as one large association, but is divided into sections, each section averaging about 150 employes. Each section has a committee, composed of a chairman, secretary-treasurer, and three or more other members, as the section may decide. Then it is put up to them that it is not only a matter of safety, but that it is to their interests financially to avoid accidents. This association has a rule that when the funds reach $300 the collection of dues is suspended until the surplus is reduced to $200. Some sections have gone six months without a collection of dues. While the dues are small yet the incentive is there to make each man more careful.

Mr. Mathison: In order to keep workmen interested in safety you have to give them something to do. I conducted safety meeting after safety meeting without being able to arouse much enthusiasm. The men were getting tired of hearing me talk when I hit upon the plan of having one of the men present take charge of the meeting. As a result one or two of these meetings beat the ones which I had been conducting all hollow. The men are taking more interest in the safety meetings now, because they feel that they are really part of them.

MR. DOUGLAS: We have found that by having employes suggest ways of avoiding accidents, and by arousing interest through discussions of the different methods suggested, we have gotten hold of some very good material for use in our safety campaign.

CHAIRMAN WILLIAMS: How many men present have called their men together as a debating club and had the question "Does Safety Pay" threshed out?

MR. MILNE: The plan ought to prove educational and at the same time provide amusement for the interested spectators.

CHAIRMAN WILLIAMS: Our next paper will help eliminate the too free use of gasoline. Mr. Shaw will please tell us how his company combatted the evil.

GASOLINE IN THE INDUSTRIES, WHEN USED AS A SOLVENT

R. A. SHAW, SAFETY DEPARTMENT, FORD MOTOR COMPANY, DETROIT, MICH.

Mr. Chairman and Members of the National Safety Council: It sometimes seems as though Fate plagues the paths of safety men by decreeing that many of our most needed articles, commercially, shall at the same time be the most hazardous, and of all hazardous commodities there are mighty few that can compare with gasoline. Perhaps it was with this thought in mind that your committee selected my topic for discussion here, so I assume that it is to be handled largely from the safety viewpoint. A few years ago, before Ford cars were being turned out at the rate of a few odd thousand per day, gasoline traveled in exclusive company and was duly respected, as exclusive company is wont to be. People thought of gasoline along with dynamite, nitroglycerine and other high explosives and handled it cautiously in one ounce lots instead of tossing it around by the tankful as we do today.

Herein, I believe, lies the reason for the frequent accidents of which we read, in which gasoline plays the part of the villain, and herein also lies the reason why safety efforts must be doubled and then redoubled if we are to keep gasoline from offsetting all its good works by disastrous bits of deviltry.

We all know, in a general way, that gasoline should be handled with caution, yet perhaps if we look back for a moment to the source of this highly volatile liquid we shall be impressed more forcibly with the reason for its explosive qualities. Gasoline is a product of distillation from crude oil, or petroleum, which comes from the wells in the raw state. The crude oil, or petroleum, is placed in a vat and when slowly heated the more gaseous or volatile parts arise in the form of vapor, which is then carried through a series of coils surrounded by circulating water. The vapor is thus condensed into a fluid, called gasoline, which is the most volatile product of crude oil.

Gasoline boils at 112 degrees Fahrenheit, which explains why it is that

when air is saturated with this easily evaporated fluid a slight spark is all that is needed to cause an explosion, with its accompanying sheet of flame. To show with what force gasoline explodes we may take, for example, a room 25 feet square and 12½ feet high in which a five-gallon can of gasoline has been placed. Even at a low temperature this can of gasoline is capable of generating 8,000 cubic feet of inflammable gas, or enough to entirely fill this room. Immediately upon becoming ignited this gas will expand to 4,000 times its original volume.

MUST BE HANDLED IN SAFEST WAY

In the automobile industries gasoline is used extensively as a solvent. In our plant we estimate that about 15 per cent of our gasoline consumption is dissipated in this manner. Our most common uses of gasoline as a solvent are in testing cylinders and crank cases, to determine their porosity; in our toolrooms, for cleaning small instruments such as micrometers, indicators, etc.; in cleaning metal parts, preparatory to painting; in our electrical repair departments, for cleaning bearings, etc., and in our pattern and coremaking departments to clean out corners of the patterns.

To eliminate the gasoline hazard we must, of course, handle it in the safest and most practical way. Assuming that it is being used in considerable quantities, the first thing to consider is the storage of the fluid. I believe it is an almost universal rule that gasoline in quantities must be stored in tanks at least two feet underground and not less than 100 feet from the nearest building. A properly designed filling pipe, so connected with the vent that the latter will always be open when the former is in use, is essential. In no case should air pressure be allowed.

Special safety cans, known as the "self-closing" type, which automatically close when not in use, are generally specified. In Michigan we are required to paint all portable cans red, so that they may be quickly detected among a group of similar sized receptacles and handled with due caution. At the Ford plant we have what we call the "oil house," where or near which our entire supply of oils, greases, etc., is kept. Departments about the factory requiring gasoline are allowed not more than one day's supply at a time and this is returned to the oil-house at night or when otherwise not needed.

Good ventilation is an absolute necessity and for this reason all rooms in which gasoline is being used should be equipped with any system necessary to insure a positive circulation of air which will safely remove the fumes to some outside point. Employes working around any considerable quantity of gasoline should be equipped with special aprons, to keep the gasoline from saturating their clothing. Special, quick-removable leather shoes, with wooden soles are also advisable. Fire extinguishers should, of course, be a conspicuous part of the safety equipment in a room where gasoline is being used in quantities, while woolen blankets which can be thrown about a person in case the clothing catches afire should be nearby.

Care should be taken to have dirty gasoline returned to its source of supply, where it can be reclaimed and used again. Under no circumstances should it be allowed to drain into the sewer system, for it can do immense damage if run into the sewer in sufficient quantities. An instance occurred in Detroit not very long ago, to prove this point. A car of gasoline happened to be left standing on a siding, over Sunday, at a place near a sewer inlet. The car somehow sprang a leak, which remained unnoticed until early Monday morning when there was an explosion that shook the entire west side of Detroit. The sewer system for several blocks in the vicinity of this car was shattered and manhole covers were blown high into the air for many blocks around. I may say, at this point, that all manhole covers on the Ford premises were perforated, immediately after this incident, in the belief that free outlets for possible accumulated gases would be provided thereby and largely eliminate the possibility of an accident like the one described.

GASOLINE NEEDED TO WIN THE WAR

In the ways mentioned previously, and in numerous other ways, we consume thousands of gallons of gasoline annually. But this year we are trying our best to eliminate as much as possible the use of gasoline as a solvent, for we have come to the conclusion that if it will do a good job of cleaning here at home then we had better give our boys "over there" a goodly amount so that they may have an opportunity to remove from the Kaiser's eyes that something which is blinding him to the futility of his course and so help to bring about a speedy and satisfactory peace.

In the Ford plant we use a product known as "Sunoco," made by a leading oil company, which consists of about equal parts kerosene and gasoline. Although this costs us a few more cents per gallon than gasoline we prefer it for several reasons. One is that it is safer to handle, inasmuch as it is less volatile than pure gasoline and evaporates much less rapidly. For the same reasons it is used in thinning paints and similar work. With gasoline very much in demand for war purposes just now we have a further reason for the use of Sunoco wherever possible.

From still another source we found it possible to annually save thousands of gallons of gasoline and at the same time remove dozens of potential sources of danger throughout the plant—I refer to the substitution, wherever possible, of "washing machines" for the gasoline method of cleaning. The parts to be cleaned are carried through these machines on a traveling conveyor, while a mixture of hot water, soda and steam is being blown on them. The parts are not only thoroughly clean when they emerge from the opposite end of the machine, but quickly become perfectly dry because of the fact that they are thoroughly heated by the water and steam. In one instance, where a special record was kept, we found a saving of approximately 9,000 gallons of gasoline per year by the use of a washing machine, besides eliminating a decided fire and accident hazard.

RULES TO PREVENT FIRES

The many gasoline fires and accidents of which we read simply prove how danger lurks at every hand and how we must keep our wits about us if we are to anticipate and successfully combat these hazards. Here are a few typical cases which resulted in fires or explosions in places where gasoline was being used: 1—The careless striking of a match. 2—Match dropped on floor, accidentally stepped on by employe. (Safety matches only should be used.) 3—An overheated bearing which quickly ignited gaseous air in room. 4—A spark made by turning on electric light switch. (Special enclosed switches and moisture-proof globes are recommended for such places.) 5—Using welding equipment in room adjoining one in which gasoline was used.

Only educational measures which will familiarize employes with the hazardous nature of the fluid they are handling will assure the discontinuance of accidents from this source, after every workable safeguard has been put into use. The judicious placing of signs warning newcomers and reminding old employes of the dangers surrounding them, in places where gasoline is being handled, is also strongly urged.

In conclusion I would say that it behooves all of us to use gasoline as a solvent only where some less hazardous substitute material or method cannot be used with success, for we must keep ever before us the realization that if an accident does occur it is practically certain to be serious. As in handling any other dangerous commodity, there is a right and a wrong—a safe and an unsafe—way of dealing with gasoline, yet if we but visualize the penalty for wrong handling and are mindful of the rules for safe handling there is no reason why this very useful agent cannot be employed in such a way that it shall continue to be of vast service in the industries and still be so surrounded with safeguards that the casualties which have followed in its wake heretofore may be largely, if not entirely, eliminated.

DISCUSSION

CHAIRMAN WILLIAMS: You will all agree that gasoline is not the proper thing to be used as a cleaning agent for parts. Who has had actual experience in trying to eliminate this hazard?

MR. BEYER: Gasoline, to make it safe, should be mixed with at least 50 per cent carbon tetra chloride before being used as a cleaning agent.

CHAIRMAN WILLIAMS: I agree with Mr. Beyer; hard experience, covering two deaths, made me realize the necessity of this combination.

MR. SHAW: Could not a law be enacted that would make smoking in garages a crime?

MR. WELLS: That matter should be taken up through the National Safety Council.

MR. BRIGGS: Where do we stand on the matter of smoking in public and private garages?

CHAIRMAN WILLIAMS: The best plan would be to take that matter up with the Standards Committee and ask them to adopt regulations which would govern gasoline hazards.

MR. SHAW: I move that the Automotive Section go on record as being opposed to smoking in garages, both public and private, and that this matter be taken up through the Standards Committee of the National Safety Council. (The motion was seconded and carried.)

REPORT OF NOMINATING COMMITTEE

For Chairman, J. J. Lynch, Chevrolet Motor Car Company, New York, N. Y.; for Vice Chairman, R. A. Shaw, Ford Motor Car Company, Detroit, Mich., and for Secretary, A. R. Howe, Standard Parts Company, Cleveland, Ohio. (Upon motion the report was adopted and the officers nominated were duty elected.)

GENERAL DISCUSSION

MR. BLANK: How many firms are meeting the subject of uniforms for women? As the number of women working in factories has naturally greatly increased with the war we have adopted the plan of providing overalls or unionalls for women. This uniform includes a heavy cap and it is a rule that the girls must use this at all times, but this summer we have had considerable trouble on account of the severe heat. In one instance a girl, when objecting to the use of this cap, took it off and pulled out a handfull of dead hair from her head—it had been rotted by the use of the cap she was wearing. We have tried several concerns, to see if they could not give us something in the way of a cap which could be easily made and answer the purpose of keeping up the hair, but we were unable to obtain anything practical.

MR. SANFORD: In the General Electric plants we use what is ordinarily known as a dust cap. This is worn at all times. Although the wearing is optional, no objection has been raised by the girls. There is no chance of getting the hair caught, the only possibility would be that one or two hairs might get into some small part of the machinery. In some of our factories we have girls working over gas fires on glass work and here a type of cap not so popular is worn, it being fastened to the head by straps. This cap is treated with a solution of ammonium-phosphate, which makes it fireproof. All our caps are supplied by the company, being dark blue or black.

MR. BRIGGS: The girls in our plant have adopted the trench caps made by the Sweet-Ore Company. The cap is very attractive, light and serviceable and keeps up each strand of hair.

CHAIRMAN WILLIAMS: We have found it very practicable, on hot days, to use caps made of newspapers. They are light and easily made.

LABOR TURNOVER

MR. BLANK: I would like to have an opinion as to what is considered the average turnover charge. No two concerns give the same estimate, but I would like, if possible, to have some statistics on the subject.

MR. SHAW: I have no data at hand in regard to this subject, but you can, perhaps, obtain same by writing Dr. Mead's office.

MR. WILLIAMS: The average per employe during the year we have found to be $69.73.

MR. BLANK: The Buick Company figures about $80.00.

MR. ANDERSON: Prior to present conditions we used a charge of $35.00, but $80.00 probably approximates conditions as they exist now.

MR. BLANK: Taking into consideration the difference in conditions in various plants and in the several departments of those plants, this average might be raised to $100.00—where green men, who know nothing of the job on which they are going to work, have to be broken in and thus use up the time of the foreman or assistant foreman. I would like to know of experiences in having the assistant foreman take over some of the work of the general foreman. The assistant foreman, not being loaded up with work as is the foreman and being a man skilled in various lines, could probably keep tract of the turnover charge and also aid in safety work.

CHAIRMAN WILLIAMS: We have a man in each department and with the assistant foreman's opportunity for close study of his particular department he is enabled to report to the foreman.

We have six workmen in the various departments; they report each first and third Monday to the foreman. He, in turn, looks over the reports, sifting the good material from the bad. He then brings it to the safety committee, who turn it over to the safety engineer. In this way suggestions are taken from the workmen to the superintendent of the plant.

Miss Liddell of the Dodge Manufacturing Company will please tell us of her work with the women employed by that company.

MISS LIDDELL: I have been with the Dodge Company a very short time, being associated previously with Sears-Roebuck as head of their safety department and as surgical nurse. Mr. Chandler of the Dodge Company informs me that the women are to wear a uniform, which includes shoes and caps. The girls working in the airplane department are the wives and sisters, in many cases, of the men who have gone to war, and we do not have the moral problem with which you are confronted in many cities.

MIXED FORCES OF MEN AND WOMEN

CHAIRMAN WILLIAMS: Are women engaged in the actual making of airplanes? Do they apply the compound to the wings?

MISS LIDDELL: I think that is being done by men.

MR. SHAW: The question arises as to whether women should be left to themselves in their own departments or whether they shall work in the same departments with men? So far we have been able to keep them separate, but the Lincoln Motor Company and the Packard Company are having them to do the same work as men and with men.

MR. BLANK: Since the work or fight law has gone into effect, we have been obliged to place some girls in the departments with men, having, of course, a woman supervisor over them. We find they are just as efficient workers as men, and once instructed in the method of performing an operation they follow that method strictly, so this necessitates that

the instructions first given be thorough and accurate. Men, on the contrary, are very apt to want to discover new ways of doing things and, in experimenting, cause a great many accidents.

CHAIRMAN WILLIAMS: That would seem to indicate that men have more initiative than women.

MR. BLANK: The curiosity of women, so called, is not apparent in her work. A boy, from 18 up, just starting to work, wants to know everything about the place; he wants to be foreman or perhaps superintendent of the plant, while a girl is content to go on from day to day doing her work as she has been shown. We have found, too, that as far as possible it is better to keep the women in separate departments and not have them working right with the men, as this sometimes occasions accidents.

MR. WELLS: I do not think that could be very well applied in our plant where the machines are all set up ready for work in the morning and you may discover that you are short of men. Would it be practicable to move part of the machinery to another department so that girls could work on it? It seems to me that would be a loss of time and money.

GUARDS FOR MACHINERY

MR. SHAW: The laws now in force for guarding machinery are not applicable to small machines. A guard may cost entirely too much and be really dangerous, where, were a smaller one used, the operation would really be more safe.

MR. BLANK: A committee of safety engineers should be able to take care of this matter; leaving it to the judgment of every Tom, Dick and Harry in the shop is not to be thought of. Where a safety committee could be appointed, the guards could be made more cheaply and would be more efficient.

MR. S. J. WILLIAMS: The National Safety Council has prepared pamphlets showing approved methods of designing and constructing guards.

MR. BLANK: We have State laws and State inspectors enforcing same requiring that certain guards be six feet high. Where a drill press, for instance, would really require a guard only three feet in height it must be six feet in order to comply with the laws.

MR. SHAW: I cannot see the necessity of such large guards where smaller ones are better.

CHAIRMAN WILLIAMS: Where you use smaller guards there is danger of their not being seen and being tripped over. I think a guard of four feet, at least, is necessary.

MR. BRIGGS: The laws of New York State require that guards be six feet in height.

MR. S. J. WILLIAMS: The United States Government has adopted a standard of 3 feet 6 inches for railings used as guards, except where necessary to have larger ones.

CHAIRMAN WILLIAMS: I think we should take the United States government as our criterion.

MR. HOWELL: At a cost of about $20,000 we have been compelled to go

through our factory making guards in compliance with the law, cutting up old ones to make new.

MR. EDDUS: The law originated in Pennsylvania and it is necessary as a protection against accidents.

MR. BLANK: Since the idea is to have guards that are 100 per cent efficient, and this law does not accomplish that end, it seems to me that we would get better results by having certain men in the shops—millwrights and men in the sheet metal shops—make experiments. The shop men might send in suggestions as to guards which they consider would be most suitable for their own particular work, as it is a psychological fact that when a man has something to do with a certain thing his interest is naturally stimulated. In this way, too, if the guards are removable, and the men see that they are really necessary, they will not be so apt to be found lying on the floor as would be the case if the men were compelled to use them without seeing the necessity of so doing.

CHAIRMAN WILLIAMS: As the hour is late, if there is no further discussion the Section will now stand adjourned.

Cement Section

St. Louis, Mo.

Sept. 19, 1918

J. C. JOSSE, Chairman
Superintendent, Continental Portland Cement Co., St. Louis, Mo.

THURSDAY MORNING SESSION

CHAIRMAN JOSSE: The meeting will please come to order. It is very unfortunate that Mr. William H. Baker, Assistant General Superintendent of the Atlas Portland Cement Company, who was to have been our Chairman, at the last minute has been prevented from coming to our meeting.

The question of accident prevention is of extreme importance and it seems to me that we should leave no stone unturned in our endeavor to eliminate the enormous suffering and expense resulting from preventable accidents. I think we all agree that the education of workmen in safe methods and practices is one of our most important weapons. Mr. R. A. Dittmar will now address us on the subject of "Safety Committees at Cement Plants."

SAFETY COMMITTEES AT CEMENT PLANTS

RICHARD A. DITTMAR, POWER AND MAINTENANCE SUPERINTENDENT, HANNIBAL PLANT, THE ATLAS PORTLAND CEMENT COMPANY

Mr. Chairman and Members of the National Safety Council: Industrial organizations are passing through an emergency period, when the need of active and efficient safety organizations is very strongly felt. Our manpower is lacking both in quality and quantity—what is left for industrial work must be conserved, trained and utilized to the best advantage. Men must be taught safety habits, to act and think safety, and to do this our safety committees or, really, our safety schools—for I believe we are all agreed that the secret in safety work is principally educational—must be adequate and adapted to the particular industry.

The cement industry calls for a line of safety work to meet its

peculiar hazards and confront its own particular problems—new problems under existing conditions of present labor turnover and scarcity of men are constantly being presented—first amongst them being the skillful introduction of woman labor into the industry.

The work of the safety committee in the manufacturing of cement is as varied as it is essential, covering a number of different hazardous operations, such as quarrying, mining and use of explosives, and railroad problems; mill work, presenting a variety of ponderous machinery that cannot be adequately protected by guards; electrical and steam power and shop problems—and all these operations on a twenty-four-hour basis. Along with the foregoing we are confronted with welfare problems. I have always felt that safety work was welfare work and the reverse, the two being so closely related that it is hard to define a line between them—so that in organizing a safety committee for a cement plant we must devise a machine that can adequately handle existing problems along the lines of both safety and welfare work.

A STANDARD SAFETY COMMITTEE

Modern tendencies along all lines are toward standardization. I would hesitate to prescribe an outline for a standard safety organization suitable for all sizes and kinds of industrial organizations, but I feel that a standard organization for safety committees in cement plants is logical and practical, at least such a tentative suggestion might be of help in organizing a new committee in the industry. I feel, to be most effective, that the organization of a standard safety committee should be founded on the central idea that it is to be educational, promulgating the idea of safety in thought and action throughout the organization.

The effectiveness and efficiency of a safety committee depends largely on its direction—we must look toward the man in charge, the chairman, so that the careful and wise selection of the chairman is of first importance. The chairman is a permanent member—we must not have a man here who advances his ideas in a lukewarm and half-hearted way; he must feel a deep interest in the work—must have a strong personality—a man who can so project his convictions that they become permanently inculcated in the education of the committee members; then ex-members will remain safety workers. It is not important what his duties are in the organization, but as chairman of the safety committee he reports directly to the superintendent of the plant.

In the standard safety committee there should be a number of permanent members, forming the nucleus or instruction staff, who are constantly in touch with all phases of safety work on the plant. Chief among these is the safety inspector, who should report directly to the committee in all his duties. The safety inspector should, however, furnish correct first-hand information to the superintendent of the plant in accident cases and keep him informed of any unusual conditions that should receive prompt attention. The safety inspector should present written reports at the committee meetings, worked up in three sections, each section to be taken up in the regular routine of the committee's business program.

as outlined later. He should have the freedom of the entire plant and make frequent inspection trips in company with the rotating members and their alternates in their respective sections, instructing and teaching them in safety work by pointing out hazards and drawing their attention to unsafe practices. To be efficient in this work of instruction the inspector should keep himself informed through safety publications of recent developments in the Safety First movement and in discussions at the committee meeting make brief mention of topics of interest appearing in current safety literature. He should prepare and maintain danger signs and slogans and have charge of the advertising in the interest of safety work. He should follow up the approved recommendations of the committee, inspect new installations and new machinery and see that the necessary safeguards are provided. There are any number of other duties growing out of this office that will naturally develop.

PERMANENT AND ROTATING MEMBERS

The other permanent members to be considered are the fire inspector or fire chief, the first-aid attendant or plant physician and perhaps one or two foremen particularly adapted to or interested in safety work and whom the superintendent may wish to train as leaders in the general movement. The foregoing members, forming the permanent committee, should be appointed by the superintendent.

To complete the committee the rotating membership idea presents itself as most logical, the term of membership depending on the size of the organization, age and size of the committee and frequency of its meetings. A new committee should hold weekly meetings and membership should be for three months only—as the committee grows older the meetings could be held bi-weekly and the term of membership can be changed to six months. The main essential is to imbue an enthusiastic spirit in the men, to get as many of them thinking safety and boosting safety as soon as possible. I feel that large committees are desirable, for, with the large committee, the permanent members or instruction staff can make greater headway in their work on the plant, and in safety work we want to progress rapidly and thoroughly.

What is the logical number of rotating members? The plant organization should first be broken up into individual departments, somewhat as follows: Quarry, mine, railroad, mill operating, mill maintenance, shops, power, packing and shipping, and there may be other desirable subdivisions. Each individual department should send a representative or have rotating members on the safety committee. In organizing a new committee the members are to be recommended to the superintendent by the foremen of the respective departments: the department then elects an alternate member to serve in the absence of its regular representative and, when the term of the regular member expires, if the alternate's work has been good and if he has displayed a keen interest in safety work the foreman should recommend him as a permanent member. This will tend to stimulate a better attitude in the alternate members and make better safety men and committee members. All the appointments should be

made by the superintendent and this is best handled by a personal letter to the man when he becomes an alternate and again when he becomes a permanent member. The superintendent should briefly outline his duties and ask his support and heartiest co-operation in safety work. In this way interest is stimulated immediately and the man will feel that his services are being depended on—he will make a special effort. The superintendent should also write a personal letter to the retiring member, thanking him for his past services in safety work, appointing him an honorary member and at the same time requesting his continued interest and action along safety lines.

It is the duty of a representative of a department to attend the committee meetings and present safety and welfare recommendations for his department; act as their representative, make frequent inspections of departments with his alternate, safety inspector and fire inspector; watch for unsafe conditions and practices; investigate accidents and be prepared to report to the committee. Where they have a representative of their own choice the men feel more free to offer candid suggestions and recommendations; they will also feel an interest in safety work and will report unsafe practices and conditions.

COMMITTEE MEETINGS MUST BE ATTRACTIVE

It should be the effort of the chairman to make the committee meetings as attractive and interesting as possible. It is essential to have a definite program or order of business, starting with roll call and minutes of previous meetings; then take up the first section of the safety inspector's report, covering a review of accidents since the previous meeting, disclosing his investigations and fixing responsibility, together with his recommendation to prevent a possible reoccurrence. At this point remarks may be received from the special representatives of the department held responsible or a report received from members whom the chairman may have found it advisable to detail at the time of the accident to make a special investigation.

Next, under unfinished business, the safety inspector should present the second section of his report. He should announce to the committee the recommendations of the previous meeting approved by the superintendent, also recommendations that have been completed with his approval and are ready for the committee's inspection and acceptance. He should bring before the committee old recommendations that should receive special attention and also report on special investigations assigned to him by the chairman.

New business should next be taken under consideration and at this time the third section of the safety inspector's report should be received. This should present his recommendations for approval by the committee. Recommendations should also be received by the committeemen—these suggestions should relate to new safeguards, maintenance of existing safeguards, unsafe practices, insanitary conditions, lighting, etc. Recommendations thus accepted and approved by the committee should be numbered consecutively, made out in duplicate on a special form, signed

by the chairman and the original forwarded to the superintendent for his approval. Recommendations approved by the superintendent should be sent directly to the safety inspector, who should assign and follow up the work and see that it is properly carried out.

A general discussion should follow with remarks and criticisms from the various members. It should be the aim of the chairman to make this section of the meeting as instructive and as interesting as possible by presenting short talks on safety subjects or by having various members talk on prepared subjects. First-aid demonstrations are very instructive and tend to excite interest; outsiders may also be invited to talk on safety subjects or the committee as a whole may make an inspection trip to various sections of the plant. Too much emphasis cannot be placed on inspection, and either the committee as a whole should follow up a schedule of inspection or the chairman may detail certain members to make a special inspection of parts of the plant or of hazards reported.

ADVERTISING SAFETY

There is one more very important consideration in promoting successful safety work in an organization: We all feel that it pays to advertise, but what is the procedure to adopt? One of the best advertisements, and one that also fills the double purpose of maintaining safety thought and stimulating interest and safety actions, especially among ex-members, is to identify each committeeman by a small gold button. The button adopted by the Hannibal committee of the Atlas Portland Cement Company presents a round green area enclosing a white cross; a gold band surrounds the green area upon which is embossed "Safety and Welfare—A. P. C. Co." The men are anxious to wear these buttons and naturally boost for safety and try to make the committee. A rubber stamp may also be adopted, to be used on all committee correspondence and on posted notices and circulars.

It is also essential to have a live bulletin system. We have adopted a plan at our Hannibal plant which has received no small amount of favorable criticism and which has been a big factor in keeping before the men the safety slogans, instructions and bulletins received regularly from the National Safety Council, together with other notices and instructions we wish to publish. We adopted a circular bulletin system, so that each slogan, picture or bulletin makes a complete circuit of the plant, occupying from day to day various stations which have been chosen in prominent places near time clocks and drinking fountains. The notice is placed in a frame and this frame is taken to the first station, on the following day it is moved to the next station in the circuit, and, after having occupied all the stations, the notice is changed. Each frame has a removable wooden back so that the notices are easily replaced. The board is painted in green enamel with a white cross at the top and a distinguishing number at the bottom.

A central bulletin board may be advisable, but it loses its effectiveness if allowed to become littered up. A bulletin board must be kept alive—in safety work too much attention cannot be directed toward developing a

good and efficient advertising system. It may also be advisable for the safety committee to get out a small booklet, setting forth the safety rules that apply to that particular organization. The committeemen should see that these rules are observed and should admonish all offenders.

In conclusion, the primary object of a safety organization is to educate the men and make them *think safety*. The class of men we deal with learn most readily by looking at pictures—seeing actual results and making comparisons; safety pictures, examples and slogans must be everlastingly kept before their notice. These men observe and imitate the actions of their fellow workmen—the committee men, therefore, should mingle intimately with the men in performing their respective duties in the plant and be constantly on guard to set good safety examples.

CHAIRMAN JOSSE: I am sure we have all enjoyed listening to Mr. Dittmar's address. There can be no doubt as to the good results which can be expected from the work of a live safety committee.

The next subject on our program is "General Hazards in the Cement Industry," by Mr. C. O. Soderquist.

GENERAL HAZARDS IN THE CEMENT INDUSTRY

C. O. SODERQUIST, GENERAL SUPERINTENDENT, UNIVERSAL PORTLAND CEMENT COMPANY, BUFFINGTON, IND.

Mr. Chairman and Members of the National Safety Council: In dealing with hazards connected with the cement industry there is much to be said about the education of the employe. For instance, let us first mention the raw material unloading track hazards, where there is no possibility of the men being adequately protected; the danger of frozen materials in the winter increases this hazard. The switching of cars, the care of tools, the construction of walks and passageways and the perfect understanding of operating signals must also be taken into account.

Men working in the raw material building, at the opening in the bin, are often subjected to many hazards, one of the commonest being that of large lumps of frozen material rolling out of the bin and perhaps bruising their feet and legs. At times it is necessary for workmen to enter these bins, and here they encounter the hazard of undermined material, also of material on tracks or on the structure. Falls of material may occur at any time and this hazard should not be overlooked.

We next come to crushers and dryers, as well as elevators and conveyors of all kinds. Here we find hazards so numerous it would be impossible to mention them all; a general classification would include gear drives, chain drives, belt drives and others, as well as revolving drums and rolls and motors to drive them. All of these offer opportunity for accidents. Then we have preliminary mills of all types and raw material finishing grinders, each has a different style of feeder and all are far from safe.

In the kilnroom we have the slow running kiln, which in itself is

probably harmless, but the machinery necessary to drive it—gears, belts, pulleys and motors, as well as line shafting in many cases—is a different matter. These are necessarily placed in locations which tend to make them dangerous, particularly for oilers; other hazards are encountered at coolers, pan conveyors, elevators, etc. Coal feeders of all types should be looked into with the idea in mind that when the kiln is down, even for a short period, the accidental starting of a feeder may cause an explosion forceful enough to blind or burn men who may pass in front of the kiln.

COAL HOUSES, CLINKER PILES AND FINISHING MILLS

In the coal house we have the usual hazards connected with drives, as well as dryers, crushers and pulverizing mills of all types. Of course, the great danger here is the possibility of an explosion. The coal dryer discharge should be carefully watched, as it may clog, causing the dryer to fill (it naturally heats very rapidly) and cause serious damage.

Our next stop is at the clinker pile, which, as a rule, has nothing but a few conveyors or cranes which handle the clinkers. As to conveyors, we all know that they are dangerous. As to cranes, there are only a few things, such as fire hazards with electrical apparatus, the carrying of loads over workmen, approaches for cranemen to enter and leave the crane and hazards where truck or truck wheels pass near walks or steps when it would be possible for men to reach or lean over runway. In the finishing mill, as a rule, we find about the same type of machinery we have in the grinding end of the raw mills.

Machinery is not our only hazard in the mill, as material of all kinds left on walks, platforms, hoppers and scaffolds may fall and cause accidents.

The stockhouse and packing-rooms have their dangerous places, such as drives for tunnel screws, usually placed in low basements; here, as well as in many other places throughout the mill, the oiler should be considered. He is required to visit many dangerous locations and he must be very careful. In the packing-rooms are the usual screws, belts, elevators and other driving machinery, as well as the packing machines—all are dangerous.

At the stockhouse it might be well to mention railroad operations, for here we have the loading platform, necessarily as close to cars as possible, causing hazards which must not be overlooked. Railroad hazards occur all over the mill, particularly where cars pass doors or ends of buildings where men are apt to step out on track in front of trains.

The slipping, tripping and falling hazard is present not only in the mill, but in the yard, shop and even in the office, unless rubbish of all kinds, as well as machinery, tools, lumber, etc., are kept in proper places of storage.

The wearing of torn clothing, flowing neckties, loose sleeves, and the use of gloves constitute other hazards.

We believe that the health of the employe should be given careful consideration and every hazard thereto given strict attention—physical surroundings must not only be safe, but must also be healthful, if men are

to go about their work in a contented manner. Plant sanitary equipment is a part of these physical surroundings and plays an important part, not only in the happiness of the worker, but also in the health and happiness of his family and of the community.

BELTS, HAND TOOLS AND GOGGLES

Hazards connected with the operation of belts include workmen being caught between belts and pulleys, their hands cut or burned by moving belts, by grasping a moving belt to stop a machine or shift a belt, or when putting belt on driving pulley while in motion. Guards should be installed where there is a possibility of workmen passing through moving belts or attempting to step over them. Any work in close proximity to unguarded belts should be classed as hazardous.

Hazards arising from the use of hand tools apply to both the user and others who work within the range of flying objects. Hammers and chisels with mushroomed heads, or hammers flying from handles, are responsible for many accidents.

It is estimated that 200,000 eye injuries occur annually in the United States. Not all of these are industrial accidents, but there are approximately 15,000 persons who were blinded in the industries. The money lost to the employer and employe is unknown, but the suffering and privations of the injured persons are enormous and of greater importance. It has been demonstrated, in recent years, that most industrial eye accidents can be prevented by wearing proper protection over the eyes or face.

PLATFORMS, SCAFFOLDS AND GUARDS

Platforms and scaffolds, when improperly constructed or built of defective materials, are a great source of danger. Ofttimes men who are detailed to erect such work are careless and do not give the matter sufficient thought to make conditions safe.

Couplings and collars, keys and set screws present many hazards. The following may be noted: Shaft couplings and set collars, clamp couplings, jaw clutch coupling, universal and flexible couplings, friction clutch couplings (where exposed), key seats in end of shaft (where exposed to contact), set screws on revolving parts (where exposed to contact). Pulley accidents are apt to be very serious, should the belt slip off the pulley and become wedged between the hanger and the pulley, or between two pulleys, thus pulling down line shafting.

The construction of guards is an important safety factor, and much thought and effort is necessary on the part of the safety man if accidents are to be considered.

BOILERS

Many hazards are encountered in connection with the operation of boilers. Care must be exercised in the inspection and operation of all types of boilers. Pay especial attention to water gauge glasses, safety valves and blow-off pipes, and the collection of scale and sediment. So many cautions might be given that I hesitate to mention them in detail.

GRINDING WHEELS, CABLES, CHAINS AND SLINGS

The operation of machinery at high speed always increases the accident hazard, unless the utmost precaution is exercised, and the grinding wheel, whose cutting surface generally has a velocity greater than a mile a minute, is no exception.

Cables, chains and slings are the mediums by which loads of material are suspended and transported through shops and mills. Many hazards may be eliminated by the proper care and careful inspection of equipment.

SIGNS

In plants where electricity is used hazards are often overlooked, because so many men do not realize the danger that lies in the electric wire. These hazards are of great importance, and, in many cases, contributing causes are scheduled as follows: In failing to ground all conduit pipes, in leaving conduit pipes open so water can enter, in using pieces of wire as fuse, in putting a fuse where water will reach it, in inclosing a motor or generator to shut off the air, in failing to pull the switch before replacing fuses, in carrying steel tools when working around dangerous electrical machinery, in failing to insulate the handles of tools, in failing to blow the dust out of the generators and motors, in failing to clean wires before splicing them, in failing to tape splices and other places where insulation is required, in screwing lamps in sockets while the current is on, in lighting cigarettes by means of switches, in looking at an electric arc without wearing blue goggles, in failing to replace all safety devices, in taking any unnecessary chances, in using defective machinery or allow machines to be used which are not properly grounded, in failing to report dangerous places, in failing to read the rule book and obey the rules, in failing to test work before leaving it, in working on live circuits unless necessary, in closing a switch without full knowledge concerning that circuit and why the switch was open, and in failing to wear a safety belt when working on poles.

The best remedy for all electrical hazards and one which should be brought out very strongly for the benefit of the workman, rather than the electrician, is *to let electrical apparatus and wires alone.*

The infection hazard is less in the cement industry, we believe, than in any other; nevertheless, great precautions must be taken in all accident cases.

LADDERS

In ascending or descending from one level to another, ladders have been an important factor. The ladder, in its various forms, has been called one of civilization's most dangerous devices, and statistics show that a great number of accidents have happened thereby. This is not strange, however, when we consider that there are probably more ladders used by man than any other single device involving hazards. Scarcely a structure is built where the peculiar value of the ladder is not employed.

After the structure is finished the ladder is retained in the home, on the farm, in the factory, in the office building—everywhere. The hazard

has been increased, because the ladder is an emergency article. Removing the trouble from the minds of man, where the error has been all of the time, and following the simple rules of construction and safe practices, ladders will be as safe as we are willing that they should be.

WELDING

Some of the hazards connected with oxy-acetylene welding may be found in the following: Testing reducing valves or gauges, coupling reducing valves, having generators near fires or lights, failure to wear goggles when engaged in welding and cutting, wearing improper goggles, failure to properly repair defective parts after notice, the use of matches, careless handling of oxygen and acetylene cylinders, using an acetylene cylinder when it is lying in a horizontal position, failure to shut off gases over night, using a hammer to open an oxygen cylinder valve, failure to open cylinder valve slowly, failure to wear respirators, and failure to provide a fire extinguisher or a bucket of water for every welding unit.

These are a few of the many hazards we encounter, and in closing will say that the practice of safety principles does not cause a workman to be slow, timid or overcautious. It demands no sacrifice of time or progress and no impairment of efficiency. It insists on the adoption of the safe course in preference to the unsafe. It emphasizes the importance of seeming trifles where preservation of life and limb is concerned. It tends to develop in the workman an instinct that scents danger, weighs possibilities and consequences and awakens in him an actuating consciousness of the necessity for using care at all times.

CHAIRMAN JOSSE: Our next paper is on "Safety Methods at Cement Plants" by Mr. H. G. Jacobsen. Lantern slides will be shown with this paper.

SAFETY METHODS AT CEMENT PLANTS

H. G. JACOBSEN, MANAGER, BUREAU OF ACCIDENT PREVENTION AND INSURANCE, PORTLAND CEMENT ASSOCIATION.

Mr. Chairman and Members of the National Safety Council: When beginning any enterprise the first step should be to determine the methods that will insure success. The world at the present time is too complex for anyone to expect success without the application of sound methods. Why should we, therefore, expect safety in our plants without the application of guarding and educational methods? Safety work at the present time is more important than ever, and it behooves us to give it very close attention.

It has been my good fortune, in the capacity of manager of the Bureau of Accident Prevention and Insurance of the Portland Cement Association, to visit some thirty cement plants during the last half-year. Inspections have been made of these plants and particular attention has been given to the methods used in accident prevention work. Let me say in this

connection, that the first and most important factor necessary is a manager who is for safety, not only in words but also in deeds.

I can, at this time, see before me two plants: At one the manager is of the opinion that the important question, particularly at the present time of unrest in the labor world, is to retain those men now employed at his plant by keeping them satisfied with working conditions, in good health and free from accidents. As a result he has comparatively little trouble in keeping the wheels turning. At another plant the man in charge agrees that these conditions are admirable, and he would like "to have them at his plant," but he does not because the methods necessary are entirely lacking. The result is confusion, poor working conditions and an abnormal number of accidents. That prevention of accidents is efficiency has been said so many times that the expression in some people's minds has grown stale. Still, I take courage in using these words once more. "Prevention of accidents is efficiency" and the man who thinks lightly of them is no better than the slacker who "does his bit" for his country by hiding behind flowing words, sticking out his chest and letting it go at that.

ACCIDENTS CAN BE PREVENTED

The majority of our accidents can be prevented if we put the work on the right basis—if we talk less and act more. The easiest way to get rid of any problem is to say that it cannot be done, that we have no time to bother with it, etc. Let us get away from lame excuses. What about whisky and the saloon, evils which only a short time ago seemed to have roots deeper than any man could dig. They are now disappearing, and will never come back. It "could not be done," said the people a short time ago, but it is being done. Preventable accidents have caused as much suffering as whisky and the saloons; they, too, must be eliminated. The world war is being fought by the United States for an ideal—war against accidents should be fought the same way.

In speaking of safety methods at cement plants we should bear in mind that accidents happen either because machinery or appliances have not been guarded or because of careless actions on the part of the injured man or some other person. The guarding of machinery should never be an obstacle in accident prevention, as, in most cases, it is only a matter of money. I believe that money used for this purpose is well spent and should be spent cheerfully.

GUARDING CEMENT MILL MACHINERY

To illustrate how machinery and appliances can be efficiently guarded the following slides are shown: Enclosed, oiled, gears in tube mill; kiln gears guarded, kiln gears guarded and standard hand rails to platform, enclosed gears on top of slurry tanks, elevators enclosed in concrete, belts on motors entirely enclosed, guarded clutch and proper facilities for oiling, guarded spur gears, standard hand rails to platform, proper conditions for entering 22,000-volt line into transformer building, conduits laid in concrete, and proper conditions of switch boxes.

Gears, belts, pulleys, conveyors, etc. can be guarded; there can be no

question about it—all that is necessary is good will. In some plants machines of every description are guarded in the most efficient manner. The workman appreciates this conditions and boosts for safety by keeping these guards in their designated positions, and, last, but not least, by adopting safe methods when doing work where safety does not depend on guards. At other plants, of exactly the same nature and similarly equipped, the same kind of machines may be seen running without proper guards, because, as said before, the easiest way to get rid of a difficult problem is to say that it cannot be solved. Have we reason to be surprised when the workmen in such plants seemingly do not show any interest in safety work? If guards are neglected by the management the greatest possibility for success in accident prevention work is overlooked, for let us not forget that a careful man is the best possible safeguard and a decided asset to your plant, in comparison with a careless man, who is certain to become a liability sooner or later.

Accidents which happen because of someone's carelessness are by far the most numerous, but they can be prevented if the proper spirit is created. It is folly to expect any result in this direction if the work is left entirely to employes; they will do their part, but it is up to the management to take the initiative and show the way. The proper time to get in the first blow, so to speak, is when the man is employed. He should then receive complete instructions in his duties and the dangers which may be connected with them if proper care is not used. It is not enough to print rule books and hand a copy to the man when he is employed, relying upon him reading it when he is off duty. In a majority of cases, if such procedure is followed, the rule book is stuck into a pocket and thereafter entirely forgotten. Rule books are not without value, but they must be supplemented with verbal instructions, and in cases where the new employe does not understand the English language an interpreter should be present.

INTERESTING WORKMEN

The best method for interesting anyone in a proposition is to give him some active work in connection with it. For this purpose every plant should have its safety committee, composed of foremen as well as workmen. This branch of safety activities has been covered completely by Mr. Dittmar in his address, "Safety Committees at Cement Plants," and I shall not, therefore, go deeper into this subject.

Aside from the safety committee, however, we have numerous mediums through which it is possible to create that good fellowship spirit which is necessary in any plant or institution to take the drudgery out of the work. Take the trouble of becoming acquainted with your men by organizing periodical safety rallies and entertainments of such nature that the men and their families will enjoy them. In this connection I would like to mention that recently a number of our plants have had great success with flag raising celebrations. At these celebrations it has been customary to shut down the entire plant for about two hours, and during that time we forget everything except goodfellowship and patriotism.

We can never find a better illustration of the difference between the right and the wrong spirit than the present war. Let us look at the German army, led or rather pushed by their war lords: the common soldiers often willingly desert whenever they have an opportunity. The German soldier does not know what he is fighting for, and the happiest moment for him is when some of his opponents in the allied armies take him prisoner and give him a square meal. An army founded on this basis cannot win a war. How about the soldiers of the allies, among them our *"teufel hunds?"* Do their officers have any trouble in getting them to fight? According to information received from the other side, the officers have their greatest trouble holding them back.

One of the important things that should not be overlooked in speaking on safety matters is proper facilities for the comfort of the men. By reason of isolated locations of many cement plants this is a problem which, in many instances, is difficult to solve, for the reason that sewers, good water, etc., are not at hand. Many plants, however, have overcome these obstacles, and it is possible for plants not already completely equipped in this respect to follow their example. The following slides will show a few examples of sanitation installations: Proper washing facilities and steel lockers, samples of wash basins made of concrete, toilet facilities, and drinking water fountains made of concrete.

GOOD HOUSEKEEPING

A clean plant—free from rubbish, old repair parts, etc.—is also a tremendous help in the prevention of accidents. A yard which takes on the appearance of a junk dealer's place of business is the best indication that the safety work is not very far advanced at that particular plant. Not only in the yard, but also in the various buildings, is it necessary to give close attention to housekeeping. All floors must be kept free of material not used in the course of operations; this is particularly true in respect to all overhead runways or platforms, as any material such as bolts, gears, sprockets, chains, etc., left in such places creates decided stumbling hazards, or the material may fall and injure people working beneath.

After having taken all possible precautions to prevent accidents, let us remember that, in spite of all our efforts, we shall still have accidents with us. They should be few and far between, but we must be able to take care of them when they do happen. For this reason it is always necessary to have the first-aid department in perfect working order, so that it may be ready to meet any emergency. Each plant should have at least one person in every department so thoroughly instructed in first aid that it will be possible at all times to care for an injured workman while awaiting arrival of doctor or ambulance. In case of asphyxiation a few minutes' delay may spell death, whereas if immediate resuscitative measures are taken the man's life can be saved in a majority of cases. First-aid rooms, properly equipped, should be maintained at every plant, and first-aid classes conducted by the company's doctor are also important.

CHAIRMAN JOSSE: We are fortunate in having with us Dr. Tucker,

who was connected with the Riverside Portland Cement Company, at the time the pictures about to be shown were taken. Dr. Tucker has consented to supplement the pictures with remarks in regard to matters of particular interest.

The showing of the pictures concludes the formal part of our program. The Missouri Portland Cement Company and the Continental Portland Cement Company invite everyone attending this meeting to a luncheon which will be served in the restaurant on the main floor. After lunch we will again discuss subjects in connection with safety work in our industry.

THURSDAY AFTERNOON SESSION.

J. C. JOSSE, CHAIRMAN

THE meeting was called to order at 2 o'clock and the following subjects were discussed:

"Shelter Houses in Quarries," "Applying Dressing to Belts," "Proper Screw Conveyor Covers," "Protection from Heavy Belts," "Cleaning Up After Jobs Are Finished," "How the Injured Should Be Cared for After Accidents," "Building Concrete Elevator Covering While Elevator Is Running," "Proper Drinking Water Supply," and "Physical Examination of Employes."

The meeting adjourned 4:30 o'clock.

Construction Section

St. Louis, Mo.

Sept. 18 and 19, 1918

WEDNESDAY MORNING SESSION

THE MORNING session was called to order at 9:45 o'clock by Mr. S. J. Williams, Chairman. A paper on "Organizing for Safety—How to Secure the Co-operation of Superintendents, Foremen and Men" was delivered by Mr. L. D. Woedtke, Director of Safety, Fred T. Ley & Co., Springfield, Mass.

A paper on "Safe Construction of Scaffolds and False Work" was read by Mr. T. F. Foltz, Mechanical Engineer, Department of Labor and Industry, State of Pennsylvania, Harrisburg, Pa.

A motion was passed authorizing Chairman Williams to select a Nominating Committee to consist of himself and others to nominate a Chairman, Vice Chairman and Secretary of the Construction Section.

The meeting adjourned about twelve o'clock noon; attendance, 75.

WEDNESDAY AFTERNOON SESSION

THE MEETING called to order by Chairman Williams at 2:15 o'clock. The Nominating Committee reported and the following were duly elected as officers of the Construction Section:

Chairman—L. D. Woedtke, Director of Safety, Fred T. Ley & Co., Springfield, Mass.

Vice Chairman—W. J. Lynch, Assistant to Vice President, Thompson-Starrett Company, Chicago, Ill.

Secretary—Edward W. Bush, Civil Engineer, Aetna Life Insurance Company and Aetna Casualty and Surety Company, Hartford, Conn.

The officers, upon motion, were authorized to act as an Executive Committee until the end of next year's session, or until their successors are

elected. They were instructed to draft a set of by-laws for presentation at the next annual meeting.

Chairman Williams read a paper prepared by Mr. Greensfelder, the President of the American Society of Engineering Contractors, on "Safe Contracting."

Mr. Hoage, of Tacoma, Wash., urged standardization in the reporting of accidents.

A paper on "Effect of Accident Prevention on Insurance Rates" was given by Mr. H. L. Geisler, Secretary, Builders' Limited Mutual Liability Insurance Company, Madison, Wis. The paper was discussed by Mr. Davidson of New York, Mr. Woedtke of Springfield, Mr. Hoage of Tacoma, and several others.

The Chairman introduced Mr. Woedtke, the newly elected Chairman of the Section, who then presided.

A paper on "Accident Prevention in the Shipbuilding Program" was presented by Mr. Ira L. Lockney, Safety Engineer, New York Shipbuilding Company, Camden, N. J.

This subject was discussed by Mr. Massey of E. I. du Pont de Nemours & Co., Mr. R. Shaw of the Ford Motor Company, Mr. Myers of Niagara Falls, Mr. Fiske of the Northwest Engineering Company, Green Bay, Wis., Mr. Hoage of Tacoma, and Mr. Davidson of New York City.

A paper on "Benefits of Accident Prevention in Contracting" was delivered by Mr. F. S. Robinson, Secretary, General Builders' Association, Detroit, Mich.

A paper was delivered on "Safeguarding Machinery and Other Equipment" by Mr. W. J. Lynch, Assistant to Vice President, Thompson-Starrett Company, Chicago, Ill.

Following the presentation of papers the Section had interesting discussions on the following topics: "Deterioration of Hoisting Ropes, Caused by Wear and Acid Fumes," "Guards on Machines," "Creating Interest by Bulletins and the Location and Maintenance of Bulletins," "Safety Organizations and Getting the Interest of Foremen and Workmen in the Same," and "The Aims, Purposes and What Can Be Accomplished by the Construction Section."

The following took part in this discussion: Messrs. Myers, Williams, Lynch, R. Shaw, Robinson, Park, Davidson, E. F. Blank, Koppelmyer, Hart and Cannon.

Mr. C. S. Hill, Associate Editor of *Engineering News-Record*, Chicago, related in interesting manner the benefits derived by a Chicago contractor by the installation of a small field hospital on a large building construction job. The labor turnover was greatly reduced, etc.

The Section extended to Mr. Williams of the National Safety Council a vote of thanks and appreciation for his arduous and successful efforts in starting this, the first, Construction Section of the National Safety Council.

The Section adjourned about 6:00 o'clock; attendance, about seventy persons.

ORGANIZING FOR SAFETY—HOW TO SECURE THE CO-OPERATION OF SUPERINTENDENTS, FOREMEN AND MEN

LEO D. WOEBTKE, DIRECTOR OF SAFETY, FRED T. LEY & CO., INC., GENERAL CONTRACTORS, SPRINGFIELD, MASS.

Mr. Chairman and Members of the National Safety Council: In addressing you at this, the first meeting of the Construction Section of the National Safety Council, on so important a subject, I realize that I am assuming a position of trying to prove the possibility and practicability of something which has been set aside and disposed of for several years with the timeworn excuse "It can't be done."

It not only can, but has been done with extraordinary success, wherever a consistent and faithful try-out has been given. It goes without saying that the usual methods of safety organization and campaign used in all other industries, especially factories, mills and permanent plants, are not applicable to construction work and general contracting, because of its continual changing of locations, variation in types and kind of work, fluctuation of number of employes, and the ever-shifting personnel of the men. These conditions, peculiar only to construction work, have been aggravated even more since we entered the world war, necessitating the use of many "green men," and suffering the loss of large numbers of skilled workers in various classes who have joined the colors or were attracted to other fields of war industries, munition factories, shipyards, etc.

Even so, with all these handicaps, safety engineering and accident prevention in construction work are not only possible, but simple and easy of application under proper methods. On account of the many branches of construction work in general contracting, and the variation in size and territory of general contractors, as a whole, it would indeed be difficult to lay out any fixed set plans or methods of organization, and I must, therefore, be confined to general methods which have already proven satisfactory, and, of course, would need to be changed as occasion required to fit any particular firm or contractor.

THE CONTRACTOR MUST HAVE A REAL INTEREST

To begin with, the head of the firm, the executive, the "big boss" must first of all be convinced that there is need—yes, dire need—of organization and campaign, and the statistics of his insurance company or his own records, if he keeps them, should quickly arouse him to a sense of duty when he realizes the number of deaths, disabilities, missing members, blinded and crippled men, etc., due to his operation: the trained and skillful employes losing days, weeks and months, away from important work: his labor turnover data and the cost of breaking in new men; not finishing his jobs on time, sometimes paying a forfeit or losing a bonus; the extremely high and ever increasing rates for his liability insurance, and the realization that it is well worth while, from every angle, to spend

time and money keeping good men, rather than hustling around, at a loss, to secure new labor, continually. In these days, when manpower is such an important factor to our government in the great world struggle, it should also be remembered that every workman in the hospital or away from his work because of an accident or injury, is one less industrial soldier backing up the splendid manhood of our country "over there" who depend on us so much "over here."

Show the employer facts and figures, quote him statistics of the government bureaus, the National Safety Council, and other reliable authority as to the part played in maiming and killing men in the contracting industry. For instance, the New York State Industrial Commission says there are more workers killed in construction work than in all the factories. In Wisconsin it is stated that 15 to 20 per cent of all fatal and serious accidents are charged up to construction work. In the Pennsylvania building trades alone (not including other construction work) 111 persons were killed and 1,600 were injured seriously enough to receive compensation during the first six months of this year, 1918.

The head of the firm may not know that records of accidents in this country show:

1 workman injured every 13 seconds.
243 workmen killed or injured every hour.
Over 2,000,000 workmen killed or injured every year.

Even this world war, in all its seriousness and hazard, is far less a drain on American manpower than our industries at home. Ask the contracting firm executive how many injuries and deaths, and how much pain, suffering and misery, were caused on or through his operations, and show him that at least 75 per cent of his accidents are absolutely preventable, and that some of his competitors have reduced their accident frequency from 20 to 80 per cent, and their accident cost accordingly. The firm's executive, of course, cannot direct the work of accident prevention and safety engineering, and he is not expected to; but he can and necessarily must give someone in his employ the authority and position of director of safety or manager of his accident prevention department, or some formal, dignified title, and he must necessarily make all allowances for reasonable expenditures in carrying out this work. He will realize that the days have long since gone by when you could get something for nothing, and when things took care of themselves.

SAFETY MAN MUST HAVE AUTHORITY

Letters and instructions to all superintendents, foremen, straw bosses, purchasing agents, department heads, field offices and jobs, must, of course, be written, and should be signed by the firm's executive, to establish the authority and secure the respect and co-operation due the man who is to carry out his work, for without such a start he can never hope to succeed. Once established, the safety director should study the particular line or lines of construction work his firm is engaged in and fortify himself with all available information, data, bulletins, instructions, safety guards, etc., applicable to the types and kinds of operations engaged in by

his firm. There is a fund of such data and information at the disposal of any one who is seriously interested. The National Safety Council has hundreds of finely illustrated bulletins, designed especially for construction work, which should be posted on the job bulletin boards. They also have issued several splendid Safe Practices pamphlets on "Goggles," "Engine Guarding and Engine Stops," "Freight Elevators," "Grinding Wheels," "Couplings, Pulleys and Gearing," "Scaffolds," etc. They have a splendid library, with three librarians in charge. They also have a specialist in safety engineering and accident prevention on construction work—Mr. Sidney J. Williams, manager of their Accident Prevention Division—who has spent several years in and about general construction work. Also, most all large insurance companies now maintain an efficient accident prevention department, and issue many valuable bulletins and furnish safety inspections, advice, co-operation, etc., without cost to their policy holders.

A number of publications are devoted entirely to safety work, as, for instance, *Safety Engineering*, issued monthly, at a small subscription price. You can also secure, without cost, and simply by application, *The Monthly Review of the United States Bureau of Labor Statistics*, by writing to Dr. Royal Meeker, Commissioner of the Bureau, at Washington. Also there are many Local Safety Council branches of the National Safety Council, and they should be joined if one is in the locality or nearby, to get the benefit of their round table meetings, mutual experiences, etc.

The matter of mechanical safeguarding, wherever possible, is most important, and a complete list of manufacturers of safety devices and appliances of all kinds can readily be secured from the National Safety Council. The fact that construction work is well safeguarded mechanically is a strong incentive and one of the best inducements for the superintendent and foreman to safeguard his job and to assist in the safety education of the rank and file of the men on the job, as it is then plain to them that the employer has done all that can be expected of him, at an expense of time and money and maintenance of a safety department to direct them, and naturally it is up to them from then on to secure results.

EDUCATE THE STRAW BOSSES

Construction superintendents, foremen and straw bosses, of course, are pushing a job continually to get it done in the shortest possible time, and at the least possible expense, and must be approached on safety work and accident prevention with clear and reasonable requests. They must be educated to the safety idea gradually and in a systematic and consistent manner, without the use of sarcasm or destructive criticism. Write them a personal circular letter at least twice a month, and always enclose with same from two to four new bulletins for each of their bulletin boards. Continually call their attention to types and causes of accidents prevalent on their jobs or on other jobs, always stating a remedy or a preventive suggestion and inviting their ideas and suggestions to eliminate or reduce the causes of accidents. Do not hesitate to call their attention to accidents which have occurred on their jobs or certain types and causes of accidents which are running the highest or which have increased in number, but

also give them credit and a little praise when they are showing good results or pulling down the number of accidents on their job. These men, so keen and able in all their work, are intensely human and accept constructive criticism as well as expect due credit, just the same as you and I.

Unless you eventually succeed in getting the superintendents, foremen and straw bosses, and, finally, the rank and file of the men on the job to co-operate with you, because they "want to" and not because they "have to," you will have failed and another safety director will be needed in a hurry.

The safety director should keep records of the accidents and statistics for each job separately by months, in order to know, while the job is in progress, whether there is an increase or a decrease in the number of accidents, and also that he may keep the job superintendents and foremen advised monthly; remember "the water which has gone over the dam is lost" and there is very little satisfaction in advising a job superintendent or foreman at the finish of a job, that he had a bad record. You would not wait until a job was finished to advise a superintendent or foreman that the job lost money or cost more than it should for any unit or for the whole job, but you would know at least monthly, and possibly weekly, exactly how the cost of the job was running.

After considerable experimenting, I have found it advisable to classify only lost-time accidents into twelve main causes, as follows:

1. Handling materials.
2. Handling tools.
3. Bad or broken tools.
4. Falling or flying objects.
5. Poor or broken staging, scaffolds and runways.
6. Lack of toeboards, rails, screens.
7. Falls or slipping.
8. Protruding nails.
9. Ladders.
10. Ropes, chains, cables.
11. Machinery and equipment.
12. Miscellaneous.

And to bunch all no lost-time accidents under one group. Also to split the lost-time accidents into compensable and non-compensable groups, as well as to record the number of disabilities and fatalities separately. This is easily done by giving each cause a number from 1 to 12 (see accident classification report) and marking on each report received the cause number and also whether or not the accident is a lost-time case, whether compensable or not, and also noting if a disability or fatality is involved.

A clerk can compile this data monthly onto the printed form. You will note it is a simple matter to see at a glance how the accident frequency is running on any job, from month to month, both by causes and as a whole. There are a number of sound ideas on this subject and I have used several of them to keep superintendents, foremen and the rank and file on the job continually interested in safety work and accident prevention. I will mention some of them:

SUGGESTIONS FOR BULLETIN BOARDS

Frequent safety letters with information, suggestions and friendly criticism.

Fresh bulletins for the job bulletin boards at least twice a month. These can be secured from the National Safety Council in any quantity desired. Also many insurance companies furnish occasional bulletins for their policy-holders. We have also used several home-made bulletins showing reproductions from photographs of good and bad actual conditions on our own jobs, such as stagings, hammering tools, equipment, elevators, debris, etc., and have also made up blue printed bulletins occasionally by way of novelty and attraction.

Occasional special articles on some one thing at a time, such as "Chains, Ropes and Cables," "Safe Loads," "Fatigue," "Spreads," "Slings," etc., the "Dropsy or Butterfinger Habit," "Fire Prevention," "Am I My Brother's Keeper?" etc.

Patriotic references with regard to "industrial soldiers," "backing up the boys," "standing by Uncle Sam," etc.

Once in a great while a prize bulletin contest, open only to employes of the firm, excluding executives and the safety department, offering small cash prizes for the best suggestions for a safety bulletin illustrating a common hazard applying to the firm's operations or to general contracting.

Snappy safety slogans at the foot of all letters of any kind between the office and the job (the National Safety Council issues a pamphlet listing hundreds of these slogans, and you can create many timely ones of your own). Also safety slogans, cautions and instructions on the backs of pay envelopes.

Danger tags with the firm's name thereon supplied in small tin half-containers, fastened to the inside of tool boxes in the blacksmith shop, tool house, field office, etc., which are available for use on defective or condemned tools, machinery and equipment.

Accident statistics, both your own actual experiences on any job or on all your jobs as a whole, and also striking general accident statistics which are published from time to time.

An occasional circular letter signed by the firm's executive, asking for a report on what is being done in the way of safety work and accident prevention, the condition of bulletin boards, goggles, tools, equipment, first aid cabinets, etc.

Safety calendars in cartoons, for use in field offices, tool houses, etc. The National Safety Council issues one at a very low cost each year. (You can have your firm's name printed on these calendars.)

Some firms also furnish the service of the Life Extension Institute at their expense to regular employes, including physical examinations and personal reports. "Keep Well" leaflets, the institute's monthly publication, *How to Live*, etc. Undoubtedly the sound and healthy employe meets with far less accidents, as he is usually satisfied, efficient and contented. This service, of course, cannot be given to the floater or temporary employe. It is also well to encourage and invite suggestions, ideas and constructive criticisms from any and all employes, as many splendid results and often good data or methods are thus secured. Competition can also be created by quoting the records of various jobs on a percentage basis of accidents per hundred men, and is a good occasional stimulant.

When a new critical departure or strict rule is necessary, it is often well

FRED T. LEY & CO., INC.

SAFETY DEPARTMENT

ACCIDENT CLASSIFICATION REPORT

MONTH OF.....191.....

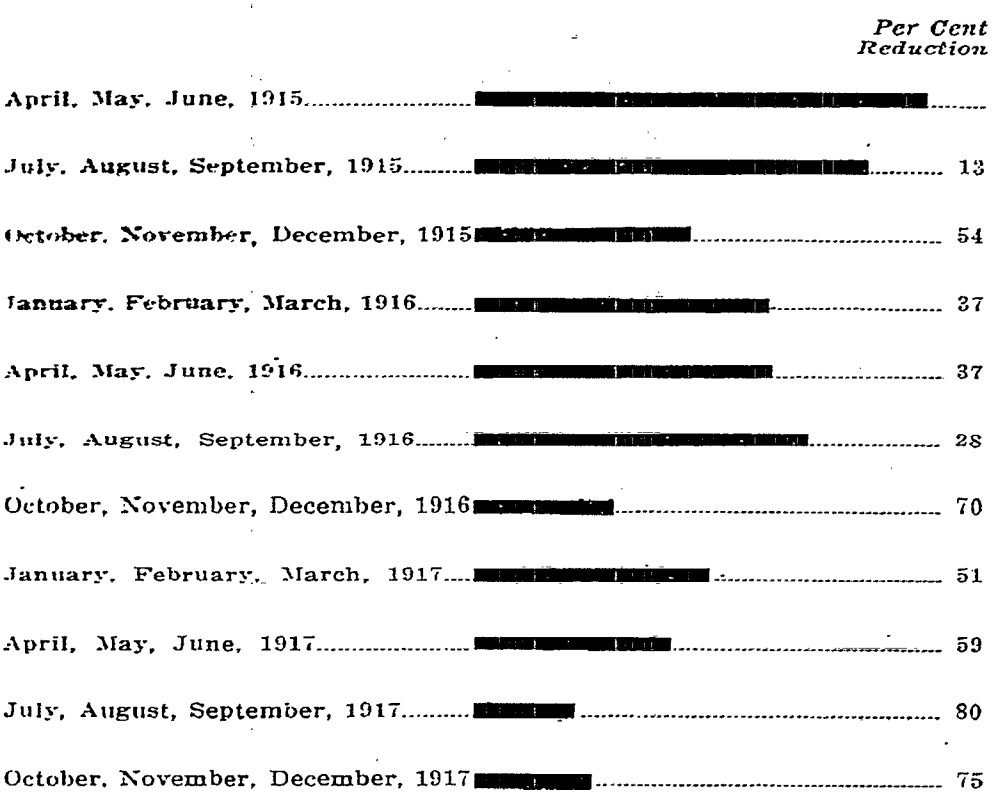
Contract	CAUSES OF LOST TIME, ACCIDENTS													Lost Time		No Lost Time		Accident Rate			Lost Time No Comp		Compensatable		Disabilities		Fatal	
			1 Handling Materials	2 Handling Tools	3 Bad or Broken Tools	4 Falling or Flying Objects	5 Poor of Broken Staging, Scaffolds	6 Lack of Toe Boards, Rails, Screens and Runways	7 Falls or Slipping	8 Protruding Nails	9 Ladders	10 Ropes, Chains, Cables	11 Machinery and Equipment	12 Miscellaneous	No. of Accidents	Per Cent of Total Accidents	No. of Accidents	Per Cent of Total Accidents	Total of All Accidents	No. of Employes	No. of Accidents per 100 Employes	No. of Accidents	Per Cent of Total Accidents	No. of Accidents	Per Cent of Total Accidents	No. of Accidents	Per Cent of Total Accidents	No. of Accidents	Per Cent of Total Accidents

FRED T. LEY & CO., INC.

LOST TIME ACCIDENTS

APRIL 1, 1915 TO DECEMBER 31, 1917, INCLUSIVE

Per Cent Reduction in Accident Rate per 1,000 Employes, Shown by Quarterly Periods



Reduction by Years—	1916 *Per Cent*	1917 *Per Cent*
Accident Frequency	25	55
Accident Cost	53	66

to have the firm's executive sign the circular letters used covering it. A small pamphlet of safety instructions and rules can be drawn up and printed, to be given every new employe, when he is hired, and also a different pamphlet on similar lines for the superintendents and foremen. These pamphlets might be called No. —, and additional new or corrected pamphlets issued from time to time in the future, numbering them in order.

The compilation of a chart, showing the accidents as a base, two or three years ago, and reduction or increase by yearly quarters thereafter, created keen interest when blue printed, distributed, and posted on the various jobs. Creating the first chart, of course, is the most difficult, and the statistician or safety department of your insurance company will usually work it out for you or with you, after which time it is not difficult to add the results from quarter to quarter. Such a chart, as for instance, in my own case, is very instructive and interesting, as it shows a fluctuating increase over a spread of three years from 13 to 80 per cent, sometimes dropping down, but usually gaining. The first quarter of this year shows the percentage of reduction as 79. The computation of the second quarter is not quite complete, on account of the season being rushed and at the peak of the construction industry.

There are any number of ideas which can be worked out to secure and keep up the job's interest in safety work which develop as you go along. There is a real study in psychology in mastering the "safety bug," and the deeper you go into it the deeper you want to go.

Before closing my remarks, I feel that I should quote a few of the preventive methods we have employed against each of the twelve main causes of accidents:

HANDLING MATERIALS

1. Wheelbarrows, canthooks, ropes, chains and slings, blocks and falls, scale boxes, dump and flat cars, derricks, cranes, etc., should be kept in good condition or discarded if unsafe. Constant inspection should be made and employes requested to report all unsafe conditions and to use danger tags for faulty or condemned equipment.

2. Stout, sound runways, platforms and stagings of selected materials and safe construction. Close supervision by foremen is required in this connection.

3. Proper piling and placing of piles of lumber, brick, pipe, cement, stone, tile, etc.

4. Continual cautioning by foremen against "fooling," the "dropsy habit," "butterfingers" and overloads.

HANDLING TOOLS

1. Heads of bull points, chisels, drills and hammering tools dressed and trimmed every time points or edges are sharpened. Also care in over or under hardening.

2. All handles well wedged and supply of new handles on hand.

3. All tools stored in modern racks in tool houses, with heads, faces, etc., exposed to show condition and need of attention.

4. Danger tags in tin half-containers, conveniently placed in tool boxes, tool houses, field offices, etc.

5. Foremen, blacksmiths and tool men made responsible for inspection, repair and upkeep of all tools.

6. Constant instruction and education against careless sawing, hammering, use of wrenches, etc., causing injuries to hands and limbs.

BAD OR BROKEN TOOLS

1. Every accident from such cause should be closely investigated, bad tools to be especially called to the superintendent's and foreman's attention, and poor tools being called to the purchasing agent's attention.

2. There are many safety types of tools, references to which can be secured from the National Safety Council, and such data should be furnished the purchasing agent.

3. Tools showing inferior quality or defective material should be taken up with the manufacturer or dealer from which they were purchased.

FALLING OR FLYING OBJECTS

1. Suitable goggles provided on every job in every tool box and tool house. It is well to look over carefully the many types of goggles on the market and secure the advice and consultation of superintendents and foremen before buying in large quantities.

2. Superintendents and foremen must be held responsible for men wearing goggles when chipping or drilling concrete, stone, iron, steel, etc. Education, preventives and sometimes force must be advanced to the rank and file on the matter of goggles by the foreman.

3. Extra sets of chipping or drilling tools should be provided on all jobs to allow other sets being repaired or sharpened and not delay or hold up any work.

4. Toe or skirt boards, screens, etc., on scaffolds, stagings and inclined runways where materials are stored temporarily, prevent men below being hit by falling objects.

5. Chutes for rubbish or waste disposal should be closed in all the way and well guarded on the ground.

POOR OR BROKEN STAGINGS, SCAFFOLDS, AND RUNWAYS

1. Sound material of adequate strength, well selected and constructed, without weak knots, also no loose boards.

2. Hand rails or ropes, also screens, in addition to toe and skirtboards on all exposed edges of staging, scaffolds, runways, floors and elevator shafts, openings, etc.

3. Diagrams made out by foremen directly in charge of work on which scaffolding, stagings, runways, etc., broke or caused accidents should be secured and the causes ascertained, so that all other jobs may be advised accordingly.

LACK OF TOEBOARDS, RAILS AND SCREENS

1. As this heading has so much in common with poor or broken stagings, scaffolds and runways, see recommendations under that head.

2. Impress on superintendents, foremen and men, the injustice of causing injuries through lack of foresight and care in this regard.

FALLS OR SLIPPING

1. Passageways, floors, driveways and working spaces should always be kept clear of waste or surplus material.
2. Gates and railings at elevator and hoist shafts, floor openings, etc., should be located at least sixteen feet away from openings to prevent persons leaning, being struck, or slipping through the opening.
3. Fooling on stairways, ladders, scaffolds and stagings should be cause for serious reprimand and discharge, if necessary.

PROTRUDING NAILS

1. Waste and debris should be kept cleaned up properly and disposed of through rubbish chutes or piled out of the way.
2. Kegs and cases, when opened, should have protruding nails withdrawn or bent over.
3. Stripped forms in concrete work should be piled clear of passageways as taken down, and protruding nails piled downward until attention can be given them.
4. Every man on the job, from superintendent to water boy, should constantly turn over or pick up lose boards or planks with protruding nails. Water boys, tool men, etc., can be equipped with hammers on belts and constantly bend over or pull out protruding nails about the job.
5. Under no circumstances allow an injury from nails to go unattended and make the superintendent and foreman responsible for attendance by a doctor immediately, and advocate the doctor using anti-tetanus serum, if at all doubtful, as lockjaw cases are almost hopeless in advanced stages.

LADDERS

1. Do not allow ladders to be painted with pigment or lead paint. Insist on new ladders being treated with linseed oil and shellac, so that defects or deterioration will always be visible.
2. Continually discouraging the use of homemade ladders and occasionally call for a report from every job as to the condition of all ladders.
3. Co-operate with the purchasing agent in securing the best possible materials in ladders, and even safety types for certain kinds of work where advisable.
4. If safety feet are used, be sure the type purchased is suitable for universal conditions, such as concrete, wet wooden floors, steel surfaces, etc., as well as for use on the ground. This is a difficult problem and the superintendent and foreman should be carefully consulted on same.
5. Ladders should be well braced or lashed to prevent slipping, wherever advisable; the safe angles of placing ladders should be complied with. The National Safety Council recently issued a bulletin showing safe angles for ladders of various lengths.

ROPES, CHAINS AND CABLES

1. Up to date tables of safe loads at various angles of slings for ropes, chains and cables, should be furnished all superintendents and foremen and posted on bulletin boards. The tables shown in old style engineering handbooks are now pronounced inadequate by safety engineers, on account of present day material used in their manufacture.

2. Coils of ropes should never be stored near acid carboys, the fumes of which disentegrate the fiber without same being visible.

3. Purchasing agents should be furnished with up-to-date specifications on which to buy hand-made or machine-made chains. The National Safety Council will furnish these specifications on request.

4. Caution superintendents, foremen and men "to stand from under the load," "avoid kinks, twists and sudden jerks," "keep loads off points of hooks," "keep cables well lubricated" and store them away from alkalies, gases, fumes and acids.

MACHINERY AND EQUIPMENT

1. Daily inspection by foreman, rigger or some responsible person of all hoisting apparatus and mechanical equipment on the job and a thorough overhauling at main equipment plant on return from a job.

2. If equipment is sent from one job to another, thorough overhauling or repairing should be made, or if same is not practical, all defects or attention needed should be marked with tags and a memorandum or letter forwarded to the job where such equipment is being sent.

3. All gearing, keys, setscrews, exposed shafting ends, revolving projections, etc., should be thoroughly enclosed or well guarded on hoisting engines, drums, winches, mixers, screens, steam shovels, saws, mechanical clutches, grinding wheels, etc.

4. Safety collars and couplings, headless set screws, shaft pulleys and clutch housings, etc., wherever practicable; adequate grab handles and steps on large equipment, such as locomotives, steam shovels, cabs, cranes, dump and flat cars, etc.

5. Correct guards on gauge glasses and water columns. This is a serious problem, as many types of gauge glass guards are not practicable, because they require additional holes in boilers, some of which already have too many holes, and cause considerable expense, and also loss of time while same are being installed. Types of gauge glass guards are now on the market which can be slipped on instantly, and do not require any drilling of boilers, loss of time or disuse of equipment; master mechanics, engineers, etc., take more kindly to these types.

6. Cylindrical or safety heads provided on jointers or buzzplaners, approved safeguards such as spreaders, blade enclosures, travel limits, table guards, pushers, etc., on all saws (circular, spread, crosscut, overhead, treadle, swing, band, etc.).

7. Hooks for large hoists, cranes, derricks, etc., provided with handles on the back, and, where advisable, with guards over points of hooks. It is well to consult with the master mechanic and especially the rigger and hoisting man on this matter.

8. Pulley blocks, whether wood or iron, should be equipped with adequate side plates or flanges to protect mesh points between ropes and blocks. Bearings, pins and wheels, should be carefully inspected periodically, as this equipment gets much abuse and wear.

9. Advocate thorough inspection of all mechanical equipment on rainy days, when it is likely some superintendent, foreman, mechanic or rigger may be idle.

10. Small equipment might just as well be purchased with the safety idea, such as safety types of gasoline cans, carboy inclinators, hammering tools, drills, bull points and chisels of the best steel, well tempered, etc.

MISCELLANEOUS

1. Adequate shoring and excavating, or tops kept broken down to prevent caving.

2. Appropriate danger signs, tags and warnings. On account of men working above or below dangerous passes, forbidding riding on elevators, the public warned to keep out, fire prevention notices, occasional patriotic bulletins—assisting the government in Americanization, Liberty loans, thrift stamps, campaigns against venereal diseases, etc.

3. First-class guards, protecting exposed electric switches, wires, transformers, etc., against personal contact by use of cabinets, enclosures, warning signs, etc.

4. Children and the public being kept away from construction work where they have no business.

5. Fire prevention methods, boilers safely housed, spark guards on smokestacks, spark screens on salamanders, fire extinguishers in job offices, tool houses and appropriate parts of the work. (The National Fire Underwriters' Association will furnish you bulletins on fire prevention.)

6. A surprising number of men are disabled and lose time through causes other than accidents. Sunburn, poison ivy, bad drinking water causing dysentery, infection from boils, pimples, etc. Personal advice and caution by superintendents and foremen can reduce this cause of loss of time in many instances.

There are, of course, many other preventive methods, suggestions and ideas in use which time will not permit mentioning. However, I sincerely trust that the general outline I have presented convinces you that safety engineering and accident prevention on construction work and general contracting is something that *can be done* and that the coming year will see it being done with splendid success throughout the entire country.

SAFE CONSTRUCTION OF SCAFFOLDS AND FALSEWORK

T. F. Foltz, Mechanical Engineer, Pennsylvania Department of Labor and Industry, Harrisburg, Pa.

Mr. Chairman and Members of the National Safety Council: During the year 1917 the Pennsylvania Department of Labor and Industry received

the following reports of accidents in connection with scaffolds in the manner indicated:

	Total	*Fatal*
1. Persons falling from structures during erection	217	14
2. Persons injured due to collapse of scaffolds and staging	367	11
3. Persons falling from scaffolds and staging	2,121	31
4. Persons injured by material falling from scaffolds and buildings under erection	385	9
Totals	3,090	65

The first group of accidents indicates an absence of protection where such should have been furnished. Poor construction is shown by the record in the second group. The information in the third group, by far the largest, tells us most vividly that we did not provide sufficient guards for the workmen on the scaffolds. Inadequate protection for pedestrians and workmen against objects falling from scaffolds and buildings resulted in the accidents shown in the fourth group. The above records have been taken from the department files with considerable caution, such accidents which could not definitely be blamed on any of the above causes being rejected; the resulting figures, therefore, are most conservative and do not begin to cover all accidents in connection with building construction.

PROBLEMS OF THE BUILDERS

The scaffold problem of the builder, then resolves itself into four items, namely:

1. Determine the necessity for a scaffold.
2. Construct sufficiently strong to prevent a collapse of the scaffold.
3. Provide adequate guards to prevent falls of the workmen.
4. Install protection to prevent injury from material or tools falling on persons.

Poor and inadequate scaffold construction may be traced largely to the desire on the part of builders to use old and poor lumber. Subcontractors generally fail to include sufficient money in their bid to cover this contingency, depending on using scaffolds erected by the general contractor. These scaffolds may have been satisfactory for their original purpose, but in some cases may not be adequate for the use of the subcontractor. Even though sufficient money has been included in the bid for the erection of proper scaffolds, there is a great incentive to skimp this portion of the work in order to increase the amount of "velvet." Too much dependence is usually placed on picking up sufficient lumber about the job to construct scaffolds. In this way not only will improper sizes be used but the material may also be mostly inferior and defective.

The work of building the scaffold is too often delegated to unskilled persons, because it is not a permanent structure and appearance is no object. Many accidents can be traced to this cause and it is surprising that we do not have more of them. The contractor should delegate a

thoroughly experienced man to be responsible for this work, and all building, changing, and removal of scaffolds should be done under his jurisdiction.

TYPES OF SCAFFOLDS

No attempt will be made in this paper to describe the different kinds of scaffolds used abroad, there being only sufficient time to discuss briefly the various types used in this country. Scaffolds, according to their construction and use, may be divided into the following general types:

- Pole scaffolds,
- Independent pole scaffolds,
- Suspended scaffolds,
- Outrigger scaffolds,
- Carpenters' bracket scaffolds,
- Painters' scaffolds,
- Needle-beam scaffolds,
- Plasters and decorators' inside scaffolds,
- Horse scaffolds.

POLE SCAFFOLDS

The general construction of the pole scaffold, used mostly by bricklayers, is as follows: "Poles" or "uprights," about 4 inches square in cross section, are erected about 7 feet 6 inches apart on a line approximately 4 feet 6 inches from the wall. Stringers, called "ledgers," 1¼ inches thick and from 8 to 12 inches wide—depending on the load they are to carry—are nailed on the poles in a position parallel to the ground. These are spaced vertically about 5 feet apart and serve as the outer bearings for the "putlogs." The inner ends of the latter (often called "putlocks"), having a cross section of about 3 by 4 inches and a length of about 6 feet, rest in holes left in the brick wall.

The putlogs support the platform planks, and there should be a sufficient number of them so that there will be at least three under every plank. With 16-foot planks, about 2 inches thick and 10 inches wide, the putlogs may be spaced the same as the uprights—namely, 7 feet 6 inches apart. If thinner planks are used the putlogs should be placed closer together. The planks, with the above dimensions, will lay five wide in the space between the building and the uprights. Their ends will overlap each other 1 foot, and there should be a putlog under this point of overlapping to avoid the formation of a "blind trap."

It will not be necessary to nail the putlogs or planks in position unless local conditions require that they be erected on an incline, or heavy vibration or other considerations should necessitate such a precaution. There should be a guard rail, at least 3 inches by 1½ inches in cross section, erected along the uprights, parallel with the platform, and about 34 inches high. A similar guard rail should also extend across any window openings on the building side of the platform where these openings extend to more than 34 inches above the platform. Below this rail, along the outer edge of the platform, a toeboard about 6 inches deep should be provided to prevent material from falling from the scaffold. If material, such as bricks, are to be placed on the platform in piles higher than the toeboard, then the latter should be higher accordingly, or the space between the toeboard and the guard rail should be filled in with boards or substantial wire screening.

In order to eliminate the possibility of the pole scaffold collapsing in a direction parallel with the walls, there should be substantial diagonal braces nailed across the uprights. There should also be braces nailed to the building at various points, such as window frames and other points of attachment, in order to prevent the scaffold from falling away from the building. On blind walls, where there are no points available for nailing braces of this kind, "spring stays" may be used. To make a spring stay, two boards are inserted in the hole in the wall left by the removal of a putlog in raising the platform to a higher level and a brick is then placed between the two boards and pushed to within a few inches of the wall. The outer ends of the boards are then sprung together and nailed fast to the scaffold. The result is that both boards at their inner ends are pressing against the top and bottom of the hole with such force that there is sufficient holding power to prevent the scaffold from falling away from the building.

INDEPENDENT POLE SCAFFOLDS

The design of the independent pole scaffold departs somewhat from that of the pole scaffold. Instead of using the building as the inner support for the platforms, an additional set of uprights is erected close to the building. This kind of scaffold is often used by stone masons, as it is usually undesirable to leave openings in stone walls for the reception of putlogs. These scaffolds are usually made in larger dimensions than the pole scaffolds, and a greater amount of bracing is necessary on account of their being independent of the building for support. Instead of the usual putlogs resting upon the ledgers, as in the pole scaffolds, boards about 1½ inches thick and about 9 inches wide are nailed on the sides of the uprights just above the ledgers and perpendicular to them and the building. These bearers, which correspond to the putlogs, add considerable bracing to the structure on account of being nailed fast.

This scaffold is usually made twice as wide as the pole scaffold, and larger members are used throughout on account of the greater strain upon the various parts. The method of laying flooring is substantially the same as that for the pole scaffold and the same consideration should be given with reference to the guard rails and toeboards. Better footing is required on these scaffolds on account of a greater weight resting upon each upright. Where there is any question as to the ability of the soil to hold the pole, there should be a substantial block of wood, about 2 inches thick and 1 foot square, nailed to the bottom of the upright in such a manner that a larger bearing area will be secured. Stones or bricks should never be used under uprights on any kind of a scaffold, as they are very easily knocked from position by trucks or material bumping against the uprights.

SUSPENDED SCAFFOLDS

Pole and independent pole scaffolds are generally used for buildings up to about six stories in height. Above this height the construction of these scaffolds becomes a large item of expense, and there is also a

greatly increased element of danger connected with high scaffolds, due to the great weight coming upon the bottom uprights. On high buildings it is now customary to use suspended scaffolds, which usually consist of substantial platform planks resting upon putlogs, each end of which is suspended by means of a cable hung from an overhead beam projecting from the building. These scaffolds are usually equipped with means for raising and lowering the platforms, which consists of a machine for each cable with a drum and means of winding up the cable.

There are two principal types of these scaffold hoisting machines. On one the winding drums are located on the platform and on the other these drums are located on the beams overhead. Advantages are claimed for both systems and no attempt will be made here to justify the use of one over the other. The first type is worked, usually, by a lever and ratchet operated directly on the cable drum on the platform; the other is operated by means of worm gears and a sheave wheel driven by a tiller rope which extends within reach of the men on the platform. These scaffolds are usually provided with cables approximately 100 feet long; where it is necessary to work beyond this range the scaffold is relocated to a new position above after the cable is wound up.

Suspended scaffolds should never be used without guard rails and toeboards, on account of the great height at which they are operated. It is also advisable to fill in the space between the guard rail and toeboard with substantial netting having openings no greater than ½ inch.

OUTRIGGER SCAFFOLDS

At certain places, such as under big cornices and for other special construction, platforms are often placed upon beams thrust out from the building. These beams should be of substantial dimensions and excellent quality, and they should be rigidly fastened on the inner ends to floor beams or substantially braced against overhead beams. No dependence should be placed upon these cantilever beams being simply fastened into the wall; they should project inside of the building to some considerable distance and there securely fastened. Guard rails and toeboards should always be used with this type of scaffold and the planks should be provided with the same consideration as used for laying the planks in pole scaffolds. These scaffolds are not recommended where it is possible to use one of the other types.

CARPENTERS' BRACKET SCAFFOLDS

With the carpenters' bracket scaffold, platform planks are placed upon brackets, which consist of horizontal and vertical members, usually about 4 feet long, and a diagonal member to provide the necessary bracing. These members are bolted together in a substantial manner, and the bracket is placed on the building with its horizontal member perpendicular to the wall. It is held in that position by a bolt anchored at the inner end of the horizontal member, extending through the wall, and bolted on the inside. This bolt, usually about ⅝-inch in diameter, should

not be simply bolted through the sheathing, but should project through a substantial block that extends across the inside of the studs.

There should be sufficient brackets in order that there may be three under each plank. Thus, with 16-foot planks, the brackets should be no farther apart than 7 feet 6 inches, in order that the planks may overlap each other about one foot over every alternate bracket. This type of scaffold does not adapt itself very readily to the installation of guard rails and toeboards. These rails and toeboards may, however, be installed without much trouble, and, where the scaffold is used more than 10 feet above the ground, they should certainly be erected. It is a very common practice to lay the platform planks upon these brackets in such manner that the points of overlapping do not always come upon a bracket. This forms a blind trap and under certain conditions may result in a man being precipitated to the ground below, should he place his entire weight upon the unsupported point of overlapping.

PAINTERS' SCAFFOLDS

The painters' scaffold is quite familiar to all. It consists of a ladder-like platform having parallel sides, but somewhat wider than an ordinary ladder, each end of which is suspended by a triangular stirrup. This stirrup is usually made of ¾-inch wrought iron or steel, and at the upper or apex corner the metal is in the form of a smooth loop for the reception of the hook of the lower hoisting rope block. The upper block of the hoisting rope is held by a large wrought iron or steel hook, about ⅞-inch diameter in cross section, which is hooked over the cornice of the building in a substantial manner. The stirrups should have appropriate brackets for the installation of guard rails as well as toeboards. It is noted with a great deal of satisfaction that this type of scaffold is being provided with these rails more generally now than several years ago. The scaffold is raised or lowered by the men on the platform and the free end of the rope is deftly looped under the rounded apex of the stirrup and over the hook in such manner that the platform is held in position without any further securing of the rope.

The loose ends of the rope below the fastening should be protected from injury or tampering by unauthorized persons on the ground, and it is a good plan to coil this free portion of the rope upon the platform. Projections in front of the platform, with rollers on their ends, bear against the side of the building and determine the distance that the platform shall have therefrom. Where the distance from the platform to the point of support overhead is great, the scaffold should be lashed to the building in a substantial manner in order that it will not swing away from the building and thus present a considerable hazard to the workmen. When the men leave the scaffold for any length of time they should either lower it to the ground, or at least lash it securely to the building in such a manner that it will not be blown about by the wind. Buckets and tools should not be left on the scaffold, as they may fall to the ground below with possible injury to persons. No more than two men should regularly work on one painters' scaffold, and no

more than three men should ever be on the scaffold at any one time. Several painters' scaffolds should not be combined by bridging the spaces between them with planks, in order to cover a greater amount of the building with a small number of scaffolds.

NEEDLE-BEAM SCAFFOLDS

Needle-beam scaffolds are used largely for riveting steel work on buildings and for working under roofs. It consists of a plank platform resting upon two beams which are suspended at each end by means of ropes. Where beams span from 10 to 12 feet they should have a cross section of at least 4 by 6 inches; for larger spans, larger beams accordingly should be used. Great care should be used in the placing of the platform planks. The beams should be parallel and, in case local conditions require that one beam be lower than the other, the platform planks should be provided with bolts in each end to prevent them sliding over the beams. It is best practice, in any event, to have the platform planks always fitted with these bolts placed about 6 inches from each end. In some cases guard rails on this type of scaffold may be a hazard instead of a help. Where the work consists of swinging a maul or a sledge, the guard rail may promote an accident instead of preventing it.

PLASTERERS' AND DECORATORS' SCAFFOLDS

Plasterers and decorators, working on large interiors, usually operate from scaffolds designed somewhat similar to independent pole scaffolds. These cover the entire floor, in order that access to the ceiling may be had as well as to all the walls. For very large areas, scaffolds are usually constructed around the four walls of the room, and suspended or needle-beam scaffolds are hung from the ceiling. In erecting the side scaffolds the same precautions should be taken as with the construction of independent pole scaffolds. The parts should be well braced and the same care should be taken as to the installation of guard rails and toeboards. There is a difference of opinion as to how the platform planks should be laid overhead. Many authorities believe that it is satisfactory to permit a space of 6 inches to a foot between the various planks, assuming that the men will not fall down through such a space. This, however, does not prevent tools or material from falling to the floor below and possibly upon persons, and it is more desirable that the platforms be built solid, particularly at the points where the men do their work. For lower-ceiling heights, horse scaffolds and ladder scaffolds may be used.

HORSE SCAFFOLDS

Horse scaffolds consist of strongly made trestles, over which platform planks are placed. They are used largely by stone masons for both inside and outside work. The work is first carried up about 5 feet from the base, after which a platform is erected with horses about 4 feet high, together with the usual platform planks. When the work is again carried beyond reach of the men, another horse scaffold may be erected

upon the first, care being taken to see that the horses are placed directly one above the other. It will not be necessary to leave all of the platform planks upon the first scaffold. The outside planks, or those upon which the legs of the horses rest, should remain in position, and the others may be removed for use above. If the work is being done inside, it is possible that the men may reach the ceiling without erecting any more tiers, and the work may then be carried on from the floor above, provided the building is of steel construction and the floor beams have been constructed before the side walls. There are cases where builders erect horse scaffolds in six or even eight tiers high, but we do not consider it advisable to go beyond three or four tiers. It is not an uncommon sight to see bricks or other material under trestle legs, and in such a case there is needed only a slight jar to upset the whole scaffold. It is advisable that, where these scaffolds are erected in tiers, the trestles legs be nailed to the planks upon which they stand. This will give increased strength to the scaffold and help to prevent its collapse, due to vibration caused in any manner. A scaffold of several tiers should also be braced against the side of the building, or by diagonal braces from the floor.

GENERAL REQUIREMENTS

There are many other kinds of scaffolds used for special purposes, these being usually small and portable, such as paper hangers' scaffolds, boatswain's chairs, pipe repair scaffolds, etc. Time will not permit any further description of these types.

The lumber used in scaffolds should be either spruce or long-leaf yellow pine; hemlock should not be used as it is too brittle. All parts should be free from defects, such as injurious ring shakes and cross-grain or unsound knots. Nails should be of the best quality and they should be driven full length, the bending over of partially driven nails being poor practice. Cables used with suspended scaffolds should be not less than ½-inch in diameter; they should be plow steel, 6 strands, 19 wires, and have a factor of safety of at least 5. They should be galvanized to order. Steel ribbon should not be used for suspended scaffolds, as it is liable to break and is easily kinked. Where rope is used it should be of the best manila grade, and, where it passes over sharp corners, should be protected from abrasion by padding or other suitable means.

Where scaffold uprights are spliced, they should be butted together and at least two boards, about 4 feet long, should be nailed on two adjacent sides. The splices on adjacent uprights should not be at the same level but should be staggered. Where fixed ladders are constructed on scaffolds, they should extend about 45 inches above the platform, in order to facilitate the landing of the workmen. Single-pole ladders should not be used. Where the scaffolds are to be used a long time it is preferable to construct stairways having full treads and substantial railings. Runways to platforms should not have a greater rise than 1 foot in each 2 feet of length. Where the rise is greater than 1 foot in 5 feet of length the runway should have cleats nailed thereon about 8

inches apart to prevent slipping. The center portions of the cleats may be omitted in order to provide a wheelbarrow track.

Where necessary, overhead protection should be provided for persons or workmen about scaffolds, in order to catch falling objects. Where a sidewalk under a scaffold is kept in service, it should, of course, be entirely bridged over with substantial material. All doors being used on ground floors of buildings should have ample protection over their entrances. Suspended scaffolds should also be equipped with either heavy canvas or heavy wire netting covers, where used with tall buildings, in order to protect the workmen on the scaffolds.

Consideration should be given to the use of life lines and safety belts for men working on thrust-outs and high elevations. These, however, should be used with caution, as they may, in certain cases, hamper the workmen and possibly promote accidents. In large auditoriums having high ceilings, and also for structural iron workers operating at great heights, safety nets are often used advantageously to catch workmen should they fall. These nets should be constructed of at least ½-inch manila rope, having meshes no larger than 4 inches square and borders of at least ¾-inch rope.

FALSEWORK

A great deal of the foregoing material applies to the construction of falsework. This class of construction cannot be standardized to the same extent as scaffold work, hence it will be impracticable to give, in detail, specifications for safe construction. Whether the falsework is erected to support a stone or brick arch, or partakes of the elaborate work used in the building of some of our modern masonry and concrete bridges and similar structures, it should in every case be given careful treatment, and be designed according to the stresses to be met. In most cases it will be necessary to make drawings, giving as much detail as if the structure were a permanent one.

Only the most experienced men should be entrusted with the construction of this class of work, and propositions of large dimensions should be handled as faithfully as though the structure were going to be a permanent one. In the design and construction of all falsework, great consideration should be given to the method of its removal after it has served its purpose. False centers should be so designed that, by collapsible keys or other means, they may be removed without straining or damaging the permanent structure. It is needless to say that all cement and mortar should be thoroughly set before the supports are removed.

CONCLUSION

All scaffolds and falsework should, while in use, be given periodic inspections to determine the appearance of any weak parts or any unauthorized changes. Wrestling and "horse-play" by the workmen upon scaffolds should not be tolerated. Workmen subject to dizziness or fainting spells should not be permitted on scaffolds or falsework, nor should any man under the influence of liquor. Projecting nails, either

on the platforms or other parts with which men may come in contact, should be carefully removed. Uprights, at their bases, should be protected from displacement by the backing up of wagons or trucks at points where this is liable to occur. Projecting parts, in the vicinity of hoisting apparatus, should be removed to prevent their being fouled and causing injury to the structure.

Fifteen years ago the suggestions given in this paper would probably have caused the average builder to throw up his hands in disgust. In fact, he would have been outbid by his competitor, if he had endeavored to comply with these requirements. However, we are gradually getting away from those conditions, but there is yet much to be done in the way of safe construction. The fact that the scaffold or falsework does not appear in the completed structure hampers greatly any rapid progress along the lines of safety. If hospital and coroner's records could be blazoned forth upon the finished structure, in such manner as are its architectural features, then we would surely achieve safety in the construction of scaffolds and falsework.

SAFE CONTRACTING

A. P. Greensfelder, President, American Society of Engineering Contractors, St. Louis, Mo.

Mr. Chairman and Members of the National Safety Council: Having been invited by Mr. S. J. Williams, Manager of the Accident Prevention Division of the National Safety Council, to discuss safety matters before the Construction Section, I am taking his instructions literally. *First,* I am going to play "safe" by defining the "party of the first part" of a contract as the "constructor," instead of the usual term, "the contractor," which is misleading in that it fails to designate which party to a contract. *Second,* as President of the American Society of Engineering Contractors, I wish, on behalf of the constructors of America, to congratulate Mr. Williams on his inauguration of the Construction Section of the Safety Council and to extend to him our earnest support in his endeavors in this important field.

Constructors are large employers of labor and as such we should be as much concerned in the problems of safety for our employes as manufacturers or public utility companies. We believe too little attention has been given this subject by our profession and we welcome experienced counsel. We have been prone to insist on men guarding our machinery against accidents or wear and tear, instead of realizing that machinery should be guarded as well to protect its operators and the public.

We are apt to regard renewal of boiler tubes, for instance, as merely necessary to produce steam, when as a matter of fact we should bear in mind also the safety of our firemen and enginemen. How often do we examine only our machinery at regular intervals to repair weak parts or renew broken ones, instead of looking a bit further and examining the ma-

chine tenders themselves to ease their own physical burdens and discomforts.

MAKE WORK CONDITIONS SAFE

Engineers, particularly in the construction field, trained in production economies are usually too short-sighted to look beyond speeding up machines to the motion study of weary operators whom we hold responsible for speed results. Steady, healthy, whole-limbed men are our most valuable asset and they deserve far more attention than has been our habit. I plead for voluntary, conscientious and vigorous relief of our human machinery, whom we tempt with wages, or who are driven by necessity to engage in work which can and does prove dangerous and often fatal. Should we not, as our brother's keeper, use our best efforts to guard our interested men and our own interests by studying and practicing Safety First.

"Safe structures," in sizes to suit, has been our specialty for years and as a profession we have gained an enviable reputation for "quality service," speed and reliability, and of this we are justly proud.

In the past constructors have probably felt that they were so beset with natural dangers, such as weather conditions, water, fire, wind and caving earth that they must devote their entire attention to guarding against these foes of profits. We have frequently admitted the failings of human estimators and suffer mental and financial tortures from misplaced decimal points and then console ourselves with remarks about the "survival of the fittest." How easy we find it to abuse the supervising engineer and classify him in inverse ratio as he classifies rock, shale or earth in our final estimate, and then we think we have really done our duty.

We are forced to contest with the ever-increasing and closer contesting competitor and calculate matters that should consume our idle moments. Sub-contractors of varied speed and certain reliability and material deliveries from various sources in and on the earth are dividing our attention. We are also asked to parley for hours with unlimited groups of skilled trades who are willing to either stop work or share our unearned increments. And last but not least we are asked to confer, at their pleasure, with individuals or capital issue committees who mention dividends, interest, net income and other financial lore.

THE HUMAN ELEMENT

To the uninitiated mere matters of signing bonds which bind and paying premiums on insurance inventions are purely incidentals, but even worms will turn, and constructors are gradually realizing that they are human beings. Human beings have affinity for others of their kind, and gradually we are learning that our subordinates and workers have problems of their own, no less serious and important to them as our obstacles are to us. Again we notice that just as we stay in the game because we like it better than any other and feel we are doing our share towards human progress, so too do we find our men relish their jobs and are anxious to succeed.

We must learn, therefore, to assume another obligation, not a burden

but a duty, and see that our fellow workmen have sanitary working conditions, proper hours of labor, proper considerations for their health and guards against accidents. We can no longer pass our share of this duty over to insurance companies or socialistic community officers, but must gladly grasp our opportunity for constructive endeavor in this human field. We should recognize there is a human trait, known as temperament, and seek to place men where they best fit and are there happy.

We have learned to keep unit costs of work, flow sheets and progress reports, and we must now study the benefits of reduced labor turnover and losses chargeable to preventive accidents.

In the National Safety Service Series, No. 659, recently issued, we notice the influence on accidents due to age, nationality, occupation and hour of occurrance and we cannot help but realize how limited our statistics are in these matters. We have just scratched the surface in our discoveries in this field, and as constructors study their individual and group problems we predict as marked improvements in this art as in others now conceded them. The laws of gravity are immutable and yet we do not always properly guard men from falling or material from falling on them. If nails were made of rubber and rusty tools did not scratch, if chips did not fly and ropes did not break, our problems might be simplified, but only by incessant vigilance can we prevent such incidents.

In conclusion, let me add that as it has taken time and the efforts of safety councilors to educate us, so too must we be patient with our workers and consistently lead them and persistently enthuse them in this vital path. Let us help make the world safe for democracy by saving the democrats and we can and will do that by *thinking safety first* and making safety last.

EFFECT OF ACCIDENT PREVENTION ON INSURANCE RATES

H. L. Geisler, Secretary, Builders' Limited Mutual Liability Insurance Company, Madison, Wis.

Mr. Chairman and Members of the National Safety Council: The building industry is one of the largest in the United States, ranking third of all industries. It is the oldest industry of which we have any record and its history is one of wonderful achievements. To this profession belongs the greatest tribute ever paid to any line of human endeavor, for the chosen profession of the lowly Nazarene was that of a carpenter and builder.

It has been my privilege during the past three and one-half years, as secretary of the Builders' Limited Mutual Liability Insurance Company of Wisconsin, to become intimately acquainted with a large number of contractors. As a whole I have found them to be a fine class of wholesome, generous, big-hearted men of high ideals, who have conscientiously endeavored to build character into the buildings intrusted to them for construction. I have many times watched some of our "grand old men"

of the building profession in Wisconsin swell with modest pride as they enumerated the number of prominent buildings which they had built. They felt, and well might feel, that these buildings stood as monuments to their honesty, integrity and achievement.

But, just as I have observed the many fine qualities of the contractor, I also have noted some of his faults. The one which has always impressed me most forcibly has been his apparent carelessness or indifference to the matter of accident prevention—I presume that this is merely the natural result of the nature of his work. The contractor is used to battling against the elements and all manner of physical obstacles, and therefore has expected his workmen to look after their own personal welfare and safety. The result is that the building profession has probably done less in the way of accident prevention than any of the other large industries. Therefore for this reason and the fact that it is one of the largest of our industries, it opens to us the greatest opportunity for real work and education in accident prevention.

BENEFIT OF THE OTHER FELLOW'S WORK

Good results from a safety campaign require both thinking and work—too many of us are prone to sit still and enjoy the benefits of the other fellow's work. I have found from experience that, as a rule, the policyholder who hollers the loudest about the high cost of workmen's compensation insurance does the least to prevent accidents and gives the poorest cooperation after an accident has occurred. This class of people remind me of a story, told me by a Hebrew friend who is very fond of telling stories on his fellow countrymen: One Sunday afternoon Isaac came upon the scene of an accident. An automobile had been struck by a railroad train, and all of its occupants had been killed or seriously injured. However, the chauffeur had sufficient strength to sit up, with his back resting against a telegraph pole, and as he exhibited some sign of life Isaac proceeded to question him as follows: "You had an accident, what?" The chauffeur nodded his head. Isaac, pointing to the deceased members of the automobile party, continued his questioning: "Was all these people killed in the accident and were you hurt in the accident, too?" The chauffeur slightly nodded his head. "Did anybody else see the accident?" A feeble "No" escaped from the lips of the chauffeur. "Has the claim adjustor been here yet?" With a barely perceptible shake of the head the chauffeur lapsed into unconsciousness. Isaac looked up and down the street and as nobody was in sight he said, with a shrug of his shoulders: "Well, if nobody has any objections I guess I will lie down for a little while." Gentlemen, too many of us are willing to enjoy the fruit without the labor.

In answer to the question, "What has been the effect of accident prevention on insurance rates?" I can merely state that it has reduced them. However, you probably will be interested in knowing what we have actually accomplished in this matter through our company in Wisconsin. The Builders' Limited Mutual Liability Insurance Company was organized about three and one-half years ago by the Master Builders Association of

Wisconsin. The latter association is composed of contractors engaged in all of the various building crafts, such as carpenters, masons, concrete men, painter, plumbers, etc., and the operation of the Builders' Limited Mutual Liability Insurance Company is only one of the many activities of the state association.

ACCIDENT PREVENTION WORK IN WISCONSIN

During the first year of our existence we did practically nothing in the way of accident prevention and although we made a material saving for our members on their insurance rates we were not entirely satisfied with the results. It was then that we first seriously considered the advisability of trying to prevent losses. We were continually encouraged and assisted in this matter by Mr. Sidney J. Williams, who was then with the Wisconsin Industrial Commission, and we feel that we owe a great deal to him for awakening our interest in safety work.

We realized, of course, that it would be necessary to convert the employer to the idea of accident prevention before good results could be obtained. We therefore got out a number of bulletins addressed to the employer. These bulletins contained some general association news, but about two-thirds of their contents was devoted to arousing interest in safety work. The interspersing of general association news was bait to get the member to read the bulletin.

We followed this up by making the theme of accident prevention the biggest topic on the program of the next annual convention of the state association. We had illustrated talks on accident prevention in construction work. These talks brought out many practical methods of safeguarding employes and provoked good, healthy discussions. In my report, as secretary of the association's insurance company, I gave a number of typical illustrations of serious accidents which cost our company considerable money, all of which might have been prevented if a little care had been exercised, and in some cases if the law had merely been complied with. The old maxim that a "man's pocket book is the key to his heart" certainly seems to hold true in most cases. Our members took a passive interest in safety work from a humanitarian standpoint, but just as soon as they realized that it also meant a tangible saving in dollars and cents they immediately took an active interest.

SAVING OF SUFFERING AND MAN-POWER

Following our talks on accident prevention work, were addresses by physicians and surgeons emphasizing the importance of calling in a doctor in all injury cases in which there might be any possibility of complications. Advice and demonstrations were given in the use of first-aid kits. The doctors brought out forcibly the absolute advisability of using goggles in work in which chips might fly and cause eye injuries, etc. Since these talks and demonstrations quite a few of our members have become really adept in administering first aid. One of our members, who does a considerable volume of work, has kept a record of the saving which he has made for our company by the use of a good first-aid equip-

ment and his estimate shows that he has saved us over $1,000 during the past year. I do not know how accurate his figures are, but it is perfectly evident that this kind of co-operation means a tremendous saving when multiplied perhaps five hundred times. And of far more importance than all of the possible saving in money is the saving of human suffering and man-power.

As soon as we got our members thoroughly aroused we endeavored to spread the work to the employes. Of course, it is much more difficult to get safety work before employes engaged in construction work than in manufacturing. The constant shifting from one job to another makes it exceedingly hard to either gather the men together for safety talks or secure results by posting bulletins, etc. However, we have been able to accomplish considerable through the local branches of our state association. In all of the important cities in Wisconsin, where most of our policyholders live, we have held joint safety meetings of the contractors and their employes. These meetings have been uniformly successful, especially in the cities in which the contractors and labor unions were on good terms. In these places the men were simply ordered to attend by the union officials and they obeyed and the programs were always made so attractive that they were glad to come again. Most of the speakers for these meetings have been provided by the Wisconsin Industrial Commission. These meetings have been very much worth while and besides giving the employe definite knowledge for the care of himself and fellow workmen it has brought employer and employe closer together and given them a common basis on which to co-operate, and co-operation in safety work is of prime importance.

We have continued along these lines for the past two and one-half years. We are now planning greater activity, especially in sending bulletins more frequently to our members. We are glad indeed that the National Safety Council is about to install a department for accident prevention in construction work and we will avail ourselves of the opportunity of securing their expert advice in furthering our campaign.

CO-OPERATIVE INSURANCE

The result of safety work by our members has undoubtedly saved them thousands of dollars. Upon Sept. 1, 1917, the workmen's compensation law of Wisconsin was amended so as to increase the benefits by about 12½ per cent. All insurance companies were compelled by the same law to use the same classifications and basic rates, and then load according to their individual experience. In the case of our company we were able to slightly reduce our rates on most classifications, in spite of an increase in the benefits of the law. This was really due to two reasons: *First*, because of our low-management expense, and, *second*, because of our favorable loss ratio. Our rates for workmen's compensation insurance today are approximately 37 per cent lower than those of the stock companies operating in Wisconsin. In spite of these low rates we doubled our assets and trebled our surplus last year and during the first six months of this year we have made a 30 per cent increase in our assets and a 40 per

cent increase in our net surplus. During the past three years we have also reduced our ratio of losses incurred to earned premiums from 77 per cent to 44 per cent. Our company puts up the same proportionate reserves and reports upon the same basis as the stock companies. The success of our company, beyond question, has been largely due to the splendid co-operation which we have received from our members, *first*, in preventing accidents, and, *second*, in seeing that proper attention was given to injuries when received.

Insurance of any kind is merely tax levied upon the many to pay the losses of the few. However, in the case of workmen's compensation insurance, you employers probably feel that it is rather a tax upon the few to pay the losses of the many; nevertheless, the tax which you pay is in proportion to the losses sustained. Never lose sight of the fact that the losses are paid by the policyholders and not by the insurance companies. If this simple fact could be forcibly driven into the consciousness of every policyholder it would cut the cost of insurance to a fraction of its present proportion. Time and money spent in accident prevention work will pay big dividends in efficiency, money and human life. I have been very much impressed by a statement which I have frequently seen in the advertising matter of the Travelers' Insurance Company. It says: "A claim paid is an apology, an accident prevented is a benefaction."

The one great task before us today is to win the war. The greatest factor in winning the war will be man-power; man-power at the front in France and man-power in the factories, shipyards and fields of America. Every effort to conserve human life and efficiency is highly patriotic as well as highly humanitarian. The great builders of this country surely want to co-operate in every way in building the universal democracy of tomorrow.

ACCIDENT PREVENTION IN THE SHIPBUILDING PROGRAM

Ira L. Lockney, Safety Engineer, New York Shipbuilding Corporation, Camden, N. J.

Mr. Chairman and Members of the National Safety Council: I am very glad of this opportunity not only to boost for safety, but, as I am a Wisconsin man, to exemplify, by taking the subject and place on the program assigned to Mr. Cross, the fact that there is still imbedded in the make-up of the truly Wisconsin man a real, genuine loyalty: not the kind you have heard about, but the same sort that it now marching to Berlin.

You all well know the vital importance of the shipbuilding industry at this time. If there were no ships to carry our armies, munitions and supplies over seas it is quite safe to guess that by now we would be thinking of a different creed of Christianity than you have heard here this week in the announcement of a wave of American fellowship.

Our great country realized this obvious necessity and its government at once set about to supply the ships, and did it with the spirit that has been shown by the Yanks that Judge Lindsey told us about Monday.

The task was done so well that after organizing the Emergency Fleet Corporation Shipping Board, that body grew so fast Washington wasn't large enough to hold it, so they moved to Philadelphia. They commandeered an office building about the size of this hotel and then grew so fast they had to cross North Broad street and occupy another one of about the same size.

Gentlemen, just as the shipping board grew and expanded, so did the shipyards expand and grow from nothing but a marshy, frog-croaking swamp to the world's greatest rattle-box—a shipyard. Just as marvellously as have our great armies grown, have the old-established shipyards expanded to meet the demands required.

I presume that in other yards, like that of the New York Shipbuilding Corporation, buildings went up, figuratively speaking, over night. Our new torpedo-boat destroyer plate and angle shop burned a week ago tomorrow night. When I return, next Monday evening, it will be no greater surprise than many I have already witnessed if the roof boards are laid and this one story frame building covers about a city block. They certainly can do things in a hurry when the necessity requires.

WORKMEN ON THE JOB

Right here I want to say that if anybody thinks the working man today has no interest in this war they should have seen the night crew drop their tools and go after that fire and work—yes, work like hell—to minimize the loss.

While Mr. Schwab and his force are straining every effort to speed ship construction they are at the same time putting into being strenuous efforts to conserve the lives and limbs of the industrial soldiers. When there is such great speed there are also many hazards. Such a condition must be accompanied with unusual prevention efforts, which fact was appreciated by the shipping board after some effort on the part of their chief safety engineer, Mr. H. A. Schultz. Now their safety organization is about, if not entirely, completed, and there is not only a shipping board safety engineer in every district but I feel safe in saying there is also a safety engineer in every shipyard in the country.

It is not fair for me to jump so quickly into the present status of accident prevention in the shipbuilding program without first referring to the excellent work done by the National Safety Council in loaning us their "Billy Sunday" of the safety game, Field Secretary C. W. Price. Mr. Price engineered and directed the pioneer safety work in the government arsenals and navyyards and, with a force of experienced safety engineers, visited all the Federal plants and yards, preaching the gospel of safety, which resulted in placing Safety First on the map in shipbuilding.

Proof of the fact that the shipping board's safety engineers are on the job is their conspicuous absence at this congress. I phoned Mr. Schultz recently and he informed me, with much regret, that it had been decided

that it was necessary that they stay at their posts and attend to their regular duties.

Some of you may wonder, if the work is so important, what I am doing here. I am very glad to offer the excuse that Mr. Schultz said over the phone that it was different about my coming, because they were not worrying about the New York Shipbuilding Corporation. That may sound egotistical on my part, but I must give the credit to General Manager Andrews, his assistant, Mr. H. C. Towle, and the superintendents and foremen who had been practicing accident prevention long before I arrived on the scene—after getting a liberal education in man-slaughter during the earlier days in shipbuilding.

HAZARDS OF SHIPBUILDING

I presume some of you have noticed that Federal statistics give shipbuilding an accident frequency rate of 218—the highest in the machine building list. You can readily see there is ample field for the conservation of workers in this industry. Also this might indicate that the hazards are not all little ones, but as I do not know the exact figures you may take my word that the severity rate is not low. Perhaps as some here are not familiar with the hazards of a yard it will be well to speak of some of them—I could hardly mention all of them in the twenty minutes at my disposal; even then, I would miss those being daily invented.

As my experience in shipbuilding is limited, having hardly seen a real-sized shipyard prior to about March 15 of this year, I am compelled to take chances of boring you with the experience of the New York Shipbuilding Corporation. Before America entered the war they were employing about 4,500 men. When I arrived, April 1, they had 7,000 men and for a month or two past they have had about 12,000 men, many of whom are inexperienced at ship work and all speeded up to maximum production to the tune of launching a 7,500-ton merchant ship in twenty-seven days and a completed vessel in thirty-seven days—the Tuckahoe. But with all that speed and the setting of that world's record not one really serious accident occurred. Again, I must take off my hat to the foremen and superintendents, as I was unable to give the job more than about an average of three-quarters of an hour per day.

HAZARDS OF A MODERN SHIPYARD

Now, as I stated, the Federal statistical frequency rate for shipbuilding is 218: I will say that our rate varies about 70 per month. No doubt you will want to know how we are doing our safety work. But before going into this I want to tell you about the hazards. They compare favorably with the structural steel construction shop, plus all the outside work. As the dangers from the Hun are not all over it is best that I do not describe in detail our plant. I will say that in general a shipyard is usually afflicted with the hazards of a foundry; of machine, forge, pattern, joiner, electrical, galvanized sheet metal, pipe fitting, plate and angle, boiler and copper shops, and of a galvanizing plant; the hazards incident to painting in confined places; those of a large plant yard; the haz-

ards of scaffoldings galore, open hatches, falling material, drowning, heat prostration and gas fumes; with all this, add during the period since America entered the war, all your own building and other construction hazards.

Can you imagine the building of ships amid additions and still more additions to buildings and torn-up yards, in the extension of pipe lines, piling of vast stores of raw material, building of new rail and road ways, and still there being no accidents? No! That you would not try to imagine it. But such have been the conditions in the shipbuilding industry. Again, add to all this the fact that the industry, in this country, has not been a live issue for several years past. I have been told that many a shipyard barely kept out of debt and other employers took large sums out of their jeans just to keep from getting in worse than they were. In view of these facts, do you wonder that many were primitive in their practices and equipment before the war?

Do you wonder that a progressive, organized safety movement goes on slowly after years of such training as that? I have suffered the agonies of disappointment and despair several times because things went slowly at first. Oh, yes; some of you old-time engineers giggle up your sleeve because you know, too, how it was in your early days; but, how would *you* like to go back to it after a few years of enthusiastic successes? I tell you, men, the safety engineer's job in a shipyard is not one of the modern snaps.

STARTING SAFETY WORK

Now for the accident prevention work. First, the usual survey of the yard was made for the grading and listing of hazards and making up of a budget—at the same time "getting onto the ropes" and becoming acquainted with the foremen and men.

The organization of the shop committees was mingled with the guard building, accident investigation and revision of statistical records, learning kinks of new compensation laws and studying how to avoid calling a hatch stanchion a cowfoot. It has been some busy job and as shipyards have not been breeding safety engineers, I presume every one who has tackled a yard has had his troubles and hard work.

Organization of the shops wasn't bad at all, but the other day I went to the hull department superintendent to talk safety. Maybe he thought that I thought he was the safety engineer, because I was plumb up against it and I thought I could coax a pointer or two out of him. He being a darn good fellow let me down easy, I sneaked out as gracefully as I could and got on the job myself. Well, it's no easy task to organize a hull department, but we have it done. The hull superintendent and I decided it was best to take the occupations separately, thus selecting committees of from three to eleven to represent the carpenters, chippers and caulkers, shipfitters, erectors, bolters up, seamers, etc. The foremen appointed a majority of workmen on each committee. After giving the men in a department a talk I always asked if they wanted a committee. They not only said "Yes," sometimes they yelled that they did.

Let me say here that it pays in a shipyard, as elsewhere, to get right with the men. Don't be a dude and be afraid of your overalls. Put them on. The men like to see that you are not afraid of dirt or work.

In closing I want to express my appreciation and boost a little for my company and the men. I have been meeting foremen for the past six years in this sort of work and have seen many committeemen, but I must say I never met the equal of the attitude of our foremen toward safety work and the help I am getting from some of the committeemen.

There is still one hard job left, that of selling Safety First to the big boss. The New York Shipbuilding Corporation broke the world's record in building the Tuckahoe and the shipping board gave every man who worked on that vessel a silver medal. I am going to tack this medal up here with the National Safety Council Bulletin, and medals or no medals, the building of the Tuckahoe will not be the only record made by the New York Shipbuilding Corporation.

BENEFITS OF ACCIDENT PREVENTION IN CONTRACTING

F. S. Robinson, Secretary, General Builders' Association, Detroit, Mich.

Mr. Chairman and Members of the National Safety Council: In order to submit information on this subject, which I believe to be of value, it will be necessary to use facts as taken from the actual experience of the members of our association—the General Builders' Association of Detroit. It is not my aim to make a statistical report of the results we have obtained in the decreasing of accidents among the employes of our members, but rather to just outline the methods by which we have obtained an improved condition.

Our association has been organized a little over two years and is composed of eleven general builders, or contractors in the building line, who take and perform the operation in its entirety and who do the major part of the work with their own organizations—I mention this to show the class of work that is covered. When we really got started and the members got to know their associates, who were their competitors, they found that they were not such bad fellows, after all. An *esprit de corps* developed which has been splendid and the different problems of the industry were gone over freely among ourselves.

One of the first things taken up was the matter of compensation insurance and public liability insurance. It was found that our members were paying about a hundred different rates in about ten different companies, and it seemed to us that with the volume of business in our hands this matter could be brought down to a more businesslike and systematized basis. We considered mutual, state and other forms of insurance, and our decision was to place the insurance of all of our members in one company at a flat rate—and we considered not only the rate, but also the systematic and responsible inspection and other attendant service which we felt could be expected and which bears more particularly on this subject. Our

insurance has been in effect less than a year and a half, which is not long enough for us to get a comparison of two distinct periods, but the records of our members show that there have been many less accidents since we started our safety movement than before.

WELL-ORGANIZED AND SYSTEMATIC INSPECTION SERVICE

In starting this safety movement we had the whole-hearted co-operation of the insurance company with which we do business, and while I am not here to exploit any insurance company, it is only fair to say that our company has helped us in every possible way to make the movement a success. The very fact that we have this group insurance puts us in a position to demand the kind of inspection and service which we believe could not be obtained otherwise. It holds the service to a high degree of accountability, which is reversing the usual order as between company and assured. It stands to reason that a well-organized, systematic and co-operative inspection service of one insurance company can render better service to a group of ten contractors, acting as a unit, than can be obtained by the haphazard inspection of ten different insurance companies toward ten different contractors.

The inspection by the safety engineer of an insurance company is important, and a man in this position should have great tact, so as not to antagonize the men in charge of a job—he should make suggestions and not give orders. We have had good results from this inspection, and we find that the men are more particular and careful in the erection of mechanical equipment—tower framing is made stronger, cat heads heavier, scaffolds and ladders more secure, etc. In fact, there is more intelligence shown all around, especially by the men in charge. Much benefit has been experienced in the case of employes changing from one contractor to another, as often happens. These men have profited by the system in vogue with their old employers and easily fall in with the same system practiced by the new one.

In the beginning a meeting was called of every one in authority on the pay rolls of our members. We explained the compensation law to them and the scheme of compensation insurance, with its attendant features, such as inspection, accident reports, medical service, hospital arrangements, follow-up methods to find employes who do not continue necessary medical attention and the like. The object of this was to get detailed information and instruction to the men in charge, to rob the system of any criticism of red tape and to dignify the general subject of accidents in the mind of each man in authority, so that he would start out on an individual campaign against everything that might cause accidents to the men working under his charge.

We organized first-aid classes, which were held weekly except in the summer time. These classes are conducted by the medical department of the insurance company and are held in the offices of our association. They are attended by superintendents, foremen, first-aid men and timekeepers; workmen are also welcomed. From charts and practical demonstrations these employes learned not only how to treat accidents, but the impor-

tance of taking preventive measures to avoid them. They are taught how to use the first-aid kit which is placed on every job, and we are positive that the coaching they receive in these classes has been of material value in helping to reduce the number of accidents.

INFECTION CASES ALMOST NEGLIGIBLE

At the commencement of the new compensation law in Michigan there was great difficulty in getting men to report small accidents which happened to them. Whether this was a matter of pride or not I do not know, but at any rate accidents such as cuts, scratches, bruises, nail punctures, etc., would not be reported. The result was that many cases of infection developed, due to lack of first-aid treatment and subsequent medical attention, and it also resulted in much compensation being paid. Since our campaign for safety has been instituted we find that a larger number of accidents have been reported, and at the same time the number of compensation cases has been decreased. This we know to be the direct result of our first-aid classes and inspection service. Perhaps the most noticeable result of this instruction is in the very material reduction in number and severity of cases of infection from wounds. Infection cases, I believe, form the most numerous and expensive class of accidents among employes of general builders, and I am glad to say that our insurance company now reports this class to be almost negligible.

When one of our members starts a new operation the association is notified of the date, the superintendent in charge and the one who has charge of first aid. It in turn notifies the insurance company, so that the company may immediately send its inspector to the site at the very beginning of operations, instead of later, when perhaps the greatest hazard may have passed. The inspector sees that the first-aid man has a kit and necessary supplies and instructs him as to physicians, hospitals, etc. It is quite probable that this early inspection may result in the avoidance of property loss, as well as personal injuries. Proper caution signs and the statutory notices to employes are thus not overlooked. Also, if any unusual public liability hazard is present, a report is made which reaches the employer, so that he may increase the indemnity limits on that particular job commensurate with the hazard. Bulletin boards are installed on all the larger jobs, on which are displayed the bulletins of the National Safety Council and our own association bulletins, with recommendations growing out of the experience of our own members and from other sources.

There is another factor which bears directly on the safety movement which has been greatly neglected, and that is the humanitarian factor. Many times I have heard contractors say that they do not bother with their accident cases—they leave them to their insurance company. This spirit cannot be kept up in this day and age, and the sooner contractors realize it the better it will be for them. The labor turnover in construction work is tremendous, and the chances of accidents increase with each new man put on—to what degree I would not venture to say—but statistics show that the percentage of accidents is far greater in construction work than it is in factory work. You will say that construction work is

more hazardous—we all know it is, but even so the percentage can be reduced in a large measure by a little educational work on the part of the contractor. It is of far more value to a contractor to keep one man at work for say twenty days, than twenty men working one day each.

CONTROL OF ACCIDENTS

Our efforts to control accidents—both as to frequency and severity—is first of all to dignify the subject in the minds of employes. Next, to place the responsibility for accidents. If the foreman is educated to the importance of the relation of accidents to the efficiency of his department, and if his discipline is duplicated by every other foreman of his employer, a big step in the right direction is being made. Hold him to his responsibility and support him by keeping up the first-aid, medical, inspection and other services to a high degree. This combination must impress all concerned that an accident is something to be avoided in the first place, or, having happened, it is to be attended to systematically, and measures adopted to make repetition unlikely if not impossible.

We, as no doubt all of you have done, have offered the services of our organization to the government to help in winning the war. The times are not normal and business cannot go on as usual, but it is up to us to help the government get what it wants when it wants it. Man power is essential, and every man injured on construction work at this time is a direct liability to the government in the winning of the war.

Only part of the rate in casualty insurance is charged to pure accidents, the rest is for bad habits of men and employers. Now is the time to mend our habits and organize in this field. You know that the construction industry is the most poorly organized of any of the large industries—in fact, at the present time it has no national organization, but I am glad to say there is one under way. Organization and co-operation can do wonderful things, and we hope that the Construction Section of the National Safety Council will be successfully organized at this time—the industry certainly needs it. The only fault that could possibly be ascribed to the Council, and that really is the contractors' fault, is that it does not issue enough bulletins relating to construction work. What our little association has done, in a small way, though we do not consider it perfect, can be accomplished on a much broader basis, and you will find that it pays and pays well in the reward of increased efficiency, saving in insurance outlay and in the knowledge of having saved waste time, which is the conservation of man power.

SAFEGUARDING MACHINERY AND OTHER EQUIPMENT

W. J. LYNCH, ASSISTANT TO VICE-PRESIDENT, THOMPSON-STARRETT COMPANY, CHICAGO, ILL.

Mr. Chairman and Members of the National Safety Council: Statistics of the Industrial Board of Illinois for the year 1915—a year in which there was a large volume of normal building work done in Illinois—

show the percentage of compensatable accidents, due to machinery and equipment, to be slightly less than 6 per cent. This does not include accidents due to hand tools, which ran 5.6 per cent. The accidents in the latter case are largely due, however, to injuries self-inflicted or by fellow workmen and not to inherent defects in the tools or lack of proper safeguards. While it may appear that the low percentage of compensatable accidents due to machinery and equipment does not warrant particular consideration, analysis of the results of these accidents indicates they result in greater length of disability and greater cost than others which run a much larger percentage in number.

One hundred and forty-eight accidents due to machinery and equipment resulted in disability of 4,740 days, or the equivalent loss in work of a gang of thirty men for six months. The average length of disability for each individual was thirty-two days, the second highest average of accidents from any source. The average cost per accident of all sources was $77.00, whereas the average cost of machinery and equipment accidents was $116.00—higher than the average from any other source. While the number of accidents from this source was but 6 per cent of the total, the cost was 9 per cent. The great length of disability and the high cost of accidents from machinery and equipment warrant special consideration.

PRECAUTIONS TO BE TAKEN BY CONTRACTORS

With the foregoing in mind, the writer presents briefly some precautions which may be taken in this connection:

1. Use only substantial machinery and equipment adapted for the work on which it is used.

2. Machinery and equipment when returned to the contractor's yard from a job should be given a thorough inspection and overhauling so that it will be in first-class condition when delivered to a new operation.

3. Under no circumstances should equipment be overloaded; take no unnecessary chances where human life is in danger.

4. Where wooden derricks, travelers or timber rigging is used, see that all timbers are in good condition and are erected plumb and square and that all chains and fittings are securely tied or bolted.

5. (*a*) Where stiff-legged derricks are used, see that they are properly weighted. On industrial work, where the derrick is to remain in one location for a considerable time, unloading materials, small concrete foundations are sometimes provided—bolts set in the concrete being used to hold the derrick.

(*b*) In very cold weather unusual care should be exercised not to overload derricks, on account of the action of the cold on the metal parts.

(*c*) Steam shovels should be kept on as nearly a level bed as possible, to prevent overturning. Special care should be exercised in lifting loads with locomotive cranes when on inclined tracks or curves.

(*d*) Only those actually required should be permitted on steam shovels or cranes, and wherever possible workmen should be kept out of the way of the swing of the loads, the operators being instructed to insist upon this precaution.

(*e*) Steam shovels and locomotive cranes should be kept orderly, and miscellaneous parts kept in their place to eliminate stumbling or tripping hazards.

5. See that all chains and cables, including rings and hooks in same, are amply strong, the use of steel cable being recommended. Keep machine fittings and cable well oiled and greased. See that all guy cables are securely fastened by substantial clamps. Plates, shackles, chains, hooks, etc., that show any sign of fracture or are badly bent should receive immediate attention, and if liable to be subjected to strain or heavy loads should be replaced.

6. Hooks lifting very heavy loads should have either a safety clamp or be securely lashed, to prevent spreading and dropping of load.

7. When lifting heavy loads, avoid sharp bends on the cable slings, and when lifting steel use wood blocking to prevent slipping and to prevent abrasion of the cable.

8. See that the shafts of hoisting engines are true, and clutches, brakes and gears engage properly and work freely.

9. Frequent cleaning of boilers and mechanical equipment serves economy in operation as well as being an important element in accident prevention.

10. To protect operators from falling materials, provide housing where hoisting engines or motors are exposed.

11. Crank shafts, gears and all revolving projections should be encased or other effective protection provided.

12. Horizontal shafting and hoisting cables should be rail guarded or some danger mark appear in the area in which the shafting or cables are located, to indicate danger to the workmen.

13. Vertical shafting or cables should be placed in unexposed shafts where possible, but when running through exposed areas should have temporary enclosure for 7 feet in height, or be rail guarded.

14. The space adjacent to moving cables, engines, etc., should be kept clear of piles of used lumber, ropes, rubbish, etc.

15. Moving cables should be free from chafing against concrete, tile, steel or other hard material, producing wear. Where guy cables turn over edge of steel plates or sharp corners provide wood or other protection against cutting.

16. (*a*) The loads should not be thrown too quickly on the motors of electric hoists. This brings severe strain on the hoisting mechanism and may result in burned-out coils.

(*b*) Cleaning or repairing should not be done while machinery is in motion.

17. Blocks and sheaves should be selected for the cables used, to prevent undue wear on the cable.

18. Riding derrick loads or material hoists should, of course, be prohibited.

19. Material hoists should be guarded with wire or other enclosure on three sides and wood bar at front opening.

20. Passenger hoists should be provided for workmen, enclosed on three sides and top, with gate enclosure at the opening.

21. (*a*) All power saws, planers and jointers should have enclosing guards.

(*b*) Unless absolutely necessary, workmen should not be permitted to ride on automobile trucks. Many accidents have occurred through falls from overcrowding, hitching on and jumping off trucks in motion.

22. Men using acetylene torches should use goggles and gloves.

23. (*a*) Many accidents occur from the use of defective and worn hand tools. Cracked or insecure handles should be replaced; saws, chisels, etc., should be kept sharp, and hammers and sledges with mushroomed or fractured head should be dressed or replaced.

(*b*) In cutting concrete, wire or other holders should be used to hold the handle of the cold chisel in order to avoid injury when the blow on the head of the cold chisel is misdirected.

24. Tools should not be left lying around to be tripped over or knocked on workmen below.

MUST EDUCATE WORKMEN

The foregoing is intended in no way as an exhaustive list of prevention measures, but simply as measures which should be obvious to any intelligent workman.

A very extensive record might be prepared of things which should be done and safety devices that might be provided, and then summed up in the statement: "Use good, substantial equipment, adapted for the purpose intended, and have it operated by careful workmen."

In the judgment of the writer, above and beyond all things the most essential measure to reduce accidents from any service is to educate the workmen to *think safety*. Fully 75 per cent of building accidents are due to carelessness on the part of the injured or fellow workmen.

The writer begs indulgence for diverting at this point from the subject assigned, to comment upon the necessity of contractors giving wholehearted support to the safety movement.

We have passed the academic stages of workmen's compensation, and the provisions of the workmen's compensation laws are now generally accepted as benefits to which the workmen are entitled as a part of their compensation. If it is well to pay a man for an injury it is far better to educate him to escape the dangers that are inherent in and incident to his work. The workmen of themselves will not naturally take a keen interest in the safety movement—this part must be initiated and fostered by the employers. Until recently contractors have given this little thought. In the past they have viewed accidents only as a source of expense and contented themselves by covering this contingency with liability insurance, and many still view the matter in the same light. From the nature of the business, workmen are employed by one and then another contractor. It follows that if the most effective results are to be attained, contractors generally must be impressed with the benefits of accident prevention.

Having been impressed, their own personal interests alone will prompt enthusiastic aid.

Contractor and employe must be impressed with the great economic and financial loss caused by building accidents. Again referring to statistics of the Industrial Board of Illinois, the number of compensatable building accidents in 1915 was the second highest of all industries; in fatal accidents it tied for first place; in the cost of fatal accidents it was first by quite a margin; in the cost of non-fatal accidents it was not far from the highest and nearly twice the cost of the third cause. It was highest in the average days of disability, with 27.3 days per case. The total days of disability was 68,436; the equivalent would be a force of 100 workmen for over two years and three months, earning over $300,000.00.

VALUE OF PROMPT MEDICAL ATTENTION

In these times of war, the loss of production of 100 workmen for two and one-quarter years in the building industry alone in one state is a calamity. Consider, in addition, the physical suffering, the loss of thousands of dollars to employe and employer and the distress in the homes of the workmen! Ordinary care would prevent most of this loss. Sixty per cent of the non-fatal accidents and 85 per cent of the fatal accidents were due to falls, falling objects and handling materials—causes which in themselves should not be hazardous.

Much suffering, loss of time and money is due to lack of immediate and subsequent medical attention. Where operations are sufficiently large to justify the establishment of a hospital on the job, with a nurse in charge and a doctor on call at all times, it conserves physical suffering, labor, time and money.

The references given do not include the tremendous number of minor accidents not serious enough for compensation.

Safety guards and protection have undoubtedly decreased accidents, but statistics show clearly the necessity for contractors fostering the instinct of self-preservation in the minds of their men, to the end that they will exercise due care for the protection of themselves and their fellow workmen. Employer and employe have an interest in common in this movement. The resultant advantages to them and to the community at large are self-apparent.

In the organization of a Construction Section for this purpose the National Safety Council will advance greatly a practical solution of building construction accidents.

Paper and Pulp Section

St. Louis, Mo.

Sept. 19 and 20, 1918

G. E. WILLIAMSON, Chairman
Chief Engineer, Strathmore Paper Company, Mittineague, Mass.

GARRETT SCHENCK, JR., Vice Chairman

A. G. PONSFORD, Secretary
General Manager, Port Arthur Pulp & Paper Company, Port Arthur, Ont.

THURSDAY MORNING SESSION

THE meeting was called to order at 10 o'clock by the chairman, Mr. G. E. Williamson, of the Strathmore Paper Company.

DELEGATES ATTENDING SECTION

A. G. Pounsford, Port Arthur Pulp and Paper Company, Port Arthur, Ont.
G. E. Williamson, Strathmore Paper Company, Mittineague, Mass.
Thomas Wilson, Industrial Accident Association, Toronto.
R. F. Milne, Lumberman's Safety Association, Ottawa, Ont.
W. A. Dearborn, Contractors' Mutual Liability Insurance Company, Boston.
E. D. Haggerty, Employers Mutual Insurance Company of New York.
R. H. Guerrant, National Safety Council, Chicago.
Robert Purner, Certainteed Products Corporation, St. Louis.
Jno. Knoerzer, Certainteed Products Corporation, E. St. Louis, Ill.
F. X. Meehan, St. Louis Smelting and Refining Company, St. Louis.
Fred W. Newcomb, U. S. Rubber Company, New Haven, Conn.
Homer M. Sinclair, Crocker-McElwain Paper Company, Holyoke, Mass.
H. C. Krannert, Sefton Manufacturing Corporation, Anderson, Ind.
G. W. Phillips, Champion Fibre Company, Canton, N. C.

A. P. Costigane, Ontario Pulp and Paper Makers' Safety Association, Toronto.

J. O. Meyers, Niagara Alkali Company, Niagara Falls, N. Y.

William Fogarty, Northern Paper Mills, Green Bay, Wis.

G. A. Umberham, Northern Paper Mills, Green Bay, Wis.

Franz H. Rosebush, Nekoosa Edwards Papers Company, Port Edwards, Wis.

Clarence E. Jackson, Consolidated Water Power and Paper Company, Grand Rapids, Wis.

Robert M. Altman, Marathon Paper Mills Company, Rothschild, Wis.

Anna Koutecky, Morris & Co., Chicago.

Jeanie E. Hughes, Frankford Arsenal, Philadelphia.

Carolyn S. Davison, International Harvester Company, Chicago.

S. W. Thompson, Wagner Electric Manufacturing Company, St. Louis.

Kathryn E. Ray, Wagner Electric Manufacturing Company, St. Louis.

Charles B. Milner, Hammermill Paper Company, Erie, Pa.

Thomas M. Hurley, Morgan & Wright, Detroit.

E. A. Vogelpohl, Illinois Glass Company, Alton, Ill.

Miss N. C. Edwards, Kimberly-Clark Company, Neenah, Wis.

Erling Riis, Wausau Suphate Fibre Company, Mosinee, Wis.

H. Ballou, Menasha Paper Co.

The first order of business was the reading of the reports of the Chairman and Secretary.

REPORT OF CHAIRMAN

Gentlemen: The year just closing has been one of gradual progress for our Section. Owing to the urgent demands upon the time of all our men engaged in safety work, however, we have been unable to accomplish some things we would have liked. Our committees, on the whole, have done excellent work. That of the Program Committee speaks for itself. The Bulletin Committee has furnished material for bulletins issued weekly during the greater part of the year. The Safe Practices Committee deserves special commendation for preparing the first Safe Practice leaflet covering an entire industry. The Membership Committee, although late in starting its work, is successfully carrying on a three-letter campaign. Owing to Mr. Shattuck's absence in the South, where he is engaged in Army and Navy Y. M. C. A. work, the Committee on Human Relations has not been able to carry on its work.

During the year the Chairman has issued two *News Letters* to our entire membership. I would recommend that these letters be sent out at least quarterly in the future. A considerable amount of correspondence has been handled by the Chairman, an important part being letters relating to organization work. Your Chairman has attended several meetings of the Executive Committee, held in New York, and from a more or less intimate knowledge of the activities of the National Safety Council can assure you that its work and accomplishments are far-reaching and well worthy of hard and consistent work on the part of our Sectional officers, committees and members. Respectfully submitted,

GEORGE E. WILLIAMSON, *Chairman.*

The report of the Chairman was received and its recommendations concurred in.

REPORT OF SECRETARY

Gentlemen: During the year 1917-18 twenty-five new members were added to the Pulp and Paper Section, making a total to date of 177 members—this number including paper product manufacturing companies. The Council has classified these members with the manufacturers of pulp and paper, and it is my recommendation that we should appoint a committee from this Section to look after their interests, especially as their work is quite separate and distinct from the manufacturing end.

Our membership has not increased to the extent it should, and renewed efforts must be forthcoming this year. The mid-year meeting of this Section, which previously has been held in connection with the annual meeting of the Pulp and Paper Section, was abandoned this year, as it was not felt that this was the proper time for the holding of such a meeting.

I have been greatly hampered in my work as Secretary, due to the fact that I have been living at such a great distance from any pulp and paper center, and consequently have been unable to give the Chairman the support he should have in his work. I would suggest to the Nominating Committee that, if possible, the Chairman and Secretary should be selected from the same locality, so that the work of the two can be co-ordinated.

Respectfully submitted,
A. G. Pounsford, Secretary.

The report of the Secretary was received, and the suggestion contained therein referred to the proper committee.

The Chairman appointed as a Nominating Committee Messrs. A. P. Costigane, H. Bellou and G. W. Phillips, instructing them to report at the Friday meeting.

The minutes of the meeting held at the Hotel Astor were then read and approved. The Section then took up the formal program prepared by the committee. The paper by J. H. Bleumer was read by the Secretary and the paper by Dr. Katherine Blackford was read by Mr. Sinclair, of the Crocker McElwain Company. Paper by Mr. C. B. Milner, of the Hammermill Paper Company, on "Methods and Results of Safety Work at the Hammermill Paper Company," was added to the program.

WHAT THE NATIONAL SAFETY COUNCIL HAS DONE FOR US

John H. Bluemer, Chairman of Safety Workers, Ideal Coated Paper Company, Brookfield, Mass.

Mr. Chairman and Members of the National Safety Council: January, 1917, we organized our safety committee with four members. We imme-

diately got busy, but all the employes regarded the committee's work as quite a joke until we got in touch with Mr. Beyer, who kindly consented to talk to us on safety work. He brought a large number of photos to illustrate his points. His speech was an excellent one and did him great credit. We have profited by our experience and eliminated all accidents, with the exception of minor cases caused by carelessness. For these the remedy lies in education.

The National Safety Council is the best organization in the world, and is rendering us every assistance in our work. In my judgment, we must have the co-operation of all men who are directly or indirectly concerned in making laws if we are to stop the ever increasing number of accidents due to carelessness. According to all available statistics, we are having more industrial accidents in this country than occur in all other countries put together. There are no laws to stop this waste or the laws are not enforced. We walk on railroad tracks, jump on moving street cars and do most anything we like, endangering our lives. We can all work hard, guard all machines, and make them fool-proof, but it will require much harder work for us to impress the general public with the fact that it is better to be safe than sorry. Let us remember our greatest enemy—carelessness.

WHO AM I?

I am more powerful than the combined armies of the world.

I have destroyed more men than all the wars of the nations.

I am more deadly than bullets.

I have wrecked more homes than the mightiest of siege guns.

I steal, in the United States alone, over $300,000,000 each year.

I spare no one, and I find my victims among the rich and poor alike, the old and young, the strong and weak.

Widows and orphans know me.

I loom up to such proportions that I cast my shadow over every field of labor,

From the turning of the grindstone to the moving of every railroad train.

I massacre thousands upon thousands of wage earners in a year.

I lurk in unseen places and do most of my work silently.

You are warned against me, but you heed not.

I am relentless.

I am everywhere—in the home, on the street, in the factory, at railway crossings and on the sea.

I bring sickness, degradation and death and very few seek to avoid me.

I destroy, crush or maim.

I give nothing, but take all.

I am your worst enemy.

I am Carelessness.

Our safety movement can defeat "Carelessness" and will help to win the war by preventing accidents, both in the industries and in our homes.

FITNESS FOR THE JOB—AN ESSENTIAL OF SAFETY

KATHERINE M. H. BLACKFORD, M. D., EMPLOYERS' ADVISER

Mr. Chairman and Members of the National Safety Council: We may assume that no intelligent employer would select a tottering old man to pin together the topmost girders of a skyscraper or a man with St. Vitus' dance to pilot an airplane. We may even go further and take it for granted that no observant superintendent would put on a sleepy, dreamy, dull-looking man as boss machine tender on a news print machine. There are many other simple, obvious ways in which an executive can tell by looking at a man whether or not he will be a safe man for a certain job. The very obviousness of these things—the fact that they have always been a matter of course—has caused many to overlook their true significance.

The logic of the situation is clear: Men do show how they will work by their looks. This is demonstrated by their showing some characteristics so plainly that every intelligent person recognizes them. If untrained observers, almost without conscious effort, see these external signs of mental and physical traits, then trained observers by conscious effort in comparison and classification can establish reliable evidences of many other such traits. As a matter of fact, a great deal of this observation, comparison and classification has been done in actual industrial practice with encouraging results.

The developing of trained specialists, capable of telling by looking at a man, what he could do and how he would do it, has naturally opened up a whole new series of problems and methods in the selection, assignment and management of employes. Formerly selection and assignment were left to foremen and heads of departments. These usually followed no standardized methods. Some depended upon their whim, their likes and dislikes, or used their authority to hire relatives and friends. Some depended upon finding out all they could from an applicant's previous record. Others talked with prospective employes and gained what impressions they could in that way. Still others made their selection in a haphazard manner, depending entirely upon what applicants they found at the factory gates.

"FITNESS FOR THE JOB"

The new movement, inaugurated five or six years ago, places the important functions of selection and assignment in a centralized employment department, manned by those who by inherent fitness and special training are qualified for the work. So rapidly has this movement spread, and so far reaching have been its results, that the value of these methods has been clearly recognized in the highest industrial, commercial and financial quarters.

Since the declaration of war upon Germany by the United States of America, with its resulting demand for the highest productive activity of every worker, the government itself has directed the establishing of centralized employment departments in the industries engaged in gov-

ernment work and has begun the training of many men and women for such departments. The ideal of those who are carrying on this work is to select for and assign to each job a man or a woman fitted to it by natural aptitude, training and experience, or, in case trained and experienced workers cannot be secured, to find those who most naturally and successfully will respond to training for the particular job.

"Fitness for the job" is rather a broad term. It includes such qualities as physical strength, energy, ability, skill and endurance necessary for doing the work. It also includes mental traits like intelligence, reason, judgment, memory, ingenuity, resourcefulness and other such intellectual talents as may be necessary for the best performance of duty. It involves also such characteristics as courage, enthusiasm, honesty, prudence, sense of responsibility, and other emotional qualities, in a combination suited to the character of the work to be done. It also includes certain qualities of will, such as decision, determination, persistence, and deliberation. In addition to all these, it also includes a natural love for the work, so that the worker may develop enthusiasm, loyalty, contentment and happiness in his job. The man or woman who is thus fitted for the work he or she is to do does more work and better work than one who is unfitted, advances more rapidly, spoils less material, breaks less machinery and tools, is better satisfied and thus less likely to be a prey to agitators, and gives far greater promise of becoming a permanent asset of the industry.

All this, of course, refers to general all-'round efficiency. We are considering, however, the specific question of fitness for the job as an essential in safety. Broadly speaking, the efficient man is the safe man for any given job. There are, however, certain elements of fitness which have to do particularly with safety. The physical elements are most of them obvious enough and pretty generally recognized by everyone. We do not send the man subject to vertigo up into high places, we do not make a taxicab driver of a very nearsighted man, we do not let a clumsy man handle high-speed machine tools, and we do not put a man with sensitive throat and lungs to work burning sulphur. There are, however, other physical elements of fitness for safety just as important as these, but not quite so obvious, which the trained observer instantly detects.

TWO DISTINCT TYPES OF MEN

To be a safe man for his job, a man must also be intellectually, emotionally and volitionally fit. Some jobs require great mental alertness, keen observation, quick thought, instant decision, perfect coolness of brain and steadiness of nerve. Other jobs require patience, watchfulness, cautiousness, prudence, painstaking care, high sense of duty, willingness to plod along with little details.

These are two quite distinct types of men. One would be an absolute failure in a job for which the other is pre-eminently fitted. Some jobs require implicit literal obedience to directions or instructions. The slightest departure from the beaten track brings disaster. Other jobs require a constant exercise of individual judgment. Here, again, are

two distinct types of people. Only a trained observer can distinguish between them except by watching their actual performance, and in hazardous occupations we cannot afford to experiment.

It is our experience and yours also, no doubt, that many most serious accidents occur as the result of almost infantile judgment on the part of some operative. This is interesting and highly important, in view of the fact that it has been demonstrated by psychologists that there are individuals who appear to the ordinary observer to be fully normal, who in intellectual development have never passed the phase of childhood. Those who have been trained to do so can determine that such people have the intellect of a child of 7 or 9 or 12 as the case may be. In view of this one fact alone, how dangerous it is to leave the selection of employes for hazardous work to those who cannot easily detect such mental abnormalities!

To illustrate further the keen discrimination necessary in selecting a man fit for the job from the standpoint of safety, let me relate the experience of one employment manager: This man was asked to select an operator for an electric travelling crane. A little study of the job taught this employment manager that the operator, unless he was careful, might not only smash much valuable machinery, but might also kill or maim some of those who were working on the floor. He, therefore, selected a man who, according to his observation, was extremely careful. This man proved to be not only slow and indecisive, for fear of doing some damage, but soon threw up the position because the nervous strain was so great he could not endure it.

His next selection was a man keen of eye, quick and skillful with his hands, prudent and careful, but courageous and decisive. This man proved to be not only well fitted for the job from the standpoint of all-round efficiency, but an exceedingly safe man in operating his crane.

RECLAMATION OF INJURED MEN

Another phase of this problem which is already engaging our attention and will become rapidly more and more important as the present war goes on, is the restoration to usefulness and independence, economically, of those who return to us maimed and crippled from the battlefields of Europe. Their physical handicaps are and will be only too painfully apparent. Their far more valuable assets of intellect, feeling and will, therefore, will become vitally important to them and to their employers. It will be a boon to them and to the nation if these mental qualities can be accurately ascertained, developed and trained in accordance with their natural talents and put to work where they will be not only efficient but safe.

We have gone far enough in this great safety movement to learn that safety devices are of great value; careful instruction, training and drilling of the workers are highly important, vivid and attention-compelling warnings in the form of posters, slogans, printed matter and lectures have produced valuable results, but we have also learned that, after all, safety comes back to the individual worker. Safety devices, safety in-

structions, safety drills and safety warnings all fail of their effect if the individual worker is either physicially or mentally unfit for the work he is asked to do. Fitness for the job, therefore, is not only an essential of safety, it is *the* vital essential.

METHODS AND RESULTS OF SAFETY WORK IN THE PLANT OF THE HAMMERMILL PAPER COMPANY

CHARLES B. MUNLE, HAMMERMILL PAPER COMPANY, ERIE, PA.

Mr. Chairman and Members of the National Safety Council: Up to the time of the general enactment of the compensation laws, systematic safety campaigns had not been carried on by industrial corporations generally. From the very inception of our plant, we were fortunate in having the close co-operation of the State Factory Inspection Department, and our equipment was safeguarded far beyond what was considered necessary before the issuing of the revised safety standards.

Before the organization of our safety department, the safety work done had been taken care of by our engineering department. In the early part of 1916 we organized our safety department, appointing a safety inspector, who devoted his full time to the work and study of the safety situation. Our first important work was to survey the general condition of the mill and compile all available information in regard to accidents, in an attempt to locate the various causes to which accidents were attributed. In this survey we had the valuable assistance of the State Department of Factory Inspections, also our insurance company.

Our next step was the study of conditions in detail to avert accidents; that is, to isolate small parts of the complete operations of making paper and, in fact, to study the individual in his own operation. The complete operations of the mill were subdivided into small units and listed in order of importance as to hazard. The small unit was then studied until practically all places of possible accidents were located and protection provided. The apparent accomplishment seemed very slow, for when one small unit had been safeguarded, we would find others still uncompleted, but, looking back over two years of systematic working, we feel very much pleased with the results obtained through the entire mill, and we believe that the showing we have made in the reduction of accidents in our plant is directly due to the thoroughness in which we tackled the small things. While we have covered the mill in a manner which has given satisfactory results, we still find that vigilance is the price of safety.

CHARTING INDUSTRIAL ACCIDENTS

We endeavor to tabulate and chart all information in regard to our safety work and, as the primary work of the safety department is the prevention of accidents, our principal head which we have tabulated and charted is "Accidents." We have charted the number of accidents for the mill as a whole, then subdivided them into departments, to show us

where the main troubles lie, and also to show us where our missionary work has borne fruit. The continual watching of these charts forms the planning board, so to speak, of the work of the safety department. Merely subdividing the accidents on paper will not prevent their recurrence and we have tried to locate some definite information whereby we can prevent similar accidents. To this end we have tabulated all accidents as to time of day and place in which they happen. We have also separated the accidents according to the kind and cause, and a record has been kept of the amount of time lost, due to accidents to our employes. In this connection I might say that we term any injury which involves the loss of any time as an accident.

A tabulation of a batch of figures and averages struck therefrom are very difficult to keep in mind sufficiently long enough readily to determine progress made or definitely to study any individual situation shown by the figures, consequently we have followed the graphic method of charting. These charts were started at the time of our original survey and have been kept up to date.

Soon after starting into safety work we learned that guards, signs, etc., had their good points, but one of the largest problems facing us was to get our employes interested in the safety game, so an educational campaign was begun. In starting an educational campaign, industrial corporations are confronted with a delicate and difficult proposition, and it is necessary to get the confidence and interest of the employes in order to disseminate safety information. The work must be carried on gradually, but persistently. Our first attempt was in the line of bulletin boards. We had boards placed in every department of the mill, on which we displayed the bulletins of the National Safety Council and such as we were able to prepare from our own individual experience. Speaking of bulletin boards, we think that we have discovered a point of interest. Our first attempt in this direction was the conventional blackboard, fastened to the wall in an appropriate place. The bulletins posted would become dusty and dirty and sometimes were mutilated. We thought this condition tended to lessen the interest of the employes, so we prepared a neat looking board, covered by a glass door, and find that the above troubles are obviated and that the men have a keen interest in getting the knowledge set forth in these displays and eagerly await the change of bulletins.

USING BULLETINS TO TEACH ENGLISH TO EMPLOYES

We realized that a large part of our foreign element would be unable to read English and the full value of the bulletins would not be obtained, consequently one of the first things we did was to have a card printed in ten languages which read as follows: "If you cannot read English, have this read to you." This was placed on each bulletin board. Aside from the foreigners getting the safety information, I believe a great deal of practical good has been derived from their becoming interested enough to learn more of the English language.

In regard to bulletins taken from our own experience we have in mind one case in particular—that of one of our carpenters. He was engaged

in doing some cutting around a large wooden tank, which was being erected, when he was struck in the eye by a chip of wood. In place of going direct to the plant dispensary he decided that he would not take the time. That evening, when he arrived home, the eye was giving him some trouble and he applied some tea leaves. Several days after the accident he appeared at our dispensary, suffering intense pain. He was at once sent to an eye specialist, who did everything possible, but an ulcer developed over the entire surface of the eye and it became necessary to remove it. Upon this man's return, with his permission, we made a bulletin in which the facts of the case were briefly stated, along with a statement, signed by him, which was as follows: "Mr. C. J. L. of the carpenter crew was struck in the eye by a chip of wood on March 2. He neglected to go to a doctor for several days. Had he gone sooner he might have saved his eye. He has been disabled since March 2 and has lost wages amounting to $140.00. This is what he has to say to his fellow workmen: 'Play safe. Report all your injuries, no matter how slight they may seem. If I had reported my injury at the time it happened, instead of waiting for two or three days, as I did, I could have two eyes now and I would not have suffered the loss of my eye. Though I will receive compensation, no amount can ever repay me for the loss of my eye. I live in great fear that something will happen to my remaining eye.'"

This bulletin brought to the attention of the employes an example of one of their fellow workmen, and, since the posting of the above, cases of particles in the eyes go at once to our dispensary for treatment, instead of allowing one of their partners to dig around in their eyes with dirty fingers, matches and the like. This case again demonstrates the safety slogan: "It pays to be careful, the more careful you are the better it pays."

PRIZES AND INDUCEMENTS FOR SAFETY SUGGESTIONS

As the greatest percentage of accidents can be traced back to carelessness or thoughtlessness, it was necessary to get the workmen interested in practicing careful methods. The greatest good can be accomplished by making the men realize that they have an integral part in this work. To this end we formed our workmen's safety committees, composed of three workmen selected from each department, each member serving for a period of three months—the oldest member dropping out each month and being replaced by a new recruit. These workmen's committees act in conjunction with the safety inspector and their duties are outlined as follows: To make monthly inspections; to make recommendations as to the best method of remedying dangerous conditions which they may find; to caution and instruct workmen seen doing anything in an unsafe manner; to investigate accidents; to make monthly reports of conditions found, etc. Our general committee—composed of the president of the company, chief engineer, superintendents, master mechanic and safety inspector—passes on all recommendations to determine their practicability, etc., meetings being held once a month.

The man who is interested in having safe conditions for himself and

fellow workmen will notice, during the performance of his regular duties, various conditions which might be improved. To take care of this condition we placed a suggestion box in a convenient and central location. All employes were informed that suggestions for improvements in working conditions and safety devices, labor saving devices, etc., were solicited, and that money prizes and due recognition would be given for accepted suggestions, according to their value, as estimated by the committee, provided they had not been previously thought of and considered. Through this channel our attention has been called to a number of important questions and the employes making the suggestions have had their interest increased by feeling that they have a say in the workings of the safety department.

The safety department endeavors to get individual information and the word has been sent forth that each and everyone who so desires may have a full hearing on any subjects of safety. In the case of accidents, details of the injury and surrounding conditions are obtained as fully as possible and oftentimes much valuable information is disclosed.

In Erie we have a Local of the National Safety Council, to which a large number of the industrial plants belong and we have had many very interesting and helpful meetings. Our safety department has taken a very active part in these meetings and it occurred to them that our employes could gain considerable knowledge at first hand through attending these meetings. Our foremen and members of the workmen's safety committees are notified of these meetings and are urged to attend. During the last year we have had a very gratifying attendance of our employes at these meetings and they seem to be greatly interested in the fact that they are working along the line of the other industrial concerns of our city. The interchange of ideas and experiences are a great incentive to them.

WHEN MOST ACCIDENTS OCCUR

We have prepared a large chart showing the distribution of accidents by hours for the year 1917 and the first eight months of 1918. In considering the distribution of accidents by hours for the year 1917 we found that the greatest number of accidents occurred in the middle of the forenoon and the middle of the afternoon; 16 accidents or 6.6 per cent occurred at 9 a. m., 14 or 5.7 per cent at 9:30 a. m. and 14 or 5.7 per cent at 10 a. m. There is then a lessening, with 3 or 1.6 per cent at 1 p. m., followed by an increase to 19 or 7.8 per cent at 3 p. m. These peaks, in the middle of the forenoon and afternoon, are found in practically all accident statistics and may be attributed to fatigue or digestive disturbances, as it is indicated that at both periods, morning and afternoon, that the workmen become more or less thoughtless of the dangers of the work. During the night the accidents run approximately uniform. It was found that 82.7 per cent of the accidents happened on our day shift, constituting 82.1 per cent of our working force, while 17.3 per cent happened on the night shift, which constitutes 17.9 per cent of our working force.

This year, so far, has confirmed our plotting of this subject up to

January, 1918. It is very evident, from the two charts, that the most critical hours appear between 8:30 and 10:30 a. m. and from 2:30 to 4:30 p. m. These charts have confronted us with another subject for study. So far we have been unable to locate a definite cause so that we can apply a remedy. This subject is receiving our earnest attention and investigation and we hope soon to be able to throw more light on it and incidentally further reduce our accidents.

A glance at the chart of total accidents for the years 1916-1917 and the first eight months of 1918 shows the progress which has been made in our plant in the reduction of accidents. During the year 1917 we were enabled to effect a reduction of 31.1 per cent over the previous year and a further reduction of 17.7 per cent during the first eight months of 1918. During the year 1917 our records of time lost also show a reduction of 28.1 per cent. We had but twenty-eight compensation cases during the year 1917, the majority of which were small.

While the results we have obtained are very gratifying, we realize that we are a long way from being perfect, and it is now necessary not only to maintain our present organization and systematic work, but to reach out and make further improvements and to set up continually new incentives to impress upon the minds of our employes the importance and value of being careful and working toward the safety of the institution as a whole.

FRIDAY MORNING SESSION

MEETING called to order at 9:45 o'clock, the Chairman of the Section presiding. A letter was read from Mr. F. S. Shattuck, former Chairman, who is at present connected with the Military Y. M. C. A.

The Nominating Committe reported as follows:

Chairman, A. P. Costigane, Ontario Pulp and Paper Makers' Safety Association, Toronto.

Vice Chairman, C. E. Jackson, Consolidated Water Power and Paper Company, Grand Rapids, Wis.

Secretary, Mr. C. B. Milner, Hammermill Paper Company, Erie, Pa.

The recommendations of the committee were concurred in.

The first paper of the session was presented by the Chairman.

THE HOUSING PROBLEM IN A PAPER MILL COMMUNITY

G. E. WILLIAMSON, CHIEF ENGINEER, STRATHMORE PAPER COMPANY, MITTINEAGUE, MASS.

Mr. Chairman and Members of the National Safety Council: In the year 1912 the Strathmore Paper Company decided to build a new paper mill in Woronoco, Mass. Woronoco is a part of the township of Russell and lies in the valley of the Westfield river, fifteen miles west of its junction with the Connecticut river at Springfield. At that time this company owned and operated one mill in the village. The population

consisted almost entirely of employes of the company and accommodations comprised twenty-six houses of one, two, three, four and eight families, with a total of fifty-one tenements. The greater part of the houses had been built for several years and were, on the whole, very serviceable and considerably above the types of dwellings usually found in paper mill villages.

In providing homes for the employes of the new mill the management started out with the following ideas in mind: *First*, the houses should be attractive both inside and out, and be provided with modern conveniences. *Second*, the housing development should not be a money-making proposition, but rents should be as low as possible with good accommodations.

FORMULATING A DEFINITE POLICY

In order to formulate a definite policy the entire problem was studied somewhat at length, substantially as follows: Lists were prepared in detail of the probable employes of the new mill, both male and female, divided according to position and whether married or single. The probable weekly earnings of each was then determined, based upon prevailing wage rates in the company's other mills. Investigation showed that the average wage earner pays out about 25 per cent of his income for house rent. Wishing to be conservative in this respect, however, we adopted the ratio of one in six, or 16⅔ per cent. Comparison was made with the rents already paid and the results checked very closely. We were then able to fix upon a schedule of rents which various grades of employes could afford to pay. This schedule comprised six classes, from $1.50 per week to $4.00 per week, by 50 cent increments. The next step was to compute allowable investments for the various classes of tenements, based upon the schedule of rents just described. Making fair and conservative allowances for deterioration and repairs, taxes, insurance and water, and a fixed rate for interest, the gross return amounted to 8 per cent. Again turning to our schedule of rents and capitalizing the yearly income from each class at the percentage just computed we were able to find the amount we could afford to invest per tenement in each class to bring the predetermined return. This brought us to a consideration of the types of houses most suitable for the community, and, after some study the following were selected:

Class and Type—	*Description*
1. Two-family, double cottage or semi-detached.	Five rooms and bath, steam heat.
2. Two-family, one above the other.	Five rooms and bath, steam or hot air heat.
3. Four-family, two families on both first and second floors.	Four rooms and bath.
4. Four-family, unit type, two rooms first floor, two rooms second floor.	Four rooms and bath.
5. Four-family, two families first and second floors.	Four rooms.
6. Four-family, two families first and second floors.	Three rooms

PLANNING FOR PERIOD OF YEARS

The problem was then turned over to the engineering department and plans were drawn and specifications prepared for the six classes of houses. Bids were received and in the majority of cases the successful bidders' figures came very close to the amounts allowed. In the case of the class 1 house, however, a considerably larger and better house, consisting of eight rooms per tenement was worked out, and the weekly rental was slightly increased to cover the additional cost.

In the fall of 1912 and during 1913 seventeen houses, with a total of fifty-three tenements were erected. Almost every year since a few houses have been added, so that we have now occupied or under construction a total of thirty new houses with eighty-six tenements. We have, of course, found it advisable to make slight changes in the design as the work has progressed and the houses have been completed and lived in, both to improve arrangement or convenience and to keep the investment within or as close as possible to the prescribed limits in days of rapidly advancing costs. When a plan was revised, in this manner, the figure one-half was added to the original class number.

At the request of some of the mill executives and department heads a few cottages have been built. Six have been built, consisting of six and seven rooms. The design of these houses has not been standardized, although the number and size of rooms is approximately the same in all.

A brief description of the several classes of houses is given in the appendix and may be of interest.

In exterior appearance, we have endeavored to make the houses attractive but free from frills. The rectangular or box type of outline has been strictly followed, except in the case of cottages, on account of simplicity and practicability of design and low cost. For the most part, side walls have been shingled and stained in browns or greens to harmonize with the wooded hills with which the valley is surrounded. In some of the later houses we have used wide clapboards and have made a trial of stucco over plaster board. Roofs have been covered with red cedar shingles, mostly, but we are now using asphalt shingles on account of their superior fire resisting qualities. Foundation walls have been of field stone, concrete or cobble stone, laid in cement mortar. In locations near the river, excavation has brought out large quantities of round cobble stones, and the majority of underpinnings and exposed chimneys have been laid up with these stones, resulting in a very attractive appearance.

The question of sites has, of course, received considerable attention, but as land is plentiful and not high in value our efforts have been confined largely to grouping the houses in districts according to classes and to providing water and sewer facilities. At the outset each one of the districts, of which we have four, was studied as a whole and a layout was made which could be followed in the gradual development of the particular location. On account of a lack of level ground the problem of grading has been a somewhat strenuous one.

MEETING WAR CONDITIONS

During the past year, we have found it necessary to erect a number of houses to accommodate the men with families who have replaced the younger, unmarried men who have gone to war. Owing to the abnormal prices which have prevailed we have made our exteriors plainer than ever and have otherwise economized wherever possible, but the advance in cost has amounted to from 50 to 75 per cent for the various classes.

Several times we have been asked if we considered our solution of the housing problem a success. On the whole, we do. The definite policy laid down in 1912 is still followed. In general, the houses have proven very satisfactory. In the last three years higher wages and increased incomes have brought requests for more houses with steam and hot air heat and the most recently constructed houses down to class 4 are so equipped. Bathrooms have been extended to all but the lowest price class of house and all classes are now provided with electric lights.

Personally, I believe that every community must solve its housing problem in conformity with local conditions. Houses which meet the requirements in one place would not be a success in another where climatic, structural, labor, and other conditions are different. I do believe, however, that such a proposition, upon which so much of the company's success depends, should be given careful study at the start and a particular and persistent working policy established and followed.

APPENDIX

A brief description of the several classes of houses follow:

Class 1 and 1½—Semi-detached houses of eight rooms each, including living-room, reception hall, dining-room, kitchen and pantries on the first floor; three chambers, sewing-room and bath on the second floor: large unfinished storeroom on the third floor. Steam heat, electric lights, modern plumbing, town water and sewer. Principal rooms on first floor finished in brown ash, second floor in N. C. pine, walls papered or painted, ceilings tinted. All floors rift pine, the majority filled and waxed.

Class 2 *and* 2½—Two-apartment or tenement house; five rooms to each tenement, all on one floor, including living-room, dining-room, kitchen, two bedrooms and bath. Class 2½ houses have two chambers finished in the third story, giving the upper tenements seven rooms. Heat, lights, finish and decorating the same as class 1.

Class 3—Four family house; two tenements each first and second floors, comprising four rooms per tenement, living room, kitchen, two bedrooms and bath. Electric lights, modern plumbing, heated by stoves. Living-room finished in ash, remainder in N. C. pine. All rooms papered or painted and ceilings tinted. Floors of rift pine, finished.

Class 3½—Similar to class 3, but with five rooms per tenement, including living-room, dining-room or bedroom, two chambers and bath. N. C. pine finish throughout.

Class 4—Unit type, consisting of four tenements, two rooms on first floor, living room and kitchen and two bedrooms on second floor, with

bath. Electric lights, modern plumbing, heated with stoves. N. C. pine finish, walls papered, ceilings tinted. Rift pine floors, finished.

Class 5—Four-family house, similar in plan to class 3, but not as large. Each tenement has four rooms, living-room, kitchen, and two bedrooms. Modern plumbing, but no bath. N. C. pine trim and floor. Walls papered and ceilings tinted.

Class 5½—Similar to class 5, with addition of bath and electric lights for each tenement; also two large bedrooms on third floor.

Class 6—Four-family house; two tenements each on first and second floors. Three rooms per tenement, including living-room, bedroom and kitchen. Modern plumbing, but no bathrooms. N. C. pine trim and floor. Walls papered or painted, ceilings tinted.

Class 6½—Similar to class 6, with two bedrooms in third story.

Cottages—Include living-room, reception hall, dining-room, kitchen and pantries on first floor, three chambers and bath on second floor. Heat, lights, finish and decorating the same as class 1.

After an informal discussion Mr. Rousseau presented an interesting paper on "The Indian Hill Development" of the Norton Company.

THE INDIAN HILL DEVELOPMENT

A. Rousseau, Safety Engineer, The Norton Company, Worcester, Mass.

Mr. Chairman and Members of the National Safety Council: The housing problem which Indian Hill has solved for the Norton Company is not the same one that confronts most of the industrial plants which have sprung up over night and who must find some means of housing, temporarily at least, a large proportion of the rank and file of their employes. However, there are many features, particularly the plan of selling the houses, which could be applied to other conditions, so that an outline of the Indian Hill development might be of general interest to all who are in any way concerned with the problem of industrial housing.

PURPOSE OF THE ENTERPRISE

Worcester is famous for its so-called "three-deckers." This is a type of dwelling which houses three families. The landlord usually lives on the lower floor and rents the two upper tenements The rent paid by each family ranges from $18 to $30 per month, depending on the size and condition of the house and the neighborhood in which it is located. Although the tenements in these three-deckers are usually quite comfortable, the environment is not always satisfactory. There are many high-grade wage earners renting tenements in houses of this type who would much prefer to live in individual houses or cottages in which they could take a personal interest. The reasons why they have not built or purchased houses of their own are because of the difficulty of finding a suitable site near enough to their work and still not so close that the prox-

imity to the place of employment would make the home surroundings unpleasant; also, the difficulty and hesitancy about financing a project of this kind with only a moderate income.

It was to give an opportunity to those of its employes who were placed in this position and who wished to improve their home conditions that the Indian Hill Company was organized. The returns to the Norton Company would be in the form of increased loyalty and good feeling between the employe and employer.

LOCATION AND ARCHITECTURE

The company was very fortunate in having an ideal site, located at the proper distance from its works for a project of this kind. This was a naturally beautiful hillside overlooking Indian Lake, which gave the architect plenty of opportunity to lay out gracefully curving streets, with gentle grades, also lawns and terraces with beautiful slopes.

The distance of this site from the works is such that the people who live there can easily walk to and from their work morning, noon and night and yet it is far enough away so that, with the aid of the hill, the plant is hidden from view from most of the houses.

The entire development, including the design of the houses, was laid out by a well-known architect, who had made a special study of community planning. He put his best efforts into the work and as a result the village has been highly praised by all who have seen it. He utilized to the best possible extent the natural curves and slopes of the hillside, as well as the large number of shade trees which nature had planted there.

The houses were laid out and planned collectively, so that the entire village would be harmonious in every detail. Here is noticeably lacking the straight rows of houses, all spaced the same distance from the street line and an equal distance apart, which are so conspicuous in most new developments. Several types and sizes of houses were built, so that there would be no monotony or sameness, yet all are harmonious in character. This is a feature which does not require the highly developed sense of beauty of an architect to appreciate, but it has a decidedly pleasing effect on the eye of the most ordinary layman. One feels at once on approaching the village that this is not an ordinary real estate development.

CONSTRUCTION AND EQUIPMENT

The houses were designed to give the purchasers approximately the same number and size of rooms as they were accustomed to in their three-decker tenements. These consist of a kitchen, pantry, dining-room, living-room, two or three bedrooms and a bath. All of these were provided and in some instances a sun parlor or glass porch was added. Several of the larger houses have open fireplaces in the living-rooms. The houses are all equipped with piping for hot and cold water and gas and are wired for electricity; an individual steam heating plant is provided in each. The floors are all hardwood throughout. Some of the exteriors are finished in stucco, while others are finished in shingles or clapboards. All are white, trimmed in green and the roofs are all slate.

METHOD OF FINANCING

In starting out on this project the question to be settled first was how it should be financed. The Indian Hill Company was organized, the directors being the same as those of the Norton Company. The policy of this company was to conduct its business without profit and without loss. The plans which were made and subsequently followed out consisted of purchasing the land, engaging the architect, laying out the streets, sidewalks and sewers, developing the property in general and building the houses.

The houses were sold direct to the purchasers, the price charged being the actual cost of the house and the land, plus a proportionate share of the improvements. The company required of the purchaser an initial payment of 10 per cent of the purchase price. In addition the purchaser gives a time note for twelve years, also a demand note, both secured by a mortgage to the company. He agrees also to take out a certain number of shares in a local co-operative bank. The payment of $1 each month on shares in one of these banks results in the return of $200 to the shareholder in twelve years. The number of shares he is required to take out is sufficient so that at the end of twelve years he will have saved a large enough sum to pay off the time note. This, added to his initial payment of 10 per cent will bring his affairs to such a state where he can have any bank in the city take a first mortgage on his property and he will own his house under the same conditions that prevail among those in more fortunate circumstances.

The following table is a reproduction of one which was given to a purchaser of one of the 1915 houses and illustrates very well the method of financing:

Your total purchase price is	$3,851.50
You have made a first payment of 10 per cent	385.15
You are borrowing on mortgage, the balance	3,466.35
The amount due in twelve years, secured by time note, is	1,000.00
The balance secured by demand note is	2,466.35
Your monthly interest during first twelve years will be	14.45
Your monthly payment to co-operative bank will be	5.00
Your total monthly payments during first twelve years will be	19.45
Your monthly interest payments after twelve years will be	10.30
Total loan	$3,466.35
Five per cent	173.32
One-twelfth	14.45
Demand loan	$2,466.35
Five per cent	123.32
One-twelfth	10.30

COSTS AND RESULTS

In regard to the costs of the houses, we can only state what these were when the houses were built. We have not even estimated what they would cost today, if it were possible to get labor and material to build them. In

1915, when the first twenty-seven houses were built, the prices ranged from $2,850 to $4,000. In 1916, when thirty more were built, the prices ranged from $3,600 to $5,200. These figures are probably more comprehensible if placed on a cubic foot basis, on account of the various sizes of the houses. In 1915 the cost was about 16 cents per cubic foot, while in 1916 it increased to 19 cents. The cost varied greatly, also, with location. We are informed that the same house which cost 19 cents per cubic foot to build in Massachusetts was being built in Tennessee the same year for about 10 cents. No attempt has been made to build houses since 1916.

The most noticeable result to date has been in the changed living conditions of the purchasers of these houses. Here are nearly sixty families living under the most pleasant conditions, with beautiful homes and surroundings. Had not the company given these families the opportunity to purchase these homes it is certain that a very large proportion of them, at least, would still be living in three-decker tenements. The interesting part is that in most instances the purchasers of these houses are occupying them and virtually securing ownership of them at monthly payments which do not exceed the amount which they previously paid for rent in a tenement house in which they had no lasting interest. It is needless to say that these families take a pride in their new homes and that the houses and lawns are maintained in excellent condition.

It is too early as yet to tell what the results to the company will be. We feel certain, however, that the loyalty of these people has been materially increased and that the ultimate result will be that they will be voluntarily attached to the company.

COMMUNITY WELFARE

EVELYN B. BINZ, ASSOCIATE DIRECTOR, EMPLOYMENT AND SERVICE, MILLER LOCK COMPANY, PHILADELPHIA, PA.

Mr. Chairman and Members of the National Safety Council: That isn't the title I'd take if I had an opportunity to do it over again. It would be "The Factory as a Community Center." So please let me use that as a topic.

"The Factory as a Community Center," not, however, the factory that chooses its home and makes its own community—like Gary or Harriman—model towns with parks, boulevards, playgrounds all provided, homes for executives, office help skilled artizans and laborers all neatly segregated.

No, no, we don't have that kind of a factory center. Ours is the ordinary, every-day industrial section, around mills that have grown out of little sheds on the back lots to plants that cover a couple of city blocks. Each mill is still surrounded with the homes of the workmen whose fathers toiled in the tiny shop and father and son both delight in telling how Foreman Billy Penn used to make the now president, R. E. ——, and the present Treasurer, C. A. ——, stand around when they started as boys in the plant. And as each plant has grown so have the neighboring

industries down the street and across the way and around the corner. Inevitably, therefore, the houses between the plants have crowded closer and closer, and the boarders and roomers grow thicker and thicker as the house lots have raised in prices and shrunk in size. The very air has thickened and darkened with the smoke from so many chimneys. The children are more in numbers and frailer in health. Of course, with the declining desirability of the houses, the Americans, English and the Germans, who formerly occupied the neighborhood, have steadily moved away, giving place to negroes and Polish workers.

QUESTIONS OF HOME SURROUNDINGS

Each race has its own particular method in economizing on the rent. The negro chooses the dilapidated shack on the dumps or the house owned by the careless landlord who never screws a hinge or nails a board. On the contrary, the Poles pick the nicer homes on the main streets—houses that are well painted, even if in lurid colors, but still shiny with good linseed oil and white lead. To make ends meet they promptly install another family in the front of the house, to use the parlor as a kitchen, dining-room, nursery and living room. The owner's family, meantime, shares the back of the house with a flock of chickens, three or four pigs, and even a cow or two—city health regulations notwithstanding. By the way, I have never seen a garbage wagon in this part of town, not even a pail of slop on the curbstone. The children of the lucky owners of cows and pigs "lug" it—there is no other word—lug it home for the family livestock. Such are the conditions in our part of the City of Philadelphia.

HEALTH SERVICE PROVISIONS

Now for our place in the community. Having as owners a father and then two sons who have the social spirit, the management early decided to install a welfare department, first, for the plant, and then for the neighborhood. We were pioneers in that line, being the third industrial plant in the city to put in a trained nurse and a doctor. We now have a fully equipped dispensary (rated as a hospital by our insurance company), a doctor's office, a well-appointed dentist's office, a woman's rest-room and one for men, the head worker's office for interviews, and a waiting-room. Our hospital not only cares for accidents and illness occurring at the plant, but also for the chronic personal ailments that need constant daily care, like varicose veins, tubercular vesicles, hardened wax in the ear, and pediculosis of the hair. Any of our people who are injured outside of our plant are treated free by the nurse and given advice, prescriptions and dressings by the doctor. Tubercular cases are watched carefully, both inside the plant and at their homes. They are aided financially, and everything possible is done for them—that, too, when our buildings are flooded with daylight and equipped with blowers and ventilators which change and moisten the air. Our machines produce no dust, and there is absolutely no disease risk.

We do not limit the hospital care to our employes. Their near relatives,

particularly their children, are sought out by the shop visitor and brought into the doctor's office or to the nurse. Along that line, we are planning a children's clinic under our shop physician, who is an enthusiastic baby doctor—a clinic where all our employes' youngsters under 3 years of age can be brought for periodical examinations and advice.

Our dentist's office doesn't attempt to cater to the neighborhood, but does care for the teeth of all those employes who desire treatment. This is not free, though the work is done about 25 per cent cheaper than a *good* outside dentist would charge. In addition, the employe is paid his day-work wages while he is in the dentist's office, so the doctor's three days a week with us are very crowded, because the men see the advantage of having the work done on the company's time. The company, on its side, does not have to put up with days and half-days lost because of appointments with distant dentists.

But though our employes and their relatives are driven to the hospital by pain or trouble, it is in our recreation-room that the whole neighborhood gathers for its fun and instruction. Used at noon as a big dining-room for all our force, who sit down together—owner next to carpenter, cashier next to apprentice, foreman next to trucker (colored at separate tables alongside the whites)—the "Reckie" becomes a concert-room with community singing, led by our shop band in the latter half of the lunch hour, a lecture-room in rest periods, and, when the tables are taken down and the floor cleared, a dance hall in the evening.

RECREATION AND AMUSEMENT FOR EMPLOYES

Big doors open on the street and passers-by are at liberty to group inside the doorway and take part in the singing or listen to the talks on the war or other subjects, which are given every two or three weeks. At night the use of the room is given (with heat and light) for any worthy community affair. The Polish Emergency Aid can have it for its bazaars, the Girls' Northeast Patriotic League holds all its activities there—its weekly drills under officers of the Marine Corps, its Red Cross meetings, its dances and its plays. From its doors start big trucks loaded down with enlisted men and girls off on a jolly picnic. All this work for the girls is done in co-operation with the War Camp Community Service, and, of course, the parties are properly chaperoned.

HELPING TO WIN THE WAR

Here, in the big room, are brought the accumulation of peach stones, tin foil, old rubber, old clothes and old shoes that are needed for gas masks and Red Cross and Belgian relief. Here, too, the Boy Scouts of the neighborhood drill or romp or give their dances. The near-by churches hold their entertainments here, for the room is equipped with piano, stage, footlights, curtain and all the paraphernalia for serving refreshments. Coatrooms and retiring-rooms open off the hall, which seats 600 or 700 people, and has a perfect floor for dancing. All this is at the disposal of the neighborhood, free of charge. Besides the bigger things in the evening, there are given in the afternoon informal affairs for the women, food

demonstrations and canning and drying talks in Polish and English by the representatives of the Food Administration. During the winter we plan to have various state and national speakers address us on such topics as health, chickens and gardens. By the way, we have a flourishing group of war gardens on ground adjoining the plant.

Through all our work, both in the factory and in the homes, we bear in mind the factory must take the lead in matters of community and national good. It must do for the adult what the school does, or ought to do, for the child. It must keep in touch with all important movements for betterment and act quickly and generously in securing action and co-operation among the home dwellers close by, in order that the great world plans may not go astray.

Of course, we are a bit proud of our position in the community, of the leadership which has been tacitly acknowledged as ours. We are glad of the spirit that pervades our people, both in and out of the shop, the response and the co-operation we get in the various movements we take up, the kind feeling that makes our section a good place to live in and the "Lockie" a good place to work.

INCREASING THE EFFICIENCY OF BULLETIN SERVICE

HARRY BALLOU, LOCAL MANAGER, MENASHA PAPER COMPANY,
LADYSMITH, WIS.

Mr. Chairman and Members of the National Safety Council: The topic of my paper, "Increasing the Efficiency of Bulletin Service," possibly suggests to you that it is my intention to suggest to the National Safety Council better and improved methods in the conduct of their business in so far as their bulletin service is concerned, but before entering upon the subject I want it understood and made clear that the organization hardly deserves any such criticism or suggestions pertaining to the matter in question.

Representing a corporation that is a member of the National Safety Council, I want to say that our experience teaches us that the bulletin service, as rendered, is the most valuable of any of the work performed by that organization. If any of you are not members and you think you are doing satisfactory work in accident prevention, you are to be criticised for not joining.

Fundamentally, bulletins are the mouthpiece of Safety First management or the means whereby the results of experience and information are conveyed to those who require it, but members of the Council must not feel that their duty is performed when they receive by mail, at regular intervals, these bulletins and have disposed of them by placing them on the bulletin boards. We should realize that our task has only just commenced and that we must carry the work along by numerous different methods, not by one continuous arrangement, but by devising ways and means of continuously varying the systems, because the average workman

must be continually enthused and kept constantly interested in Safety First work. It is a big problem to get them interested and another to keep them interested—you cannot succeed without the help of an efficient bulletin service.

USING BULLETIN BOARDS TO BEST ADVANTAGE

When bulletin boards are first installed in a plant or in any department, interest and enthusiasm is naturally aroused, but the proposition soon becomes of a more or less monotonous nature, and it is to break up this condition that prompted me to choose for my subject the one that I did.

Instead of filling your boards entirely with bulletins pertaining to accident prevention, insert among them, at frequent intervals, a bunch of news items pertaining to something about the plant. Do not adhere entirely to the serious side; if there is a good, harmless joke on some of the workmen, or even the officers, use it; commend a workman or a department now and then through these news items. Such things will get the workmen into the habit of always watching the bulletin boards and will thereby cause every bulletin to be read. Personally, I do not believe in bulletins having too much reading matter on them. If you will watch carefully, the majority of the men will take more interest in and read more intelligently, short, to-the-point bulletins. Use large, plain type and as few words or sentences as possible.

Do not depend entirely on the bulletins furnished by the National Safety Council to fill your cases, as it is impossible for them to always make bulletins fit each and every local condition in the various plants; depend partly on your own efforts for bulletins; use your own originality. You surely know just what room, department or machine has the largest percentage of accidents, consequently it is up to you to make a bulletin of that condition, explaining it plainly. It does not look neat and practical to have a plant pasted all over with bulletins; nevertheless, in particular hazardous places you should have well-printed, large-size bulletins securely posted, informing the workmen that these particular places require special care, etc. A metal bulletin board, permanent in nature, should be used.

If we really wanted to slightly criticise our National Safety Council, as well as ourselves, we ought to state that there are not a sufficient number of bulletins issued in foreign languges. We all know that it is the foreigner who cannot read English who is really in the most danger, because he is not educated in Safety First work. Why not help him out of his trouble or possibly threatening danger by telling him, through bulletins printed in his own language? When you do so, remember to issue bulletins along the ideas I have mentioned as to news items and the like and which pertain to his particular class or nationality. By all means try this method. He is the kind of man we want to read the bulletins, in preference to others.

If a certain department is doing first-class work, whether it be in preventing accidents and sickness or in workmanship, post it on the bulletin board. Watch the places where employes eat their noonday meals—that

is where you want to place your bulletin boards. Workmen do not want to stop at a factory fence gate to read bulletins. Keep up the interest by continually changing the color, size and shape of bulletins. Everyone of us would stop and look at a bulletin if it was triangular in shape, printed on colored paper and with a different colored ink, because our curiosity would get the better of us.

USE OF EXECUTIVE SERIES BULLETINS

We assume it is not the intention of the National Safety Council to have all of their bulletins posted through the plants of their members. We oftentimes get those in which it is intended to convey an idea in a general way to the mill manager or the safety committee. I mention this for the benefit of those who are not members, so they may learn of another benefit derived from the Council's bulletin service. These bulletins express excellent ideas, and are intended for the manager and chairman of safety commitees, and are deserving of especial study. They often furnish ideas which you can perfect and use as a bulletin to suit your own needs and conditions. These bulletins oftentimes result in benefits through the discussion and argument that follow their consideration.

We all understand that "two heads are better than one," consequently when we get up our own bulletins why not help out the Council's bulletin service and improve and increase its efficiency by sending copies to the chairman of the bulletin committee or direct to the National Safety Council? If your bulletin is a good one, they will want it in order to get the value it contains before the rest of the members. If you are not a member, send the bulletins in just the same. In addition, keep a list of plants, especially of those in the same business as your own and located in your vicinity, whose local and peculiar conditions are similar to yours, and when you get out a bulletin pertaining to such a local condition send a copy to each one on your list, having it understood that you expect them to reciprocate. In this manner you will interest plants who are not members of the Council. They may have bulletins of considerable worth, and you in turn will receive the benefit. Give the Council the benefit of any good suggestions brought out by these non-members.

At the plant with which I am connected we not only have the usual accident report blanks, but each foreman has a blank on which to report "near" accidents. It would surprise you to know what a help it is and how interesting it is to read these reports. The reason I mention this is because, oftentimes, some condition is reported on these near-accident reports to give justification for a bulletin on the subject. If a near accident appears extremely important and serious it is described on the bulletin boards, stating the location and oftentimes the names of the parties involved. So much curiosity is aroused as to make the bulletin board a popular place and the affair is thereby so well advertised that the effect is decidedly pronounced.

As we all work deeper into the study of safety it becomes apparent that the bulletin service should be extended beyond the plant—that whatever we do outside will be of indirect benefit to the company. To carry this

work further, we naturally select the homes and public places. It is often worth while to enclose the checks on pay days in an envelope with safety ideas printed on both sides of it. The envelope is carried home and there read by the workman and his family. I feel that it is just as important to get safety bulletins in the home as it is to get dentists to work on the teeth of workmen or nurses into the home during sickness. Consequently we must work with the children: first, in order to help them with the interest they will create in the home, which will have the desired effect on the parents, and, second, to impress upon the children themselves the necessity of safety work, so that they, too, will be protected, and when they get into your factory (or some other) they will have the instinct of self-protection against accidents. To get the children talking safety causes the father or brother to think more seriously and to realize that there is really something in safety work after all—that it is a serious matter and nation-wide in its scope.

SPECIAL USES OF BULLETINS

A year ago our company offered cash prizes to school children for the best sets of Safety First rules pertaining to the home, the streets and to other public places. The enthusiasm created and the benefits which resulted were beyond our expectations. After all the papers were submitted to us through the school teachers we picked out the best ideas and consolidated them into a single bulletin and had the teachers give one to each pupil, with the request that they be taken home for study and posting.

Have you ever wondered what good might be accomplished through use of the bulletins you discard to make place for new ones. No doubt you crumble them up and throw them into the waste paper. Your public libraries would like to get them, so would your school teachers. In your state, the law requires that a certain specified time must be devoted every month in the schools to a study of causes of accidents and fires and to their prevention. Our teachers often run out of material and suggestions and consequently they are pleased to get the discarded bulletins.

If you have wideawake police and fire departments they, too, will welcome new or old bulletins when such material naturally pertains to something along their lines of work. In any event, don't throw away your old bulletins, put them to work.

DISCUSSION

Discussion of Mr. Ballou's paper brought out some interesting points on bulletin service. Mr. J. O. Meyers of the Niagara Alkali Company, Niagara, mentioned the following points: (1) Interest was centered on the bulletin board by the use of a map, showing the Western front, which was corrected daily, as the reports came in. (2) The Safety Committee of the Niagara Alkali Company were sworn in as police and firemen in the City of Niagara, and were thus authorized to act in emergency calls in either

the city or plant. Each man was bonded in the sum of $1,000 and when called out by the city was paid for the services rendered.

Miss Edwards of Kimberly Clark Company stated that they were getting out bulletins on specific accidents in the plant on small sized sheets, suitable for filing in loose leaf-books, one bulletin being given to each man as he left the plant.

Others taking part in the discussion were Mr. Guerrant, National Safety Council, Mr. A. P. Costigane, Mr. G. A. Umberham, Northern Paper Mills; Mr. Morris, American Rolling Mills Company; Mr. C. E. Jackson, Consolidated Water Power Company, and Mr. B. Johnston of the U. S. Smelting Company, Midvale.

Mr. Guerrant and Mr. Costigane discussed Mr. Milner's paper.

Mr. Forster brought out a number of interesting points in connection with the housing problem. He stated that proper housing of employes was absolutely essential to the keeping of men in munition plants. The U. S. Government, realizing this, had appropriated $100,000,000.00 for this work; this was equivalent to 20,000 houses, but was not sufficient to meet the needs at the present time. In designing the houses, the Government has set a high standard and discourages the erection of shacks by private individuals. Mr. Forster said the Government is equipping all the houses it erects with bathrooms, steam-heating plants, etc.

In following up his work in this connection, Mr. Forster has plotted curves for a number of cities. One curve is based on population, the other shows housing facilities, taken over a period of a few years. In practically every case the two curves were diverging to a greater extent each year, owing to the fact that very few people are building at the present time. All of the houses being constructed by the Government are controlled and built by them.

Mr. Forster thought that industrial companies going into the housing problem could figure 50 per cent on the investment to be allowed, due to stability of labor. He stated that the British government is seriously considering investing over $5,000,000,000 in providing houses for returned men. It is thought that the U. S. Government would have to adopt the same course after the war: "It will be necessary to build 400,000 homes per year in the U. S. to take care of the normal increase of population," said Mr. Forster. He added that this program is not being put into effect at the present time.

Dr. Page of the Rome Brass and Copper Company also gave a short talk on the housing problem. He said the houses built by his company were all constructed of red tile, completely modern, and had from five to eight rooms. These houses are sold on a deposit of $100; $15 per week is paid by the men until the total cost of the house is met. These houses range in price from $1,800 to $3,000.

After a further informal discussion the session adjourned.

Textile Section

St. Louis, Mo.

Sept. 19, 1918

DAVID S. BEYER, Chairman
Vice President and Chief Engineer, Liberty Mutual Insurance Company, Boston, Mass.

S. HAROLD GREENE, Secretary
International Cotton Mills, Boston, Mass.

THURSDAY MORNING SESSION

THE meeting was opened by the Chairman, David S. Beyer. In the absence of the Secretary, Mr. J. K. Robinson, Safety Engineer, Atlas Powder Co., was appointed to act pro tem.

Chairman Beyer said the small attendance was due, no doubt, to the wide distribution of textile industries, the high railroad fares and other war conditions.

Dr. F. D. Patterson, Chief, Division of Hygiene and Engineering, Pennsylvania Department of Labor and Industry, Harrisburg, Pa., was unable to be present and give his paper on "Proposed Pennsylvania Safety Standards for Textile Equipment."

Miss M. L. Morris, Connecticut Mills, Danielson, Conn., was also unable to be present and give her paper on "Employment of Women in the Textile Industry."

The committee appointed to draft a set of standards for the textile industry reported progress. More time was asked in which to prepare a complete report of their work. The Committee on Standardization of Safety Appliances for Textile Machinery is made up of the following:

Joseph Bailey, Agent, Butler Mills.
F. P. Bascom, International Cotton Mills.
Alexander Makepeace, Richard Bordon Manufacturing Company.
James Strang, Saco-Lowell Shops.
E. W. Thomas, Boot Mills.
Jesse A. Knight, Agent, Manomet Mills.

This committee plans to appoint sub-committees to take up details of

the textile industry—carding, picking, weaving, etc. They are to go over the different types of machines and come to some definite conclusion as to what would be the best safety devices to use.

A Nominating Committee was appointed by the Chairman to submit a list of three names for officers of the Textile Section for the coming year.

The Chairman then opened the meeting as a round-table discussion on "Safety Problems in the Textile Industry."

EXPERIENCE OF ENGLISH EMPLOYERS

It is known that English manufacturers have experienced the same difficulties as the American manufacturers. To illustrate this point the Chairman read some paragraphs from the report on "Conferences Between Employers, Operatives and Inspectors Concerning Fencing of Machinery, Prevention of Accidents and Temperatures in Cotton Spinning Mills," by Gerald Bellhouse, H. M. Spt. Inspector of Factories, N. W. Division.

Mr. Alfred Duncan of Ontario, Canada, stated that the relative number of accidents for all industries in Canada was 100/1,000, comparing with 87/1,000 for the textile industry. He stated that in his work he found most proprietors were willing to adopt some safety methods. He also received promises, but little had been accomplished. The Workmen's Compensation act of Canada does not classify accidents; it is, however, estimated that over 60 per cent of all accidents are from machinery. There is an increase at present, since a large proportion of the help are women. Mr. Duncan also said that manufacturers employing over fifteen workers must maintain a first-aid kit. In all industries where 200 or more workers are employed a first-aid room must be maintained by a nurse or another competent person. Also that in Canada there are no universal standards and that the protection needed is up to the inspectors.

The Chairman gave as his experience that most manufacturers have standards of their own to overcome certain hazards. Also that the manufacturers of textile machinery have and make appliances for the machines they sell. They do not put them on the finished product as a rule, however, unless they have a definite call for the same.

Mr. A. E. Conrath of the International Harvester Company of St. Paul, Minn., said the practice of their plant was to have a nurse apply first aid, also for a doctor to inspect the patients for further treatment. Their policy is "Do not clean machinery while it is in motion," but certain parts of the machine could be cleaned while the machine is in motion if the parts were specified. If the parts permitted to be cleaned while the machinery is in motion are not specified the workmen will take advantage of the rule.

MACHINES PROTECTED WHERE POSSIBLE

Mr. Charles Wagner, International Harvester Company, Chicago, said his company have 1600 spinning machines (for twine, etc.). These are protected in such a way that the cover cannot be lifted unless the machine is stopped and machine cannot be started before the cover is again

in its proper position. Pictures of these guards can be had by writing to the International Harvester Company, Chicago. The company has always employed women in this branch of work—about 40 per cent are women. Their plan has always been to make their machines as nearly "foolproof" as possible. They have experienced some trouble to educate their workers to safety, but their accidents from machinery have been very few. Several recent accidents have resulted from elevators.

Mr. A. E. Conrath, International Harvester Company, St. Paul, Minn., said that they conduct educational classes—a teacher comes to the plant every noon and conducts English classes for twenty minutes. At night a matron takes charge—Polish girls constitute most of the classes. Safety First is taught to workers. When a girl is employed she is taken in charge by an old, experienced worker and she is given a book of rules for her particular work. (These rules can be had by writing to Mr. A. E. Conrath.) Injuries at the St. Paul mills are mostly of a minor nature, such as scratching fingers on needles. They have some trouble getting workers to have these minor injuries treated by the nurse. A doctor is at the plant at all times and a matron applies first aid to minor injuries. A nurse comes to the plant at noon.

Bulletin boards are used for safety work and women are permitted on the safety committee. Two girls out of each fifty look after the safety of their group and report to the foreman. A suggestion system was started for safety work and during the first month 679 suggestions were received, a large percentage of which were good and practical. A special follow-up form is used, a copy of which is sent to the suggestor stating the action that has been taken on the suggestion. If the suggestion is accepted the suggestor is paid a bonus, according to its value as determined by a committee. The general safety committee consists of the general foreman, matron and the captains appointed from among the workers. On Tuesdays and Fridays the workers are personally warned to be safe about their work. Medals are given to efficient captains and banquets, movies and speakers are means of retaining interest in safety work.

TEACHERS ARE IMPORTANT FACTORS

Mr. Charles Wagner of same company, Chicago, said that in their plant suggestions are made on a regular slip and suggestion boxes were located at different points in the plant. Employes are notified of the results of their suggestions and the timekeepers receive notice to pay workers for such suggestions and to include it in their pay. All employes submitting suggestions receive a letter of thanks, whether their suggestions are accepted or not. Thrift stamps are used as prizes at present. Bulletin boards are used to show departments and their respective foremen the safety scores. The teachers are the most important factors in the mill—workers are put on probation for a certain length of time, then tried out as teachers. There is a certain maximum and minimum rate of pay while teaching; bonuses are also paid.

Mr. J. P. Calderwood, Travelers Life Insurance Company, New Haven, Conn., said it has been their experience that workers would hesitate to

hand in safety ideas on account of being suspicious of their foremen. Check stubs and numbering systems are used so that no other worker would know who made the suggestion. Successful numbers are posted on a bulletin board.

NEW OFFICERS OF SECTION

The Nominating Committee submitted their report and their recommendation was accepted by acclamation:

Chairman. Mr. David S. Beyer, Vice President and Chief Engineer, Liberty Mutual Life Insurance Company, Boston, Mass.

Vice Chairman, Mr. William S. Ide, S. Slater & Sons. Webster, Mass.

Secretary. Mr. John Rennie, Safety Engineer, Jos. Bancroft & Sons, Wilmington, Del.

J. K. Robinson. Secretary pro tem.
Safety Engineer, Atlas Powder Company, Wilmington. Del.

Woodworking Section

St. Louis, Mo.

Sept. 17 and 18, 1918

E. K. PRITCHETT, Chairman
Haskelite Manufacturing Company, Grand Rapids, Mich.

F. G. LOVETT, Vice Chairman
Furniture Manufacturers' Safety Association,
Woodstock, Ontario, Canada.

F. A. BARKER, Secretary
Lumbermen's Mutual Casualty Company, Chicago.

TUESDAY MORNING SESSION

THE SECTION was called to order at 10:45 o'clock, with Mr. F. A. Barker, Secretary of the Section, presiding, and S. J. Williams, acting as Secretary.

Address, "New Ideas and Methods to Keep Employes Interested in Safety Work," Mr. Lee Dunlap, Chief Factory Inspector, State of Missouri, St. Louis. In the discussion following this paper Mr. R. F. Milne, Inspector, Lumbermen's Safety Association, Ottawa, Canada, stated that machinery should be guarded by the manufacturers and that it was a hardship for the purchaser of a machine to have to guard it after it has been installed. Mr. B. H. Smith, Longville Lumber Company, Longville, La., spoke of the importance of employes obeying safety rules. Mr. R. J. Hoage, safety engineer, Associated Lumbermen, Tacoma, Wash., described the methods he has used to keep workmen interested in safety, including the use of a safety "tag day." Employers in his State have profited from accident prevention work through a lowering in the rates of the State insurance fund. Mr. Ira Lockney, safety engineer, New York Shipbuilding Corporation, Camden, N. J., favored the plan of requiring an employer to pay additional workmen's compensation for an accident resulting from his failure to guard his machinery as required by law—such plan being in force in Wisconsin.

A discussion took place on the subject of sectional bulletins and *Safe Practices* pamphlets to be issued by the National Safety Council for the Woodworking Section. All present agreed that such publication should be issued and it was suggested that *Safe Practices* pamphlets might be

issued on the following subjects: Logging, saw mills, woodworking establishments and lumber yards. Photographs for bulletins might be secured by the Council's staff at the plant of the Chicago Mill and Lumber Company.

A most interesting illustrated paper was then presented on "Yard Accidents and Their Prevention," by Mr. Julius Seidel, Julius Seidel Lumber Company, St. Louis, Mo. The meeting then adjourned.

WEDNESDAY MORNING SESSION

THE SECTION was called to order at 9:45 o'clock, with Mr. Barker presiding and Mr. F. M. Rosseland acting as Secretary.

Following the presentation of Dr. L. P. Kuhn's paper, "Infections and Bloodpoison in the Woodworking Industry" (read by Mr. Barker, Dr. Kuhn having been called into government service), some discussion was had and Mr. F. D. Campau told of the success of his organization, by training first-aid men, in reducing the number of infection cases. Mr. Barker stated that Dr. Kuhn had expressed himself as being skeptical about first-aid men.

REPORT OF NOMINATING COMMITTEE.

The Nominating Committee (appointed at the Tuesday morning session) presented their report:

Chairman, Frank F. Fish, Secretary, National Hardwood Lumber Manufacturers' Association, Chicago.

Vice Chairman, J. E. Rhodes, Secretary-Treasurer, Southern Pine Association, New Orleans, La.

Secretary, F. A. Barker, Lumbermen's Mutual Casualty Company, Chicago.

Upon motion, duly made and seconded, the report was accepted and the gentlemen named were elected. The Nominating Committee also recommended that the by-laws be amended to provide for an Executive Committee, to consist of the officers and four or five members; it was further recommended that Messrs. R. G. Hoage, F. D. Campau and Thos. Wilson be elected as Executive Committeemen and that the committee be authorized to add to its numbers as it thought best. The recommendations were accepted by the Section.

After a general debate the Section adjourned.

NEW IDEAS AND METHODS TO KEEP EMPLOYES INTERESTED IN SAFETY WORK

LEE DUNLAP CHIEF FACTORY INSPECTOR, STATE OF MISSOURI, ST. LOUIS, MO.

Mr. Chairman and Members of the National Safety Council: On reading the topic assigned me I was reminded of the motto of a most excellent newspaper in my native state, the *Louisville Evening Post*. "If new and true, not otherwise."

I have not been in my present position long enough to do other than observe the methods of others. Certainly, I have been so limited in experience that suggestion of a change of methods would be presumptuous and to encourage others to become interested in a newer and more constant way I must needs know more myself. After seriously considering the subject I am forced to proclaim with the psalmist, "There is nothing new under the sun." I might possibly be better prepared, or equally so, to discuss the subject of "The final perseverance of the saints" than the subject assigned me.

There is much that passes for new that is not—much that has been long discarded, only to be brought to light again under a different name and different shape. Novelty is always fascinating and he who brings to bear the element of novelty for the purpose of attracting attention will surely have an audience. Where there is no sacrifice of honor or truth, or where there is no injustice, one is fully justified in appealing to that tendency of human nature—to long for the new in order to better conditions of mankind. It is a safe assumption that the greater part of humanity can be moved by two sentiments, namely, self-interest and pride. The hope of pecuniary reward appeals strongly to a fair share of us, hence to put a price upon efficiency, fidelity and exceptional skill is not unworthy. This objection can be reasonably urged, however, that the vast range of difference in native capacity causes exceeding injustice to the less fortunately endowed. I prophesy that within a short time the philosopher will be among our workmen, in our factories, just as he is among our drafted men, giving them grading according to their capacity to understand and learn. When a young man is entering upon his life work he is often told by one in authority that his natural capacity is of an inferior grade, but that by constancy and a certain mode of procedure he can overcome his natural deficiency.

APPLICATION OF OLD IDEAS AND METHODS

The new ideas and methods are the old ones carried out in a new and systematic way by mechanical devices, a plan of education and medical inspection. The constant application of a number of minds among the workmen on a subject of self-interest and safety interest soon causes other workmen to take notice and they will begin to make suggestions. These suggestions must be recognized. Often they are impracticable, but by modification or enlargement they can be made to work. Try them and if successful give the workmen public credit for their ideas. This course appeals to his pride and ambition. If this suggestion is worked out by teams in their first aid or safety prevention duties the work brings not only a humanitarian interest but promotes a safety interest spirit, making each member active and watchful for obstructions and the proper placing of danger signals. You can promote interest among employes by asking suggestion as to safety devices or the best method of guarding certain machinery. When you adopt the suggestion you recognize the employes ability and make such recognition public. This not only binds the employe more closely to safety standards but arouses keen rivalry and rapidly makes other minds alert for new ideas. We all have a spirit of

rivalry and desire for accomplishment and none of us are so timid and modest but that we like, even though our ability be limited, to be recognized and rewarded—still more, all of us like nice things to be said about us.

When an accident occurs post a notice at the place where the accident happened, telling the nature of the accident, to whom it occurred, why it occurred, and why it should not have occurred. You can say: "J. Martin lost a finger of his right hand on this machine. Contrary to all posted rules he attempted to clean the machine without shutting off the power."

I have had much to do lately with registrants. The truth is alarming in the loss in broken windows of men's souls. I'll not offer any statistics in eye accident prevention, but when the remedy is so simple and to be had at so little cost, it is absolutely indefensible not to use goggles. You will be told by an employe that his work is hindered, retarded, that he is rendered less efficient by the use of goggles. No greater error could possibly be made. Proper fitting is needed, proper cleansing is simple, all that is needed is care that vision may be made perfect. To interest men in goggle accidents the same plan can be used as is noted above: "While clipping steel at his bench Frank Murdock lost his right eye by being struck by flying metal. He had been supplied with goggles and told to use them, but it is likely that when the accident occurred, they were in his pocket."

It occurs to me that a splendid plan could be inaugurated by picking two good, reliable men from each department—especially safe, sound and efficient men who obey every instruction given—and supply them with the safest standards of accident prevention, goggles, etc., with positive instruction to wear them all the time when working upon dangerous machinery. When an accident occurs have the foreman call the attention of the injured man to the methods used by the two special men, emphasizing that these two workers were constantly in danger but had suffered no impairment of hands or fingers, or loss of sight, and I venture to predict that all workers in that department will be demanding goggles and standard devices similar to the ones used by the special men.

A CAMPAIGN OF EDUCATION

If you were raised on a farm you will fully appreciate this illustration: When working a mule and a horse together, if a runaway occurs the mule always pushes the horse into a barbed wire fence. Shall we understand then that animal instinct is greater than man's instinct? Shall we understand, when a slight accident occurs, that instead of applying at once to a physician the injured man begins picking the small injury? It is quite likely in a short time that this seemingly small injury has grown to a serious infection. Again, applying the natural remedy, if an animal is injured nature would repair it. Shall we understand that a mule and a dog are wiser than men?

This campaign is essentially one of education. In co-operation with the Federal and State inspectors we strive to educate our men, telling them that carelessness takes a tremendous toll of human life—that it exacts

heavy penalty. It takes the workman away from the asset column and makes of him a liability. It does not even do him the honor of listing him as a by-product. The *Saturday Evening Post* yearly publishes the names of "Who's Who" and I am indebted thereto for a bulletin of the greatest "Who Is Who?" I will just call your attention to a few. This "Who's-Who" spares no one but finds victims among the rich and poor, young and old, strong and weak. He is everywhere, in the house, upon the streets, in the factory, at railroad crossings; he avoids no one, he gives nothing, but takes all. I indict Carelessness as the greatest of "Who's-Who."

One plant I know of had thirty-two accidents, not one caused by the lack of mechanical safeguards: another, nine accidents, and not one caused on a machine properly guarded. Accidents should have no part in an efficient plant, properly conducted.

Another plant, in five years, increased the number of its employes 61½ per cent. and increased its machinery 26½ per cent. but decreased its accident ratio 46 per cent. The plant was well, wisely and safely protected. A conclusion is reached here, one that is important, that mechanical devices do not always prevent accidents—but proper education will reduce accidents 25 per cent. It is due the workman that he be stimulated by attractive rewards to overcome his natural deficiencies. This is one of the newer ideas in our swiftly changing industrial life and has immense possibilities. Every workman in a hazardous department should be submitted to a psychological test in an effort to learn whether or no he is fitted by nature for his particular assignment of duty. This is no longer theory but a workable and extremely interesting branch of mental science and destined to have a wonderful influence on our future industrial life. Grade a man according to his natural endowments, ascertain if he is capable of improving his condition, and then, as a means of enlarging his efficiency and meeting your own needs, offer a reward for his overcoming of natural defects. Thus a vast potentiality is put in our hands, and it is our duty to our day and generation to make full use of these advantages. There are those who are naturally capable but indifferent; by this same psychology we can learn if they have that ethical quality we call pride—an appeal of this nature will many times succeed when all else fails. To that end cautious and tactful praise is our surest resource as pride and vanity are immensely different in definition. Stubbornness and discretion are frequently confused and confounded, but for our purpose we may dispense with the niceties of definition. When a prospective workman has been told he grades low mentally and that without patience and application the future holds only darkness for him, the stimuli of reward of a substantial kind, of pride in the character of his work and future outlook, will ofttimes arouse the most lethargic spirit. It is our own duty to use these forces, not only for our own interest but as a means of advancing standards of efficiency and citizenship. The vastness of the schemes now unfolding in our national life enchains the imagination, and while the application of the policies now being tried out may work a hardship on a few, by curtailing their liberties, it will add immensely to the wellbeing of the larger mass of mankind.

WHEN THE EMPLOYER IS INTERESTED

When compensation principles are more equitable and fair, the excessive overhead and enormous legal expenses are adjusted and reduced, when the employer knows that charges are fixed that he must make provision for them, a new idea of compensation will be substituted for the haphazard charge against fault and malicious conduct. When the employer sees his premiums increase he begins accident prevention work and seriously considers how costs may be reduced. From every angle, accidents prevented are better than accidents compensated.

The employment of men and women in certain occupations known to be attendant with more than ordinary danger to health, with unnecessary sickness and shortening of life, is the chief reason for medical inspection of plants by State Departments of Factory Inspection. It is believed possible, by public education and enforcement of proper measures, to largely prevent loss of health and to reduce loss of time through corrective measures.

Medical factory inspection means to make use of facts concerning conditions of premises where men and women work, to study possible injurious effects of certain processes upon the health of the worker, to inspect devices and methods designed to protect workers from injurious and dangerous substances, as well as to detect pathological signs or symptoms of certain poisons, dusts, and fumes incident to such occupations, to inquire into the health of employes, both for purposes of aiding those found in ill health or physically unfit for work and for protecting others from infectious diseases, and to collect and make proper use of data, etc., pertaining to occupational hygiene. It is only when work is carried on under abnormal conditions—with relation to duration, speed, tension, character of working place, degree of illumination, purity of air, and ordinary sanitary care—that work begins to be harmful to the worker, and seriously affects his health and shortens his life. A great many of our industries are at present carried on under such abnormal conditions that they unduly increase the morbidity and mortality rate of the workers. Dangerous as are many of these industries, many of the risks are undoubtedly preventable.

The subject of fatigue is becoming an important factor, especially in plants doing war work. Large numbers of girls who never have worked before are entering industry. They have to be taught and it takes time to accustom them to their work and to become efficient. The health of women in industry is more quickly undermined than is that of men. Many women have to cook, clean, wash and sometimes care for a sick person in their family after a day's hard work. Oftentimes women, by unreasonable demands made upon their strength by this combination of factory and household duties, break down under the strain.

EXCITING NEW INTEREST

The Missouri Factory Inspection Department considers the frequent physical examination of employes to be of great value in conserving the health of the workers—with new conditions creeping into industry we

consider it essential that methods be instituted for the better care of the physical condition of work people.

Accidents occur oftener to non-English speaking people than to native-born Americans—teaching the English language should be made a part of our industrial life. We have compulsory education and compulsory building laws, why not compulsory safety standards and safety devices made, applied and sold with the machine?

We need not travel far in search of novelty as a stimulus in advancing present ideas of efficiency. The air is full of new ideas and newer ones appear every day. The very novelty of accident prevention work will excite interest and interest will bring the needed mental development. In this connection we need not conjure our brains about arousing an interest in the mental attitude of safety. The idea of safety is an instinct and the obligation laid upon those in authority is to call attention to it and thereby add the habit of thoughtfulness to instinct. Heretofore the psychologist has been as one apart, visionary, of no practical use to society, but now, in society's upheaval, he is coming into his own and in the future he will have an honored place in social development and in ideas of novelty, and interest in my topic will fall within the philosopher's domain for the unfolding, in a practical sense, of all these ideas imply.

This is no time for the idler—he should be put in the same cell with the slacker. You must work or fight. Labor is dignified. The Master was a carpenter and Paul a tent maker—both earned their bread by the sweat of their brows. Labor is the only thing that produces something from nothing. This is no time to quibble over the definition of constructive words nor the time to break agreements. The "scrap of paper" business must be assigned to our enemies, must have no part in the conduct of our business. The government has taken over the finest body of young men under the sun—rich and poor, learned and unlearned, city and country alike—and is levying enormous taxes. It would be a contradiction of all our highest ideals of employer and employe in our industrial life to begin quibbling over the niceties of contracts. Stubborn employers and employes must understand that we are in the midst of war and that the war must and shall be won. Eternal vigilance is the price of liberty. The President is amply justified in taking over industries which may be necessary to maintain war service. We must understand that the government at Washington still reigns and is being administered wisely, safely, and that all is well with America. We must work hard, play hard, pray hard, and the whole world will be made safe for all mankind to dwell in peace and safety.

SAFETY IN OPERATING LUMBER YARDS

JULIUS SEIDEL, PRESIDENT JULIUS SEIDEL LUMBER COMPANY, ST. LOUIS, MO.

Mr. Chairman and Members of the National Safety Council: When the request to speak before the Seventh Annual Safety Congress of the National Safety Council came to me I was not, at the time, fully aware

of the scope of its activities. Furthermore, I was uninformed as to what subjects pertinent to lumber operations or woodworking industries would be introduced. On receipt of the program, some time later, I scanned its pages and found to my surprise that I was the only St. Louisian on the list of speakers who was engaged in the lumber or woodworking business. This fact placed a deep-felt responsibility on me, for I take it that in speaking my own viewpoint I must, in a large measure, speak as a representative of the business itself and of its importance to St. Louis in an industrial way. The work the Council is doing is of the gravest importance to the future destinies and development of our people and "our people" means the United States itself—the greatest power for the good of mankind that was ever founded.

You are meeting in my home town, the city of St. Louis, for I was born within five minutes' walk of your meeting place. I welcome you as a citizen of what to me has always been, is now, and always will be, all things considered, the greatest of cities in the greatest Republic of the world—a city that has proved its loyalty to our institutions at all times and is giving its unqualified support in both man power and money to our country.

In presenting a survey of improvements, already introduced in some yards, and touching upon future possibilities for safety in the operation of lumber yards, I am, indeed, discussing a subject which has always been very close to my heart. This feeling, perhaps, was accentuated by the fact that my training in lumber began with its actual handling, stocking and grading; in short, I served my term as a private and had to win advancement. This training afforded me the means of studying conditions, environments, and, above all, workingmen. While there has been much advancement made in the betterment of conditions for the office man you will understand that the topic assigned me was that of practical operations: Namely, the handling of the material itself.

ROUTINE WORK IN A LUMBER YARD.

The work of yarding comprises, on inbound cars, the unloading, inspecting and stacking, and on outbound work the loading of wagons, trucks and railroad cars. In the main, it is what might be ordinarily termed "laboring work"—with one exception, that of grading or inspecting. While lumber inspecting has become a scientific study, in both hard and soft woods, an inspector must nevertheless be able to do both handling and inspecting at the same time. The larger part of the handling of lumber is done outdoors and the workmen are consequently exposed to the conditions of weather. This applies to, I would say, 90 per cent of the total lumber production. Rain and snow and extreme temperatures are the only barriers to work in a lumber yard. The work is healthy.

When I was apprenticed in the lumber business there was not the thought given to the workingmen that is given them now. Things moved along in a more haphazard fashion. Fortunately, the help at that time was more steady, and, therefore, in time, became more proficient in its work. In case of injury to a man the blame was his and he was admon-

ished to be more careful. Laborers sought work near at hand, or within walking distance, hence little thought was given to their physical comfort during working hours. Practically all the handling of lumber was by hand, and on heavy timber handling it took real muscle. Cant hooks, crowbars and dollies were some of the simple means to help out in a mechanical way. Introduction of labor-saving devices came along very slowly. The matter of devoting time and thought to the prevention of accidents was not a study, as it is today. Lumber yards were run on a very crude plan and the awakening came slowly. While there were many employers who were very considerate of their men's welfare, taken as an average the business was truly a "lumbering" business. It is reasonable to assume that businesses requiring skilled and educated workmen must be leaders in considering safety devices and physical comforts. Their surroundings in business must be in harmony with their home surroundings but, be they educated or uneducated, we must recognize the human side of men. The humanizing of business is the beacon light of our country. The Christan side of man is developing and such features as the duty we owe the man—I will not say employe—are not to be thoughtlessly overlooked. To even those who look upon business as business only, the reasonable precaution in protecting life and limb is recognized, not only a duty under the law, but is realized as the common sense thing to do to save themselves from, perhaps, financial ruin.

SAFEGUARDING THE PUBLIC

The first consideration in establishing a yard is the public hazard. Squatter-town yards, located on open areas, are a fire hazard and positively unsafe from that standpoint. From the standpoint of public safety all yards should be fenced in. Open yards invite trespassing. The climbing of children on unpiled lumber, whether carelessly or carefully unloaded, may cause it to topple over and cause injury or loss of life. One of the old-time customs—the piling of lumber outside of the fence line, on sidewalks parallel with streets—was considered good advertising and is still allowed by special permit in some cities. It is a public menace of the most hazardous kind to persist in the practice and its discontinuance in the interest of public safety has my strongest endorsement.

LUMBER SHED BALCONIES

Lumber sheds today are more properly termed warehouses. They are used for storage purposes and in cities where land values are high are built from eighteen to twenty-four feet in elevation. The standard shed has two stories, the lower bins being six to twelve inches above the level of the driveway and the second story eight to twelve feet above floor level. In front of the second-floor bins is what may be termed a runway or balcony, ordinarily reached by a "lean-to" ladder.

In building a shed it was my conception to have the balcony wide enough to allow a free and comfortable walkway for the man, since a protruding plank might knock him off. Furthermore, the planking of a uniform width and surfaced to a uniform thickness to prevent stum-

bling. An experience of my own, in which a workman missed his footing and was compelled to jump down, causing a sprained ankle, and the knowledge of another accident in which a workman fell and received injuries from which he died, led me to believe that the men were not sufficiently safeguarded while working on the balconies. At a large expense, therefore, we put up railings to provide safety. Permit me to say that safety and saving of labor interlock in most cases and by careful study we found that we could so construct and set the rail or rails that it became an easier means of handling the lumber. The wood used in our construction was free of defects that might impair its strength and was framed up with bolts and lag screws. In shed No. 1 we put in two lines of removable wooden rollers 3½ inches in diameter. This work has been erected within the past year, and was designed primarily for safety, but it has proven a labor saver as well.

LIGHT AND AIR IN LUMBER SHEDS

Light and air are not only two essentials to good health, but also are mandatory to the avoidance of accidents. Driveways should be wide and transoms should be provided to admit light, and plenty of it, during the daytime. Accidents occur in gloomy sheds. Side transoms, running the full length on both sides of the shed, will throw the light clear to the back wall on each side, and, therefore, are much to be preferred over any other type. We have wired our sheds and installed overhead 100-watt lamps for use during the fall and winter, but aside from that we have wired up and down (enclosed in pipe) on alternate posts on first and second floors and inserted plugs within easy reach. We use twenty-five feet of protected heavy wire with a guarded lamp at the end, so that in stacking the workman in the back, twenty to twenty-five feet from the driveway, has proper light to work by. Sheds should be of good height, to create better air circulation and make the workman safe and comfortable in summer, especially when working on the second floor deck.

PROTECTED LADDERS

Protected ladders prevent accidents. Ladders the full height of the shed, running from floor line to rafters and securely fastened, set at right angle with and one foot back from the drive mean safety. Movable ladders tip easily and may be run against. It is unsafe to use loose and exposed ladders in lumber sheds.

HANDLING TIMBER BY CRANE

Heavy timbers were formerly handled by brute strength. Primitive tools, such as pieces of pipe or iron bars, helped some, but muscle was the chief essential to making the timbers move. Timber was the most expensive lumber we had to handle when safely done. A large crew of men was necessary to avoid accidents by "letting go." Furthermore, we could not pile over eight feet in height, as the weight of the timber prevented it, and the hazard increased with each course upward. The

locomotive crane has made timber piling as safe as any work in the yard and piles twenty feet in height are not uncommon. The cost of operation has been decreased about two-thirds and space is conserved at the same time. It is possible, in many cases, to unload a car of timber with safety in one hour. It is needless to mention that all cables and grabhooks are regularly inspected. Operators are not exposed to hazards and the timbers swing by and not over them.

LOADING AND UNLOADING

The unloading of lumber is not hazardous to any serious degree, yet loading of heavy timber by crane, both on cars or wagon, is not devoid of risk. Lumber trucks and trailers are being equipped with rollers, so that by turning a ratchet handle the entire load is safely dropped in two minutes. It must always be remembered that labor-saving devices redound to the benefit of the public. A further point to consider is the fact that our country saves and conserves much man power that can be used for other valuable purposes.

MILL OPERATIONS

In speaking of mill operations I do not refer to sawmilling or the log as gotten out of the forest, but apply the term to what is commonly known as remilling. This means sawing up a square timber of large dimensions into smaller sizes. Then, again, a great deal of timber in its original size is surfaced up by being put through a timber planer. Unloading timber by hand is always coupled with an element of danger, and, having this in mind, we concluded to construct our plant so as to do this handling by an overhead traveler and a hoist—this meant safety for the workmen. Large timber can be swung from the wagon, and one man does the trick without hazard. After the resawing or surfacing a traveling crane, with one workman on the outgoing side, takes up the piece and places it on the wagon. If I were to tell you that a piece of timber weighing 4,000 pounds can be handled with safety and ease by one man you could conceive the benefit of this apparatus. This hoist is now being altered to be operated by electricity, adding speed and additional safety.

BALL-BEARING ROLLERS

The infeeding and offbearings of planking and timber requires man power and we introduced, therefore, and that of recent date, a system of ball-bearing rollers on the infeed and outfeed of machines, likewise for conveying between fixed points. The hazard of accident on handling heavy material is obviated. Rollers are fastened on stands which, being set on casters, are capable of being moved with timber on them up to the rigid frames and then conveyed for distances.

We have used gravity carriers for straight shots for many years, but recently found that it was possible to turn corners with lengths of lumber up to sixteen feet. The prevention of accidents is clearly at hand and the saving of man power very material.

HUMANIZING A LUMBER YARD

We now approach the safeguarding of the health of the workmen in the yard. In locating a yard it is imperative to arrange for drainage. Pile foundations, in a straight line on the ground, retard the flow of rain and an uneven ground surface will hold pools of water which become stagnant and are breeding places for flies and mosquitoes, known to be the worst spreaders of infection and disease. We deemed it wise, before commencing piling, to provide our yards with drainage and spent large sums to start right. Proper fall of the land from the front line to the rear of the piles afford quick drainage and inlets take up the water and carry it off to the city sewer. Rock foundations, with flat rock set on proper spacing, permit the water from the roadways to flow away below the piles to the same inlets.

The better trades and crafts demand consideration for the person. Laborers, who are the majority of our workmen, do not, however, lay claim to much in the way of comfort. But, gentlemen, a laborer is human, he is part of the nerve and sinew of our nation. The country needs him, we need him, and his family needs him as a provider until such time as his children can help. Education being mandatory, it is reasonable to conclude that our boys will ask for better conditions than those under which our forefathers worked. Evolution is here. Lumber yards must meet conditions and humanize themselves.

Some five years ago, in opening up our new yards, I realized that our laborers had no shelter beyond a small shanty in a corner of the yard or by standing about in the shed. The country was preaching temperance and yet yards were thoughtlessly blazing a path to the saloon, where a workman could sit down in a warm place, at least, until a shower had passed. No man could well accept such hospitality without reciprocating in trade, hence, often drinking without desire, and the business took a chance on him when he got back on the job. It is safe and sane to guard your business family, and we immediately put up a substantial brick service building, modern in every way, centrally located in the yard, easy of access and provided with a steam heating plant. The laborer has his dressing-room to change his apparel and toilets and wash basins afford sanitation and cleanliness. The lunchroom is steam heated and supplied with chairs and tables. During rain, sleet and snow the workman can retire in comfort. He can enjoy his lunch. Having a raincoat, he can change his clothing when necessary, in a warm room, and save himself from sickness. I have often heard the expression "that men won't appreciate it," to which let me say that on the spur of the moment they may not take full advantage of the improvement in conditions, and that for the reason of my having gone over the same trail. Men must be educated to take care of themselves and many respond slowly—it is for the employer to take the lead and show the way.

MODERN OFFICE CONDITIONS

Having escorted you with care about the yard—in perfect safety—I will ask you to step into the office for just a moment. Inspiration to do,

to plan, to execute, must come from the office. You could not well lay plans for safety in an insanitary hovel of an office. Every business should be self-respecting enough to have a clean, cheerful and orderly office. Safety of the health also demands good light, ventilation, heat, etc. Every spot a light spot and every desk a light desk makes every face a bright face and everyone a booster and an enthusiast and a safe bet, because his physical condition makes him sure of himself.

THE PATRIOTIC ASPECT

Let me say a final word: The propaganda for safety has always been a most patriotic matter, but sometimes has been thoughtlessly set aside. The world war has aroused our nation to think more, to have a greater regard for the man himself. Every man of this nation, whether of menial position or an executive, is today a patriot. The man power of the nation is being disciplined. Caste, creed, rank and position are being swept aside in the recognition that, to be a nation, the government comes first and treats all with equal thought and consideration. During the period of the war the democratization of our people will become firmly instilled into our souls and beings. The companion in the ranks will be your chum for the remainder of your life.

Tell me, therefore, will you be less considerate of his welfare when the return to peaceful pursuits again take sway? If he were your lumber stacker would you hold his welfare less dear than when you were together in the ranks? Gentlemen, the desire for safety means a desire to help your brother. We have but blazed a small trail. The future will determine a higher regard for all things that spell safety and they will be inspired from within by the personal desire to help others.

INFECTIONS AND BLOOD POISONING IN THE WOODWORKING INDUSTRY

CAPTAIN LEROY PHILIP KUHN, M. D., VICE-PRESIDENT CHICAGO SAFETY COUNCIL, CHIEF SURGEON LUMBERMEN'S MUTUAL CASUALTY COMPANY, CHIEF SURGEON ILLINOIS MANUFACTURERS' CASUALTY ASSOCIATION, ATTENDING SURGEON AMERICAN HOSPITAL, FELLOW AMERICAN MEDICAL ASSOCIATION, MEMBER ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES ARMY.

Mr. Chairman and Members of the National Safety Council: Chief among the causes of infections in the woodworking industry is the disastrous splinter. The appalling number of employes who suffer from blood poisoning as a result of a neglected sliver, or a sliver wound improperly treated, is a subject worthy of your most careful consideration. In the State of Illinois, during 1917, there were recorded 1,214 accidents in the woodworking industry. Twenty-seven per cent of this number were "infection cases," caused by neglect or improper medical attention. The approximate cost was $72,817, including compensation, medical and legal

expenses, adjusting claims. Any employe will tell you how he has removed dozens of splinters from different parts of his body, but never has he endured so much pain as that caused by this last little sliver, the one he thought too small to be worthy of attention.

Doctors are frequently called upon to finish the removal of a splinter that an employe has toiled painfully over for a day or more, often causing an area of infection which is hard to control. Just as frequently we are called upon to remove splinters which have been deeply imbedded into the muscles underneath the skin for more than a week, with only a moderate degree of inflammation or swelling as a result of the foreign substance retained in the body. A few weeks ago I removed a splinter four and one-half inches long that had been eleven days in the posterior portion of a man's thigh.

DELAY IN REPORTING TO DOCTOR

Some splinters cause little infection while others are virulent, especially if the employe attempts their removal and infects the wound where the splinter is located. Most cases do not seek medical attention until the pus forming organisms start celebrating the victory of a dangerous U-boat. I like the term U-boat as applied to slivers—the two go well together. A sliver not removed remains quiet until re-enforced by micro-organisms or someone inexperienced in surgical technique; suddenly the employe has severe pains and cannot sleep. The next day he reports to the foreman and then the doctor starts his offensive drive against millions of virulent micro-organisms. Likewise the submarine watches her victim a few hours, possibly a few days, before the opportunity comes to make the final attack. You may think this illustration a little far fetched, but I have gone through this experience so many times with employes that I am sure you cannot be too careful about the medical care given U-boat sliver accidents.

You may have 100 splinter cases during the next six months, with only a few wounds severe enough to require medical attention, but it is from this small percentage that arise stiff fingers, blood poisoning and a possible loss of life. You ask: "Why should we have such a high infection rate from the few cases sent to the doctors, when clerks and fellow employes remove 35 per cent of the splinters?" The damage is done before the employe applies for medical attention. The U-boat has sent home its poison through the lymphatics to the heart, kidneys and other vital organs, so that the patient's resistance falls about 50 per cent before the doctor has an opportunity to remove the sliver or drain the infection produced by some one not familiar with the proper surgical treatment.

I have heard employers say that ten and fifteen years ago they had no serious trouble from slivers and that they removed dozens without any infections. That may be true, but I have heard of cases of blood poisoning ever since I was old enough to remember. It is a significant fact that "war wounds" are much more numerous and more serious than the wounds of those employed, but wounds of war heal in less time, re-

turning the soldier to the battle front, because soldiers receive the best surgical attention immediately. Twenty-seven per cent of the total amount paid for compensation in the woodworking industry in Illinois during 1917 was caused by infections, which later resulted in severe forms of blood poisoning. Occasionally a death resulted from this cause. Fourteen per cent of the total amount paid as compensation was paid for disabilities—the loss of a finger or an arm.

SOME MEN VERY SUSCEPTIBLE TO BLOOD POISON

With some men a pin prick, if left without medical attention, will develop into a severe lymphangitis of arm and a slight abrasion into a suppurating wound may destroy a tendon in a finger if allowed to progress. Out of every one hundred slight cuts or splinter abrasions, twenty-five will develop infection in severe form unless given prompt medical attention. Employes consider it beneath their dignity to have these slight wounds attended to, but isn't it better to pay attention to a slight wound than suffer the result of an infected arm or stiff fingers? One is liable to gamble more with life chances than with money and waste more by daily carelessness than any other means.

Infections of the finger tips and the hand are among the most common lesions a surgeon has to deal with. The infection may range from a mild process in the epithelial layers, or in the pulp of the finger tips to a virulent lymphangitis which cripples the hand by extensive involvement of tendons and the smaller joints, sometimes resulting in a permanent deformity. As a rule, if the involvement of tendons and joints is not diagnosed or intelligently treated early by a good surgeon, damage may result to such extent that a tendon may be lost or the joint affected so that the employe will suffer a full or partial loss of use of the finger involved. The anatomy of the hand, the courses that infection pursues through the tissues and the niceties of surgical drainage must, therefore, be considered in detail apart from the general subject of infection. When we have a mild infection, which later causes cell destruction (characterized by an accumulation of pus in the end or side of a finger), it becomes necessary to establish prompt and adequate drainage by incisions into the tissue containing the pus.

THE USE OF LOCAL ANAESTHETICS

I wish, at this time, to discourage the use of any local anaesthetic or quick method of opening and draining infections either in the doctor's office or in the emergency room of the factory. Surgical technique and the preparation of the patient should be the same as in any other operative case and the patient should be completely relaxed by anaesthetic. As a rule, after I have made the first cut through the skin, I use blunt dissection with digital exploration of the infected area, so as not to injure any more of the smaller blood vessels and nerves than possible. Parts of the fingers, together with certain portions of the hand, have a very poor blood supply; in fact, in some places in the hand, the lymph

flow nourishes the tissues. This lowered blood supply to the hand reduces the power to resist infection, so that one should be exceptionally careful about incisions and the drain material used. It lowers the vitality to resist infection to lay drain material in contact with such poorly nourished structures as tendons and joint surfaces. Rubber tubing or gauze, dry or moist, should never be used as they soon clog up with exudate, acting as a cork and traumatizing the wound. The best drain is gauze, impregnated with mercurial ointment 10 to 30 per cent. Guttapercha tissue may be used and makes an excellent drain. After drainage is well established, the hand should be elevated, with the patient in bed and the wound cared for every day.

THE GREAT SYMPTOM IS PAIN

The one great symptom—all patients suffer—is pain. Draining the infection and elevating the hand, with rest in bed, will overcome pain. If the patient is allowed to go about with the hand down and possibly working, the doctor is going to have a difficult time controlling the infection and just as hard a time in managing the patient. The improvement will be so slow that the employe will become discouraged and may not return for treatments, going to his family doctor or to some one who usually knows as much about the proper treatment of infections as he does about trench war, and while the patient goes from bad to worse until the tendon sheath is involved, so that, by the time he comes back to a real doctor, the usefulness of the finger is gone, no matter how carefully the surgeon cares for the infection.

Patients invariably refuse to allow the doctor to open and drain the infection until they suffer so much pain that they are unable to sleep or eat; somewhat in a state of collapse. Most infections can be controlled, if taken early, by a slight opening and with proper treatment. Regardless of moral suasion and all the tact possible by the doctor, patients often drift along until finally convinced by everybody concerned (including prudent family advisers, quacks and higher-thought exponents) that the advice previously given by the surgeon is the proper method to pursue. The final outcome of the situation is that the employer is liable for the employe's ignorance and reluctance in giving consent for logical treatment. This does not seem fair to the employer or the doctor in charge and frequently both are brought to industrial board hearings by an employe asking for full loss of use of a finger or possibly by a defendant asking compensation for the loss of the employe's life.

INDUSTRIAL BOARDS SHOULD BE GIVEN GREATER POWER

As a remedy to some of these defects (from the viewpoint of one who is constantly meeting conditions as they exist) I would suggest that industrial boards have full power to act immediately, on the advice of an attending surgeon, when an employe refuses to follow directions and pursues injurious methods which may end disastrously. A conference with the employe's medical representative is without science and value

and serves only to delay matters. If an employe refuses to follow the directions given by the medical representative of an industrial board, the employer should be entirely released from liability resulting from injurious methods pursued by the employe.

IMPORTANCE OF PROMPT TREATMENT

During the year 1917 I treated in my office seventy-three sliver patients from woodworking industries. Fifty-nine were sent to the office soon after the accident happened and recovery followed within three to five days; *i. e.*, the wound healed without infection. Fourteen reported for treatment at my office from three to eighteen days after the date of accident, without having had any medical attention; ten of this number recovered without serious complications. Two were delayed on account of spreading infection and two were sick almost unto death for a week or longer, with the possibility of amputation. One patient recovered, with the partial loss of an arm; the other was more or less permanently disabled. The cost of caring for the two cases of blood poisoning was more than the combined expenses of the other seventy-one, to say nothing of the compensation paid, the serious illness suffered and the possibility of death as a sequel.

If it is prudent to have war wounds attended immediately, is not the same plan reasonable for injured employes? The time has come when we should entirely do away with the idea of allowing clerks and others to treat slight wounds. I am about ready to say that it is time to put aside the first aid cabinet unless it be used by some one who can do more good than harm with it.

In connection with the discussion of infections we have sequelae resulting, or the partial loss of a hand which has been compensated for by money, but which never can be replaced and always inhibits the usefulness or earning capacity of the employe. I refer to the rehabilitation and re-education of soldiers of industry—a subject employers will of necessity give a good deal of attention to after the close of the war.

REHABILITATION OF INJURED INDUSTRIAL WORKERS

When the Government has placed the injured soldier in a useful and remunerative occupation, through a process of re-education, and this result of war has disappeared, it will be our duty and pleasure to rehabilitate, re-educate and refit seriously injured employes—or soldiers of industry—to employment, that they may not be a burden to their families or the communities where they live. This can be done largely through institutions now being perfected for the purpose of caring for returned soldiers. When these institutions have finished their work with the soldiers, they might be continued for the benefit of the disabled soldiers of industry. If it cannot be done through these military institutions, I would suggest that a one mill tax on each dollar be collected, with other general taxes, to be known as the "rehabilitation fund for injured workmen." The staggering cost of maintaining such an institution at state

expense may possibly force society to consider ways and means for a more direct way to handle the question. I should like to see maimed folk put where they belong, where their sound energies and sturdy intelligence can be turned to mutually profitable account. A missing foot is not a drawback for desk responsibility, one hand or two play little part in the employment as a superintendent; imagination does not need eyes. ideas may be produced in the dark. While wounds are still in process of healing let the injured workman join a class in the convalescent school in preparation of future employment.

MOVEMENT SHOULD RECEIVE PUBLIC SUPPORT

No greater opportunity for practical charity ever existed; no greater privilege was ever offered than is held out to him who would provide means for the poor employe to regain his usefulness and face the battle of life and existence on an equal footing with his fellows. Those giving fortunes for the advancement of education. of science. art or religion would do well to pause and consider if saving lives of workmen and restoring them to helpless dependents is not nobler and better than the elevation of culture to a high plane or the carrying of learning to natives of foreign shores. We should always remember that public health is the foundation on which reposes the happiness of a people and the power of a country.

WHAT SOUTHERN PINE MILLS ARE DOING TO REDUCE PERSONAL INJURIES

J. E. Rhodes. Secretary-Manager. Southern Pine Association, New Orleans, La.

Mr. Chairman and Members of the National Safety Council: The business of cutting down trees. hauling logs to the sawmills and sawing them into lumber is one of the most dangerous occupations in which men engage. The introduction of machinery. while increasing the output, if anything, increases the hazard. The business of manufacturing lumber involves labor of the heaviest kind throughout the entire operation, and lumbermen are very well aware of the dangerous character of the business. It is their constant aim to reduce the personal hazards of the business to a minimum and to that end they will very gladly welcome any co-operation or advice which may be offered by those interested in the national Safety First movement.

I have been requested to describe briefly the measures taken by the manufacturers of Southern pine to reduce personal injuries in their logging and sawmill operations. In addition to what is being done by individual companies the Southern Pine Association, an organization consisting of 200 of the most progressive manufacturers of Southern pine, is inaugurating a campaign of education under the auspices of its committee on Safety First, which consists of manufacturers representing the entire pine producing territory. The association is making an elaborate set of moving pictures

to illustrate the causes of the majority of accidents in the mills and woods. These will be exhibited in the picture theatres of all sawmill towns, and brought to the attention of the men wherever possible. In addition large numbers of posters and placards, such as are furnished by the National Safety Council, are distributed to the mills for conspicuous display around the plants and premises. Slips for insertion in pay envelopes are furnished the mills, each tract containing a lesson in Safety First. Attractive illustrations make these personal warnings more effective.

USUAL SAFEGUARDS ARE INSTALLED

The majority of the sawmills take such precautionary measures as covering gears and pulleys, providing hand rails for oilers and posting dangerous places. They generally prevent the wearing by employes of loose or baggy clothing, gauntlet gloves and aprons too securely fastened to the person. Foremen are instructed to select men for each particular kind of work with reference to their physical and mental fitness. Where an operation calls for an active type, men of slow habits and sluggish movements are not assigned.

Where the work can better be done by a tall man with a long reach, with greater safety to himself, a short man is not employed. The use of goggles is compelled of men working near saws where splinters or pieces of wood or metal are likely to fly. The raising or removal of guards over saws or other machinery is strictly prohibited. Men are taught to approach gears from the safe side. They are taught not to reach over pulleys or shafts. Superintendents are instructed to discharge any man who evidences a reckless disregard for his own safety or that of others. Men who are injured the second time under the same circumstances become objects of suspicion and if injured the third time in the same way they are usually discharged. Because of the hazardous nature of their work special care is taken to protect the oilers, who are men usually selected because of their caution and fitness.

With the shortage of labor in the South there has been an increase in the number of accidents, due to the number of inexperienced men employed. This fact alone necessitates greater effort on the part of employers to safeguard their men. Practically all the Southern pine sawmills now have facilities for taking care of personal injury cases. The majority of mills are equipped with, or have ready access to, doctors' offices or hospitals. Some of the hospitals are splendid institutions, and would be a credit to municipalities of considerable size. Many doctors' offices in mill towns have been equipped to take care of operations of practically every sort necessitated by accidents. A plan inaugurated by many of the lumber companies, and the adoption of which the association will encourage among all, is the appointment of committees among the men for the purpose of educating one another in the causes of accidents, and how they may best be prevented. This work is especially efficacious among colored men.

In the workmen's collective, and other forms of insurance carried by lumber companies, provision is made for careful and regular inspection

of all safety appliances and all other equipment. A written report made by the inspector representing the insurance company is made to the management of the lumber company. These reports are furnished to committees of employes, where they exist, and in all cases are furnished to the superintendents, with instructions to see that the suggestions made are carried out.

PLANNING FOR COMPREHENSIVE SAFETY CAMPAIGN

The majority of manufacturers of Southern pine maintain railroad operations, some of which consist of rather extensive railroads, recognized as common carriers. All of the equipment of their railroads is in conformity with the safety requirements of the Interstate Commerce Commission and trains are operated in accordance with recognized railroad standards. There are fewer personal injuries on logging railroads than in the work of cutting down timber and getting out logs.

One of the plans of the association, in connection with its Safety First campaign, is the compilation of comprehensive statistics showing the number of men employed in each operation and the number of accidents and deaths, both among colored and white. No reliable statistics of this nature covering the entire industry are available at present. Statistics, however, from certain individual firms, clearly indicate results of the precautionary measures to which I have briefly referred.

For instance, in one of the large sawmills in Louisiana, employing about 400 men, there were 43 accidents in 1915, 33 in 1916, and 19 in 1917. In another large plant, employing about 500 men, personal injuries reported in 1915 were 158; in 1916, 99, and in 1917, 56. The latter represents 11 per cent of the employed men in 1917. Very encouraging records have been made at many of the mills and a decided reduction is also being made in logging and railroad operations.

With the shortage of men due to the war, many of the Southern pine mills are employing colored women, chiefly for the handling of lumber around the planing mills and yards. When these women prove physically fit, which is determined after about three weeks' trial, they are found especially competent and careful, and up to the present time no serious accidents have been reported among them.

When plans which have been mapped out by the Safety First committee of the Southern Pine Association shall have been put into effect by the mills, the record of personal injuries in such a hazardous industry will be one to which the lumber manufacturers can point with pride.

ARE SAWMILL INDUSTRIES KEEPING PACE WITH ACCIDENT PREVENTION PROGRESS?

C. L. HARRISON, SECRETARY, HIMMELBERGER-HARRISON LUMBER COMPANY, CAPE GIRARDEAU, MO.

Mr. Chairman and Members of the National Safety Council: Not long ago, speaking before a convention of merchants in this country, Mr. H. G.

Selfridge, of London, who took the department store idea from America to Europe, stated that the hardest problem confronting the big merchant was the education of his "one-man shop" competitors regarding the fundamentals of business. He explained that to them overhead costs, deterioration, etc., were vague and unconsidered factors, yet they were the very problems that engrossed most of his time and thought. It is almost identically the same situation which rules in the sawmill industry. The comparatively few big organizations do not set the standard for their small competitors, who are legion. The little mill operations, scattered over the length and breadth of the land, with an organization consisting quite often of the owner's family—father and the boys, so to speak—is a crude and unscientific unit of production, wasteful in material, in labor, and in all that goes to make up industrial efficiency. Practically every other industry turning natural resources into manufactured form, with the possible exception of mining, consists of very large units, and it is because of this outstanding fact that I must come before you today to plead guilty for the industry I represent to the charge that, as a whole, it has not kept pace with the steel, the cement, the textile and the other great industries in the prevention of accidents.

This is unfortunate, from an economic standpoint, not only because the lumber industry is such a large employer of manpower, but also because the average mill is so inaccessible that even in minor accidents the injured cannot be given that careful medical aid which, in the well-equipped hospital of the industry that *has* kept pace with accident prevention, would put him back in his place in the least possible space of time. It is true that the lumberman is a pretty sturdy and hardy individual, as a rule, so the lack of hospital attention is often partially made up by the self-application of turpentine to the cut and similar remedies to other common injuries. However, the energetic little germ, after all, is not a great respecter of persons, and even though the lumberman works along with cuts and bruises on his anatomy, which would put the ordinary workman out of business, he pays for it over and over again in the frequent development of very serious ailments from very trivial causes.

ACCIDENT FREQUENCY

Strange as it may seem the ratio of accidents is greater in sawmills employing native American and white labor than in those using negro help almost exclusively. For a long time this was a puzzle to me, until I happened to mention it at one of the meetings of our operating committee, whereupon one of our foremen explained it quite reasonably and logically by saying that the white man is independent, resourceful and a little bullheaded, as a rule. He will ignore the word of caution passed him by his foreman, and do the task in the way he thinks best, while the negro is like a child—once hurt he will avoid the chance of a similar injury, and he will do what he is told more readily than the white man. The best way to overcome this tendency in the white man is to appeal to his reason and not put him under positive orders to discontinue an unsafe practice. The boys at the mill still laugh a bit at my eternal insistence

that if you tell a truth often enough and interestingly enough it will finally make an impression on the most stubborn mind, but this has been borne out in our accident record. The bulletin board, kept right up to date and placed where the men must read it, has had its influence, so that today, with a greater labor turnover than ever before, and the deterioration in quality that is universal because of the inroads of the army, our major accidents are few and far between, although I must admit that our minor ones are all too frequent—they are, however, almost wholly the result of awkwardness and not of carelessness, and practice at a given task is the only cure I know of for awkwardness.

The discussion of a subject does little good unless it is constructive, and I am afraid that so far I have not made much progress in that direction. When I received this assigment I made up a little questionnaire and requested the American Hardwood Manufacturers' Association of Memphis to send it to its entire membership, comprising some 200 of the best and largest mills of the Mississippi delta. The fact that only forty-six replies came back is, to some extent, a measure of the interest of the mills and the statistical records that have been kept on accidents.

I submit this questionnaire as compiled:

Question No. 1—How many men do you employ? *Answer*—Forty-six members report a total of 4,796 employes, ranging from 14 to 336; average number employed, 104.

Question No. 2—What were the number of accidents during the last six months? *Answer*—Thirty-six members report a total of 351 accidents, ranging from 1 to 55. Ten members report no accidents; average, 8.

Question No. 3—How many were serious, and how many were of a minor nature? *Answer*—Thirty-six members report a total of 320 accidents, ranging from 1 to 55: minor, 282: serious, 31: average, 7; none, 10.

Question No. 4—Did you find that most of them were due to carelessness or to defective machinery, etc.? *Answer*—Thirty-four members report due to carelessness, 10 blank, 1 with one exception (1 to 50 per cent carelessness, 50 per cent defective machinery).

Question No. 5—Has the class of men employed anything to do with the number of accidents: that is, do you find that accidents occur mostly where inexperienced men are employed? *Answer*—Twenty-six members report inexperienced: 3 experienced: 5 both: 6 no: 6 blank.

Question No. 6—If you use women, is the precentage of accidents greater for your female labor than for the male labor? *Answer*—Thirty-six members report no women used: 2 less: 2 do not know yet; 2 yes; 4 blank.

Question No. 7—Has there been any increase over the last six months period, or has there been a decrease? *Answer*—Normal, 23; decrease, 11; increase, 8; blank, 4.

Question No. 8—What safety devices do you use, and what means to prevent accidents? *Answer*—None, 8: all recommended by insurance companies, 12: best we can get, 1: good, careful foreman, 1: guard and protect all exposed parts, 13; blank 5.

Remarks—Keep machinery in good order and caution men to be careful, 1: guards and caution to men daily on the danger of carelessness, 1;

caution new men when breaking in, 2; all that are useful, constantly caution men to be careful, 1; what the insurance companies suggest, also have "Danger" and "Carelessness" signs throughout the mill and personally urge employes to be careful at all times, 1. Total, 46.

CO-OPERATION AND EDUCATIONAL CAMPAIGNS

You can readily see that most of those reporting have not even gone into the fundamental causes of their accidents, and have not kept accurate records. I will say, as a practical operator, that the ten mills reporting no accidents simply do not have a system under which minor accidents are reported to the management. There is not a mill in existence where finger and toe accidents are not more frequent than one in six months. This data is read into this discussion for what it is worth, although personally I think it so incomplete and inconclusive that it is practically of no value.

It seems to me that the problem of the little mill in safety practices is an unsolvable one. The price of inefficiency must be paid, and it is useless to spread propaganda to the small mill operator—he has a large stove in winter and all outdoors in the summer to absorb such "high-brow stuff" as discussions of economic loss caused by accidents, etc. Even if such educational matter were available for distribution to him you can realize that he absolutely would not use it.

Lately there has been a growing tendency in the lumber industry to block up timber holdings into large operations and bring them to a very high state of efficiency. The Great Southern Lumber Company, at Bogalusa, La., is perhaps the most conspicuous example of this type of mill and here you have a unit of the sawmill industry which has not only kept up with progress in accident prevention, but has set the pace in no uncertain fashion. This good example is being followed by many lesser lights and the cause is making headway along these lines. It seems to me that these larger mills could be encouraged to greater efforts at this time by an appeal to patriotism as well as common sense in the conservation of the scanty and constantly dwindling labor supply.

The usual type of manager of the big sawmill is a fellow who has worked his way up to the top; the college-bred example, sensitive to theory and trained to analysis, is conspicuous by his absence. This holds back the ultimate solution of the problem to a considerable extent, as you must realize. The appeal to the average operator must be of the "follow-up" kind, and here is where the fine organization of the National Safety Council can do a tremendous lot of good. No employer of labor can continually look over the Council's bulletins, no matter how superficially or carelessly, and not eventually come to the conclusion that the fundamentals of safety engineering can be applied to his plant with profit. I think that the funds of the Council should be freely used in spreading propaganda of this kind—I presume much of this work has been done.

The trade papers are pretty carefully read, as a rule, by the lumberman and frequent discussions of "safe practices" should be published in their columns. If the idea once takes root, the fascination of preventing injury is bound to take hold, especially in the lumber group, where the usual

We then began educating our men in safety through the teachings of well-organized Safety First committees and by propaganda. That the man's mind might be fully imbued with the idea it was necessary to purge the senses and remove therefrom those thoughts which produced disaster, and replace them with the safeguards of caution, carefulness and thoughtfulness, both for self and co-worker. With all we had done and all we had said and all the money we had spent our motives were still doubted in some quarters. But as time went along, with our endeavors unrelaxed, the sincerity of our purpose began to be accepted, and a marked improvement was visible in the mental, physical and social life of the men. Accidents rapidly decreased, the social life of our camps began to improve and employer and employe began to realize that we were all just co-workers: that this old world was a pretty good place and that one God watched over us all.

This was the fruit of Safety First understanding and we were going along in the peaceful pursuit of the lumber industry. Trees were being felled, skidded and loaded; transported to the mills, via steam railways, to be cut into lumber and distributed to the world with less human sacrifice than in the old way. But, after all, we had in ignorance, to a degree, been playing a game of selfish safety, for on the other side of the great mother of waters a struggle which we had not realized was going on for the safety of the world. When our President signed the declaration of war against Germany, there was heralded to the American people the greatest Safety First bulletin that history will recall to coming generations.

THE WAR AND THE LOGGING INDUSTRY

It was not very long before we began to observe among our workmen the effect of the volunteer. Then came the draft and a heavy demand for labor from the war industries, offering greater wages than the lumber industry could at that time meet. This removed from our ranks the migratory laborer, together with some of our most efficient and experienced men. Consolidating the volunteer, the drafted man and the migratory workman with others who went to the war industries for a higher wage, a rather gloomy future was presented for further safety work and it was predicted that our efforts would soon be forgotten. And at this time, I must add, there was a large increase in the demand for lumber and we had a patriotic duty to perform. The nation had to train a large army and build many ships for overseas service; the soldier had to be housed while in training at home and fed when he went across. This condition had to be met quickly and it was up to the lumber industry to produce the goods.

Our older and more experienced men were going to war and other industries and we were compelled to replace them with inexperienced employes over and under draft ages. We would have been justified in expecting a chaotic condition, both in efficiency of work and safety. This was a natural conclusion and one calling for much thought, but we soon found the old men coming back and the young men, who had not attained their majority, entering the service. They had grasped the meaning of the

great Safety First bulletin that had been issued by our President and sanctioned by every red-blooded citizen of this country. The worker felt the need and assumed the obligation to do his bit and do it well; to do it well he necessarily had to do it safely. He realized that the loss of his life or limb in industry was a loss to the cause and to his brother who would face the enemy's charge.

When this war came upon us it found the lumberjack a good fellow by nature. There were phases of life he did not understand, perhaps he had not given the serious side of his being the full thought that justice and improvement to himself warranted. His environments were the surroundings of nature and upon them he largely depended, accepting them with satisfaction. But now natural things were torn to pieces and from his think-box he must secure the tools to perform services that would protect him. That was what Safety First had been endeavoring to make him resort to, but it required the war to make him realize that all that had been said and done was true and for his benefit.

NO MARKED INCREASE OF ACCIDENTS

The older men, who had left the camps and mills to engage in less strenuous efforts, returned to find the days of recklessness, such as had existed in their era, passed away and though older and more or less unfamiliar with the changes which modern progress had brought into the industry, the passing years had sobered their thoughts and they took hold of things and surrounded themselves with such wisdom as would maintain them in the ranks with all their vigor. The minor who has come to us has done so in answer to the demands of the war, with the idea and knowledge that, though his labors may be hard, he is blessed with a safety here that is not to be found over yonder. Around him are the older men who have returned—the men of experience and caution. Over them all is the predominating spirit that, though industrially engaged, we are working for one sacred cause—to protect ourselves, our country and our comrades who have been called to that land of Hun-made hell.

It is gratifying, in all this, to be able to say there has been no marked increase in our casualty list. There is some slight scarcity of labor, and operating efficiency is naturally impaired to some extent, but Safety First is maintaining its good record; this, I conclude, is due to the fact that our entire Nation has thrown off the tendency of selfishness and entered into a generosity which embodies the human race. We are no longer like tenpins, to be knocked down with one ball; instead we are supporting one another. This has been the effect of war and we are placing ourselves on a more secure foundation from a point of safety; this is the first lesson in all things worth while.

The conclusion of the war will find the lumber industry on a sounder basis, from a humanitarian standpoint, than has been its history in the past. The workmen are raising themselves to a higher sphere; from which comes the greater ambition to be a part of the vital factors in the accomplishment of the world's work. This cruel calamity has awakened the thinkers of today to the fact that none are safe who do not prepare.

All of history's great and laudable achievements have been written in blood, heart-throbs and sacrifices. I know that the workman in the lumber industry is a better man today than he was yesterday, and while he is paying the price he is also receiving his reward for the part he is playing in the present conflict.

Attached will be found a few of the many rules and lessons we have taught the men to obey throughout the logging operations over which I have jurisdiction. Time will not permit the reading of other means we have for reaching the men through safety work. There is no phase in their lives we do not endeavor to touch and to inculcate the true meaning of our intention. Every workman must be a safety man and teacher. He is given a fair chance, but he must learn the lesson if he would stay in our ranks and avoid the brand of slacker.

In conclusion, accept through me the greeting of the logging fraternity and feel assured their best efforts are working hand-in-hand with the Safety First movement, that the war may be brought to a satisfactory conclusion and the hand that now wields the sword will again swing the axe and drag the saw in safety.

SAFE PRACTICES

Playing in cabooses should not be allowed while trains are going to and from work; there is danger in being thrown out of the caboose or of falling over seats and breaking arms and ribs.

Men should not be allowed to get on or off a caboose while train is in motion; there is danger of falling under the wheels.

Standing in caboose door or sitting in the door and hanging the feet out should not be allowed; if a log is close to the track there is danger of it knocking a man out of the caboose. If he is sitting in door and his feet are hanging out or if he is standing in the door and the caboose is wrecked, he might be seriously injured or killed.

Cabooses should be scalded out with hot water once each week to prevent the spreading of disease germs caused by expectorating on the floor. Cross-cut saws and axes should not be carried in cabooses. In case of wreck there is danger of serious accidents. Cabooses should be equipped with red tail lights to prevent engines following running into them.

Cabooses full of men should not be backed to and from work.

Cabooses should not be pulled after dark or before daylight by an engine that is not equipped with a good headlight.

Cabooses should be inspected once each week to see that all running gear is in good condition.

Cabooses should be equipped with a chain and hook, in connection with a drawhead, to prevent it from getting away in case a pin should jump out; also, they should have good brakes, kept in proper condition at all times.

ENGINE AND TRAIN CREWS

Riding footboards and pilots of engines should not be allowed.

Jumping off engine footboards and running down tracks between rails or over frogs and points to throw switch should not be allowed.

Men going under engines should always be careful to see that they are well chocked. Precautions should be taken while under engines not to hit mud or other valves that might have steam pressure.

Whistles should be sounded or bells rung when starting a train or approaching road crossings or curves.

Brakemen should be very careful in going between two loads of logs to make a coupling. They should see that there are no extending logs that might catch their heads or bodies or push one log off another car on top of them.

Engineers should equip their water glasses with guards to prevent glass from flying and causing injury in case glass should burst.

In coupling trains on hillsides, cars should be deadmanded with ties before engines are backed in.

LOADERS

When a loader is working or moving from one skidway to another, men on the ground should be careful and not walk under boom; the sheave might fall or the boom might break.

Men going under cars after toggle chains should always be certain that the logs are safe before reaching under for chains.

Men (other than fireman and engineer) should be kept off the loaders; there is danger of men not understanding machinery being crippled. An insurance agent once came to see me while I was loading; I had a compression grease cup on the crosshead pin; he stepped up too close when the engines were running and the cup knocked the "peeling" off his shin. I saw him a year afterward and he still had a sore leg.

Men should not be allowed to ride on loader feet when machine is moving from one skid to another; the foot is liable to hit a tie or block and throw them under the wheels.

UNLOADING AT ROLLWAYS

When unloading at rollway, men should not stand on skids while train is in motion; there is danger of a log rolling off and catching the men on the skids.

Rollway men should see, before knocking toggles, that there are no knots or limbs on loads of logs that would hit them after load breaks.

In knocking patent toggle, before tripping hooks, men should be careful and see that there is no log that will roll off car and catch them.

Save Your Child from Accident

Six thousand children under ten years of age killed each year by accident in the United States.

Burns	2,894	Street Cars	244
Drowning	884	Railroads	217
Automobiles	380	Other Vehicles	440
Falls	783		

Teach Your Child

1. **Look to the Left and Right**—When you start across the street, look to the left and when you reach the middle of the street look to the right.

2. **Coasting**—Don't coast or run into the street—an automobile may pass at any moment and you will be struck.

3. **Matches**—Don't play with matches—big fires have been started, and many little children have been burned to death because some child fooled with matches.

4. **Drowning**—Be careful near the water—never go swimming unless an older person goes with you.

5. **Hitching On**—Don't hitch on to street cars or automobiles—it is dangerous.

6. **Passing Cars**—Don't pass in front or behind a car or automobile until you know what is on the other side.

7. **Playing in Streets**—Don't play or roller skate in the streets—automobiles and street cars are passing constantly and you are liable to be struck any moment.

Governmental Section

St. Louis, Mo.

Sept. 23, 1918

LEONARD W. HATCH, Secretary
CHIEF STATISTICIAN, BUREAU OF STATISTICS AND INFORMATION, STATE OF NEW YORK, ALBANY, N. Y.,

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THURSDAY AFTERNOON SESSION

MEETING opened at 10 o'clock with S. J. Williams in the chair, all of the officers of the Section being absent.

Paper by Mr. L. A. De Blois on "The Responsibility of Explosives Manufacture and Handling" was read.

Paper on "The Need for Uniform Safety Standards" was read by Mr. C. E. Oakes of the Federal Bureau of Standards, as a substitute for Dr. Stratton. In the discussion of this paper Mr. R. M. Little agreed that uniform standards are to be desired, but emphasized the necessity of amending such standards from time to time to keep them abreast with current practice. Mr. Arthur H. Young said that standardization is very necessary and that the Bureau of Standards is peculiarly fitted to undertake this task—better fitted than any other agency. The Bureau of Standards did exceptionally well in assisting the formulation of safety standards by and for the Federal safety engineers. Mr. Grant Hamilton, in charge of the newly created Bureau of Working Conditions, U. S. Department of Labor, described the plan of his bureau for co-operating with the Bureau of Standards, with the National Safety Council and other national and State organizations in the formulation of safety standards. Mr. Heelan presented a written discussion of the same subject on behalf of Mr. David Van Schaack.

A paper was then read by Dr. W. H. Wood on "The Prevention of Lead Poisoning in the Manufacturing of Storage Batteries."

The report of the Nominating Committee, previously appointed, was received and the following officers were elected by the Section for the coming year: Chairman, Mr. Charles H. Verrill, U. S. Employes' Compensation Commission; Vice Chairman, Mr. Harry A. Mackey, Chairman, Workmen's Compensation Bureau, State of Pennsylvania, Harrisburg, Pa.,

and Secretary, Mr. C. E. Oakes, Safety Engineer, Bureau of Standards, Washington, D. C.

After an informal discussion the Section adjourned.

THE RESPONSIBILITY OF EXPLOSIVES MANUFACTURE AND HANDLING

L. A. De Blois, Safety Engineer, E. I. du Pont de Nemours & Co., Wilmington, Del.

Mr. Chairman and Members of the National Safety Council: In the manufacture and handling of explosives, compounds and mixtures of a widely different nature are encountered, especially if we include within the general term "explosives" the "commercial explosives" (nitroglycerine —for oil well shooting—dynamite, blasting, gelatin, black blasting powder, etc.) and "military explosives" with which it is a common though improper practice to class smokeless powder. Smokeless powder of the type used by our government for cannon is known as a "single-base" powder, the base being nitro-cellulose (gun-cotton). It is not a true explosive, but produces its effects through rapid burning which, with the confinement afforded by the gun, results in the development of high pressures. Small quantities ignited in the open burn quietly and even hundreds of thousands of pounds, when accidentally ignited, have burned off rapidly with no other effect than the development of extreme heat. On the other hand, the double-base "smokeless" powders, used most frequently for small arms, contain nitroglycerine and may, if closely confined or burned in bulk, detonate violently. In this respect they closely resemble the high explosives, which are said to "detonate." Black powder, which is a mechanical mixture rather than a chemical compound, is said to explode rather than detonate and small quantities may even burn off rapidly without explosion.

CAUSES OF EXPLOSIONS IN MUNITION PLANTS

The usual effects of the accidental ignition of any considerable amount of these substances can be considered in general as injury or death from: (*a*) Shock, dismemberment, burns or missiles in the case of high explosives or black powder and (*b*) burns from the combustion of smokeless powder.

The accidents from smokeless powder deserve further comment. In the combustion of large quantities a high degree of *radiant* heat is evolved. Radiant heat follows all the natural laws of light and is reflected, refracted or absorbed, and as a wave motion through the ether is independent of wind velocity. Consequently, persons making their escape from burning buildings may be seriously burned without actually coming in direct contact with the flame or hot gases—the conditions are somewhat similar to sunburn of a great intensity.

In explosives, a widely varying degree of sensitiveness is encountered.

Dry fulminate of mercury and chlorate mixtures are exceedingly sensitive to the slightest shock or friction and so find their usefulness in primers and caps. They must be handled with the greatest care. The effect of the detonation of the small amounts that are handled is extremely violent but correspondingly localized. At the other end of the scale are TNT. (trinitrotoluol), ammonium nitrate, picrate, etc.—high explosives so insensitive that they safely withstand not only rough handling but even the shock of projection from cannon and require "boosters" of more sensitive explosives to effect their detonation. Some of them are practically noninflammable, others will burn without detonating unless rigidly confined. TNT. if burned in very large quantities may, as it becomes heated, detonate—a fact that has become generally recognized only after the occurrence of several catastrophes.

Many other factors exert decided influence on the sensitiveness of explosives—temperature, pressure, moisture, fineness of granulation, purity, etc. The character of the blow or shock and the materials with which it is administered are of importance. A grain of smokeless powder may be pounded indefinitely with a wooden mallet but rolling it between two soft wood surfaces may cause ignition. A small spark of static electricity that can be passed through nitroglycerine without effecting it will detonate a 60 per cent nitroglycerine dynamite.

The writer has indulged in these general comments on the varying behavior of explosives to show that the manufacturer, who seeks to manufacture safely, faces not one problem but a widely varying array of complex problems. No general rule for handling these substances can be formulated. All explosives throughout the manufacturing process must necessarily carry with them the potentiality of accidental explosion. The more remote this possibility, the more difficult it becomes to impress the average employe with respect for what he has not seen occur. "Familiarity breeds contempt."

RESPONSIBILITY FOR ACCIDENTS

One class of accidents are the explosions or fires that have been general or widespread in extent, but could have been localized. As in the case of TNT., some of these have occurred through failure to recognize the possibility of serious explosion. For years the transportation of TNT. on common carriers was permitted in England without special restrictions, and one large English shell-loading plant operated in a closely congested residential district. Other cases have occurred from inexperience in plant layout or lack of capital to invest in the amount of real estate necessary for proper separation of the manufacturing units. There are still other cases contingent on the national emergency—the necessity for the continued operation existing and sometimes antiquated plants delivering an essential munition, where individual risk must be incurred, temporarily at least, because "we are at war."

The responsibility for such unfortunate accidents may lie with the individual, the designer, the owner or even with the nation. It might, under certain circumstances, be considered as part of the burden of the state if conditions were at variance with the existing statutes or regula-

tions, or against the dictates of common prudence. No general assignment of responsibility can be made—each case must be judged on its own merits.

The above refers in particular to accidents which are disastrous from the spread of the zone of destruction. Much has been done to decrease them, both in number and in extent. The Institute of Makers of Explosives, some years ago, undertook a detailed study of past explosions all over the world and formulated the "American Table of Safe Distances" for barricaded and unbarricaded buildings—a table which has stood the acid test of more recent experience. The institute has also issued model ordinances to govern safe storage of explosives in public communities. The Bureau for Safe Transportation of Explosives, the United States Bureau of Mines, the Departments of Labor of New Jersey and Pennsylvania, the National Board of Fire Underwriters and the National Fire Protection Association have all contributed notably to explosive safety.

But at the beginning of each explosive accident, whether of minor nature or a catastrophe, there is the original cause—the act or circumstance that produced the initial explosion, detonation or fire. In the writer's opinion, these may be broadly classified as recognized or unrecognized causes. The recognized causes are the shocks, friction, sparks or heat that were known to be dangerous before the accident occurred. The unrecognized causes are similar, but were not understood before the accident happened. This rather fine distinction is drawn, not because of anything inherently different in the causes themselves, but rather in view of the growth of manufacturing conditions. It should be recognized that there are acts so obviously dangerous that no sane, normal person would commit them in the presence of explosives. In every case explosion would inevitably follow. There are other acts, obviously dangerous to the experienced or trained mind, which might readily cause explosion and would do so in a certain percentage of cases, but there are also acts which would cause explosion only after long repetition. When explosives were manufactured on the small scale required in earlier years this latter class of "hundred-to-one shots" had little chance for manifestation, but when war was declared and the amount manufactured increased enormously the "hundred-to-one shots" made their appearance. They form the "unrecognized" hazard class, and many of them were doubtless attributed to maliciousness and masqueraded as "the work of plotters." Witnesses and circumstantial evidence alike were often wiped out by the explosion and the real cause remained undetected.

In the experience of E. I. du Pont de Nemours & Co. accidents from fire and explosion yield as readily to organized safety work and intelligent design as general industrial accidents, and a plant that is properly free from one will be equally free from the other. It is probable that the hazardous nature of explosives is about offset by inherent respect for their properties, and what remains can be leavened with the spirit of carefulness.

While accidents from explosives run a high percentage of fatalities they constitute in number only a small percentage of the total cases, and are also low, in respect to the relative payroll exposure. From this the

general conclusion may be drawn that from 70 to 80 per cent are, like ordinary industrial accidents, the direct result of carelessness or kindred failings, and it would seem logical, at least, to expect this to be the case.

What are the most important responsibilities of the manufacturer of explosives? The writer would suggest the following in order of importance:

A. AS EFFECTING THE MAGNITUDE OF THE ACCIDENT

1. Subdivision of the process into separate buildings or compartments, so that the direct exposure is as low as consistent with proper production and *supervision*. Maximum number of operatives to be fixed and enforced.

2. Reduction in quantity of explosive material to the minimum consistent with continuous production. Surplus to be removed to a safe distance. Explosives to be kept away from exits, as far as practicable. Maximum quantity allowed in the building to be fixed and enforced.

3. Ample free exits to be maintained with clear "getaway" outside.

B. AS EFFECTING THE POSSIBILITY OF ACCIDENT

1. Scrupulous cleanliness throughout.

2. Close and careful supervision by experienced and trustworthy men. No careless or rough handling of materials or equipment.

3. No major repairs during operations or in the presence of explosives. No repairs except with proper authority.

And, above all, the safety habit—not tolerance of safety measures, nor approval of Safety First, but actual, active safety practice.

THE NEED OF UNIFORM SAFETY STANDARDS

CHARLES E. OAKES, FEDERAL BUREAU OF STANDARDS

Mr. Chairman and Members of the National Safety Council: This is, I believe, the most opportune time that could have been selected for the presentation of this important subject before the National Safety Council. In view of the unqualified support which the President and every department of the government is giving the movement to safeguard the soldiers of industry from the hazards and diseases surrounding their work, it devolves on us as safety engineers to provide an economical procedure for the carrying out of these humanitarian measures. One of the methods of effecting economy is standardization, a word which is almost synonomous with "economy." It has ofttimes been repeated that 50 per cent of the accidents are preventable—25 per cent by education, 25 per cent by mechanical safeguards. It is the latter broad division with which we are most concerned. That they are inseparable, however, is almost axiomatic.

I should like to bring to your attention, at this point, a difference between purely physical hazards and disabilities resulting from processes which produce industrial disease. "Accidents," so called, from industrial

disease can be reduced to a far greater degree relatively than physical accidents through the employment of purely engineering means. It might easily come within the province of the body undertaking this work of standardization to prescribe certain processes which must, or perhaps it can be stated negatively, which must *not* be used.

PHYSICAL CAUSES OF ACCIDENTS

It must be admitted that it is extremely illogical to educate the men in safety and immediately send them into dangerous shops. The spirit of the employer should be to surround the employe with adequate safeguards which will positively prevent the employes being injured. Mechanical safeguards are the only means of accomplishing this end. The interest in the workmen's welfare is thereby concretely shown to them and it is only when this is done that their attitude is changed from a combative to a receptive spirit. Therefore, it is evident that the physical causes of accident should be removed prior to any extensive educational program being attempted, and the manner of this accomplishment should be such that the maximum of economy will result for the Nation as a whole. to the manufacturer of machinery, to the buyer of machinery and to the administrators in whose hands law-enforcing powers are given.

Standardization has been advocated for a number of years. and has been carried out locally, if I may be permitted to use the term in this case, by a number of State Commissions having authority over problems of accident prevention, by insurance organizations and by various technical organizations. Their work is most praiseworthy, but the work of accomplishing national standardization has been hampered by their limited field. A diversity of standards cannot fail to result in other than a waste of labor and material. There are as many as three different standards in operation in some of the States. This can hardly be called standardization. We may well ask ourselves at this juncture as to what constitutes standardization.

Safety standards which will truly standardise safe practices must include a number of essentials. They must first of all be practical and must not be so confined in scope or be so rigid as to hamper the development of new and better processes, and due regard must be given to the economy of operation. They must afford the maximum protection with a minimum outlay. They must be simple, complete and explicit, and they must be so comprehensive that they will be as easy of application in Maine as in California.

It is only necessary to name the great variety of interests affected to be immediately convinced as to the need of a uniform set of standards.

First, let us consider the Nation as a whole. At the present time our industries are working at maximum capacity, turning out munitions of war. We are confronted with a huge labor turnover. Efforts are now being directed in various ways to reduce it. What will be the relation of uniform safe practices to the migratory worker? The answer is simple. If he meets the same practice, *and the standard must be high*, in

every State, there is no occasion for a change of job in so far as this particular phase of the problem has a bearing. When it becomes known among the workers that such a condition exists everywhere, his mental attitude will change from a spirit of dissatisfaction, which is usually based on lack of knowledge to a spirit of contentment.

DELAY AND EXTRAVAGANCE IN LABOR TURNOVER

That this condition is recognized by our government at the present time is shown by an extract from a letter of the Secretary of Labor authorizing the creation of a Working Conditions Service in the Department of Labor. He said:

"The hurried development of new enterprises and the extension of existing plants to meet the need created by the war necessarily tend to a less degree of care than exists in time of peace with reference to working conditions, but at no time is it more essential to maintain throughout the most essential industries working conditions which will enable wage earners to remain satisfied with their employment, so far as one element is concerned, the delay and extravagance caused by an unnecessarily large turnover."

From a somewhat different point of view the migratory worker constitutes another argument in favor of uniform standards. If a workman has become accustomed to machinery the methods of safeguarding of which were entirely different from those in his new environment, the hazard to the workman is greatly increased. Thus we may say with conviction then that our migratory worker is an argument for uniform standards.

The next argument in favor of standardization is the economic gain to be derived from it. The argument which I am about to make is based upon the accepted fact that accident prevention has come to stay. This means that purchasers of machinery will insist in increasing numbers on the incorporation of safety features in the original design of the machine.

That this state of affairs is an accepted fact is evidenced by the great amount of machinery and appliances which are now sold only by reason of the safety features which are part of their operation. Examples of these are steam boilers, electric switches, certain types of lathes, and mechanical and electrical interlocks on railroad switches.

It is axiomatic that the incorporation of safety features in the original design of the machine will result in a far less cost to the buyer of the machine that if he is required to safeguard such machines by purely piecemeal construction—a form of practice which is acknowledged extremely poor engineering and on its face shows short-sightedness. Great benefits will accrue to the manufacturer of machinery also. The financial returns derived from a standardized type of apparatus should not be underestimated. This saving, of course, is reflected in the selling price to the consumer. There is, however, one instance where piecemeal construction is warranted. In fact, the only construction which is possible, namely: The safeguarding of existing installations. Many of the safeguards for such construction are available in manufactured form ready

for installation. For the same reasons stated above this industry should have a guide to good practice: a guide resulting from the co-operative study of the problem. It is undoubtedly true that the principles of safety are equally applicable to the safeguarding of both existing installations and new types of machinery. As the standard must be based on these principles it necessarily follows that the functioning of the safeguards must in either case result in the maximum of protection. We will by one stroke effect an economy which it is impossible to estimate in dollars and cents.

COST OF SAFEGUARDS

Few I believe realize the magnitude of the outlay which is being spent for safety devices on existing installations. As an example, allow me to cite the case of a company, one of whose plants I recently visited. This company operates over fifty plants. I was informed that an expenditure of $1,000,000 had recently been authorized for safeguards in the plant visited. Many of these will, of course, be made at the plant, but a great many will be purchased. This is one of many hundreds of plants supporting the safety movement. The economy that will accrue to these companies through standardization cannot be estimated.

A factory equipped with standard safeguards will necessarily join forces with the safety organization in the maintenance of an orderly and clean establishment so necessary for the reduction of accidents. Not only must standards be formulated for safeguarding machines themselves, but the arrangement of plant and of the machines must be given attention. This will insure an orderliness and cleanliness which would not otherwise result from haphazard construction.

One very important result of standardization will be the gradual diminution of piecemeal safeguarding; that is, the safeguarding of existing installations. It is obviously impossible in a great many cases of existing installations to make a safeguard an integral part of the machine itself. We therefore lose at one stroke a principle of great value. Designs which make it necessary to operate the safety device before the continuation of operation can proceed give the maximum of protection.

The effect of standardization on the rates of insurance which are charged by the casualty insurance companies is noteworthy. It is a matter of common knowledge that casualty insurance rates have been steadily reduced during the past few (pre-war) years. This, of course, is due to a betterment of the physical condition of the plants in the country, even though operated under widely different sets of standards. It will not be necessary to dwell on the effect of a national standard on insurance rates, as this can be seen at first glance. The economic benefits to the employer is, of course, apparent.

The insurance companies themselves are vitally concerned in this problem from the standpoint of making inspections. At present there is continual conflict in the recommendations of insurance inspectors and State inspectors, due entirely to difference in the standards which they apply. It has not been long since even the insurance companies themselves were inspecting under different standards. This condition has been

remedied by the joint action of various rating bureaus in establishing one standard for insurance companies.

Another important result of standardization will be the advent of a greater amount of automatic machinery, which is noteworthy because of the greater security to the worker. The attendant economic advantage to the manufacturer because of their use cannot be easily estimated, but is at once apparent.

NEED OF A NATIONAL SAFETY CODE

What can be said as to the need of a uniform set of standards by our administrative bodies? The application of a code in practice must be followed up, and the best method of doing this great work is through our State factory inspectors and industrial commissions. A truly national standard will result in the application of much smoother administrative machinery than has been the case in the past. Disagreement will occasionally arise over the interpretation of standards. Under present practice the administrative body making the code or the factory inspector, in many communities where no standards are adopted, is the final arbiter. Under a national code questions of this nature will be decided in the light of a nationally accepted practice. As an instance, an example of a national code may be found in the National Electrical Safety Code. Bureau of Standards Circular No. 54. This code has been adopted in whole or in part, or is under trial in some eight States and is being studied by eighteen others. A number of questions of interpretation have arisen and have been easily settled on submission to the bureau.

The point which I wish especially to make here is this: A truly national standard can be secured only through an agency which can co-operate with all interests and can co-ordinate their thoughts and efforts. This agency should be unbiased in its opinions and decisions and should act only in an *advisory capacity*, since only by such action can the decision be said to be based on purely economic and engineering principles. It can be said without fear of dispute that one of the reasons that the formulation of the National Electrical Safety Code and its introduction into practice have met with such signal success has been due to the purely advisory capacity in which the Bureau acts.

It is generally conceded that no administrative body is intentionally unfair. If such bodies have available a national standard, decisions will be more uniform and fairer than would otherwise be the case. There will be a decreasing tendency to establish a national precedent, or legal decisions on which precedent might easily be based on purely local practice.

RELIABILITY PLACED ON ULTIMATE WORK

Another great advantage of national standardization is the reliability which can be placed on the ultimate work, especially if it is undertaken by a well-established and unbiased body. Standards formulated by such a body will be put in practice by individual companies before they are even submitted for mandatory action to the various States. This means that the desired effect will become noticeable from two to four years

sooner than it otherwise would. An excellent example of this is the above referred to National Electrical Safety Code. This code, even now, is not recommended for adoption by the bureau, yet it is being widely used by utilities and manufacturers, and has already affected standardization in the electrical industry.

A word regarding the method of procedure in formulating and introducing a national standard into general practice will perhaps not be out of place here. The keynote with which this work must be conducted is by co-operation with all the interests affected and the coordination of the thoughts and efforts of the individuals and companies interested. There are seven main classes of interests who will be vitally interested in the work, namely: Employers, workmen, engineering societies, safety experts and technical organizations, insurance organizations, State departments of labor and State factory inspectors, the various federal departments and bureaus, and manufacturers of safety appliances and machinery.

The nationalization of safety methods and practices should be brought about by co-operative means and the body charged with this work should have no legal status whatever in the enforcement of the standards. They should stand on merit alone. This is distinctly a public service. That it is a monumental task cannot be doubted, but assurance must be given that it will be promoted without danger of lapses in activity. It will be realized that the initial preparation of a set of standards is only a beginning of the work. It must be developed and revised from time to time and its application in practice followed up by an agency which can make interpretations whenever necessary.

SAFETY WORK IMPERATIVE IN WAR INDUSTRIES

In closing I shall appreciate your indulgence while I quote from a speech by Secretary Redfield, which shows clearly the urgency of the situation: "I think it may be truly said that two facts become increasingly evident in connection with our industries as the war situation develops in this country. The first is that every industry whose products can contribute directly or indirectly to carrying on the war will be operated under intense strain. The second is that as the draft progresses and men are called to arms there is likely to be an influx into the factories of inexperienced persons, including probably many women, unfamiliar with the industries in which they become employes. Under these circumstances there is, of course, danger that the loss of life and the suffering from injuries, regrettably incident to industry, may increase. Nay, it seems certain that unless earnest thought and continuous care are given to the matter, it is sure to increase. May I, therefore, express the hope that through every agency an earnest effort may be made to see that not only are the safeguards for life and limb provided by laws maintained in full force and vigor, but that a special appeal is made to our leaders of industry to safeguard by careful provision and constant thought the lives of the toilers now so necessary to our country." Standardization is one of these agencies.

THE NEED OF UNIFORM SAFETY STANDARDS FROM THE STANDPOINT OF AN INSURANCE COMPANY

DAVID VAN SCHAACK, PRESIDENT, NATIONAL SAFETY COUNCIL
PRESENTED BY J. J. HEELAN, SUPERINTENDENT, BUREAU OF INSPECTION AND ACCIDENT PREVENTION, AETNA LIFE INSURANCE CO.

Mr. Chairman and Members of the National Safety Council: One of the major obstacles in obtaining compliance of industrial manufacturers with recommendations for physical, mechanical and miscellaneous safeguarding is the lack of national uniform safety standards. By way of illustration, there are at present in a number of States not a few organizations that have compiled safety standards which overlap on the same subjects and these standards are often just enough different to make the topic of safeguarding very unpopular with the manufacturer. These different codes have been drawn up with the best intent by the National Fire Board of Underwriters, Industrial Accident Boards of various States, manufacturing organizations, State Insurance Bureaus, Workmen's Compensation Insurance Companies, Employes' Compensation Commissions, the National Safety Council and others.

NO UNIFORM STANDARDS

One manufacturer expressed this problem very fittingly by stating: "I will soon be compelled to employ a technical man simply to escort inspectors through our plant and a crew of repairmen to comply with such changes as various inspectors see fit to make, for they have no uniform standards. The last here the last served. It is a Chinese puzzle." A practical illustration is provided by a comparison of the district police elevator and escalator regulations of the Commonwealth of Massachusetts with the Industrial Compensation Rating Schedule Standards. According to the former the gate guarding the entrance of the shaftway, when closed, is to be not less than 3 feet 4 inches in height, measured from the sill to the top of the upper horizontal member of the gate. The lower edge of the lowest horizontal member of any gate, when closed, shall not be more than 3 feet 4 inches above sill. You will see by this ruling a single bar swung across the hatchway will comply with the regulations.

Since gates of this height have decapitated employes who have been looking into the elevator shaft to locate the elevator car, and because objects have rolled beneath the lower member of such gates, the insurance companies have, out of this experience, constructed a different ruling. All insurance companies in certain States require a gate, protecting an entrance to an elevator hatchway, sixty-six inches in height. The clearance between the lower horizontal member of the gate and the sill shall be two inches (a few exceptions to this ruling are made for hatchway covers, lower landings, etc.) With these existing conditions the manufacturer at once inquires the reason for the difference in standards and why the State inspector's recommendations will not suffice.

In cases where an assured conducts a manufacturing industry in several

States the management cannot see the reason why the specifications drawn for a safeguard in Massachusetts cannot be used in Pennsylvania. If an insurance company is operating on a universal method of safeguarding throughout the country it can readily satisfy the request of the assured for uniformity. The next problem which confronts the assured is this: That the safeguards which will satisfy the insurance company in the several states will not be acceptable to the various State inspectors and it is these complications which retard the installation of safeguards and thus hinder the progress of accident prevention, for no one would be more anxious to comply with recommendations made for the safety of his employes than the average manufacturer, providing such standards were uniform and based on thorough technical study and investigation.

CONFUSION ARISING FROM GENERAL PROVISIONS

The problem of providing standard hand rails for elevated platforms will give a very good illustration of the difficulty set forth in the previous paragraph. In the different States the standards for a hand rail vary from twenty-eight to forty-two inches in height. The methods of guarding a horizontal belt vary in different states from a forty-two inch rail to a seven-foot high enclosure, and the appalling fact is that a number of safety standards have been subject to annual changes ever since the inception of workmen's compensation.

The need for uniform safety standards, from the standpoint of the insurance companies, can be plainly seen when one realizes that there are now thirty-seven States in which workmen's compensation is in force. In each of these States the standards for safeguarding, as it pertains to State supervision, is for the most part left to the judgment of the State inspector. The facts are very clearly presented by Dr. G. M. Price in his book entitled "The Model Factory": "Our factory legislation abounds with general provisions, with vague and indefinite rules and regulations, with such terms as 'proper,' 'adequate,' 'suitable,' 'sufficiently guarded,' 'if practicable,' 'whenever necessary,' 'in discretion of the commission,' etc. There is hardly a paragraph in the State factory laws which does not contain these general terms, which leave so much to the imagination and interpretation of the employer and manufacturer and so little power of determination of what is to be done to the inspector and commissioner."

In the various compensation States, where the States desire to be a law unto themselves as to the form of safety standards required, it is necessary for the insurance companies to train their inspectors in the use of these various standards. In most cases the variation in the different State bureau standards is just sufficient to create a chaotic condition in the inspector's mind as he travels from State to State, and thus the efficiency of the inspector is impaired to a marked degree. Besides this difficulty each insurance company is required to keep on hand rating schedules and compensation inspection reports which must be filed with the various bureaus and the "handbook of safety standards" to care for these various conditions. Furthermore, examiners and raters must be trained to care for these various State requirements. And, generally, the

differences of these various State standards are so minute that it seems a great waste of money and time on non-essentials, which resources might be turned into the avenues of real active accident prevention work.

Last week each of the insurance companies received a copy of the plan of safety organization for use in shipbuilding plants which are operated by or under the supervision of the United States Shipping Board and the Emergency Fleet Corporation. The difference between this form of safety organization and the safety organization form now in use by the various State bureaus is so slight that it might just as well have been uniform rather than in its present state, confusing to the inspector who must use two forms of safety organization in the same city. In this case it was necessary to print a limited supply of copies of this form and instruct our inspectors as to any variations. If these were isolated cases which we have related the companies could readily adjust their forces to meet the necessary changes, but similar incidents in various compensation states are occuring continually.

NEED OF FEDERAL ACTION

In an effort to eliminate certain useless so-called safety standards certain State industrial commissions and insurance companies have endeavored to promulgate standards based, for the most part, on their past experience from causes of accidents of various types. In a number of cases this has met with a reasonable degree of success, but the time is now ripe for a uniform set of standards throughout the country. Some progress was made in the unifying of safety standards this past year by the National Reference Committee on Schedule Rating of Workmen's Compensation Risks, this committee being comprised of representatives of most of the compensation rating and inspection bureaus. Their findings were submitted to the various compensation bureaus and industrial accident commissions for criticism and suggestion. The result obtained was a marked advance in favor of a unified code of safety standards.

A unifying Federal movement is now needed to standardize a number of problems which are yet unsolved because of individual and local pride. This must eventually give way to the combined opinion of technical and public knowledge based on facts. This unifying force could well be vested in the Bureau of Standards at Washington. Not long ago we had about the same problem in developing a uniform electric code. After three years of continuous study and investigation, and the revision of successive preliminary drafts, which were submitted to electrical power plant engineers and electrical engineers in general throughout the country for discussion and criticism, the Bureau of Standards at Washington has presented a National Electric Code for use on trial. A national industrial safety code on standard methods of safeguarding might be developed in like manner. In this way we could readily get the co-operation of the manufacturers, engineers, State boards, and accident industrial commissions, insurance companies, and various industrial organizations. In thus compiling industrial safety standards which would be universal in their use the installation of physical safeguards would be made very much easier, more practical, and free from yearly changes.

THE PREVENTION OF LEAD POISONING IN THE MANUFACTURE OF STORAGE BATTERIES

DR. W. H. WOOD, MEDICAL DIRECTOR, WILLARD STORAGE BATTERY COMPANY

Mr. Chairman and Members of the National Safety Council: Sometime last spring we had a very welcome visitor in the person of Dr. Alice Hamilton of the United States Department of Labor, who, after going through our plant and acquainting herself with the various phases of our campaign against lead hazard in the manufacture of storage batteries, wrote me as follows, which is my reason for appearing before this body today:

"Dear Dr. Wood:—I have been thinking, since I visited your plant in Cleveland, that it would be a very good thing if the methods in use there for the protection of men against lead poisoning could be made known. The meeting this coming fall of the National Safety Council would be a good opportunity for such a presentation, since it would then reach men in charge of various kinds of lead work. I should be very glad if you would consent to prepare a paper on 'The Prevention of Lead Poisoning In the Making of Storage Batteries.' This is, as you doubtless know, regarded in England and Germany as one of the most dangerous of the lead trades and peculiarly difficult to control in any of its details. You are controlling it better than I have seen it done anywhere in this country or in England.

"What I should like to have you bring out in such a paper is, first, your way of preventing dust, quite original with you so far as I know. Then, I wish you would describe just what you provide for personal cleanliness, since in this trade bodily cleanliness is more important than almost anything else. Tell what provision the company makes in the matter of working clothes and how you succeed in having your men eat lunch and leave the plant in a safe condition. Then, finally, I wish you would give your own personal experience in this work, that you would tell what you consider a works physician's task. I find so many industrial physicians—not as many as formerly, but still too many—who are content to go to the office and attend to the men who come there, but who know nothing about the processes that go on in the plant, do not understand what sort of work their patients have been doing, and never think of undertaking themselves the reform of the working conditions. The procedure in your plant is in such strong contrast to this that I should like to have it brought out clearly.

"I hope you will consent to write such a paper. Work of this sort is valuable, first to the establishment in which it is done, but its usefulness becomes much greater if it can be made a matter of general knowledge. Sincerely yours, "ALICE HAMILTON."

The management of the Willard Storage Battery Company, having a full appreciation of the hazards inimical to this industry, have been untiring in their efforts and have stopped at no expense to minimize the dangers incident thereto. Their entire willingness to adopt any suggestions that tend to eliminate the lead hazard or look toward the bettering

of the conditions of employes, irrespective of cost or effort, has been a constant inspiration to each of us to press on until we have at least made the risks and hazards of this industry no greater than that of the ordinary manufacturing establishment. I think you will agree with me that were it not for this hearty co-operation on the part of the management, the strides we have made towards the end to be achieved, viz, ideal working conditions, would not have been possible.

I will touch briefly on the following points: First, "Buildings;" second, "Dust Prevention Measures Used in Manufacturing;" third, "Sanitation," and fourth, "Care of Employes," in the order named.

BUILDINGS

All buildings are one story high, with the exception of the general office building and building "B", which is two stories, and a small section of building "F" which is four stories high. The buildings are all of the continuous monitor type, insuring the maximum of light and air, with graded concrete floors surfaced with one and one-half inches of asphalt mastic, which construction permits frequent flushing, is easy on the feet and is an excellent trucking surface. The buildings throughout are slow-burning heavy mill construction; they are divided into 20-foot bays with columns 45 feet apart. Every 45 feet a section of the roof 15 feet wide is raised above the main roof 7½ feet, to form the monitor, each side of which is solid glass. Each sash is pivoted at the center, which allows a clear opening to the outside air of approximately 5 x 20 feet. The monitor sash are all operated from within by mechanical operators or by cords which can be reached from the floor. The outside walls are 50 per cent glass, with counter-balanced sash which open at top and bottom. The heating and ventilating systems give six complete changes of air per hour with all windows and doors closed, which is rarely the case except in extremely cold weather. Each building or section of a building is provided with a small basement which contains steam heating coils through which fresh air is blown by a large centrifugal fan; from here the air is distributed to various parts of the buildings through underground ducts, either of brick or large sewer tile. The openings into the rooms are arranged at intervals of twenty to forty feet around the outside walls and also at every column, which is supported on a hollow base; this distributes the air in four directions from floor upward to the monitor. All equipment and apparatus within the buildings has been designed and installed with a view of making everything convenient and easily accessible to the workmen and the visitor is at once impressed with the absence of any congestion of men or materials. In other words, everybody has plenty of elbow room and everything has its place and is kept in its place.

DUST PREVENTIVE MEASURES USED IN MANUFACTURING

All apparatus used in the various processes of manufacturing has been designed and equipped to prevent the dust from arising to contam-

inate the air. Inspection tables are made with heavy screen tops with boxes underneath, to which suction fans are connected. Punch presses and circular saws used in lead work have suction connections near cutting edges. In all cases this suction is great enough to carry away every particle of dust that might arise. Semi-automatic machinery has replaced much hand labor in the handling of lead oxides. In the mixing-room the oxides are fed from hoppers directly into weighing cars which are automatically dumped into dust-proof mixers. This machinery is operated by levers in an adjoining room, which renders it unnecessary for men to go near the mixers. We could not locate an absolutely dust-proof mixer on the market and we found it necessary to design equipment to be used in connection with the mixer that would make it absolutely dust-proof.

In spite of all the improvements we made in the design and equipment of apparatus, we found much difficulty in keeping the dust down on the floors and benches in certain departments. Sweeping raised the dust, so did the men and trucks passing over it. We decided that the only practical way was to keep the floors and work tables in such a condition that any lead dust which came in contact with them would be changed to a non-dusty state and permanently held in that condition. Our problem then was to find some substance that would keep the floors and tables in the condition required—and that would not be injurious to the batteries, that could be easily washed from the floors and tables and yet be a practical proposition from a commercial standpoint. After much experimenting we found that a solution of magnesium sulphate meets all these requirements and at the same time acts as a flux when it reaches the smelter in the reclaiming process. The peculiar property of this mixture is its power to retain a certain amount of moisture, remaining in a more or less plastic state which does not readily disintegrate even when subjected to a great deal of crushing and friction from the one and two ton trucks constantly passing to and fro. All scrap and waste oxides, as well as the tables and floors, are kept in a non-dusty condition and all refuse is kept in this condition until it goes into the smelting furnace.

SANITATION

Since our employes are not allowed to eat or carry food into the workrooms, each department is provided with a lunchroom. The men working in the lead departments are at liberty and are encouraged to go to these lunchrooms to eat at any time, as a full stomach tends to minimize the danger of lead poisoning. In addition to the regular lunch hour, two rest periods of fifteen minutes each, one in the morning at 9:00 o'clock and one in the afternoon at 2:30, are given to all employes, at which time they have an opportunity to eat lunch or visit the commissary if they so desire.

Good substantial food is furnished by our commissary department at cost. We urge upon our employes the importance of drinking lots of milk and at present the consumption is one and one-half pints per day

for every employe in the plant. By far the larger portion of this milk is consumed by the employes in the lead departments, which means that the consumption per capita in these departments is considerably greater than one and one-half pints per day.

All departments are equipped with ample washing facilities, which includes washbowls and shower baths. Creosote in the washing powder, which makes a soluble lead carbonate, helps remove all lead accumulating on the hands. Employes are supplied with the necessary overalls, rubber gloves, rubber aprons, rubber overshoes, respirators, goggles, etc., signing up for articles received. New supplies are issued upon the return of those worn out or unfit for further use. No charge is made for these supplies, provided they are returned to our welfare supply department. If such supplies are not returned at the time an employe severs his connection with the company they are charged to him at cost. Every employe is given three hand towels each week in addition to the necessary large bath towels, the towels being laundered at the company's expense. Overalls also are laundered twice each week at the company's expense.

CARE OF EMPLOYES

On entering the employ of the company every employe is given a book of instructions and regulations, setting forth the hazards of the industry together with the precautions necessary to prevent lead poisoning. These books are printed in all the languages necessary to reach the foreign born and are read and explained to them in their own language, so as to prevent any possibility of a misunderstanding. The notices covering "Instructions to Employes on How to Prevent Lead Poisoning," issued by the Ohio State Board of Health, are read to the employes every month. Our foremen are especially trained and keep a constant watch on their men, to see that they do not eat their food with dirty hands, that they wash out their mouths thoroughly before eating or drinking, and instruct them to keep their teeth clean, etc. Every drinking fountain has a large sign above it reading "*Wash Out Your Mouth Before Drinking.*"

All employes are given a thorough physical examination before they are put to work and are re-examined at least once each month—oftener if it is deemed necessary. All our employes are given free medical attention, irrespective of the cause of illness; in fact, they are encouraged in every way to come to the medical department with the most trivial accident or slightest complaint. If employes are off one day for any reason they must go through the medical department before they are allowed to resume work. In this way we keep in very close touch with all our force.

In connection with our welfare work we have men and women, in addition to the doctors, who are circulating around among our employes every day and they very quickly locate any one who is in need of medical attention. Obstinate constipation, loss of appetite, or weight, or other signs of lead absorption is sufficient cause for transfer from a lead to a

non-lead department. The employes are encouraged to take epsom salts baths, which helps prevent lead and other impurities from accumulating in the system. The salts, in five-pound bags, are supplied free to be used at home.

I would like to say, at this time, that our plant is carefully divided into lead and non-lead departments. The lead departments are so arranged that the hazardous positions are segregated as much as possible; in fact, we have many positions in the lead departments where there is absolutely no lead hazard. This arrangement makes it particularly easy to handle the lead cases, as the minor cases can usually be handled without transferring to another department, while the ones calling for more strenuous treatment are transferred to an absolutely non-lead department. Employes transferred are given the same rates they had been been getting and for this reason no trouble is experienced in making the transfer.

CONDITIONS AND METHODS TO BE OBSERVED

We firmly believe that the lead hazard can be practically eliminated in this industry if the following conditions and methods are complied with and faithfully followed out:

First. A plant with the maximum of light and air, with floors that will permit of frequent flushing.

Second. Machinery equipped and designed to handle all oxides in the dry state, eliminating lead dust due to hand processes.

Third. A plant equipped with proper sanitary appliances and employes furnished with suitable clothes to protect their bodies from the lead dust.

Fourth. To keep a constant, organized medical supervision over employes and at the same time use every endeavor to educate them to cooperate in overcoming the dangers.

In conclusion I want to make the flat statement that the Willard Storage Battery Company does not have any serious cases of lead sickness.

Chemical Section

St. Louis, Mo.

Sept. 17, 1918

E. H. FIESINGER, Chairman
Solvay Process Company, Syracuse, N. Y.,

A. B. MITCHELL, Vice Chairman
National Aniline and Chemical Company, Marcus Hook, Penna.

R. G. GRISWOLD, Secretary
E. I. du Pont de Nemours & Co., City Point, Va.

CHAIRMAN FIESINGER: The Fourth Annual Meeting of the Chemical Section of the National Safety Council will now come to order. In the absence of Mr. Griswold of E. I. du Pont de Nemours & Co., Secretary, Mr. H. F. Doepke, Safety Engineer of the National Aniline and Chemical Company, of Buffalo, N. Y., will act as Secretary.

Due to the fact that we are at war and the chemical industry has increased so rapidly it seems we all have to put a little more effort in our work to minimize the accidents in our industry; therefore coming to that part of our program this morning, I wish everybody to take an active part. We want a real, live discussion.

The following delegates are in attendance:

DELEGATES IN ATTENDANCE

James O. Meyers, Niagara Alkali Company, Niagara Falls, N. Y.
N. Duffett, Union Carbide Company, Niagara Falls, N. Y.
E. H. Park, M. E. Zurich Gen. A. and L. Insurance, Chicago.
C. C. Rausch, Assistant Director, American Museum of Safety, New York.
C. E. Oakes, National Bureau of Standards, Washington.
E. W. Merrick, U. S. Metals Roofing Company, East Chicago, Ill.
H. C. Lee and T. R. Weedon, Semet Solvay Company, Syracuse, N. Y.
L. C. Myers, National Aniline and Chemical Company, Marcus Hook, Pa.
Dr. L. Veillon, H. C. Morrison and H. F. Hecker, Monsanto Chemical Company, St. Louis.

C. P. Fiske, New Jersey Zinc Company, Palmerton, Pa.

J. P. Begley and H. B. Gardner, American Steel Foundries, Granite City, Ill.

C. M. Brading, Wisconsin Steel Works, South Chicago, Ill.

G. Burnam, Victor Chemical Works, Chicago.

C. E. Rice, Dow Chemical Company, Midland, Mich.

A. H. Massey and H. N. Miller, Dupont Engineering Company.

J. A. Hepp, Aluminum Ore Company, East St. Louis, Ill.

R. A. Berry, Certainteed Products, East St. Louis, Ill.

O. R. Westfall, Aluminum Ore Company, East St. Louis, Ill.

C. E. Murphy, A. E. Staley Manufacturing Company, Decatur, Ill.

Dr. W. H. Wood, Willard Storage Battery, Cleveland, Ohio.

A. S. Ross, Milwaukee Coke and Gas, Milwaukee.

H. E. Jamieson, Mack & Co., St. Louis.

J. R. de la Torre Bueno, General Chemical Company, New York.

J. P. Calderwood, The Travelers Insurance Company, Hartford, Conn.

A. B. Newman and H. M. Harker, Monsanto Chemical Works, East St. Louis, Ill.

A. N. Chase, Atlas Powder Company, Forceto works.

W. B. Blakey, Atlas Powder Company, Reynolds works.

J. K. Robinson, Jr., Atlas Powder Company, Wilmington, Del.

S. H. Kershaw, Hercules Powder Company, Wilmington, Del.

Wm. Demko, M. D., Monsanto Chemical Company, St. Louis.

H. C. Koehler and A. W. Sferra, Monsanto Chemical Works, St. Louis,

W. E. Walter.

We will now have the report of the Program Committee.

REPORT OF PROGRAM COMMITTEE

J. R. de la Torre Bueno, Chairman, General Chemical Company, New York City

To the Members of the Chemical Section: This year your committee was confronted with a double problem—the uncertainty as to the date of the Congress and the intense strain the war has put upon the industry as a whole, particularly on its officials and executives. This made it impossible to urge upon these very busy men the preparation of formal papers. After due deliberation, the round table discussion we have provided was determined upon as the best way to elicit discussion from the floor and to bring out the many minor safety practices our members have developed.

We were fortunate to secure Mr. L. A. De Blois as leader of the discussion but for most of the sub-divisions we have been unable to secure speakers in advance. Dr. L. Veillon of the Monsanto Chemical Company will lead in discussing "Liquid Coal Tar Products" and Mr. C. P. Fiske of the New Jersey Zinc Company will lead in discussing "Fumes and Gases." We count on those present to take up the various topics. This plan also

makes a more elastic session, not bound down to the time schedule of a formal program. Discussion from the floor will be limited to three minutes for each speaker, unless the meeting indicates its desire to accord him a longer time.

Your committee is sure that a strong discussion of our safety problems, to which all contribute, will repay every one of our members present for the time and effort to bring them here. (Upon motion the report of the committee was received and the recommendations unanimously adopted.)

APPOINTMENT OF NOMINATING COMMITTEE

CHAIRMAN FIESINGER: As a nominating committee I will appoint Mr. De Blois of the Du Pont Company as Chairman and Mr. Bueno of the General Chemical Company as the other member.

GENERAL, HEAVY CHEMICALS

ACIDS AND OTHER LIQUID PRODUCTS

(*a*) *IN PROCESS OF MANUFACTURE

(*b*) †IN PROCESS OF TRANSPORTATION

**In Bulk. †In Containers*

It gives me pleasure to introduce Mr. De Blois, who is to lead the discussion this morning.

MR. DE BLOIS: All of us in the chemical industry face tremendous problems, not only in developing our work in this country, but in taking over the work formerly done by Germany, and certainly the greatest amount of good can be accomplished by a perfectly frank and free discussion. The chemical industry, perhaps, has a reputation among other industries as being peculiarly secretive; probably there are good reasons for it, but the time has come in this country's business where we have all we can do ourselves without worrying much about what the other fellow is doing. Certainly in safety and health there is nothing gained by keeping to ourselves that which might better be given to the general public or to those interested for their good and benefit.

The first subject is now open for discussion.

MR. C. P. FISKE (New Jersey Zinc Company, Palmerton, Pa.): I want to get the opinion of the delegates as to the advisability or otherwise of having a bottom outlet in tank cars transporting 98 per cent sulphuric acid. An inspector visited us recently to pass on some drums in which there was a certain acid. He said there should be no bottom outlets in tank cars for transporting this acid: on the other hand, we know a certain amount of sludge forms and it will be difficult to clean cars and remove this sludge. I would like to hear a discussion on this topic.

MR. DE BLOIS: Mr. Bueno, what does the General Chemical Company do?

MR. BUENO: We do not put in a bottom outlet. The cleaning is a technical detail with which I am not familiar.

MR. H. C. LEE: (Semet Solvay Company, Syracuse, N. Y.): I cannot see why tank cars could not be cleaned the same as any other tank. In cleaning tanks we put a man down with a rope attached with which to get him out in case there is an excess amount of fumes; but as far as bottom outlets in cars are concerned I can see how they might prove very dangerous. If anything happened to the outlet there would be no way in the world to stop it. If the tank sprung a leak the contents might run all over the country. But I cannot see any difficulty in cleaning such cars through a manhole. You have sufficient opening to get a man down to clean the sludge out.

MR. JAMES O. MEYERS (Niagara Alkali Company): With a bottom opening in tank cars, in the case of sulphuric acid, I believe you would be running less danger than if you sent a man into the tank. Sulphuric acid is necessarily corrosive to the skin; if you put water in the tank you know what the result would naturally be. So it is not only a question of the respiratory organs, but the possibility of the workman having his skin burned very badly—it would be more serious than if he inhaled the fumes. The experience we have had has not been very serious with the exception of a leak in a car burning a part of our plant.

USE OF PLUG IN BOTTOM OF CAR

MR. R. T. REED (E. I. du Pont de Nemours & Co., Jacksonville, Tenn.): I have watched the difficulty of cleaning such cars. I believe you should have, instead of a valve for an opening at the bottom, a good sized plug. This could be taken out and replaced by means of a safety screw nickel wrench, which would protect the men from getting too near the plug when operating it; at the same time you would have your opening at the bottom. I believe there should be an opening at the bottom.

MR. DE BLOIS: Don't you need a larger opening than would be provided by a plug? In order to wash out heavy sludge if you do not have a large opening it would be a slow process.

MR. REED: The general practice is to use a four-inch nozzle. We have always found a bottom outlet to be a very good thing. We have not, as far as I know, had any trouble with a tank car of that kind in the last four or five years. It seems a very safe arrangement.

MR. DE BLOIS: It has been our practice in the Du Pont Company and I assume it has been followed pretty closely, in washing out the tank cars, to drive two dogs over the flange of the nozzle before attempting to remove the bolts, for this reason: We used to have men burned quite frequently when the last bolt or two were removed, if there was a spurt of acid from the amount still remaining in the nozzle or below the draw pipe in the tank; the dogs were driven on and the bolts taken out one by one, and, finally, a long bar was inserted and the dogs pried off at a distance. There was little chance of the men being splashed.

MR. DE BLOIS: There is danger, of course, in removing the lower bolt, because you are apt to have residual acid in there.

MR. E. H. PARK (Engineer, Zurich Gen. A. and L. Insurance, Chicago,

Ill.): The practice suggested is perfectly feasible and frequently done in boiler work. The only suggestion I wish to make is the liability in carrying off sulphuric acid to have it corrode in the bonnet. You can make the bonnet any reasonable size, up to 9 inches in diameter, and put in a large plug of the Allen set screw type, the large end of the plug fitting the inside of the car. That could be removed by a long handle coming up through the manhole on top; therefore, you could take out the plug on the outside and underneath the car. The plug cannot work loose and it will screw absolutely tight and stay tight. The only question is whether you can get something that will not be eaten by the acid; you cannot put steel to steel, as that will rust and corrode—you would have to renew that after awhile. You can make the diameter to suit the particular kind of acid you desire to carry off. For most deposits you would need a big plug, but for heavier deposits you would require a larger one.

MR. DE BLOIS: An accident occurred this year at one plant caused by excessive pressure applied to the nozzle in a tank car, due to the screwing down of a bolt through the yoke which held on the cover. Are any of the delegates familiar with the accident?

MR. T. R. WEEDON (Semet Solvay, Split Rock, N. Y.): We had the top of one of the covers blow off, but luckily nothing of a serious nature resulted. The manhole cover was badly corroded and when pressure was put on it popped.

MISTAKES OFTEN CAUSE TERRIBLE ACCIDENTS

MR. DE BLOIS: The case I had in mind brought out the weakness of a cast iron nozzle, the nozzle on the car in question was of that material. Of course, you can bring pretty high pressure to bear through the action of a screw. The appliance which held the flange down caught under the edge of the cast iron nozzle and as it was screwed down it broke the nozzle all to pieces. The car, I believe, was under pressure and a rather serious accident either happened or was narrowly averted.

While we are on the question of tank cars it might be profitable for the Section to consider points in connection with emptying such cars. I have had a good many accidents when connecting up tank cars for the blowing out of the acid and so on.

MR. BUENO: I would like to relate an accident we had at our Buffalo plant: The men were emptying tank cars—300 of them—and went to work on a tank of acid, taking it from the railroad track to one of our buildings. One of the men made a terrible mistake, he opened the air before he opened the feed line, and as he opened that line by mistake the acid shot sixteen feet high, covering him completely. He is still suffering from the burns he received. He did not use the safety device provided by the company, he did not wear a hat or overcoat and as a consequence was badly burned. Have any of the gentlemen here had a similar experience and what have they done to prevent a mistake of that nature?

MR. MEYERS: We make muriatic acid by a process of our own and also as a by-product of benzol. We have had a series of accidents of like na-

ture, only not so severe. We have sulphuric acid and never use water in that case, because we knew we would have accidents because of our men not being trained. It is now our purpose to have a trained man put in charge of each crew of men. We use pumps exclusively and they are working satisfactorily.

MR. DE BLOIS: I am sure you have had other accidents, gentlemen, unless you have been luckier than we have. How about repairs to the acid lines? Have you had trouble with residual acid when the pipe fitters went to break the lines after they were drained?

MR. H. C. KOEHLER (Monsanto Chemical Company, St. Louis): A number of such cases have come to my attention. We fight the hazard in this way: Wherever there is a leaky acid line we put an acid danger sign underneath, calling the attention of the pipe fitter to the fact and asking him to report to the different departments before beginning work on the line. This has met with some success, but from time to time we have had the difficulties most people experience, I think, in men going ahead on their own initiative without making inquiry. However, I think this precaution has lessened such accidents considerably.

MR. FISKE: We met that proposition by holding one man absolutely responsible for fitting up the line, unloading the cars and taking down the line. No one else has any right to touch that line or car from start to finish, only that one man. The hazard is not avoided at all by putting up a sign, although that system has its merits. I can't say I know of any accidents; our sulphuric plant is only a year and three-quarters old.

MR. BUENO: Would not a by-pass prevent accident to pipe fitters? If repairs are to be made you open the valves and any acid in the line will go to the by-pass.

DANGER OF RESIDUAL ACID IN PIPE LINES

MR. DE BLOIS: I will answer the question to the best of my knowledge. I think one vent would not be effective. Long acid lines have been installed and you are apt to have sags in the line, where you will get residual acid. Unless you install a bend at every sag you would still have acid to contend with. You will also have this trouble: A line runs from building to building, with acid under gravity pressure. Repairs are needed, in the middle of the line somewhere, and there is a valve here and there. When the valves are shut there is still pressure on the line and anyone who undertakes to open the flange may be burned with acid. Suppose the valves, for operating reasons, have been closed during a cool night and it is warm the next day when you undertake repairs—the sun has been beating down on that line. You have an increased pressure between the two valves and if you break a flange out comes the acid.

One of our plants has recently adopted a plan which may be of interest: It simply provides a lead sleeve over and around the pipe through which you blow acid from the tank car. The sleeve is loose and about eighteen inches long, I think. When they hook up the tank car at the acid line to blow it, there is always danger of the gasket blowing out between the

two flanges, at the connection, and sometimes a man has been burned. The function of the sleeve is simple: It is slipped down over the flanges, so if the gasket blows out and a leak results, the man operating the valve or the tank car it safe. It is a very simple precaution.

MR. LEE: All our lines are equipped with bands of lead around the joints on the line, flange joints as well as guards. These are put together with stiff boards, bolted together, which can be removed very easily when we want to get at a joint. The value of this device was demonstrated to me one day. I stood near the line, nearer than I am to you, dumping 95 per cent nitrate. The gasket blew out of the flange but on account of the lead guard around the flange it simply ran down the pipe, instead of spreading all over. If it had not been for that guard I would have been showered with 95 per cent nitrate. We have not experienced any particular trouble with anyone being burned since we adopted the guards.

ALKALIES AND OTHER SOLID PRODUCTS

(*a*) *IN PROCESS OF MANUFACTURE
(*b*) †IN PROCESS OF TRANSPORTATION
**In Bulk. †In Containers*

MR. DE BLOIS: We have a rather long program listed and we must devote a part of our time to "Alkalies and Other Solid Products," after which we will take up "Dusts and Fumes." Lots of us handle caustics. Don't you have trouble? We do.

MR. FIESINGER: Do you favor any particular style of goggles when handling caustic; any other than the standard types or any particular shaped lens? Or any particular type of shoe?

MR. MEYERS: We have tried wooden-soled shoes but they are just as bad as leather; in fact, the men insist upon using leather shoes. We have very little caustic on the floors, unless there is a break or something which makes it impossble for the men to be on the floor.

MR. DOEPKE: We are using an absolutely tight fitting goggle, very light in weight; there is no lens, it is an all-vision goggle, the material is apparently some sort of mica composition. I have tested the goggle with nitric and sulphuric acid and in other ways. You will find this goggle a very satisfactory type. When the inspector was in our plant the other day I showed this goggle to him and he had to admit it was the most satisfactory type he had ever seen. I do not know who manufactures them. We have been using them four or five months and they are the only ones our men will wear.

MR. DE BLOIS: Do acid fumes in the air affect the visibility of the goggles?

MR. DOEPKE: Not acid fumes, but steam will. It is a non-flam goggle.

MR. MEYERS: We have tried pretty nearly every goggle with the exception of the non-flam. The men object to goggles because of the steam from their own perspiration—that is, when it forms on the inside. The

men can always wash the outside with their handkerchiefs, but the goggles have to be cleaned on the inside as well.

MR. DOEPKE: A goggle that has lenses of vision is limited, but this goggle is made of mica and has sufficient space to see through.

MR. DE BLOIS: Gentlemen, we are not the only ones facing the problem of steaming goggles—it occurs even with gas masks in the trenches. All ordinary glass steams very rapidly. What has been the experience of the delegates with the steaming of goggles?

DANGERS ENCOUNTERED IN HANDLING CAUSTIC SODA

DR. L. VEILLON (Monsanto Chemical Company, St. Louis, Mo.): Goggles are always objected to by the men and I believe it might be well to discuss the problem of handling caustic soda without exposing men to the danger. Even if a man wears goggles he can be very severely burned on the face, hands or rest of the body by caustic soda as I believe a great deal of it is handled rather roughly. Caustic soda is shipped in solid cakes and in most processes it is dissolved. In some processes it is used in a solid form, as in the manufacture of phenol. Young chemists usually ask a man to cut open a drum—the result is a nice cake of caustic soda; then they ask him to get a sledge hammer and break the cake. The caustic soda will fly over the room and burn the man's hands; he will not notice it right away, especially in summer because of his perspiration, but you can get the worst kind of a burn from caustic soda. It corrodes through the skin and makes ugly burns, hard to heal, and subject to infection, of course.

It might be well to ask some of the users of caustic soda what method they pursue in handling it. We have gotten away from breaking up the cakes, after first opening the iron drum. The next step, I think, was to break the caustic soda while it was still in the container, using a sledge hammer over the iron drum. After the caustic was broken up in that way, they cut the drum open and the soda fell to pieces. This was easily shoveled into a tank and dissolved—but even that was a dangerous method. I think it might be well to point out the ease with which a good solution of caustic soda can be prepared with a minimum of danger to the men handling it; this is accomplished by using an automatic caustic soda dissolver. Such a dissolver is made; I have used it and found it exceedingly practical. The dissolver is an open, square tank, the width is a little more than the caustic soda drum; the length depends on the number of drums you want to dissolve at one time. The tank has a false bottom and instead of breaking up the caustic soda cakes you break the outside covering, which can be done with a sharp chisel without danger, and roll the cakes into the dissolver, three or four on top of each other. Fill the dissolver so as to have the water touch the first cake for possibly six inches. That is all you have to do; next morning you will have a nice 70 per cent solution of caustic soda. All the danger of men being splashed with caustic soda and a great deal of vile language about the plant has been done away with.

IMMERSE CAUSTIC SODA DRUM IN TANK

MR. MEYERS: We have such a dissolver. We take off the cap and simply immerse the drum in the tank until the water reaches the center opening (four or five inches in diameter) in the top of the drum. That is generally sufficient to dissolve caustic over night.

MR. DOEPKE: We use a great deal of caustic soda, dissolving it in the manner described by Dr. Veillon. Why is it necessary to break up the caustic soda when a granulated form may be had?

DR. VEILLON: There is none to be had at present. There may be some small quantities of crushed caustic soda to be had, but manufacturers refuse to furnish it as they cannot get the necessary labor. We use a great deal of caustic soda in our phenol plant and are about to install a crusher. Whether or not it will be a success I do not know, as it is really a coal crusher. It has hard steel rings which will hit the soda and no hand breaking will be necessary.

MR. DE BLOIS: We will take up our next subject, returning to this one later if we have the opportunity. Mr. Fiske will lead the discussion.

DUSTS

IN MECHANICAL OPERATION OF MANUFACTURE FUMES AND GASES

MR. FISKE: In outlining the discussion on "Fumes and Gases" it appeared advisable that they should be treated as one subject and probably the same methods are used for combating common hazards. I feel, however, that certain classifications could be made; so I divided them as follows: Fumes and gases not soluble in a non-poisonous liquid; fumes and gases soluble in non-poisonous liquid; those that are more or less solid or mist-like in their nature, and could be filtered out. The treatment for mist-like fumes would also apply to dusts.

PROTECTING WORKMEN AGAINST NON-SOLUBLE MATERIAL

Under the first class, which are not soluble in a non-poisonous liquid, it is plain that a neutralizing agent could not be employed in the common form of a respirator, such as most of us use in our plants in one department or another. In that class, my practical experience has been that carbon monoxide, the poisonous constituent of blast furnace and producer gas, is the proper constituent; the same as CO is not a proper constituent of gas, although gas itself is not a hazard, we have to look after operating conditions. We find the very best scheme for protecting workmen against non-soluble material is in the form of a respirator; this combines a mouthpiece connected to a long, light, flexible tube—long enough to reach a pure supply of air. We have tried a patented half-hour rescuer, but the men do not want to use it. It is cumbersome and in hot weather, warm, and unless it is constantly inspected to see that the potash is fresh and the oxygen cylinder full, it is not fit to use. We have tried the tube prin-

ciple with other forms of mouthpieces, but find they almost invariably leak around the face. They are not so well liked by the men as the present mouthpiece. What is wanted, in most emergencies, is an equipment that cannot get out of order, that is rapidly donned and allows a maximum freedom of motion while in use.

Under class 2 we have to contend with sulphur dioxide, sulphur trioxide and hydrochloric acid. None of these is ordinarily classed as a poison, but the same steps must be taken to prevent their being breathed as though they were poisonous. As a protection against such fumes men often prefer a slightly dampened cloth folded several times and tied across the nose and mouth. This is very simple to apply, easily rinsed or thoroughly cleaned, and when not in use it is dropped around the neck, out of the way, while the ordinary form of respirator is an inconvenience when so worn—I speak of the respirator with which most of us are familiar, a muzzle of fairly flexible rubber. For that reason many of the men do not want it and will not use it.

We have another form of respirator, it is all cloth and fits tightly over the nose and mouth. This is one of the principal objections to most forms of respirators.

WORKMEN MUST WEAR APPROVED TYPE OF RESPIRATOR

We also have, under the third class—which includes for the moment, dusts—the same conditions and merely a filtering element is satisfactory. Some may question whether this is a fume or dust, but as it is unquestionably a fume when first formed, and is so fine and light that it remains in suspension a remarkably long time, we have always considered it a fume and adopted safeguards accordingly. Our precautions are directed almost entirely, however, against the so-called leaded zincs, carrying as high as 25 per cent lead oxide. All workmen coming in contact with leaded oxides are required to wear one of two or three approved forms of respirators all the time he is in contact. They have their choice of type and we find that quite a variety of taste is shown.

At the end of each shift, the respirators are thoroughly washed. For a time we included a weekly disinfection, formaldehyde being the reagent generally used. We found, however, that in order to use a strength which was sufficient to give proper results, a smell was left in the respirator to which the men decidedly objected. Disinfection was abandoned: whether wisely or not, is a question.

The precautions I have mentioned aim to eliminate absorption through the respiratory organs only. As there is no doubt that lead may be absorbed through the alimentary track, and possibly through the skin, further steps are taken through the installation of a change room, washrooms and a lunchroom, all in one building. In the change room we have a system of hangers, suspended on chains which run over pulleys placed high above the floor, the other end of the chain runs down to a hook and ring, secured by an ordinary padlock. We have abolished lockers in this department.

When a man begins work on leaded oxide he is assigned two of these hangers, one for his street clothes and one for his work clothes, the hangers being situated in different parts of the change room. He is also provided with a kit containing a tooth brush, tooth powder, soap and a nail brush. He leaves his dinner pail in the lunch room and is not allowed access to it until he has washed thoroughly. Upon finishing work for the shift he is made to wash thoroughly and is required to take two shower baths per week. He is furnished with two face towels and one bath towel per week and is allowed ten minutes before lunch and before quitting time to wash up. The towels are washed in a well-equipped laundry run in connection with the change room. An attendant is constantly in charge to see that all regulations are rigidly enforced.

All men on this work are examined once every month by the company's surgeon and if they show first symptoms of lead poisoning, no matter how slight, they are transferred to other work. In the interval between examinations, if a man complains of any sort of illness, he is immediately sent to the doctor, regardless of his scheduled examinations. By the adoption of these precautions we have been able to eliminate lead poisoning, with the exception of the first symptoms in a few cases, which, if taken in time, never lead further.

EDUCATION OF WORKMEN GREAT FACTOR

It is true that a great factor in obtaining proper results from all these precautions is the education of the workmen themselves. We have to contend with their tendency to take a chew of tobacco from a package of fine cut or roll a cigarette while their hands are actually filthy with poisonous oxide. An extreme case might be cited in which a man washed his hands and face very carefully in the wash basin and then began to use the same water for brushing his teeth. Not only in this particular work, but in all chemical hazards the education of the workmen is of extreme importance.

The men must be taught that what we are trying to accomplish is for their good and proper co-operation can be obtained only by their gaining a proper understanding of conditions; the difficulty is increased by the large percentage of foreigners, but it must be met. The best place to eliminate hazards is at their source and every bit of leakage means a loss of raw material, intermediate or finished product. From the viewpoint of economy alone all possible leakage should be eliminated. To this end proper design and erection of equipment are necessary, as well as eternal vigilance on the part of both foremen and workmen. In spite of all precautions leakage will sometimes occur, and in such cases the use of hoods and exhaust fans will often clear the atmosphere sufficiently to make respiration safe. Such installations involve expense; so much so that sometimes they are considered almost prohibitive; on the other hand such installations are sometimes gold mines in disguise. I have in mind the installation of a ventilating fan and bagroom in a crusher system at one of our plants. This crusher was working on leaded ores and lead poisoning

reached a point which led to a decision to adopt preventive means regardless of expense. Lead poisoning decreased to practically nothing almost at once. The ores which went through this crusher were later roasted and it is our accounting system to charge all losses between raw, uncrushed ore and finished product against roasting at a practically uniform percentage of loss. At the end of three months it was found that the figure of loss would have to be decreased as we were gaining on roasted ore. We found that the saving accomplished by the bagroom paid for the installation in about one year.

THE HUMANITARIAN STANDPOINT

From a strictly humanitarian standpoint no expense can be considered prohibitive. If the manufacture of a certain necessary product involves danger to the health and the lives of the workmen through poisonous gases which could be removed by the expenditure of an amount of money which would eliminate all profit, under existing market prices, then the humanitarian might properly argue that the price of that product should be raised until it allowed a reasonable profit. Are we not, however, approaching the humanitarian's viewpoint and for reasons not entirely his? Most of us can remember the days when men could be obtained for almost any job, no matter how hot, dirty or unhealthy it was, provided the pay was high enough. We all know those times are past and conditions are changing rapidly, even now, due in no small measure to the present war. What they will be in the future none can tell, but all indications point toward the necessity for making conditions healthful and even pleasant. If this is accepted as true, it behooves us to be laying our plans for the elimination of all such hazards, regardless of cost. In other words, we must cease asking "Will it pay?" and substitute "Will it work?"

Mr. Doepke: It takes a lot of special study to meet these problems. The cost of a ventilating system is largely initial and amounts to very little, compared with the rest of overhead expenses. We have an extractor at one of our plants, that has caused us a great deal of trouble. One winter day I met one of the men who had just collapsed. We took him to the dispensary for treatment and then ordered him to go home and take off his clothes. Instead he went to a saloon, reaching home about 11 o'clock. He had on his work clothes and they were permeated with fumes. When he got home he sat in front of a stove. He collapsed again and it developed into a serious case. We are installing a suction ventilating system at the bottom of the plant to take away the fumes. We will soon have a flow of fresh air and expect this to improve our conditions.

FOREMEN HELD RESPONSIBLE

Mr. Meyers: Our first plant was built as an experiment; we knew nothing about the manufacture of benzol and you can realize our difficulties. We wash our chlorine, or, rather, use a drier, into which we pumped sulphuric acid. This made a fine situation but we overcame it by putting a special compressor hose on the flange at the bottom. We have construct-

ed a new outfit outside of our main building and for benzol fumes we use a system similar to the one just described.

We do not allow our men to work in their street clothes and they are required to change their clothes in the locker-room. Each foreman is responsible for the men under him. We supply overalls and gloves and place a special mark on them for the foremen's identification. When the men leave the plant they must take a shower bath before going into the locker room. In that way we are able to prevent benzol poisoning.

MR. DOEPKE: Our men change their overalls twice a week—a very important point, because they become permeated with fumes. The proposed rules for the State of New York specify a change of working clothes at least twice each week.

DR. VEILLON: You refer to nitro chlorine benzol?

MR. DOEPKE: Yes.

DR. VEILLON: It is not very toxic. We furnish not only overalls, but underwear and socks and the men change their clothing every evening—a lot of workmen sleep in their underwear. We have had toxic cases and traced them to that fact; the man changed his overalls but he sometimes wore his street underwear in the plant and little splashes of benzol caused the trouble. We make the men change their socks, underwear and clothes and give them a clean set of overalls every day. This looks good on paper, but it is up to the superintendent to see that the orders are carried out—the main thing is to see it is done. Our plant physician examines the men who work in the hazardous departments every day and sees that they actually change and take their shower baths.

MR. DOEPKE: I appreciate the suggestion of Dr. Veillon and will recommend the system for our plant. We have a regular physical examination and give our men a daily supply of sour milk to counteract poisoning. It is easy to make rules on paper, but to enforce them is a problem. Make it an absolute rule that your foreman shall not start the process of manufacture unless he is convinced that the men in his department have actually changed their clothes and underwear. This should reduce the hazard almost to a minimum.

MR. FIESINGER: The discussion on the next subject will be led by Dr. Veillon.

COAL TAR PRODUCTS

1. SOLID—
   - (*a*) IN PROCESS OF MANUFACTURE
   - (*b*) IN PROCESS OF TRANSPORTATION
2. LIQUIDS

DR. VEILLON: I think a round-table discussion of the subject would prove of more value than any paper I could deliver. Suppose we start with benzol, as it is a rather dangerous coal tar product to handle. We are comparatively small users and not producers. If there is a producer of benzol present we would like to hear from him.

MR. MEYERS: We are trying to arrange a fire prevention system and suggestions would be very much appreciated.

DR. VEILLON: We have come to the conclusion that benzol should not be stored when very hot and are putting all our storage tanks under ground —I believe that is one of the very best safeguards against fire. We also found it necessary to lead the vents of tanks out over the roof.

MR. MEYERS: With regard to electrical equipment, we use Crouse-Hinds vaporproof in our switch systems. It is enclosed in a locked case; when the case is opened it locks itself in that position; it also locks itself closed. There is no possibility of a spark.

EXTENSION LIGHTS FORBIDDEN

DR. VEILLON: You could hardly imagine a manufacturing plant without extension lights, but we enforce such an order in departments where benzol is handled. We are using sockets where thousands of gallons are being distilled every day—in production and recovery a tremendous amount is distilled every twenty-four hours. We had a tank, used as a separator, in which water and benzol were distilled. The automatic separator stopped and a man, wanting to find the trouble, got an extension light. It seemed he had a good extension cord and he asked for one of the vapor sockets; then he screwed in his plug and dropped the lamp inside the tank. Next thing there was quite a severe fire. From that day on, no more extension cords were used. The rule was not a new one, but it needed such an accident to pound the dangers they exposed themselves to into the men's heads.

MR. MEYERS: We lock all our vapor-proof sockets. The General Electric Company makes a vapor-proof safety lighting device—it is a small, narrow, single-storage cell and hangs, in some cases, on a man's belt at his back; a very fine cord-covered wire leads to a small incandescent light in his hat; it originally was used for mining purposes. It is the safest thing we have had and we use it around our benzol department.

MR. MASSEY (Du Pont Company): Why do you put your benzol storage under ground?

DR. VEILLON: In case of fire these tanks would not be exposed to the heat.

MR. MASSEY: Could you not use screens?

DR. VEILLON: Very likely, but I would rather have it out of the building.

MR. A. S. ROSS (Milwaukee Coke and Gas Company): At our coke plant we distill and rectify large quantities of benzol and ammonia and at the chemical works, at the phenol plant, a great deal is used. We make it a practice to put all new tanks underground. Vents to all tanks extend above the buildings. Twice within three years tanks have been struck by lightning but caused no damage, just a small amount of fumes.

USE OF HELMETS, MASKS AND LIFELINES

DR. VEILLON: For a good many years, possibly ten, in the use of benzol, we never met a circumstance that made us think benzol was toxic.

When we did have a case we did not recognize it as such. Benzol poisoning, however, is a fact and must be met, although it is a rather difficult proposition to overcome the hazards. Wherever you handle benzol the fumes will be all over the room, and when you consider a ventilating system you will probably find that in the winter the rooms, to be properly ventilated, would be so cold the men could not work in them. It is best to safeguard each individual and not try to guard against benzol fumes by taking care of the whole manufacturing room, although a great deal can be accomplished by doing away with all leaks. Periodical inspections should be made of all gaskets, manholes, flanges, pipe connections and so on—you may run along for months, losing a lot of benzol, and not be aware of leaks, until a toxic case calls your attention to some pretty bad ones. The best method of safeguarding this apparatus, we find, is the vents to carry the poisons out through the roof; while benzol is heavier than air it nevertheless carries off the vapors and keeps the room free from obnoxious fumes.

FATAL ACCIDENT DUE TO ERROR

MR. MEYERS: We found that poisoning by benzol, chlora benzol, is killing in its effect. We had three men in a repair room; one was a drier. It was his duty to work where he would come in contact with more fumes than most men in the process of manufacture. He was sent to do some repairing and, by mistake, someone turned on the fume line. After working for some time they managed to pull him out; the other two men, pipe fitters, were not exposed to so much of the fumes. They lived, but the drier died after several hours of intense suffering.

Another case was that of a man sent into a tank with a rope around his waist; evidently the helmet did not work well, so he removed it, not realing that the main thing was to get out of the tank; as a consequence he fell with his face in the sludge. In a few minutes a man wearing rubber boots went in after him: this man slipped and fell also. Several minutes afterward the foreman, realizing that something had happened, looked in and saw both men lying with their faces in the sludge. He got them out, rushed them to the hospital and in three hours' time they were back on the job, experiencing no bad effect. The doctor explained they were both new men and had not been long exposed to the fumes. We have found the effect is accumulative.

MR. DOERKE: As I see it, the hazard really sets in after you have nitrate of benzol. We had quite a few cases of sickness, mostly among Italians and Poles, but we could not explain why. We traced the cause and finally discovered that most of these people became sick after working around diamond vats, especially in cleaning operations. We installed an arrangement that greatly overcomes this hazard by putting round sticks at the bottom; they are staggered, interlocking, and they keep continually scrubbing the vat, so in cleaning it is not necessary for a man to enter the vat at any time. You cannot persuade the men to wear masks; they find them inconvenient, but if you let a low pressure of air into the vat and at the same

time have a suction fan at the outlet of the manhole, I think you will find a continuous flow of air, doing away with all kinds of poisoning during cleaning or repair work.

MR. DE BLOIS: It is time to close our session. It has been a very interesting meeting and I am sure will prove very helpful in formulating new ideas and bringing new men into the Chemical Section.

REPORT OF NOMINATING COMMITTEE

CHAIRMAN FIESINGER: The next order of business will be the report of the Nominating Committee.

MR. DE BLOIS: The committee wishes to present the following nominations: Mr. E. H. Fiesinger of the Solvay Process Company for Chairman; for Vice Chairman, Mr. H. C. Slade of the Hooker Electro-Chemical Company, Niagara Falls, N. Y.; Secretary, Mr. F. M. Shott of the United States Rubber Company, Detroit, Mich. (The recommendations of the committee were unanimously adopted.)

The Section then adjourned.

Public Utilities Section

St. Louis, Mo.

Sept. 18, 1918

C. B. SCOTT, Chairman
General Manager, Bureau of Safety, Chicago, Ill.

C. E. PAIGE, Vice-Chairman
Manager, Malden & Melrose Gas Light Company, Malden, Mass.

H. B. HARMER, Secretary
Safety Engineer, Philadelphia Electric Company, Philadelphia, Pa.

WEDNESDAY MORNING SESSION

CHAIRMAN SCOTT: The Section will please come to order. Each delegate will please stand and give his name and the name of the company with which he is associated, that the record may show all of those present.

Wills Maclachlan, Inspector, Electrical Employers' Association of Ontario, Toronto, Ont.

Herman Spoehrer, Secretary and Treasurer, Union Electric Light and Power Company, St. Louis, Mo.

W. H. Hilton, Toronto.

A. O. Mitchell, Adjuster, Northern Indiana Gas and Electric Company, Hammond, Ind.

H. A. Johnson.

F. B. Van Doren, Utilities Mutual Insurance Company, Albany, N. Y.

John Bailey, Bell Telephone Company of Pennsylvania.

C. B. Walsh, Bell Telephone Company, Philadelphia, Pa.

Samuel H. Reid, Bureau of Safety, Chicago.

F. N. Leonard, Public Service Company of Northern Illinois, Chicago, Ill.

G. F. Johnson, Pittsburgh Coal Company.

J. J. Hayes, Southwestern Bell Telephone System, St. Louis.

H. J. Bayliss, Southwestern Bell Telephone System, St. Louis.

A. B. Dow, International Harvester Corporation, Chicago, Ill.

James Harmon, Interstate Public Service Company, Louisville, Ky.

George T. Hellmuth, Chicago, North Shore and Milwaukee Railroad, Chicago, Ill.

W. P. Strickland, New York and Queens Electric Light and Power Company, Long Island City, New York.

J. B. Douglas, The United Gas Improvement Company, Philadelphia, Pa.

G. E. Clarkson, Welfare Bureau, Pittsburgh Railways Company, Pittsburgh, Pa.

W. A. Yandell, Union Electric Light & Power Co., St. Louis.

CHAIRMAN SCOTT: The first item on our program is the report of the Chairman. In view of the fact that the Chairmen of the various committees will submit reports, I, as Chairman of the Section, will make no special report. The Secretary of the Section will please read his report.

SECRETARY'S REPORT

MR. H. B. HARMER (Safety Engineer, Philadelphia Electric Company, Philadelphia, Pa.): *Mr. Chairman and Members of the National Safety Council:* I have the honor to report to the members of the Public Utilities Section for the current year the activities of your executives and of your Section. It was the intention to hold frequent meetings during the year, but owing to necessary pressure and the increased duties of your officers, two meetings only were held, both in New York City.

The following Safe Practices pamphlets were recommended and the National Safety Council was asked to compile and complete them for distribution: "Prone Pressure Method of Resuscitation;" "Street Lamps;" "Chains, Hangers, Hooks," etc.; "Handling and Storing of Coke;" "Loading, Unloading and the Hauling of Poles and the Safeguarding of the Same on Public Highways Before Erection;" "Protection of the Public in Street Hazards, Due to the Necessary Work by Gas, Electric, Telephone and Telegraph Companies During the Construction and Maintenance of Manholes, Laying of Pipes, Erection of Poles and Stringing of Wires;" "Protection of Employes in Street Hazards Due to the Same:" a special bulletin on "The Location and Design of Electric Switches in Gas Plants."

Your Safe Practices Committee prepared photographs and bulletins for use as standard bulletins, material for over 100 being furnished the National Safety Council for publication and distribution.

A membership campaign was inaugurated under the direction of your Membership Committee. A personal letter on Sectional letter paper and signed by the Chairman, a six-sheet folder containing a list of present members and other valuable data pertaining to the Section, together with samples of Public Utility bulletins and a membership blank, was sent to 1,015 electric light and power companies and 149 gas companies —prospective members.

Much has been accomplished during these trying times, due to the unselfish efforts of your Chairman and your committees and the usual high standard of co-operation by Mr. Cameron and his staff at National Headquarters.

CHAIRMAN SCOTT: We will now hear the report of the Membership Committee.

REPORT OF MEMBERSHIP COMMITTEE

SECRETARY HARMER: Mr. Edward L. Davies, Chairman of the Membership Committee, is unable to be present. His report is as follows:

Our 1917 report showed a membership of 203. During 1918 we obtained 23 new members but had a cancellation of 28 members. We have a present membership of 198.

Your committee sent out, under date of March 11, 1918, a circular letter, enclosing a folder setting forth the advantages of membership in the Council, giving the details of membership and enclosing specimen bulletins. This letter and folder was sent to 1,015 electric light and power companies, 149 gas companies and a list of telephone companies supplied by the Bell Company.

Upon receipt of notification of a cancelled membership your Chairman has written the member, asking the reason for same and earnestly requesting the member to reconsider the matter and continue his affiliation with the Council.

I wish to emphasize to the members of our Section the importance of continuing their memberships and also their interest and activity in our Section, as their influence is widely felt because of their close contact with the public. The committee wishes to express its appreciation of the work and hearty co-operation of the Chicago headquarters office of the Council.

(The reports were accepted and filed.)

REPORT OF SAFE PRACTICES COMMITTEE

Mr. Chairman and Members of the National Safety Council: It gives me great pleasure to report that the activities of the Safe Practices Committee for the past year have largely consisted in the successful continuation of the work inaugurated and carried on to a high pitch of perfection by last year's committee. The committee wishes an expression from the Transportation and Public Service Sections as to the advisability of preparing pamphlets for these sections or is it their thought that the hazards have been sufficiently considered in the National Electrical Code. Pamphlets for these sections are desirable from the point of view of bringing the work up to date, also the collection of information on hazards in standard form.

The committee has also, through the co-operation of various member and other organizations, collected material and issued bulletins weekly on safe practices. These, in practically all cases, have been illustrated by photographs from actual conditions. In this connection the Council staff might well consider a definite plan of field work to secure photographs and data according to schedule, with the approval of Sectional officers, as pressure of war work has reduced the material available through voluntary effort.

The committee believes that Safe Practices pamphlets in their present form should cover all industries in detail. These form a manual for safety engineers and shop committees.

F. W. FISHER, Chairman.

(The reports were accepted and filed.)

THE FORMAL PROGRAM.

CHAIRMAN SCOTT: At the time we arranged our Sectional program I said, and I still believe, that one of the most important subjects that public utility interests have to consider is that of public safety. I am sure we have made definite progress toward getting safety into our plants and into the minds of our employes; that we have succeeded in our efforts to enlist the interest of our men and that we have thereby reduced the accidents to our employes; but there remains an issue that troubles us safety men, as citizens and as individuals, having regard for the life and injury to the public. It is that something should be done, by taking advantage of the close relationship between public utilities companies and the public whom they serve, in reducing the public accidents. The program committee, with that thought in mind, selected the subject indicated by the first number on our program, "Interesting the Public in Co-operative Accident Prevention." In looking about for a man to present the subject, our selection was made with difficulty, but finally we secured a man with constructive and helpful ideas on the subject. He has prepared a paper that I know will be of great interest and should, by application of its recommendations, do a great deal of good. I take pleasure in introducing Mr. Herman Spoehrer.

INTERESTING THE PUBLIC IN CO-OPERATIVE ACCIDENT PREVENTION

HERMAN SPOEHRER, SECRETARY AND TREASURER, UNION ELECTRIC LIGHT AND POWER COMPANY, ST. LOUIS, MO.

Mr. Chairman and Members of the National Safety Council: Public utility companies have long since recognized the importance of accident prevention organization within their ranks and by systematic attention to the subject have obtained most gratifying results. As was natural, in the beginning safety education was devoted only to the workmen employed by the utilities, since accidents involving the employe were of constant and frequent occurrence, the more obvious, and the more closely affecting the orderly operation of the utility. The jar produced upon the harmonious mechanism of the business, and the clearness with which the employer was impressed with the social, industrial and personal loss, the family suffering, and endless resultant evils whenever a workman was disabled or killed, quickly developed—among those who were in a position to do most to check the growth of the industrial casualty list—a decision to abolish as far as possible all avoidable accidents to employes.

Gradually, yet rapidly when the age of the movement is considered, the

development of accident preventative measures took place, first in a disjointed way among individual companies where the hazards were extraordinary and caution was wellnigh a necessity for self-preservation, then to businesses less hazardous, until finally the bulk of the industries of the country combined in an active campaign to increase efficiency, conserve manpower and safeguard society by protecting their employes from accidental injury or death. Into this campaign they have thrown the same energy and systematic methods that they used in building up the commercial phases of their organizations and have added to the technical sciences that of safety engineering, having Safety First as its motto. Industry has thus occupied its full field of activity and added to its original function of creating the artificial necessities of life the equally important one of conserving life itself.

A TYPICAL SAFETY ORGANIZATION

The safety organization of the Union Electric Light and Power Company is probably typical of those maintained by utilities for the protection of employes. The organization consists of a central safety committee directing and co-operating with a comprehensive organization of safety subcommittees, one in each divisional group of employes. The practice is followed of having each subcommittee at its monthly meetings analyze and discuss all accidents that may have occurred under its jurisdiction during the previous month, with the view of determining the causes and providing against a recurrence of similar accidents. Hazardous conditions are reported, investigations made and safeguards are recommended and installed. The practice of having the linemen and troublemen submit the tools and appliances which are furnished by themselves to the safety sub-committee for inspection was adopted and found to be a good procedure. The prone-pressure method of resuscitation is rehearsed weekly by each linemen's gang, under the guidance of the company's medical director, for the purpose of maintaining the efficiency of the men in the application of the method.

The effect of our safety organization is shown by the comparative figures for 1916 and 1917, there being among our employes thirty-nine fewer accidents and 3,911 less disability hours in 1917 than in 1916, notwithstanding that a much greater amount of construction work was carried on in 1917 and station operations were under construction conditions. This gratifying experience is an example of what has been done among utilities for the greater safety of their workmen.

The success of the safety movement as affecting employes has led to the broadening of the movement to include the public, and at the present time many utilities have in their safety organization a public safety committee to carry on this branch of work. This phase of the work obviously presents much greater problems than that of promoting employe safety. In the one case the employe and usually the place in which he works are under the control of the employing company and the best obtainable conditions prevail for the application of persuasion, warnings and compulsory education to eliminate dangerous methods of doing things and for the prompt correction of dangerous conditions in and around the company's

property and equipment. As to employes, therefore, the situation is definite and capable of solution. In the case of the public, on the other hand, there is present no authority over the individual, and usually none over the premises where accidents may occur, except in so far as company equipment is concerned, and where such equipment is involved there is, of course, usually no company representative present to warn the incautious or imprudent of the possibility of injury. Moreover, the sources of injury are often of such innocent appearance as to give rise to no suspicion and disastrous experience is often the only index to their destructive potentialities when not properly handled. The public being, comparatively speaking, individually isolated, goes on daily suffering countless accidents because of inadequate warning from those to whom experience has given advisory qualifications.

ACCIDENTS A DRAIN ON THE NATION

The evils resulting from these countless avoidable accidents are so numerous and have been so often recounted among us who have kept up with the safety movement that it is unnecessary to repeat them here. When we say that every accident producing any degree of disability or requiring any curative attention to the victim results in a waste, a net loss to the individual, to those dependent upon or supporting him, an economic loss to society and therefore to the Nation and to the world, we have given sufficient reason for making it a part of our business to promote public safety. The fact that occasionally an accident which could have been avoided is suffered by an individual of the public from our equipment and compensated through our claim departments furnishes an apparently selfish and lesser reason for its promotion, but this, too, is important, since ultimately the cost of such accidents is paid by the patrons of the utility in the cost price of its product.

The main problem in the promotion of public safety is to make personal contact with the public, to reach the individual in order to obtain and hold his attention, to arouse his sympathetic interest, and to impress upon him the necessity for and the great saving effected by the cultivation of habits of caution and prudence. The public is simply a collection of individuals—we use the word to distinguish them from our employes—and must be individually impressed. Caution, like a fist fight, is in its very nature a purely personal matter. The individual must realize his own personal interest in the matter and that it is up to him to look out and to protect himself from needless accidental injury. Having acquired the habit of conscious carefulness he is then in the best position to extend his activities to the protection of the less prudent by arousing in them the same careful spirit that he has developed. When a sufficient number of the public have been so reached and impressed the time and conditions will be ripe for effective co-operation towards accident prevention. The subordinate problem is to spread information of the more prevalent hazards or risks, to advise concerning safeguards and precautionary measures and to instruct in safe methods of doing things so as to promote proper habits of action.

TACT REQUIRED TO REACH THE PUBLIC EAR

It requires tact to reach the public ear and in this connection it seems that it may best be done by discussing with the public those accidents which arise out of the handling of our commodities or are in some way related to our business. The element of mutual interest thus prevents us from appearing to our great audience in the role of gratuitous advisors. While it seems necessary to dwell on the hazards related to our business, care must at the same time be exercised lest we create a mistaken impression that our commodities and our operations are extraordinarily dangerous and unsafe, thus discouraging their use to the detriment of our business.

The accidents affecting utilities of which the public should be informed and continually warned may be classified into those occurring within and those occurring outside the home. Of outside accidents, the most frequent and serious are those resulting from broken and fallen wires. Our company has had two experiences in this class of accident which emphasize the problem of prevention and the necessity for public co-operation. In one case, which later resulted in a jury's verdict for $50,000 against the utility, a live wire blew down in an alley. Two women observed the wire falling and both left the scene, the one to try out the telephone, the other the electric light, to determine which wire had broken, instead of one standing guard to warn any passer-by of the danger while the other should notify the police or the electric company. A few minutes later two boys came along in the alley, one of whom came in contact with the wire and received injuries rendering him helpless for life—the fingers of his right hand being practically burned off and his left hand and arm being made useless. The uninjured boy made a signed statement that as they were walking down the alley they saw the wire and he cautioned his companion against touching it. He later testified that they were running and that he shouted a warning but at almost the same instant the accident occurred. The nature of the victim's injuries indicated that he had undoubtedly grasped the wire.

In another such case a wire was burned down by a tree blowing against it during a storm. The mother, from a window in their home, saw this wire fall and cautioned her boy—about six years of age—against touching the fallen wire, but notwithstanding the warning the child later went out and took hold of the wire and was rapidly being burned to death when he was rescued by a passing negro boy who fortunately had the presence of mind to drag the victim from danger, using his own hat as a glove and catching the victim's clothing.

Both of these accidents illustrate the danger of dangling wires and are peculiar in that in each case the victim had been cautioned, showing the difficulty of prevention in some cases without actual restraint, because of the heedless disposition of some persons or classes of people. On the other hand the heroic action and prudent procedure of the negro boy furnish a really inspiring example of the possibility of cultivating the safety spirit even among the humbler and most handicapped elements of our population.

A similar class of accidents are those arising from children climbing trees or poles or guy wires and coming into contact with live wires These are of more or less frequent occurrence. Our State court reports carry a recent case where a boy climbed a tree to reach a bird's nest and fell from the tree on the wires of the electric utility. Our company was concerned in a case where a lad was electrocuted by climbing guy wires. In this case, after the planting of the stub, thoughtless persons at some time dumped earth around the stub and raised the ground—this enabled the boy to reach the lower guy. Another guy was attached from the same pole and stub, so that he was able to walk along the lower guy while holding the upper until he finally took hold of the power circuit. Just at this instant a lad on the ground was helping a third to mount the guy wire. The latter, standing on the shoulders of the boy on the ground, was grasping the guy wire, and thus the current was grounded through the bodies of the three boys, with the result that the first was instantly killed and the other two severely injured.

ACCIDENTS DURING CONSTRUCTION WORK

Another frequent source of accident is the erection by contractors of various temporary or permanent structures in close proximity to high-tension lines or their carrying on operations without due regard to such proximity. An example of this, terrible in its results, recently occurred at the Bevo plant in this city, costing the lives of nine workmen of the construction company erecting the building. These men were taking down a steel cable which guyed a temporary tower used to hoist concrete. This cable crossed above the street circuit to its anchorage and was slacked off at the top while the gang below reeled it up. No notice had been given the electric company and no safeguards were employed to prevent contact with the live wire, which finally occurred from too much slack in the cable, with the above disastrous result. Derrick rigging, the erection of fire escapes and other structures are likewise constantly giving rise to accidents and hazardous conditions. These matters more especially affect builders and contractors and co-operation with them must be effected. City ordinances may aid also with this phase of the problem.

Street excavations, for the purpose of laying conduits and gas and water pipes, also contribute to accidents to the careless public, intoxicated persons, automobile speeders and incautious and abstracted persons frequently becoming involved in more or less serious mishaps from this source.

The transportation departments of utilities are occasionally involved in accidents affecting the public. Many of these arise from the careless practice of "jay-walking"—by which pedestrians take unnecessary chances of injury by automobiles. Municipal legislation is already looking toward a solution of this problem in many cities and the practice is being discouraged everywhere. Manhole accidents are also of occasional occurrence, covers becoming broken and displaced. The public can co-operate by reporting these conditions to the utility.

Accidents are also caused to the public by objects being dropped from

poles or lines by overhead workers, notwithstanding the fact that there is always a groundman under the worker from whom passers might take warning. Greater vigilance is required to prevent these cases. This suggests the idea that a standard warning sign might be adopted and popularized by the utilities to indicate to pedestrians that overhead or aerial work is being carried on in the vicinity, similarly to the use of the red flag indicating work on or below the street level.

CO-OPERATION BETWEEN UTILITIES AND THE PUBLIC

The foregoing constitute the most frequent outside accidents which can be largely prevented by co-operation between the utilities and the public. Public co-operation can be further enlisted by warning our patrons of those accidents likely to occur in the home. Chief among these are fan-blade cuts from attempting to move fans while they are running or in rescuing curtains or papers which have been drawn into them without first switching off. The possibility of causing disastrous fires by leaving electric irons on the board with the current on, or of receiving burns from short circuits in old and frayed iron cords, the dangers of coming in contact with the metal parts of lamp sockets or fixtures while part of one's body is in water in the bath tub or while one is standing on damp or wet cellar floors, the hazards of permitting wiring installations or alterations by incompetent or unauthorized persons, and of permitting amateur experimentation with the meter or wiring or with apparatus connected to the house circuit by the scientifically bent boys in the home should all be called to public attention. Accidents also occur from the failure to properly close valves of gas appliances, permitting an accumulation of gas which causes a flash of flame when the appliance is lighted. Blowing out the gas, fortunately, is at this late day seldom indulged in, but the dangerous method of looking for leaks with an open flame is still of frequent occurrence. The public should be advised that the proper procedure is to ventilate as thoroughly as possible and then phone the gas company, which in most cities will be found to maintain a 24 hour trouble service.

Accidents due to absence of or insufficient illumination may also be touched upon by utilities. Among these may be mentioned the selection and administering of wrong medicines in darkness, falls down stairways or on steps on which unseen objects may be lying, and falls over furniture and other objects.

EFFECTIVE METHODS OF MAKING CONTACT WITH THE PUBLIC

We have found at least three effective methods of making contact with our patrons to secure their co-operation towards accident prevention. The first of these is through our employes, installation men, inspectors, meter readers and others whose work takes them to the customer's premises. These men frequently have an opportunity to call attention to unsafe conditions noted on the premises and in a tactful way to suggest safety measures. Also in the manner of doing their work and safeguarding

installations made for patrons they are able to give valuable object lessons in safety first.

Another means we have used with gratifying success is that of writing letters to patrons where particularly dangerous situations have been found by employes. When carefully worded these letters nearly always find a favorable reception and accomplish much good. As an example of our gratifying experience with this method we cite our correspondence with the Warren Steel Casting Company of this city for whom our company constructed a receiving sub-station in 1916. When the work was completed an unsafe condition was noted and reported to our safety organization, and we wrote the following letter:

A WARNING OF UNSAFE CONDITION

St. Louis, Mo., Oct. 7, 1916.—Mr. C. E. Hayden, Waren Steel Casting Company., *Dear Sir*: The suggestion has reached our Safety First Committee through one of our foremen, that a fence be placed north of the east line of your plant to a point opposite this company's pole, thence west to the pole, thence west to a point approximately five feet west of the Union Company's pole, thence south from this point directly to and fastened to the sub-station, and that this fence be made of sufficient height to keep any trespassers out of these premises. The reason assigned for this suggestion is that the outlets on the sub-station are so low that it is feasible and possible for a man, who might be carrying upon his shoulder some long object tilted at the right angle, to come in tact with the high-tension wires, the consequence of which would undoubtedly be fatal. We have in our organization a Safety First Committee, comprised of our employes, who offer safety suggestions on any unsafe conditions about the company's plants and property, and also on consumer's premises in so far as we are interested. As secretary of the committee above referred to I have been directed to refer this suggestion to you, and I trust it will be received in this spirit.

"We will be pleased to receive an expression from you in this matter. Thanking you for your interest and co-operation, I remain, very truly yours. H. Spoehrer, Secretary, Central Safety Committee."

THANKS FOR WARNING

To this letter we received the following reply:

"St. Louis, Mo., Oct. 19, 1916.—Union Electric Light & Power Co. Attention Mr. Spoehrer. *Dear Sir*: We have your letter of the 7th inst., containing a suggestion for protecting anyone from coming into contact with the high-tension wires which enter into our sub-station. We thank you very much for this suggestion and your interest in this matter, and assure you that same will be given our immediate consideration and attention. Again, thanking you, we are, very truly yours,

"C. E. Hayden, President, Warren Steel Casting Company."

As a result of this brief correspondence a condition over which we had no authority was corrected and the safety movement secured a substantial

boost. The persistent pursuit of this policy will do much towards securing public co-operation.

A DRAMATIC PRESENTATION OF SAFETY WORK

A third effective method is by means of motion pictures illustrating dangers and how they may be avoided. These films have already been shown throughout the country and are doing great good. Shortly after our company actively engaged in safety work we prepared such a film, which was exhibited in most of the theaters in this city, and before a number of civic organizations, and was everywhere well received. This film illustrated both the right and the wrong way of treating a dangling wire, thus teaching by contrast. First, a passer-by is shown discovering a fallen wire. Instead of remaining on guard he goes away to telephone. In his absence a child comes along and is attracted by the wire, and in a few seconds receives a serious shock. A second man appears, who with the aid of a stick clears the wire from the child and directs a doctor to be called, and in the meantime applies the prone-pressure method of resuscitation in an unsuccessful attempt to restore the victim's respiration. Then follows the portrayal of the correct method to be followed in which the person discovering the fallen wire stands guard until the next passer-by approaches, whom he dispatches to the telephone to notify the electric company. In a few minutes the company's repair auto arrives and the troubleman cuts down the dangling wire, thus avoiding injury to anyone. This film created a vivid and lasting impression on the onlooker and conveyed a valuable lesson.

Public co-operation may also be enlisted by the outside circulation of the company's trade periodical to a limited extent among the public. Our company has among its patrons some 3,000 preferred stockholders to whom our periodical, *Wire and Pipe*, is regularly sent. Each issue contains articles and statistics on safety and accident prevention in a section set aside for safety promotion, and thus this large and influential group of patrons are gradually enlisted in the safety movement. In the absence of or supplementary to a company publication, newspaper advertising may be used to advantage, as witness the recent advertising campaign of the National Safety Council having as its keynote the conserving of manpower for the defense of the Nation and the successful prosecution of the war.

UTILITIES COMPANIES AND EDUCATIONAL CAMPAIGNS

The subject of municipal ordinances is one deserving of attention as a means of promoting public safety and thereby indirectly securing co-operation in the prevention of accidents. Ordinances based upon the safety principle, regulating automobiles, pedestrians, buildings and building construction, elevator and boiler inspection, trespassing, etc., all tend in this general direction, and utilities can aid by offering suggestions to the framers of these laws, based upon our experiences. This likewise must be very tactfully done, lest a selfish motive appear to actuate us, thereby arousing antagonism and producing an effect exactly opposite to that desired.

The attainment of the desired degree of public co-operation will be of slow accomplishment, but it can be done. The suggestions here given are offered as means which have proved useful. Doubtless others have had similar experiences with other methods. If so the national safety organizations of our utilities and other industries furnish a medium of exchange of ideas which puts us in touch with the best there is in progressive safety thought. Our relation as public utilities places us in the best position to conduct a successful campaign for the enlistment of public co-operation in accident prevention, and we should put forth unremitting efforts to secure this immeasurably beneficial result.

APPOINTMENT OF NOMINATING COMMITTEE

CHAIRMAN SCOTT: I am sure we all appreciate Mr. Spoehrer's paper. Before proceeding with its discussion I will appoint a Nominating Committee to make recommendations of officers to serve this Section the coming year—this committee to make its report at the close of this session. As Chairman I will appoint Mr. Charles E. Morrison, Mr. James B. Douglas, and Mr. Herman Spoehrer.

It has been suggested that we continue this Sectional meeting in a round table discussion on Friday morning. I would like an expression on the subject.

SECRETARY HARMER: We asked for a full day at the Congress, but we were only assigned a half-day. Many of us can only get away once a year and we only see each other for a few hours. Lots of problems come up during the year and we need all the information that we can secure from other members of this Section. We wish to discuss the problems that confront each one of us particularly and to get the other fellow's ideas and experience. that we may make progress to a definite end. Each of us has a problem of some kind that we want to demonstrate. That is the purpose of convening this meeting.

There is nothing on Friday's program that particularly interests the public utility man—that is our reason for selecting that time.

MR. DOUGLAS: Last year, when we brought the Public Utilities Sectional meeting to a close, it was the opinion of all that the session was entirely too short. I know from personal experience that there is a great deal we need to talk over, and I believe it would be a very good thing, provided it doesn't conflict with the Health Sectional meeting, to have a meeting on Friday.

(After some discussion the Section voted to hold a session on Friday morning.)

DISCUSSION

CHAIRMAN SCOTT: It is unnecessary for me to say that I have listened with a great deal of interest to Mr. Spoehrer's paper, for any one who has been engaged in accident prevention work for public utilities for over ten years cannot help but be attracted to a paper upon the subject of "Interesting the Public in Co-operative Accident Prevention."

Before I enter into any discussion of the body of this paper I would like to say a word regarding the last paragraph, in which Mr. Spoehrer

states that the "national safety organization of our utilities furnishes a medium of exchange of ideas which puts us in touch with the best there is in progressive safety thought."

During the past year I have had the privilege of being Chairman of the Public Utilities Section of the National Safety Council, and naturally have a special interest in the activities of this branch, and what I would like to see is more of the round table spirit in this Section. Round table meetings are appreciated by the majority of safety men, as is also the annual Congress of the National Council, but when it comes to the all-year advantages of the Council, or of the Public Utilities Section, as a clearing-house for safety ideas, many are not fully awake to the opportunities afforded. It is for this reason that I make an appeal to members of the Public Utilities Section to make available to the Council their safety knowledge, as well as receiving the aid *from* the Council.

RESULTS OBTAINED BY SYSTEMATIC DRIVES

Getting back to the subject for discussion, Mr. Spoehrer, in speaking of the effect that the safety organization had upon his company, stated that there were thirty-nine fewer accidents in 1917 than in 1916. My experience was that 1917 was a very bad year for accidents, and that while a company was fortunate to have *any* reduction, especially when it was carrying on a greater amount of construction work than usual, I am wondering what percentage this decrease amounted to. It is an unwritten rule in my office, when speaking of reductions to speak in terms of per cent, for while thirty-nine is a fine reduction from 100 accidents, it is comparatively trivial if 1,200 or 1,500 had occurred during 1916.

If I did not know to the contrary I might believe that Mr. Spoehrer had prepared his paper from the data in my office, for I have in mind examples which substantiate practically all of the points which he has brought out. For this reason, even if so inclined, I could not take exception to any part, but, on the other hand, would like to support this paper with these illustrations from the records which I have just spoken of.

I am becoming more and more of the opinion that our best results can be obtained by systematic drives. By this I mean to concentrate our efforts toward one specific goal at a time, and when that task is accomplished to direct our energy against some other one hazard. Of course, a study is first necessary to determine at what place our attention should be centered.

The result of this plan being carried out on one of the properties under the service of the Bureau of Safety was all that could be hoped for. During the year 1916 this company reported seven fatal accidents to the public, due to ungrounded secondaries. Striking at this hazard our inspectors made recommendations that the secondaries at all locations be grounded, with the result that fatal accidents from this cause were eliminated, and the year 1917 showed a clean record as to this condition.

Mr. Spoehrer has correctly said that the broadening of the safety movement to include the public obviously presents much greater prob-

lems than that of merely promoting employe safety. The term public includes all outside of the employ of the company, and must not be confused with or confined to consumers or customers of the company. In some of our organizations the local telephone men are invited to attend meetings. To others we invite miners from mines supplied with current by our plants. One, at least, held joint meetings with the fire department, and it was found to be to their mutual advantage, for fire inspectors would often find very poor and hazardous wiring conditions. In one location, copies of our monthly Safety Bulletin are sent to the public library, to ministers and school teachers and leaders in the town's activities, all of whom are welcome to attend the regular monthly safety meeting of the employes.

That class of accidents arising from children climbing trees or poles or guy wires, is one of the most important, on account of the seriousness of these accidents, a large per cent of which result fatally.

ACCIDENTS TO CHILDREN

Last week there was held in my office what is called the inter-company safety conference, a meeting of representatives from the several companies under the service of the Bureau of Safety. The subject for this meeting was "Fatal Accidents." As results of the meeting showed, it might well have had for its subject the title of Coroner Hoffman's book, "The Record of the Dead as a Lesson to the Living." A great portion of this meeting was devoted to a discussion of fatal accidents which had occurred to the public during the present year to date. Of the eleven accidents reported this year, five occurred to boys of 12 years and under. As a step toward the prevention of this class of accidents this body appointed a committee of two for the purpose of drafting a letter to be sent to school authorities in all locations in which were operated the public utility companies there represented, asking these authorities to caution the children with reference to climbing poles and trees. This letter is also to contain aid in the instruction of accident prevention in general, and is to be signed by the local manager of the public utility company in each location. It is only through educational means that this class of accident can be reduced, and the school offers a field that, up to the present time, has hardly been touched. The Public Safety Commission of Chicago and Cook County has arranged to hold a safety campaign in Chicago during the week of October 27, which will probably in some way parallel the work being carried on in St. Louis this week. At that time it is planned to reach every single one of the 450,000 children of our 585 public and parochial schools.

I have no doubt that it was with the realization of these numerous fields of accident prevention activities that Mr. Spoehrer spoke when he said that the public phase of the safety work obviously presents much greater problems than that of promoting employe safety, and I sincerely hope that his address will be but the starting point of a great nation-wide campaign which has for its goal the "Interesting of the Public in Co-operative Accident Prevention."

MR. MORRISON: The proposition is absolutely reciprocal—the obligation is just as great on the public utility as it is on the public, perhaps more so. The public utility should see that all of its overhead and underground lines and branches are in standard condition: then we will eliminate a great many public accidents. We want the public with us, in order to solve this whole problem, which is a tremendous one. I am not taking the stand that industrial accidents in our plants can be eliminated; I do not think that is possible—never will be; but we can eliminate a large part of them. We can divide the subject into several groups. *First*, the interest of the public utility because of the function it plays to the public. *Second*, the interest of the municipality, including the police and street cleaning departments, the school children, and all the multifarious divisions of the municipality. *Third*, insurance carriers, because they are to carry so much public liability insurance. The first problem is to gauge our future activities by the facts presented in our past experiences, so that we can lay our course for the future. Our local State and Federal governments have enacted legislation looking toward the safeguarding of the public in a more stringent manner and the reporting of every accident. We must have all the data we can procure—the facts in regard to each case—that we may know just how to go about curing these evils.

MR. MACLACHLAN: A point was raised in connection with the co-operation between other employes and the electrical employes. The big drive we have been trying to make in Ontario has been to see that every electrical man thoroughly understands the prone-pressure method of resuscitation and can keep it up for at least fifteen minutes. We have asked the co-operation of the police and fire departments and electrical employes in factories. We have had very gratifying results so far.

MR. STRICKLAND: I have the mortality record as published by the United States Continental Registry Area, which covers about two-thirds of the United States. In Cook County, for instance, it shows twenty-one deaths from shock; based on that, there would be 800 deaths in two-thirds of the area of the United States from all kinds of electrical shocks. I would like to know if that would be considered somewhere near correct?

CHAIRMAN SCOTT: We can look into that later, Mr. Strickland. Owing to our limited time we had better confine discussion to our papers. If we go into the matter of resuscitation from electrical shock we will take the entire morning and not get to the point that we are driving at. I think, however, that your figures are approximately correct.

SELLING THE SAFETY IDEA TO THE PUBLIC

DR. GEYER: The same question arises in every Section: How shall we sell the idea of safety to the public? The industrial safety expert is doing his work, this Section is doing its work, and the Public Safety Section is doing its work, but the problem remains: How shall you head all of this up so that cities, municipalities and towns may accurately and definitely know that this work is a part of the city's business? Isn't it about time that we demand of our cities the appointment of safety engineers? If safety work is what we think it is, and it is worth

pushing in the cities and towns, it will help make our safety work public and establish us on a definite footing. If we do not secure publicity in regard to our safety work we will naturally drift away. As a doctor who has been connected with industry, and who has been definitely interested in public health work, I can see tangible justification for demanding a safety director, just as much as for a health director for a city. It seems to me that you must get away from voluntary service in safety work. We have always wanted it, we have always needed it, but finally the responsibility for the results of voluntary service should be placed with some definite officer in the municipality. We look to the State safety director to come into our industries—we know how rarely they come and how little, relatively, they add to the movement, but if the State safety director's work could be hitched up with that of the municipal safety director the problem might be more readily solved.

MR. W. H. MULLIGAN: In Montreal a new department of safety has been created. It is under the supreme charge of one man and he has control of the fire, police, and other utility departments. It has only been in operation a few months and as yet we have no statistics as to its accomplishments.

STATE DEPARTMENTS OF PUBLIC SAFETY

MR. DOUGLAS: Some States have what are called departments of public safety, having to do with the protection of the public from assaults and for the handling of crime. It seems to be a misnomer, in part at least, and I think that a branch such as Dr. Geyer suggests could be incorporated. I know of only one city, Philadelphia, where they have an efficient department of public safety.

CHAIRMAN SCOTT: Have you records of accidents?

MR. DOUGLAS: Only insofar as officers report accidents on the streets that come to their attention. In a limited way we have done something to interest the public in the prevention of accidents: that is, the United Gas and Improvement Company has printed folders and distributed them to the public. In Indianapolis a guide is published entitled "What Not to Do." It calls attention to the care with which you should handle gas ranges: it suggests that people should not search for a leak with a light, that they keep lace curtains away from gas jets, etc., but it is a very small start in that particular line. Something of this nature could be elaborated very effectively. The data we have and what could be suggested here might be utilized as a basis and a committee appointed by the Section could compile a booklet of suggestions to the public.

CHAIRMAN SCOTT: That is a good suggestion. I believe there is a mistaken sentiment in the minds of some public service people, who are opposed to calling public attention to the hazards of the business which necessarily imperil the public. It is a mistake for utilities people to be afraid to call the attention of the public to such dangers.

CITY SAFETY ENGINEERS

MR. J. WOODHEAD: I represent a carrier of public utilities liability insurance and the remarks just made suggest the difficulty of getting the

proposition into the minds of the people in general—in fact, it is like trying to teach religion to an old man. It is very much easier to convert a dozen children in a Sunday school than it is one old man that has been on the highroad for a long time. By converting the children we carry the religion home to the fathers and mothers and more parents have been converted through their children than directly by the preacher. It is the same in accident prevention and my experience and investigation has brought me to the conclusion that the way to get to the public is through the school. You can instill safety into the children—they absorb it quickly and carry it home. It is thus disseminated over the country with greater speed than in any other way or by any other agency that I know of. We had an example of this in Kansas City. The railways company there engaged a young man for this purpose and had moving pictures and lectures in every public school. A most wonderful amount of good was accomplished along those lines. The children had safety talked to them all the time and you will find them doing safety work on the street and practicing it in their play. Unfortunately this was not taken up by any city or municipal authority, only by the school board on permission. If some plan can be devised whereby this thing can be carried systematically and finally into the schools I am sure it would be the quickest way we could accomplish what we have set out to do.

CHAIRMAN SCOTT: Mrs. Riddle, a representative of the Bureau of Safety, delivered 640 safety lectures in the public schools of Chicago last year, addressing approximately 300,000 school children.

MR. WOODHEAD: Would the insurance carriers on public utilities feel justified in making a donation to the city in order to establish city safety engineers, so as to start the city off on a program of public safety work; would the insurance carriers of the city feel justified because of the reduction of accidents?

A DELEGATE: It might be that they could afford to actually pay the salary of a safety engineer for the city in order to start a thing of that kind. They would be amply repaid by the insurance they would save, due to reduction of accidents.

CHAIRMAN SCOTT: The suggestion should be considered.

A DELEGATE: I think the chief thing is to carry this work on continually; if you can throw in a contribution to pay a public officer, do it. He does the work year after year; he carries it into fresh classes of children and brings it home to the minds of children who may have forgotten it. Safety work that is not done on schedule and with regularity and system accomplishes only half what it should.

CHAIRMAN SCOTT: Mr. Douglas has made a very helpful suggestion. I will entertain a motion to authorize such a committee, if it is your pleasure. (Upon a motion a committee was authorized.)

REDUCTION IN NUMBER OF ACCIDENTS

MR. SPOEHRER: Safety measures have accomplished a great deal in our organization. We had a reduction in the number of accidents of

25 per cent. The percentage dropped in 1917 as compared with 1916—it ran about 10 per cent. We are more particular in reporting accidents of a minor nature than formerly and for that reason it is harder to make a showing. The Bevo plant accident was out of the ordinary. There the contractor went to the trouble of getting a permit from the proper city department to erect a structure by means of which he was suspending a guy cable over our high-tension lines. His application for the permit expressed its purpose and it was to have a clearance over the high-tension wires. When he came to remove the cables he had, in the meantime, taken down the structure. Of course, he recognized the danger but he did not re-erect the safety tower.

We have had several other accidents of that kind during the past year, where construction men have strung their derricks and swung the steel cables which operated the derricks up over our high-tension lines. The question is: How can that class of construction men be reached? We are not always aware of the kind of construction work that is going on, because we are not always notified. We will have to bring about a different attitude on the part of the contractor doing that class of work, so that we will be notified and have cognizance of the progress of such work, so that we may co-operate or advise with them. We had the same difficulty during the erection of a building, a fire escape was projected too close to the high-tension lines. We understand from our legal department that we are responsible and that we must provide proper clearance, but in most cases we are not aware that such things are going on. The matter should interest the building department—Mr. Douglas referred to conditions in Philadelphia where they have a director of public safety, who has under his supervision the fire and other departments, but that has no bearing on accident prevention. We need active relations between the two.

Mr. Van Doren: It would seem to me that the work could be taken up by the superintendents of buildings—we have them in all cities. When a piece of work is going on the electric light and power company should be notified and they, in turn, could see that proper clearance was established and proper structures were erected. This would avoid many accidents.

Chairman Scott: If there is no further discussion we will take up the next item on our program. I know of no man more diligent and constructive in his safety work than Mr. Moses. Unfortunately he is unable to be present, so I have asked Mr. Douglas to present the paper.

A MODERN IDEA OF ACCIDENT PREVENTION

Herbert W. Moses, Superintendent Welfare Bureau, Edison Electric Illuminating Company of Boston, Boston, Mass.

Mr. Chairman and Members of the National Safety Council: More than six years having passed since the importance of accident prevention work became so generally realized, should we not pause long enough to reflect upon the successes or failures we have made, to find out where

we stand at the present time and to look into the future sufficiently to enable us to perfect our plans for the effective continuation of this vastly important and ever increasing phase of our industrial life?

Not so many years ago the insurance companies were really the only experts on industrial accidents—their causes, results and remedies. The employer usually insured his liability risk, reported his cases as accidents occurred, and left it to the insurance company to determine the responsibility and make settlements with the injured employes. Such procedure was natural, perhaps: the employer's feeling being that the insurance company was merely earning its premium. The delays and expense of adjusting claims, together with the modest amount finally paid to the injured, were necessarily a part of the now antiquated system.

Before the coming of workmen's compensation laws a few companies undertook the serious study of accident prevention; possibly they were impelled more from a business viewpoint than from humanitarian aspects. Credit for initiative in this regard must be given to the steel industry. Next in order came the united efforts of public utility companies, especially the electric lighting interests, in making a broad and comprehensive study of accident prevention work in its relationship to the industry.

BIRTH OF A NEW PROFESSION

The coming of compensation laws brought about an entire change of attitude in accident prevention work. The realization that there were two sides to the problem—the business side and the humanitarian viewpoint—and the removal of restraints under which the employers had been under the old liability acts, gave rise to an immediate and far-reaching interest and desire to get at the root of the trouble and deduce the remedies therefor. Safety engineering became a new profession. During the past five years we have found in a number of well-established and well-managed industries the incorporation of a safety department. The subject has been studied from all angles, beginning at the drafting table where new construction takes its shape, extending to the building contractor and the manufacturer who supplies the apparatus, on to the department heads and the foremen who are responsible for the safe operation of the plant, and even to the men themselves through shop meetings, safety literature and bulletins which have been so widely distributed.

This, together with the accumulation of a vast amount of interesting data, has occupied our attention for five years. The development of the work has been so rapid and important that it has made possible the organizing and carrying on of the work of the National Safety Council, which has contributed so much through its close personal touch with industries generally, and through its annual safety congresses.

It appears to the writer that the method of procedure has been very much the same in all industries. Naturally some variation has been made here and there, due to special conditions and due also to the keenness of mind of the safety engineer in any particular plant to devise new and attention-compelling means of keeping the subject of accident prevention alive and constantly before the army of industrial workers.

a similar nature. This can readily be accomplished by making a clearing-house of the National Safety Council, and through the round table discussions which have become such an important part of annual congresses.

In our endeavor to meet our own specific problems we should not pass too lightly over the large percentage of accidents which are common to other industries. The feeling should not prevail that because such a large percentage of accidents are common to other industries the same are minor or unavoidable and cannot be controlled. Oftentimes too little attention is paid to the causes of minor accidents, the big problem of the safety engineer being to eliminate the serious accidents and to cut down the number of days lost. I remember hearing one safety engineer say that he did not care how many accident reports came to his office, so long as none of the cases were serious enough to cause any lost time. Such an attitude, however, if persisted in, would eventually result diastrously, because through neglect and inattention to the cause of minor injuries, major injuries would be sure to follow—our only hope for complete success is through reducing accidents as a whole to a minimum, by giving the same constant and vigilant attention to the causes of minor accidents as we do to our more serious cases.

FITNESS OF THE WORKER

I have come to believe that the accident prevention problem is one of the deepest and most serious that the employer has to meet in his business today. It means much more than a casual study of the causes of and the remedies for accidents. When I began the study of accident prevention work, more than six years ago, I was firmly convinced in my own mind of the close relationship between accident prevention, employment and medical supervision of employes. My reasons for so believing, however, were not very clearly defined at that time. Six years' experience makes me feel all the more thoroughly convinced of the relationship of these three departments one to the other.

The efficient production of any commodity, to a large degree, depends upon the fitness of the worker for his job and the regularity with which he attends to his work. Our experience has proved that the new man is a poor accident risk—that fact alone makes it desirable for us to study with care the causes for our labor turnover. The Boston Edison Company has made a careful analysis of its labor turnover covering a period of four years, and some very interesting facts have developed—it may be of passing interest to know the method of procedure.

New employes are put in one of two general classes. Either to fill vacancies or because of the natural growth of the business. Those leaving the company's employ are also divided into two general classes—resignations and discharges. These two latter classes are each subdivided into ten parts, ten standard reasons having been adopted for resignations and ten for discharges. This was so that all departments would use the same terms in removing employes from the pay-roll, thus enabling comparisons between departments. From such records an analysis was made by departments, from a summary of which it was very obvious which

departments were having the most trouble in keeping employes, also the specific reasons for their leaving. With this data it was a simple matter to make adjustments between departments so as to equalize conditions throughout the company. For example: It was found that one department, in particular, was losing 90 per cent of its employes because the workers could get more money elsewhere. This immediately indicated to the management that the scale of wages in that department was too low; a higher scale, therefore, was immediately adopted, and this resulted in retaining a great many of the employes. In another department it was found that practically all of the workmen were discharged, the reason being given as "inefficiency." The management immediately said to the head of that department: "One of two things appears to be the matter; either you are not using sufficient care in the original choosing of your employes or your discipline is too strict"—the result has been that the department today is much better able to retain the services of its employes. These points simply illustrates the advantages and value of a careful study of labor turnover. In three years the Boston Edison Company reduced its labor turnover from 53 per cent to 33 per cent. During the last eighteen months, however, since times have become so abnormal, the labor turnover ratio has increased to about 45 per cent.

CENTRAL EMPLOYMENT OFFICE

A central employment office can handle the filling of vacancies or the addition to forces much more efficiently than can individual heads of departments. In the first place, it becomes the duty of one man or department to find efficient labor. Methods become standardized, the type of help required by the organization becomes known and one individual can deal with employment agencies, trade schools, placement bureaus and the like, better than can a number of men, each with his own ideas as to the best method of choosing help.

Through a central employment office a prospective employe is assured of cordial treatment when making his application. He is given a better introduction to the company, and is made to feel at home quicker than if turned loose in a large organization where no one is especially interested in him. It should be a function of the employment office to follow up a new employe and see that he is placed in the position to which he is best suited.

Promotions from within should be encouraged by freely transferring employes from one department to another as they show efficiency and higher positions should not be filled from outside the organization until it has been determined that there is no one within the organization who is qualified for the vacancy. The employment office should also have a certain supervision over the discharge of employes, so as to eliminate many of the petty jealousies that exist between foremen and their subordinates.

If department heads would follow the practice of filing with the employment office their requirements for help considerable in advance of the time when such help is actually needed, more applicants of a better type could be assembled from which to make a selection than is now possible

when the department head chooses to find his own employes. Also the reporting in advance to the employment office of the fact that an employe is to leave would often result in the retention of the services of a desirable employe by transferring him to some other department—this is especially true in the case of seasonal employes. In general, the employment office should be a sort of clearing-house, to which should go all requests for labor and to which employes could come for transfers and make appeal in case of alleged unfair treatment.

A study of accident and sickness records should always be made by the employment office in determining an employe's qualifications for promotion.

It is felt that a central employment office could create an effective standard of employing labor of the better class, and through its intimate knowledge of the business could advise the applicants of their ultimate future and could create and retain an incentive to get ahead by promotion and by transfer from one department to another, to the end that eventually it would become unusual to discharge an employe.

If properly organized, the employment office might perform a further important duty in supervising the equalization of wages paid, with special reference to employes engaged in similar work, but working in different departments.

DUTIES OF MEDICAL DEPARTMENT

As to the medical department, its first duty should be to select for employment only those applicants who are physically fit for the work which they are to undertake. This not only safeguards the company in cases of accident and sickness, but also assures the present employes that they are not being called upon to associate with those having communicable diseases. Through systematic periodic examinations the older employes who have become physically unfit for their work should be either transferred to new work or eliminated from more active service.

An important function of the medical department should be the general supervision of all accident and sickness cases within the company and through carefully compiled statistics to determine by departments the causes, results and remedies for such disabilities. A medical organization within the company, in cases of accident, renders prompt treatment, takes a keener interest in bringing about a quicker convalescence, and can better prevent malingering than by having the employe placed in the care of some institution or outside doctor.

The medical director should have an intimate knowledge of the hazards of the industry, and through his contact with accident cases should be helpful to the central safety committee in controlling many of the hazards. He could keep the employe supplied with first-hand knowledge of injuries and results; he could from time to time conduct clinics and write articles in non-technical form regarding accident hazards, personal hygiene and the usual minor illnesses.

Our experience in studying sickness during the past five years shows it to be a menace even greater than accidents, both in regard to the number of cases, the days lost and money expended, all of which reflects directly on

the efficiency of production. For these reasons I think that the control of sickness can readily go hand in hand with the control of accidents.

For comparison I quote the result of accidents and sickness from the records of the Boston Edison Company for the past five years:

Accidents—

Number of fatal cases, 12.
2,253 cases lost no time.
515 cases lost from 1 to 14 days; total, 2,582 days.
173 cases lost more than 14 days; total, 8,977 days.
A total of 2,953 cases and 11,559 days lost.

Sickness—

Number of deaths from natural causes, 39.
Number of cases losing from 1 to 14 days, 11,721; representing 33,698 days.
Number of cases losing in excess of 14 days, 595; representing 38,201 days.
A total of 12,316 cases and 71,899 days.

BASIS FOR FUTURE STUDY

If I have digressed from the subject, it is because of my desire to impress upon others my belief that there is a close relationship between the subjects of accident prevention, employment and medical supervision, and that this relationship forms the basis of our study for further progress during the years to come. We are all agreed, I think, on the fundamental principles of accident prevention work which we have developed during the last few years. We are ready now for the superstructure to be built upon this well-laid foundation. Each industry, because of peculiar hazards, will build that superstructure in a different way, following, however, clear and well defined principles.

There are two problems which will always hold our attention in the pursuance of this work: *First*, that of developing means to best hold the attention of the employe and to instill in him a spirit of caution; and, *second*, that of educating the public to the hazards met in their daily pursuits. These subjects are capable of much discussion and must be solved by those in charge of safety work in different organizations or communities; the success of such work depending, as it does, upon the general intelligence of the employes and upon local conditions.

The writer believes that a very effective way of reaching the employe is to give wide publicity to company accidents. We have tried successfully having the company's medical director hold two safety meetings each week, the same employes attending each meeting. At the first meeting the accidents for the past week were discussed, also methods of preventing a recurrence of such accidents. The injured man's name and department were given and the injured man was asked to be present, if possible, to tell just what happened. The men in attendance themselves decided who was responsible for the accident. At the second meeting the doctor illustrated on some volunteer from the audience the method of first-aid treatment for the particular accident under discussion.

DISCIPLINE AND RE-EMPLOYMENT

There is still one other important method by which accidents can be controlled, but which I believe has not been adopted to any great degree, viz.: That of stricter discipline, either through suspension without pay or absolute discharge, in case the responsibility for an accident can be placed upon an employe.

There is an unusually good opportunity at the present time for the safety engineers among the lighting companies to do a good bit of work for their fellow employes, namely, that of convincing the life insurance companies that the electrical industry is not a particularly hazardous one and thus making it possible for those employes whose duty it is to handle live apparatus or lines to obtain life insurance at reasonable rates. The life insurance companies' attitude regarding our industry appears to be unfavorable. Competition in writing life insurance is keen, and it is my personal feeling that insurance companies generally are broad minded enough to be willing to revise their schedules of hazards if they can be shown that their present statistics are out of date.

One of the great problems of the safety man is getting a job for the employe who has been injured. Oftentimes an injured man is ready to take up "light work" before entirely well and able to resume his former employment; sometimes it becomes necessary to fill an injured man's place because of the length of his disability, and there are cases where the substitute has proved himself more capable. The re-establishment of the injured man, who, through an accident, has lost an arm, leg or eye, makes the case more difficult. Such problems require the utmost amount of judgment, tact and diplomacy on the part of the safety man: he must be fair to the employe and to the company; furthermore, he must overcome the reluctance on the part of department heads who hesitate in carrying on their pay-rolls any but those physically qualified to turn out a good day's work.

What is to become of the man maimed by accident and whose earning capacity is thereby reduced? In view of the number of such cases the question is most profound, and, while not wishing to be premature, is one which will demand our greatest consideration after the war, when thousands of wounded must be replaced in industry. Should we not now begin to think about the reasonable solution?

DISCUSSION

MR. J. B. DOUGLAS (The United Gas Improvement Company, Philadelphia): Undoubtedly the coming of the workmen's compensation law awakened the majority of employers to the importance of preventing accidents, and except for a few of the leaders of industries these laws and the publicity which preceded their enactment appear to be responsible for the safety movements among employers today. Employers in general knew little about accidents and when one occurred left it to their insurers.

The publicity incident to the consideration of compensation acts played a leading part in getting employers interested in the possibilities of sys-

the arc. The size of wire feeding the arc and the reactance of the generators, transformers, lines, etc., limit the current in a short circuit rather than the fuse or circuit breaker. In fact, if the fuses or circuit breaker are not selected with reference to the reactance of the system on which it is working a very severe explosion may occur when they attempt to operate under short circuit conditions.

Therefore, apparatus 500 volts and below should be designed and installed with the thought in mind that the workmen should be prevented from making short circuits. It is well to keep all line parts out of reach of everybody, except the electrician and in addition the electrician must be protected from short circuits.

GENERAL INSTALLATION RULES

There are two general rules in laying out an installation that will help to lower the hazard from both a shock and burn standpoint: *First*, Do not crowd parts that must be adjusted, connected or cleaned. *Second*, Ground all parts that are supposed to be dead. As the voltage increases the above rules become of more and more importance.

All apparatus, such as switches, etc., on a system of 220 volts or lower if properly mounted and located with respect to the operations does not need to be entirely enclosed, but higher voltages demand enclosing, except in cases of high-voltage disconnecting switches which must necessarily be mounted out of reach of anyone and operated by means of a pole. Recent experience shows that on all power systems of 15,000 kw. or above the disconnecting switches should at least lock in the closed position.

In connection with high voltage the greatest hazard is from shock. The most frequent accident is caused by men coming into contact with lines supposed to be dead when they are alive. This can best be guarded against by the use of a ground chain, which should have a good contact with the lines as well as with the ground. Two chains should be used, one on either side of the point where the work is to be done. When work is to be done on a tower or pole with some lines alive, guards should be used unless there is ample clearance not only for a man to pass but also for material.

The subject of fire hazard is receiving a great deal of consideration and the United States Bureau of Standards is working on a national code which will not only cover fire hazards but also life hazards and I feel we should all give this movement our heartiest support.

CHAIRMAN MORGAN: I shall take the first opportunity to thank Mr. Petty for his thoughtfulness in forwarding his valuable contribution.

The Section will now adjourn.

FRIDAY MORNING SESSION

CHAIRMAN MORGAN: The Section will please come to order. We left one subject unfinished yesterday—that of employment pertaining to accident prevention. Suppose we continue the discussion for a time?

How many accident prevention departments are a part of the employment department? Is there any one here whose company has such an organization?

DUTIES OF SERVICE DIRECTOR

MR. J. O. MEYERS (Niagara Alkali Company): In our organization we have a service director. He has charge of employment, safety, welfare and the medical department; it works very well. The reason for its success, I believe, is the fact that the director is able to have all the reports from the respective departments under his hand; he keeps well posted, at the same time the system co-ordinates the working of each department.

MR. MATTHEWSON: In our plant the safety and service department takes charge of the safety work, the welfare work, the employment work, and the hospital. We have a man for safety inspection work, one for the employment, and a first-aid man to assist the doctor in the hospital. The name "Service" covers a multitude of sins, but you co-ordinate a great many things.

CHAIRMAN MORGAN: One of our hardest jobs in selling safety to the management is to sell a name for ourselves. If you go to the ordinary layman and hand him your card as manager of the "service department" of the X Company he things you are probably running a delivery wagon. The name "employes' service" does not exactly fill the bill either. Most all of us want to stay away from the word "welfare." We haven't a name and I hope someone with a four-deck brain will coin one soon. "Industrial relations" might do. I'd like to hear suggestions for the naming of a department of this sort.

MR. A. C. GIBSON (Pittsburgh, Pa.): Ours is called the "department of safety and civics." The word "civics" covers quite a multitude of tasks; the department of safety is a work in itself—the department of civics comes under the department of safety but we have separate organizations for handling the work.

PROPOSED SAFETY FILM

CHAIRMAN MORGAN: We will now start our formal program. At the meeting of the Metals Section, Foundry Division, Tuesday, your Chairman reported the activities of the Accident Cause and Remedy Committee. Mr. H. H. Robertson, President of the Asbestos Company of Pittsburgh—he is also President of the Pittsburgh Local Council—was Chairman of the Executive Committee of the Council and had charge of the creation of a moving picture film. After consulting several of his committee it was decided that Pittsburgh was the best possible place on account of the type of industry which abounded there to get a proper stage setting for a foundry film. After a study of the question the Accident Cause and Remedy Committee got together a fine collection of data on the most prolific sources of accidents in foundry practice and this syllabus was turned over to a professional scenario writer. We did not get quite what we wanted at first but, ofter a process of rewriting, and rearranging we finally secured a very good scenario. The plan of utilizing the idea has not been worked

out in detail, but Chairman Robertson has the matter in charge. I am sure he will be pleased to receive your suggestions.

Our first paper this morning is by your retiring Vice Chairman. Mr. Elam will discuss a topic of universal interest.

REVIEW OF EDUCATIONAL METHODS

F. H. ELAM, MANAGER CASUALTY DEPARTMENT, AMERICAN STEEL FOUNDRIES, CHICAGO, ILL.

Mr. Chairman and Members of the National Safety Council: I believe that it can be safely stated that all safety endeavor has an educational value, and a review of educational methods, if complete, would have to include the whole range of safety activities. To keep within the time assigned to me it will, therefore, be necessary to restrict this review to narrow limits and to consider only a few of the more prominent phases of educational methods in safety.

With your permission, I wish to direct your attention to the importance of making sure that all safety methods are made as highly educational as possible. To do this it will be necessary that safety methods must first be founded on sound principles that will appeal to the common sense of the greatest number, and, second, these methods must also be alive or vibrant with what may be expressed as the personality of the best things in our common humanity. This quality is often designated by the terms "human interest," "personal magnetism," "enthusiasm," etc., but whatever the name used, the quality to which I am referring, to permeate the great mass of indifferent workmen in the world, must spring from the very life and spirit of those interested in and working for safety.

To insure this condition, those who deliver the oral instruction, prepare the written word, or draw the picture for the safety bulletin, must be animated by an enthusiasm born of an inherent love and sympathy for humanity in general and a warm personal interest in their neighbors which induces them to study and work for the best interests of their community and the world at large.

Those so constituted are able to reach across the chasm separating the various stations and conditions in life, overstepping the barriers of ignorance and prejudice, and deliver their message of safety. They are able to interest the different heads of departments and obtain their co-operation, imparting to them their own illumined view of the importance and righteousness of safety and the truth that whatever saves a life, prevents suffering and the waste of human energy, is economically sound, and, therefore, good business; also that safe working conditions do not retard production, but are the greatest aid to the easy attainment of the largest output with the minimum expenditure of physical and mental exertion.

It is needless for me to enlarge further upon this subject, except to say that all who have participated in the work of safety committee meetings,

have experienced and felt this power where it was possessed by the leader or chairman, or have felt its absence when lacking. The safety worker, be he safety engineer or inspector, who is lacking in this quality, no matter what his training and educational attainments may be, is in the wrong work and is doomed to failure, and the sooner that he gets into other lines of endeavor, the better for him personally and for the cause of safety.

I have tried to show the need of the proper spirit in the personal element connected with educational methods in safety, but this need does not stop with personal efforts, but must be transmitted into all of our methods so that the inanimate agents of safety will glow and reflect this force of personality which I have just referred to. The art of making inanimate things, such as bulletins, statistical charts, signs, guards and numerous other agencies truly educational, consists in making them convey to the minds and hearts of the workmen their message by the aid of the illuminating quality or power referred to. It is the lubricant, if I may use the simile, that causes the entrance of the message into the consciousness of men without friction.

SAFETY BULLETINS

Safety bulletins are used today as never before, for educational purposes, but many of them are a waste of paper and ink, because they are lacking in the qualities just referred to. There are differences of opinion concerning what safety bulletins should show. Many object to a bulletin picturing anything of an unpleasant nature, terming such as negative, forgetting that some of the most valuable lessons of life are taught by fear, and that the Creator would not have given us the power to react to fear if it was not to be an educational medium in our lives: also that life does not entirely consist of pleasant themes and experiences, but is made the richer by the suffering that is inevitable in every life and which, if bravely faced, will help us to better and nobler ways of living.

Just one example to illustrate the point: The bulletin which faithfully and vividly portrays the results of infection and blood-poisoning in the body has great educational value. If the bulletin shows how slight an abrasion or an injury was at the beginning, and that no treatment, or that unclean and ignorant methods were used in treatment, and that such repulsive and terrible result followed, then also depicts the proper manner of reporting an injury to the plant surgeon and medical department, the workman has learned through the sense of sight that here is something to be shunned and the bulletin has produced results that no amount of oral instruction could have done.

The ignorant workman sees and understands where the spoken or written word would not be appreciated. The more intelligent workman has his attention attracted to the subject of the proper care of slight injuries in a way that appeals to him, because the approach has been made in what he considers an impersonal manner—no one has attempted to instruct him or ordered him to do some specific thing, two things which he resents with all his being.

When a copy of this bulletin reaches the front office, the manager's attention is challenged and a mental picture is portrayed that is not forgotten. When the next monthly casualty report is submitted and he sees that there were ten serious cases of infection during the month he will appreciate as never before what the term "serious" means when applied to infection. When he further notes that nine of the above cases were the result of neglect, he will unconsciously visualize the needless pain and suffering that has resulted because someone in authority has been indifferent, to express the situation as charitably as possible, and failed to see that these workmen were compelled to report to the doctor and receive proper treatment. The result of this vision will be that the educational value of that particular bulletin will shortly be recognized by every foreman in the plant.

CARTOON BULLETINS

Bulletins that convey safety truths in the form of a caricature are powerful educational agents. I am not advocating that any injured workman be caricatured, but if the circumstances surrounding an avoidable accident can be humorously portrayed in bulletin form it will reach more workmen than the best photograph of the accident will, because it speaks in a tongue universally understood by the educated and by the ignorant alike, and is also understood by the foreigner within our gates as readily as by the native born.

As has been referred to, workmen resent anything that savors of forced instruction or positive orders. They also detest being preached to. The safety cartoon will deliver the message and score a bull's-eye more often than any other agency, and do it so subtly that the workman is not conscious of the act.

In support of the foregoing statement, I submit that cartoonists have presented the real issues of the present world war in the most forceful and graphic manner to millions who would never have caught the full meaning of the message as delivered on the printed page or as spoken by statesmen and publicists. Cartoonists are among our greatest educators and it is to be regretted that so few of them are using their art in the interest of safety.

As opposed to the foregoing examples of what bulletins should be, I will use the term "positive" for want of a better word. The "positive" form of bulletin is used most often and its educational value is high, the trouble being, however, to keep such bulletins from being too formal. There is a constant danger that they will overshoot the mark, because their formality, while in good literary taste, is lacking in the human touch or characteristics that will reach the workman.

One of the finest examples of the "positive" bulletin that has come to hand is the National Safety Council Bulletin Board Series, No. 683, showing the picture of Lieutenant Walter R. Flannery, and describing the act which won him the French War Cross for bravery. It then connects this act with an incident that had occurred two years previous, where wearing safety goggles had preserved his sight. Such a bul-

letin makes a powerful appeal to the educated or thinking man, but it is questionable how effective it is with the other kinds of workingmen.

PLANT MAGAZINES

The plant magazine is a medium of promulgating safety ideas of the highest order, but unfortunately its use is restricted to the larger units of industry. As an educational medium it has an accumulative effect, because it goes into the home and because its power is multiplied by the interests and home influences which its message starts into action. What has been previously said refers with equal force to the plant magazine. Where it is edited by wholesome, enthusiastic, 100 per cent men and women it is one of the most powerful agents we have today in the cause of safety.

SAFETY LEAFLETS

The safety leaflet is a tract preaching a sermonette for safety and its educational value is great or small according to the ability of the author to express his thoughts in sympathetic understanding of the needs and limitations of his readers.

SAFETY SIGNS

Safety signs, illuminated and otherwise, have a large place in our safety work and their educational value is great, being one of the first mediums of expression used in safety endeavor. To make these signs truly useful they must be given the same quality of human sympathy and understanding as the other mediums which have been referred to.

GUARDS

Guards are not usually considered from an educational point of view, but are installed to prevent contact by the workman with dangerous locations. They have an educational value in that they continually suggest thoughts of safety to everyone who sees them. Many have, no doubt, experienced difficulty in keeping guards in place after they have been installed and to prevent their destruction by thoughtless workmen, who feel that the guards have been installed to impede them in their work and to save the employer money.

Guards are frequently equipped with signs which read "Do not destroy" or "Replace at once after repairs are made," and similar slogans, but we find that such signs do not help to any great extent in keeping the guards in place.

If a guard could be given a personality it would, without doubt, make it a subject of greater respect to the workmen, and the suggestion is offered that there might be attached to every guard a small sign which would read: "I am here for your protection," conveying the idea to everyone that had anything to do with the guard that it was a personal matter on their part to reciprocate and do their particular duty in helping the guard to discharge or perform the duty for which it was constructed.

In closing this review I wish to remind you that the best methods to use in safety work may not always measure up to the intellectual standards that we would desire, but it is a condition that has to be met in the education of the workmen of the world and is not a theory.

DISCUSSION

MR. WOLTZ: It was brought to our attention yesterday by Dr. Shoudy, in another Section, that the words "blood poisoning" are used indiscriminately in describing infection; as a matter of fact, blood poisoning practically means the loss of a member very shortly, or perhaps death. In describing an infection the word "infection" should be used and not "blood poisoning." Differentiation by laymen is rather difficult, because they do not know the real difference in the meaning of the words; but it is perfectly safe to use the word "infection" in bulletins.

MR. J. A. OARTEL (Carnegie Steel Company): That is one of the clearest-cut presentations of a bulletin I think I have ever heard—the Council would do us a favor if it were put into a *Safe Practices* pamphlet or leaflet. Just a word on the negative side of the question. Whenever a very serious accident occurs in our corporation it is written up completely and sent to all constituent companies. This may be called a negative method, but I know it is putting the constituent companies on the job because the report reaches the sub-safety committees of all the plants of the corporation. They discuss the accident in detail and try to devise means to prevent a similar occurrence. (The suggestion for embracing the subject of "Infections" in Safe Practices pamphlet was indorsed by the Section.)

REPORT OF COMMITTEE ON NOMINATIONS

CHAIRMAN MORGAN: We will now hear the report of the Committee on Nominations.

CHAIRMAN WOLTZ: Your committee has been greatly impressed by the excellent material from which to make selections for officers of the Section for the coming year. We really were at a loss as to whom we should recommend to this Section because so many men were worthy of the distinction of presiding over the deliberations of this Section. We felt that true work and worth should be recognized and that those who had devoted much of their time and expended a great deal of labor in the preparations for this Congress should be recognized. In conformity with that idea we offer the following nominations:

Chairman, Frank Morris, Safety Engineer, American Rolling Mills, Middletown, Ohio.

Vice Chairman, Homer J. Weeks, Chief Safety Engineer, American Steel Wire, Pittsburgh, Pa.

Secretary, W. E. Watters, National Malleable Castings Company, Chicago.

(Upon motion the nominees were unanimously elected.)

INSTALLATION OF NEWLY ELECTED OFFICERS

CHAIRMAN MORGAN: Your retiring Chairman wishes to express his appreciation for the honors conferred on him by his fellow members of the National Safety Council and it is with reluctance that he retires from the active work of the Section. One can hardly devote three consecutive years of work—and I assure you it entails considerable effort to get together these annual Congresses—without carrying away a vivid recollection of the many splendid acquaintances gathered in the work. I shall continue my interest in the Section and do my utmost for its continued success.

I take pleasure in introducing a real fellow, Mr. Frank Morris, Secretary of the American Rolling Mills, Middletown, Ohio, as your Chairman, and Mr. Homer J. Weeks as your Vice Chairman. Mr. Waters was called home yesterday, but we all know he will be on the job.

CHAIRMAN MORRIS: I thank you for the honor you have conferred on me. If there is no further discussion of Mr. Elam's excellent paper we will take up our next topic.

DOES DISCIPLINING PAY IN SAFETY?

GROVER G. KINGSLEY, SAFETY ENGINEER, HALCOMB STEEL COMPANY, SYRACUSE, N. Y.

Mr. Chairman and Members of the National Safety Council: I believe that disciplining does pay in safety, that it helps to reduce accidents and that it makes for a more democratic organization if the policy is sound and based on common sense. Discipline in American industries today is more the exception than the rule, but when we stop to consider and weigh the results that have been obtained by the railroads and large corporations in promoting safe practices through their methods of disciplining we cannot help but believe that the exception is bound to prove the rule.

SOME INSTANCES WHERE DISCIPLINING HAS PAID

The railroads and large corporations, to my mind, have conclusively proven that discipline *does* pay in safety, that it is a potent factor in accident reduction. The railroads have obtained control of the human element of their organizations mainly through disciplinary methods and the results accomplished have been for the benefit of that human element.

Where would the railroads be today if it were not for the strict safety rules they have and the enforcement of those rules? It has been found by them that in order to eliminate carelessness and the drink evil from among their operatives they simply had to appeal to their men through their jobs; that is, lay them off or discharge them for the violation of safety rules. Talking to the men of how they were endangering the lives of their fellows, how they were wrecking their homes and destroying the happiness of their children had little effect in the majority of cases and went for naught. The railroads realized that when these human appeals

failed they had to take drastic steps in order to keep their roads on a safe operating basis. The only recourse left, therefore, was the strict enforcement of rules, a rigid policy whereby a man was compelled to obey instructions or lose time or his job. This has been the experience of the railroads and large corporations and the results show that the policy of discipline adopted enabled them to decrease their accident frequency to a marked degree.

The railroad is a striking instance where disciplining has paid. Our own government is another. In fact, our government is, to a large extent, made up of disciplinary machinery. We come in contact with this discipline every day in the observance of our laws. It becomes habitual with us to observe these laws and we do not ordinarily look upon them as the discipline of our civil life, which they really are. If it were not for this discipline our government would not amount to very much: in fact, there would be no government. The rights of individuals would not be respected at all, with the result that chaos would predominate. We can easily see that disciplining has paid with the railroads and pays in our civil life. Then why should it not pay in our industrial life?

In industry we have this condition: A large number of men work in a limited area and come in close contact with each other throughout their working hours. This condition cannot help but result in the disregarding of the rights of fellow workmen unless some control is exercized by the organization or the men themselves. The disregarding of these rights may be through carelessness or purely accidental, but whichever it may be the facts should be determined and the violators penalized accordingly. I believe the establishment of operating and safety rules defining the rights of employes with respect to their fellow workmen and the enforcement of these rules is the most effective way to bring about a smooth and safe working force in any plant.

THE EMPLOYER

Most employers realize that it is their duty to protect the rights and lives of their employes. They realize the value of discipline in other organizations, but they fear that it will inject a militaristic spirit in their own. The employer should realize that discipline, in order to be effective, should be democratic, with the employes making their own rules and enforcing them, the same as we do in our civil life. The employer should believe in discipline and back up the policy to the fullest extent, never interfering when men are being disciplined by their fellows except in cases where it is a known fact that injustice is being done. In other words, discipline will enable him to have more complete control of the human element under his supervision.

THE EMPLOYE

The part the employe should play is a democratic one. He should be allowed to make his own operating and safety rules, subject of course to the approval of the general manager. He should also enforce these rules. A good way to make rules is by departments, through departmental

safety committees. The rules made will be practical for they will be made by practical men on the job and men subject to the conditions. A good way to enforce rules is to allow the men to discipline violators by holding fair trials, where the facts are brought out before a jury of fellow workmen, who will determine the penalty for the offense. I have enough confidence in men to believe they will take hold of a plan of this nature and carry it out serious mindedly. I know that it has worked out in several instances with good success.

THE FOREMAN

In establishing a plan of this nature it is very essential that the foreman be sold on the plan at the outset; the success of the plan hinges on the degree of co-operation received from the foremen. This is true of all safety work. The big thing for the foremen to see is that discipline will aid them to control their men and keep them on the job, at the same time increasing production and lowering their accident records. If the foremen can be made to see these things, in the majority of cases they will be willing to report the violations of rules and unsafe practices.

EFFECT OF DISCIPLINE

Some prominent safety engineers believe that the "soft pedal" should be put on discipline; that we should "go easy" on any policy that would seem to create an adverse sentiment toward safety. If they mean the promiscuous discharging of men for the violation of safety rules, I say, put on the "soft pedal." It is not the intention of discipline to turn men out upon society adverse to safety—we would be defeating the prime purpose of our safety education by doing so. But when a man repeatedly violates safety rules and is not disciplined for it in some way, I say it is pure folly. Discipline does not necessarily have to be a discharge, but it should be of such nature as to impress upon the man the fact that his fellows will not tolerate unsafe practices that endanger his life and the lives of others. It may be necessary to warn him, change his job or lay him off, but in any event immediate disciplinary steps should be taken.

One good that discipline will accomplish, I believe, is the prompt reporting of minor injuries to the first aid. I do not believe there are any of us who are not troubled with this problem. I am firmly convinced that discipline will accomplish a great deal in this direction.

DISCIPLINING AND THE WAR

Inaugurating discipline in industries engaged in the manufacture of war materials is something that should not be undertaken unless one is absolutely sure of the outcome. For whatever we do we have no wish to interfere with production in the industries which are so essential for the maintenance of our fighting men. If it is definitely known that disciplining will increase production and not disrupt the organization I see no harm in going ahead. We should lean to the conservative side in any case.

I have tried to point out in a general way some instances where disci-

plining has paid and what I believe a good policy to follow if disciplining is to be made to pay. The thought that I would like to leave with you is this: That whatever policy is adopted in regard to discipline we should be sure that the democratic principle is the underlying one and that the men themselves take the major part in enforcing the policy.

DISCUSSION

MR. GATES: When I bring up the subject of discipline for a violation of safety rules to our management I am told that it is almost impossible to secure the labor we need, without adding other difficulties. We must overlook things that in normal times we would not; in other words, we cannot afford to discharge men for anything except the most serious infractions.

MR. KINGSLEY: When we speak of discipline we ordinarily think of it as some harsh measure, whereby someone is going to lose time or their job. I look upon discipline as constructive. By that I mean that if a man fails to wear goggles, for instance, his attention is called to their necessity for his protection. The last recourse should be discharge. If you have an ungovernable man, a man who will not obey safety rules, you have a condition in your plant that you will have to eliminate in some way, and of course, the ultimate thing is discharge.

DISCIPLINE PAYS IN EVERY WALK OF LIFE

MR. MATTHIESSON: Does disciplining pay in safety? I believe it does; it pays in all our walks of life. A great majority of our people obey the laws because they are afraid of them and not so much because they love them. You are afraid to speed your machine because of the police court, not because you do not want to speed. In safety you try to get this propaganda across, and it is very essential to make it a law which must be enforced. I do not believe in bearing down with a very heavy hand and discharging a man for every little infraction of a safety rule—but discipline may be of various natures. There may be a small fine or a large fine. as in the police courts. It is not well for every safety inspector to inflict such penalties—he may let personal feelings come in or he may be too harsh. We made it a rule in our plant that if a man failed to report to our hospital on receiving an injury he was liable to be laid off for five days. We only laid one case and that was decided by a trial before our superintendent. The men know there is a penalty for not coming to the hospital and they come. Disciplining in safety must be tempered with justice and careful consideration, but I believe the safety law must be enforced the same as civil law, and that some discipline or penalty commensurate with the offense must be taken into account in order to get the full enforcement of that rule. Be careful in disciplining not to make the men despise the safety movement.

MR. KINGSLEY: Mr. Chairman, I'd like to hear from you on this subject. We discussed it last night and you have some very sound opinions on it.

CHAIRMAN MORRIS: Mr. Kingsley and I have been corresponding for several months on this subject. Suppose you have two men who are

ing. Every year we have a paper from Dr. Chaney and we always benefit from them. The doctor writes:

"My Dear Mr. Morgan: Please convey to my fellow workers of the Metalurgical Section my regret that I am unable to meet with them this year. I am tied up with a job which I have undertaken for the National War Labor Board at the Bethlehem Steel Works. Things will be going at a great rate during the time of the sessions. Very truly yours,

"LUCIAN W. CHANEY."

The other letter is from our old friend Roy Butler and reads as follows:

"Mr. Earl B. Morgan: I received the invitation sent us in regard to attending the Sectional dinner and entertainment. I think I am the most disappointed man in the whole world (Kaiser William included) for I had made all arrangements to be on hand early Monday morning and help make a grand week of it. But owing to the doctor's orders I am not allowed to leave Ashland. Regards to you, the Section and all who attend the Congress. Yours, "ROY A. BUTLER."

CHAIRMAN MORRIS: The letters will be included in our minutes. We regret the absence of our friends at this Congress. We have a very interesting paper by Major Burr, who is also unable to be present. If there is no objection I will read it.

SAFETY IN THE STEEL MILL OF TODAY

MAJOR K. M. BURR, SAFETY INSPECTOR, GARY WORKS, ILLINOIS STEEL COMPANY

Mr. Chairman and Members of the National Safety Council: The subject, "Safety in the Steel Mill of Today," seems broad enough to permit a ramble off into almost any direction. The first thought suggested is that safety in the steel mill of today differs from that of yesterday. As we are living in history-making times it is proper to mention the fact that the history of industrial safety is a short one. It has been but a few years since Safety First really became a business, since which time it has developed rapidly. But a short time ago no man really was employed exclusively in the work of accident prevention. The first men to take it up as a regular job are still with us and still actively engaged in safety work.

With a rush the business grew until it now employs thousands of earnest, enthusiastic men. Each safety man, I take it, has gone through, or will go through, about the same experience. The route goes from safeguards to education. Schemes and propaganda are tried out—pushed for all they are worth, only to be followed by newer and better ones. No matter how good a record is made, it is not good enough. A business that stands still is going backward—conditions that were allowed in steel mills of yesterday are not permitted in the steel mills of today, and just as surely will many things that we are more or less complacent about now soon appear terribly dangerous, and we will be tackling them. A good safety man is never satisfied.

ADVANCED SAFETY IN OPERATING DEPARTMENT

There was a certain colored church which had been presided over for many years by Parson Jones. Now, Parson Jones was an old man whose exhortations were regular and orthodox, and whose prayers, though of generous length, were always about the same old stuff. In time he passed on and the flock was to be herded by a new shepherd. And on the occasion of his first service the new parson spread himself. His prayers were unusually long and lurid, covering much that was new and novel. After the services Deacon Brown was asked his opinion of the services. He replied: "This heah pahson ain't so mighty movin' in his disco'se, but when he pray, Oh, My! he shore am a mahvel. He's a mighty smaht man—why, he done asked the Lawd Almighty for things that old Pahson Jones didn't even know the Lawd had."

So it is in the steel mills of today. We are asking for operating conditions which yesterday we would hardly have thought possible. And the best part of it is that we are getting them, too.

The dominating thoughts now are of the great war. It is affecting every business and the affairs of every man. It has brought many difficulties to the steel mills, and certainly has greatly increased the difficulties of accident prevention. Most steel mills by this time are well safeguarded from a mechanical standpoint, so that our troubles along that line are practically limited to the difficulty of getting necessary materials and supplies without unusual delays. This is really a comparatively unimportant matter as compared with those that affect the human equation, as that is always the greatest problem in safety work. It is there that our difficulties have been multiplied.

SCARCITY OF GOOD EXECUTIVE MATERIAL

The military needs of our country, of course, come first. Already many of our best safety men have gone into the service of our country. The general personnel of all of our plants has changed. The labor turnover is greater. We have an increased percentage of new and inexperienced men in our organization. Many of our foremen and leading workmen who have been prominent and efficient in safety work are gone, and the new ones must be trained and imbued with their responsibilities at a time when their worries with new duties and obligations are great—much greater than were those of the old foremen whom they have succeeded. In this connection I believe it is well recognized that foremen who are in direct charge of working forces are the greatest factors in the operation of steel mills.

As a result of the rapid increase of steel making capacity in this country there has been a scarcity of good foremen. War conditions have made this still worse. To the men under him the foreman represents the company, and their attitude toward the company is influenced more by the actions and talk of the foreman than by anything else. It is important, therefore, that the foreman himself not only thoroughly understands the attitude of his company, but should have some training along these lines

to enable him to become more effective in transmitting these ideas to the men with whom he comes in contact.

Therefore, I believe that great benefit would come of a well-developed plan of conducting schools of instruction for foremen. In these schools foremen would not only be made more efficient in the handling of their operating duties but would learn, some of them for the first time, just how thoroughly their company is anxious to maintain a satisfied working force, and how much it desires their safety and welfare. There would, of course, be many other advantages that would be gained by thus giving the plant management an opportunity to get better acquainted with the various foremen, and by personal contact with them influence them for good.

Another one of the enemies of Safety First, and probably its strongest opponent, is pressure for production. As our government is demanding a maximum output of steel, operations have been speeded up and every nerve is being strained to increase production, with the usual result that there is a tendency to put speed before safety.

WAGE SCALES AND THE WAR

Largely as a result of wartime conditions, wages have gone up rapidly. Men are making much more money than ever before. This, unfortunately, has resulted in many cases in men taking advantage of almost any excuse and laying off, somewhat as the colored boy reasoned when the traveler asked him if he didn't want to make a quarter by carrying his grip and he replied: "No, sah; I done got a quatah." This is another thing that is bringing more gray hairs in the heads of the superintendents and foremen who are responsible for keeping things at high pressure. It is easy to see how all these influences have made more difficult the work of safety. Though war has brought us these troubles, the need of effective work in accident prevention is much greater than ever before. Our duty is to do everything to conserve working forces at maximum efficiency by preventing accidents and thus keeping men on the job.

Most of us in the steel business have gone far along the lines of mechanical protection in adopting rules for safe methods of operation. Safety in the steel mill of today is largely a matter of education—propaganda, if you please. One of the strongest weapons for effective work is in our hands for use—that of patriotism. There is no doubt that the men of the steel mills are intensely patriotic. Anything of a patriotic nature meets with a ready response. We safety men, therefore, must take full advantage of this spirit and bring out to the fullest extent an appreciation of the fact that the prevention of accidents is a patriotic duty.

We must pound into the minds of men by every means in our power this idea—our country needs steel to win the war—needs all the steel we can make, and then some. Our country needs every man on the job every day. Injured men cannot be on the job; therefore, it is the patriotic duty of every man to do his utmost to prevent accidents. Don't let this idea get away; keep hammering on it all the time. Keep it before your safety committees; get their help in getting the spirit into their men.

Don't let an opportunity pass for holding mass meetings of workmen where this idea is emphatically expressed. Keep it on your bulletin board. It is no effort for any man to talk war. Every one wants to help. Don't let any man forget that he can help, and that it is his duty to work every day and do all that he can to keep other men on the job by preventing accidents, and thus maintain the army of steel workers at the highest rate of effectiveness in support of our boys "over there."

[*Note*: Let me say for the Major that although the accident prevention record at Gary Works for 1917 was the best ever made at that plant, the record for 1918, based on eight months of this year, shows a reduction over 1917 of 13 per cent.—R. J. YOUNG.]

CHAIRMAN MORRIS: Our next paper is by Mr. S. W. Ashe. When the government called for safety engineers to plan safety work in the arsenals and navyyards Mr. Ashe was one of the foremost in the work. He is unable to be present, but, with your permission, his paper will be read.

PLACING WOMEN IN INDUSTRY

S. W. ASHE, EDUCATIONAL AND WELFARE DEPARTMENT, GENERAL ELECTRIC COMPANY, PITTSFIELD, MASS.

Mr. Chairman and Members of the National Safety Council: Judge Gary estimated that it would require 5,000,000 men and $100,000,000,000 from America to win the present war. We have a population in this country of over 100,000,000, of whom 40,000,000 are wage earners. It has been stated that for each man on the firing line it requires five additional workers to supply his needs of guns, ammunitions, clothing, food and all the other material incident to fighting. A total of 30,000 people in the near future will, therefore, be required to do our part in this conflict. This will leave but 10,000,000 workers for other than war industries. According to statistics compiled by the Section on Industrial Training for War Emergency for the Council of National Defense, 8 per cent of the female population of this country are engaged in products directly relating to war, whereas in England 25¾ per cent are thus engaged. To bring the proportion up to that of England it will be necessary to add over 8,000,000 women to the war industries during the next few years and fully 2,000,000 must enter the coming year.

WOMEN ACTIVE IN WAR INDUSTRIES

England has been particularly successful in the employment of women and there is no reason why this country cannot be equally successful, especially as there are many industries where female operatives have already been used on mechanical operations for many years. Everyone realizes that the present war is a "woman's war" and we will have to rely on their patriotic interest to a very great extent in order to win. That we can count on the women to respond is evidenced by a recent campaign which was carried on in New Haven largely under the direction of Mr. Otterson of the Winchester Repeating Arms Company. It was found that

many additional women would be necessary in the industry and, due to the difficulties of housing, it did not seem desirable to attempt to rob other communities of their help, so an endeavor was made to enroll the additional help from the New Haven territory. Within a period of less than a week 5,000 women volunteered their services for the period of the war. This is typical of the spirit with which our women are planning to win the war and, in view of the very urgent need of them for industry, this general spirit of co-operativeness is a great blessing to employers of labor in the present war emergency.

CHARACTERISTICS OF FEMALE OPERATIVES

Female operatives have certain valuable traits for factory work, where the materials handled are not heavy and where the operations are not complicated. To the average female factory worker her job is a stepping stone to the time she marries. She is interested in her work, therefore, in a large measure, more for the immediate returns it brings in than with any idea of making a future out of it. She concentrates better, therefore, on ordinary work and does not lose interest readily, as sometimes happens to many men. With her greater tendency to concentrate there is less tendency to accidents. She is naturally alert and gets out of danger quicker than men—those men particularly with sluggish natures. At one time the writer made a comparison between women and men engaged in the same class of work, namely winding small transformers, and was surprised to see that the tendency to accidents among women on this class of work was less than one-third as great as among men. While figures covering the total employes in an organization are deceptive, due to the many heavy tasks performed by men rather than by women, there is such a wide difference between the number of accidents occurring to men rather than women that the figures are worthy of interest. As an illustration, an organization employing over 6,000 employes, about one-sixth of whom are women, the following major accidents occurred from 1914 to 1917:

Year.	*Men.*	*Women.*	*Year.*	*Men.*	*Women.*
1914	563	10	1916	627	24
1915	245	8	1917	945	45

It should be realized in considering these figures, however, that most of the operations performed by the men are much heavier than those performed by women.

THE NEED OF A FACTORY TRAINING SCHOOL

Statistics show that accidents occur largely to new employes, those in point of service for less than six months. This is due partly to the unfamiliarity of a new man to the dangers of his new job. Take a woman from home, put her on a good sized machine with which she has had no previous contact, and at first she is afraid of it. Suppose, however, that a small separate room containing a few machines is set aside in the fac-

tory for training purposes. This school should be in charge of a man, a foreman, who is a gentleman and who understands thoroughly the handling of female help. This is important, for the success of the school depends largely on this man. Under this foreman, should be a woman who has had considerable shop experience and at the same time has the happy faculty of getting along with other women. She must be a woman's woman. She should be able to secure the confidence of the girls whom she trains, she should be the first one that the new employes meet. This will give her an opportunity to explain carefully to the new operator, the machine upon which she is going to work, to show her how simply the machine runs, what little effort is required to operate it, what few parts of it the girl has anything to do with and after all, how much easier it is to run than a sewing machine. She can also be taught the minimum number of operations required to turn out the products, she can be given the correct viewpoint towards her employer and can be saved from learning the faults which she would be the first to learn if placed directly in the shop upon being engaged. While the girl is in the training room, she can be made acquainted with the various social agencies in the organization and can be encouraged to participate in all these activities. We should bear in mind that the social side appeals very strongly to women. In our Mutual Benefit Association we find that while the insurance feature appeals particularly to the men, the social side appeals more strongly to the women.

NEW ENGLAND TRAINING SCHOOLS

Much is being done everywhere to encourage the further introduction of factory training schools as a war emergency in the New England territory. Such schools have been started throughout New England at the Scovill Manufacturing Company, Waterbury, Conn.; the Taft-Pierce Company, at Woonsocket, R. I.; the Norton Grinding Company, of Worcester, Mass. and the Brown-Sharpe Company, Providence, R. I. Other schools are under consideration and will shortly be introduced. One of the most successful schools of this type which we have (described in the February, 1918, issue of the *National Association of Corporation Schools Bulletin*, page 74) is that maintained by Mr. Carpenter of the Computing and Recording Machines Company at Dayton, Ohio. This school is operated in conjunction with the factory, manufacturing the Russian type of fuse. Of the total force over 5,000 are women. In from ten days to three weeks, Mr. Carpenter stated, they turned out from this school girls who could operate heavy hand turret lathes on work requiring great precision. These girls, when entering the shop, attacked their machines with vigor and confidence and it did not take more than three weeks for them to reach the high average of work shown possible by their time studies. In addition to training the new operators, old operators were also put back in the shop and trained so that within two months the average production of base forgings, for instance, was increased from twenty-four pieces per hour to fifty-five pieces per hour. It can be seen, therefore, that the factory training school besides having many advantages from the safety standpoint has further decided advantages from the production standpoint.

SPECIAL SAFETY REQUIREMENTS FOR WOMEN

While the tendency to accidents among women, as before stated, is much less than men, there are two special dangers which we must always guard against in the employment of females, namely the danger from their hair being caught in moving machinery and the danger to their clothes in case of fire. While it is an established fact that in all cases where buildings have been equipped with sprinkler systems and pressure on the system maintained, there has never been loss of life in the case of a fire, still it is important where women are engaged, to avoid panics, that fire drills should be regularly maintained. Quite recently a special type of bloomer overall uniform has been developed which is quite attractive. It gives the girls considerable freedom of action and at the same time eliminates the dangers from loose dresses. While in some places the bloomer type of overall has been a success in other places it has not worked out well, due to sweating of garments, girls catching cold in changing from overalls to skirts, extra time required to make change and difficulties of laundering. A good, snug-fitting bungalow apron of light khaki material with a small collar and short sleeves is a happy compromise garment.

LET'S ALL GET TOGETHER THIS YEAR

CHAIRMAN MORRIS: Gentlemen, in closing our Sectional meeting I wish to ask the active co-operation of all the members of the Section. The work is trying and can only be met if every one will take an interest and do his part in pushing the work. Your officers will do their part. For myself I can only paraphrase the old hymn we used to sing:

I will go where you want me to go, dear friends,
I will see what you want me to see;
I will try to do what you want me to do, dear friends,
I will try to be what you want me to be.

The Section adjourned.

Metal Section—Foundry Meeting

St. Louis, Mo.

Sept. 17, 1918

EARL B. MORGAN, Chairman
Advertising Department, Curtis Publishing Company, Philadelphia, Pa.

F. H. ELAM, Vice Chairman
Employment Manager, Curtis Publishing Company, Philadelphia, Pa.

C. B. HAYWARD, Secretary
Safety Engineer, United States Government Explosive Plant "C," Nitro, W. Va.

THURSDAY MORNING SESSION

THE FOUNDRY SECTION was called to order by the Chairman, Mr. Earl B. Morgan, who made an informal report of the work for the year.

REPORT OF SECRETARY

Mr. Chairman and Members of the National Safety Council: Your Executive Committee in the early part of the present year saw fit to elect me as your Sectional Secretary, Mr. Dudley R. Kennedy resigning Jan. 1, 1918, to take up important work with the government. It was my privilege, during the year preceding the present one, to act as Chairman of your Program Committee and the work connected with this office made me feel the importance of conscientious and unselfish energy so necessary to produce the results that the Iron and Steel Section have been accustomed to. With this knowledge and feeling I accepted the position, deeming it a privilege to again serve this Section as one of your executive officers. I can truthfully report that it has been a pleasure to act in this capacity and to hope that my efforts have helped in some measure toward your continued success.

Due to the pressure of business at this all-important period of our lives and the impracticability of the executive officers personally attending the

meetings that should guide and control our activities, it was considered wise that the one held in December should be the only conference of this nature. All business relative to the Section has been taken care of through the mails and although perhaps not as interesting and helpful as personal contact, yet I can report that success has attended most of the matters taken up in this manner.

It is remarkable and highly satisfactory to us, as a body, to know that even though the present conditions of the country are congested with increased business and sacrifice, yet many memberships have been taken out in the National Safety Council by the iron and steel industrial companies. We appreciated the fact that the percentage of increase in membership would not be as great as in the preceding years of our organization, but it is encouraging to note that even at such times as the present industries all over the country still maintain their interest in safety and uphold the greatest organization ever instituted to carry on the work which we are privileged to assist in.

Our Section is divided into the Foundry and Iron and Steel Divisions and each has produced a program for this Congress that should give evidence of much thought and study on the topics to be discussed.

CO-OPERATION OF MEMBERS APPRECIATED

The assistance of the members has been appreciated and your officers would report that this help has exceeded that received last year by a good margin. No doubt this was due to the plea made in our monthly *News Letter*, issued just after last year's Congress. We hope that every Iron and Steel Sectional member will give as much assistance, and more if possible, the coming year. The suggestions and ideas that are received from our members in connection with what should be put into the program of our Congress gatherings go a long way toward making the individual meetings successful, instructive and interesting.

The bulletins issued during the past year, under the guidance of this Section, although not great in number have been most instructive and carefully selected. The publishing of our monthly *News Letter* has been successfully maintained, but with harder work on the part of the executive officers than should have been necessary. Few of our members, outside of the officers, have come across with material to help make this activity of our Section a success. We hope that the men at the head of our Section the coming year may be able to report differently at the Eighth Annual Congress, for it is through the assistance of individual members that the *News Letters* become valuable, interesting and worth while.

Your Secretary has been assisted in the performance of his duties, whenever that aid was sought, by the other executives of the Section, and their co-operation has been appreciated. I take this opportunity to thank them. It is always difficult for one or two men to handle detail matters if a helping hand is not given them willingly and the efficiency of this office, as well as any other, depends wholly upon the recognition of this fact by all those who may be connected with this Section.

C. B. HAYWARD, Secretary.

FOUNDRY MANAGEMENT FROM THE STANDPOINT OF ACCIDENT PREVENTION

G. A. Hart, Superintendent, National Malleable Castings Company, Melrose Park, Ill.

Mr. Chairman and Members of the National Safety Council: To prevent accidents to employes in the foundry should be one of the many important duties of the management. I believe this requirement is becoming more fully recognized by the steel casting industry and that the scope of the safety movement is enlarging constantly. For success in this work the management must fully realize its importance, both from the humane and commercial points of view, and with a clear understanding of the matter I believe they will appreciate its worth and endeavor to make it successful. The movement is important at this time, in fact I consider it absolutely necessary, from a patriotic point of view to conserve our manpower, and I appeal to all the industries to put into effect at once the most efficient methods to prevent accidents to employes.

To carry on this work in a successful manner some form of organization must be effected. A modest start would be to appoint a safety engineer—one who is tactful and interested in the work and has a general knowledge of plant operations. He should carefully study shop conditions and unsafe practices before offering suggestions for improving conditions. Conferences with those in charge of departments affected by the proposed suggestions are always beneficial.

WORK OF SAFETY COMMITTEES

In seeking to increase the influence of the safety movement we found that accident prevention committees, made up of employes, gave splendid results. They are appointed by the heads of the departments and consist of four or five employes, each serving four months, but are not all relieved from duty at one time. These committees meet regularly and their suggestions and criticisms are recorded and sent to the plant safety committee, consisting of an executive officer, the safety engineer and the head of each department. Each and every suggestion, complaint or recommendation receives careful consideration and is acted upon promptly.

After the safety organization had been in operation for some time we found our serious injuries began to reduce in number and our minor injuries increase—the increase being brought about by the men learning the importance of reporting a class of injuries they had previously neglected. This reduced the number of infections; in fact, since our committees have been organized, we have had no serious infections from injuries to our employes.

A never-ending campaign of education in accident prevention is necessary and all sorts of devices and methods are utilized to keep our men alert to prevent injury to themselves and their fellow workers. Every effort is made to educate employes to a proper understanding and obser-

vation of the rules laid down for accident prevention. When violations occur a distinction is made between errors in judgment and plain disregard of rules.

The workmen on the accident prevention committees have become very much interested and offer suggestions freely. They have learned to recognize dangerous conditions and note harmful practices and as a result such matters reach the attention of the plant safety committee promptly. The plant safety committee is practically an executive committee in passing upon the recommendations of the department committees; in addition, however, each member of the first-named committee is watchful for the safety, comfort and welfare of the men. No safety suggestions are allowed to grow cold—if a safeguard is considered necessary it is immediately installed.

WORK OF THE SAFETY ENGINEER

Occasionally difficult problems arise as to the best method of safeguarding a dangerous condition or overcoming a harmful practice. These matters are usually referred to the plant safety engineer for careful study and investigation. In a number of instances decided improvements in the methods of manufacture were brought about by this procedure, which indicates clearly that a study of safety often results in other benefits.

In general the safety organization, as outlined above, has been found to work out successfully if given proper support by the works management; it must have such support under any form of organization, otherwise very little progress will be made.

As a supplement to the work of the safety committees, and to assure the management that the safeguards installed are kept in proper shape, the inspector makes a thorough inspection of all machinery and equipment at regular intervals and reports on printed forms the results of his investigation. This method has been found to be of great value.

In closing, I beg to state that the adoption of a proper form of safety organization in the foundry is not detrimental to its efficient management; on the contrary, experience shows great benefits have resulted.

LUNCHROOMS

H. H. Haylett, Director, Employment and Welfare, Benjamin Electric Manufacturing Company, Chicago, Ill.

Mr. Chairman and Members of the National Safety Council: In these war times if would seem necessary to confine any remarks concerning the efficiency of any agency to its direct bearing upon the winning of the war or upon speeding up industry, to measure up to the requirements which have been placed upon it, during these times of intense production. The term of "the second-line trenches of our army" is now being applied to industry as related to the war, and certainly our boys in the first-line

trenches "over there" require the undivided support and effort of the industrial army over here.

The connection between lunchrooms and the second line of trenches is a very close one, for it has been said that "An anemic industrial army is predestined to retreat and defeat." Therefore, the efficiency of an industrial army must necessarily be just as dependent upon the quality and quantity of its food supply as is that of the military army, and when we look back we can remember the words of Napoleon that "A military army must move forward on its stomach."

My personal connections with lunchrooms and so-called commissaries dates back to the time when I first become interested in the proper housing and feeding of railroad men, at various division terminals, and extends over a period since that time to the point where, for two years, I operated their lunchrooms and commissaries, for the Commonwealth Steel Company of St. Louis, at their plant in Granite City, Ill. Therefore, in referring to "experiences," in the balance of this talk, I shall mean our experience at the Commonwealth Steel Company.

OUR REASONS FOR A COMPANY LUNCHROOM

Our company felt there was large value in wholesome food for the workmen; that many workmen left their homes in the morning with an improper dinner in their pails—either because the wife was sick or some other adverse condition had prevailed. Very often the need for economy prevented getting the proper food. Often, too, the nearby saloon offered a substitute, with liquor and "free lunch," for a proper meal. We also felt that there would be considerable value in removing our men from the associations of their work for a half-hour at noon time, where sociability and goodfellowship should take the place of shop etiquette and where the men would be taken away from the environment of work and thrown into another sphere, which, of itself, would be recreational in its influence upon them, for even when the food itself is nourishing and readily digestible, it happens frequently that it has to be eaten under conditions which militate against its real value. A meal taken amid dirt and dust in the close atmosphere of a shop, which has been occupied for some hours by a body of toiling workmen, gives but little stimulus for healthy digestion. We therefore decided to abolish a small, poorly equipped lean-to, where an outsider had been serving lunches to our workmen and took the following fundamentals as our guide for the new works restaurant:

FUNDAMENTALS

Convenient Location—The restaurant must be convenient to the workmen.

Attractiveness—It must be attractive, light, airy, well spaced, and with plain but neat, clean and attractively substantial equipment.

Prompt Service—Service must be prompt and adequate; slow service is certain to make the works restaurant a failure.

Hours—The restaurant should be open at all hours when there are

night shifts. Coffee, tea, cocoa and milk, together with rolls, sandwiches, pie, etc., should be obtainable at any time.

Food—The food served should be of first-class quality; fresh, properly prepared and cooked, appetizing, and of sufficient variety.

Prices—The price of the food to the workmen should be so low as merely to cover cost, or at most to provide only a small margin above cost. The price of any given meal or article of food should be prominently displayed. This is essential for prompt and satisfactory service.

Payment for Food—Method of payment should be by placing a check on tray before workman eats, and his payment of cash, or coupon, to cashier upon his exit. Tickets purchased in advance save the workmen from carrying much loose change in their work clothes.

Management—First and last the success or failure of the works restaurant depends upon its manager.

LOCATION AND ATTRACTIVENESS

With these requirements in mind we rehabilitated an old pattern storage shop within our plant and centrally located near the administration offices and shops. A kitchen addition was made to this building, all floors were made of concrete and kitchen and lunchroom equipment to the value of some fourteen to fifteen thousand dollars was installed. An improved type of table was selected, which after various changes were made, became the standard for the lunchroom. Plenty of light and ventilation were secured by the use of this old shop and, after the rafters had been concealed and the decorators had finished their work, we found ourselves with ideal conditions in which to install window boxes, hanging baskets, etc., to make the place cheerful and homelike.

The cafeteria plan was adopted, because of the increased facility it afforded for rapidly handling a large crowd.

LUNCHROOM OPEN AT ALL HOURS

The noontime and midnight meals, of course, were the heaviest meals. However, much might be said of the men who had their breakfasts and evening lunches from this lunchroom. Many times home conditions were such that they would have come to work from a hastily and poorly prepared meal, had it not been for their opportunity to stop into the plant lunchroom and quickly secure necessary nourishment for their morning's work. The lunchroom has served from 1,800 to 3,000 meals daily during normal conditions. The men are seated within six minutes at the noon and midnight rushes and the lunchroom is pratically clear one-half hour after the whistle blows. When facilities became overcrowded at meal time it was necessary to allow certain departments the use of the lunchroom one-half hour earlier.

STAFF REQUIREMENTS

Under this plan it was found to be necessary to keep on hand a force of some thirty employes for every 1,000 persons served at one sitting. Where special waiter service, however, was required—such as might be the case in

serving a force of the administrative or clerical employes, superintendents, foremen, etc.—the lunchroom staff must necessarily be correspondingly enlarged. However, the cafeteria plan was found adaptable to practically all of the employes of the plant and the curve of efficiency invariably rose after a hot lunch.

FIRST-CLASS QUALITY OF MATERIAL USED

Plain, wholesome cooking, with only the best quality of materials is furnished. During normal times it was found that the average cost per meal, figuring from monthly statistics, showed 17 cents per employe per meal in this lunchroom. Recent conditions, of course, have necessitated a gradual increase in these prices, but a real saving is still effected and the quality has not depreciated.

TO BE RUN WITHOUT PROFIT OR LOSS

The lunchroom was to be run without profit and without loss, as far as possible; the company, however, agreeing to meet any deficit required, feeling that such expense would be much offset by the additional efficiency and value of an employe's work toward the end of the day, after a hot, wholesome meal had been served him at noon, as compared to his value at 5 o'clock, after having eaten a cold lunch from his dinner pail, in the same environment in which he had been at work all day.

METHOD OF PAYMENT FOR MEALS

The problem of paying for meals rapidly, as employes were leaving the lunchroom, was solved by the installation of a checking system, by which a printed ticket was placed upon the employe's tray, totaling the amount of his purchases, as he left the service counter. He then was free to eat his lunch at any table which he might select, but in leaving the dining-room, after his meal was finished, he passed the cashier's cage and there he paid for his meal, either in cash, if he so désired, or by coupons issued by the company, in the denomination of 5 cents each, so that if a meal totalled 17 cents, he would, in all probability, pass in four 5 cent coupons and receive a cash refund of three pennies, or he might produce two pennies and three cupons. Most of the men preferred to secure pennies in change, however, to take home to their children in the evening. Some men frankly admitting that they looked for the odd change for this purpose.

MANAGEMENT INVESTED IN EMPLOYES

A board of governors, elected from employes who were members of the Employes' Fellowship Club, was made the advisory committee in the management of the lunchroom. Through this agency every employe in the plant had opportunity for suggestion or helpful criticism in the management of their lunchroom. The company, however, employed its manager and looked to him for efficient results.

REQUIREMENTS OF MANAGER

Constant supervision and the careful adaptations of means to ends are needed on the part of the manager of an industrial lunchroom. He must have great tact and discretion, he able to judiciously select appropriate menus; to prevent loss of good food which must be sold quickly and at a low price, such as the worker can afford to pay. He must be a good buyer, for the average plant must look to him to make the purchases for his department, rather than to the plant purchasing agent, who is usually not qualified in this line, and he must be given the financial resources of the company to make adequate purchases when the market conditions are right. Food materials can be made to pay, but the incidental expenditures are relatively heavy. Therefore, the tariffs can only be kept low by careful management.

INNOVATIONS

Many successful innovations may be tried to vary the daily operation of an industrial lunchroom. If there is a plant band it may occasionally be used at noontime to the enjoyment of the employes. Some official of the company may donate a Victrola and the employes furnish the records, moving pictures may be shown in a shadow box, while canary birds invariably tune up during the rush periods and help to give a homelike atmosphere to the room.

AUXILIARY LUNCHROOM FOR FOREIGNERS

We later provided a room, separate from but adjoining the main lunchroom, where the same line of equipment, such as tables, etc., is found as that maintained in the main dining-room. Here, however, is provided a room for the man who prefers to carry his own lunch, and here he may come, without any charge, into a well-heated building, kept clean and sanitary. Provisions are made so that he may heat his coffee pail over a gas plate provided for this purpose—later washing same in a nearby sink—and here he will find numbers of men from other points in the plants doing the same thing. If, however, in addition to the lunch which he carries, he should desire a bowl of soup, a cup of coffee, or a piece of pie, as the case may be, to augment what he has brought from home, he may procure same at the prevailing rates charged in the main dining-room.

There has been a great deal of use made of this section. It has a seating capacity of some 200 employes and has tended to keep refuse, paper, etc., localized and away from points where it would litter the plant. Many men who make use of this lunchroom are foreigners, who prefer their own types of cooking to those generally adopted in our country. The same spirit of sociability and good fellowship prevails in this section as is to be found in the main lunchroom.

COMMISSARY OR EMPLOYE'S STORE

Another outgrowth from the lunchroom idea was the retail section, or employe's store, from which there was sold to the employes who so desired

any of the same materials or food which were served in the main lunchroom. Canned goods, fresh meats, coffee, vegetables and all staples were soon in demand after the opening of this employe's store, with the result that the buying capacity was increased by the combination of lunchroom and store handled together. Waste was eliminated and many direct benefits derived.

DEVELOPING THE "FAMILY SPIRIT" AMONG EMPLOYES

The point of contact through the lunchroom, which the employer receives, with his employes, is of vital concern in the average plant, and any thought on the part of the employes that his employer is looking after his physical needs as well as providing him with an opportunity to render faithful service with fair compensation, makes him put more zest into his work and show a better type of appreciation and loyalty for his firm.

Surely, in addition to these features, the necessity for conservation, under the immediate war conditions, would make it seem wise to help the employe be economical and still provident in the matter of his own meals, and any employer who displays such interest soon finds a reflex action on the part of the employe which figures fail to account for in dollars and cents.

The industrial lunchroom has, therefore, many opportunities of service to the employe and its returns to the company, for any amount of capital which may be invested in it, are amply taken care of in more efficient workmanship on the part of the man who has received proper consideration and the nourishment necessary to carry on his work.

WASH AND LOCKER ROOMS

H. L. Krum, Works Director of Claims and Safety, International Harvester Company, Deering Works, Chicago, Ill.

Mr. Chairman and Members of the National Safety Council: In considering my subject several different aspects have presented themselves. My earliest impression of factory men was formed as a boy visiting in an industrial community. When the quitting time arrived I looked at the passing workmen with grimy hands and faces and still greasier clothes with no desire to enter upon work of that nature. In more recent years I have observed men, similarly unkempt, crowd against the lighter colored clothes of the gentle sex and leave evidence of their passing; or observed the aftereffect when some lady has occupied a seat just previously vacated by some workman who unknowingly made his mark—a grimy one, of course. The public at large has just ground for complaint and in demanding that these conditions be remedied. There is and has been for several years no plausible reason why any industry should, at closing time, turn into the streets and public conveyances greasy, dusty or ill-

smelling workmen, as the case may be, from varied occupations. On the other hand the employe has reason to expect that facilities will be placed for his use that will enable him to return to his home in a recognizable state, a worthy pattern of example for his family. Looking at the matter from a purely selfish viewpoint, we all concede that a slovenly appearance indicates a slovenly mind and hence slovenly workmanship may be expected. If provision is made to change from street clothes to work clothes, and, later, personal cleansing after work, before reattiring at night, we may expect our men to carry themselves with an assurance that presentable appearance only affords. With the shedding of factory garb it becomes easier to cast aside the unpleasant thoughts, worries and annoyances of the day.

We are judged by appearances and with the public at large surely a very unfavorable impression of some industries must prevail and this same thought undoubtedly extends to some who might have entered employment had the appearance of the workman suggested inviting working conditions. If a workman presented himself at the employment window, in normal times, appearing as he does on leaving some industries the analysis would be that he was a bum and not worth considering. It becomes of mutual interest for the employer to provide for the employe safe storage for street clothes, where they may be accessible at quitting time free from dust and odor, and where his sweaty work clothes may dry before they are required on the succeeding day, and also to have proper wash and shower rooms in conjunction therewith. Comradeship is also promoted among the men, owing to the association morning, noon and night while in the change and wash rooms.

LOCATION

It is contended by some that wash and locker rooms should be in a building separate and apart from the place of employment. Advantageous features of such arrangement suggested are freedom from the dust and odors of manufacture, greater accessibility to sunlight and free circulation of air; also its possibilities in architectural and landscape effects, beautifying the plant. To those who object to employes taking a "bite between meals" this plan places lunches in a less accessible location. Incidentally, some employers support this latter practice.

With a range of climate such as is generally found in this country, from mild to severe, sometimes within a day, it would be more than foolhardy to expose a perspiring worker to the elements while en route from his work room to the wash and locker room. The preferable location, therefore, for these facilities—from the viewpoint of health as well as economy—is in a portion of the workroom or in the same group of buildings where the employe will not be exposed to climatic change. Switch tracks, etc., are also avoided by this arrangement. Such facilities, when in a portion of a manufacturing building, should be located along the route to and from work, preferably in a corner, where light and air enter from two sides. Additional ventilation may be available from a workroom where manufacturing permits. The area assigned should be of sufficient

size to avoid interference of men and be separated from workroom by fireproof partitions.

Note.—No other sanitary installation under any condition, should be installed in the same room with lockers, wash sinks or showers, but should, however, be reasonably convenient.

FEATURES COMMON TO WASH, LOCKER AND SHOWER ROOMS

Doors—Two self-closing doors are recommended, marked respectively "Entrance" and "Exit" to avoid confusion. Both doors to have wired glass observation windows to avoid injury by collision and both to open outward in accordance with fire rules.

Windows—Windows should be of proportions ample enough to afford adequate light and ventilation. Swinging type of window is preferable.

Trim—Best sanitary measures indicate that hospital practice be followed: that is, to eliminate all trim (window, door casings and base) and finish floor, ceiling and all corners round.

Plaster—Rough-wall finish, while attractive, collects dirt; it is, therefore, recommended that a smooth, special mixture cement be applied.

Floor and Drain—Floor should be of a smooth cement, properly pitched to drain to the center of wash sink or shower compartment to be drained. Floor material should meet wall line with a fillet and extend upward about six inches, presenting a base impervious to water used while washing down with hose.

Illumination—Adequate lighting installation, preferably electric, should be provided, sufficient to equally light all portions of rooms and compartments.

Decoration—Rooms should be painted in color sufficiently light in shade so as to add to illumination and expose any unclean areas.

Heating of Water—Either of two methods are suggested in the heating of water: to use live or exhaust steam through a coil in boiler regulated by automatic control. The exhaust steam method obviously is most economical.

Heating of Rooms—It is recommended that heating facilities be sufficient to maintain an equal temperature in room or rooms assigned. That coils or radiators be so arranged as to permit cleaning beneath and about same.

Hose Connections—Sufficient connections should be provided in various rooms for attachment of hose for cleansing purposes.

LAVATORIES VS. WASH SINKS

From a factory viewpoint lavatories are considered objectionable for sanitary reasons. Where workmen use stoppered basins in rapid succession they could not, if they would, properly cleanse lavatory before the one next in turn uses same, consequently, the residue becomes increasingly evident. An installation that permits washing under a stream of running water of proper temperature overcomes the difficulties mentioned and a more thorough cleansing is afforded with less loss of time.

Wash Sink—A wash sink of our design, known as the "Harvester" type, meets all objections from a sanitary viewpoint. It might be termed a roll-rim, flat-bottom enameled iron sink, measuring 30 inches by 6 feet by 8 inches deep, its rim rising 31 inches above floor, being supported by two enameled iron pedestals. It is fitted with two low-pattern double-pipe supports, with six double-mixing faucets marked for hot and cold water, with three galvanized malleable iron faucet connections, right and left threaded. Faucets are placed on 24-inch centers. A flat waste strainer at center carries off water at once. A drained soap tray, 3¾ by 5¾ inches and one-half inch deep is secured to supply pipe above each faucet. Washing facilities should be in the ratio of one spigot to every six men employed, based on the maximum number employed in any one shift.

Showers.—Personal comfort in the using of showers is more fully met where same are in a room, apart from lockers and wash sinks, where equal and adequate temperature may be maintained. Preferable arrangement suggests the allotment of an area for each shower of no less than 4 by 4 feet, and separated from one another by a partition starting 18 inches above floor level and extending upward therefrom 5 feet 6 inches. Splashing upon one another is thus avoided and "horse play" reduced to a minimum. Each compartment should have a mix valve so located that same may be controlled from position removed from spray; a sponge rack, liquid soap container and removable wood-slat floor mat complete equipment. An area sufficient for lockers, benches and dressing space should be afforded in shower room, thus avoiding exposure to colder temperature in general locker room. In dusty or hot trades a ratio of one shower to fifteen men, based on the maximum number employed in any one shift, is a proper apportionment.

Foot Tubs—In foundries and other similar trades the presence of foot tubs would be a proper portion of equipment. Objectionable practice of using lavatory or other wash facilities would then be avoided.

Lockers—Much difference of opinion exists as to this portion of equipment. It is desirable that lockers should be raised at least 8 inches above floor to enable cleaning beneath same. Further, the top should be sloped at least 45 degrees to prevent an accumulation of litter thereon. All agree that the material should be of sheet metal and that sides, back, top and bottom should be solid. As to the door, inasmuch as it cannot be made tight enough to be vermin proof, it, therefore, seems practical that perforated metal or small mesh wire occupy a fair portion of same, mainly to enable inspection without interference with contents. As to dimensions, lockers have been observed from 12 inches square and 32 inches high, all the way to 60 inches in height.

It is to the advantage of employers, in more ways than one, to have favorable comment made upon the appearance of employes. If we would be governed by average measurements it will be determined that the common shoulder measurement of a coat is 18 inches and the length of an overcoat seldom less than 48 inches, therefore, we have two governing measurements. Summarzing, the locker should be 12 inches wide, 18 inches deep and 60 inches high. A hook placed at proper height to the

right or left of the 18-inch sides of locker will accommodate a hat and is wide enough for a coat hanger if desired.

The two-tier method of placing lockers is impractical and unsafe, inasmuch as garments on hooks of upper lockers can only be reached from stools or with sticks. Of importance is the numbering of lockers and keeping record of their assignment, if for no other reason than that the clothes of an injured employe may be located without a shop-wide inquiry. The inspector will also find use of such record in determining the user of any unsanitary locker.

The most cleanly locker and wash room ever observed is one where the grouping in one room is sufficiently large to warrant the keeping of an attendant in the room constantly. Under this arrangement all contents of lockers are reasonably safe without that lock found so annoying when a complete inspection is desired and no master lock system is extant.

DISCUSSION

BUELL W. NUTT (The Strong, Kennard & Nutt Company, Cleveland, Ohio): If the war has done no other thing for our country's manufacturers it has accomplished much in that it has awakened them to the truth of the old adage that "Necessity is the mother of invention" and that things which seem impossible require but the "Open, sesame!" of a need that will not be denied to make them accomplished facts. The romance of the "impossible" things that we have accomplished is one of the most interesting chapters of this world-wide drama. There is not a business which it has not touched nor an industry but has contributed its share, and as we hear of the startling inventions, new processes and wonderfully improved methods it is like the telling of an Arabian Nights tale. Methods in use for years have been discarded, machinery worth millions has been scrapped and whole industries have been abolished that new and more useful ones may take their places. It is impossible to calculate the tremendous amount of thought and effort and the huge amount of money that all this has cost, but great as this cost may be, it is lost sight of in view of the benefits derived, more particularly so because they are of a permanent nature, based upon new knowledge and new thoughts brought into action.

Let me tell you of a romance in the manufacturing optical business. Perhaps many of you have never given much thought to the subject of glass, supposing that all glass was very much alike. On the contrary, there are a great many different kinds of glass and the glass used in the optical industry is entirely different from that commonly called window glass; different in composition, texture and in many other points. It may interest you to know that there are several hundred different kinds of optical glass, all of which have their uses. The glass used for spectacle lenses is of a different variety than that used for microscopes and binoculars, although to the layman the appearance may be identical. Each kind of glass must be worked out by a formula designed to produce certain results and not only must the glass be colorless, free from bubbles and im-

perfections, but it must also have certain optical properties upon which the theory of lenses is based. Many of the colors also are the result of scientific research and experiment and are not used because they are beautiful or have a pleasing effect on the scenery. Sir William Crookes, an English scientist, made over 300 shades before he succeeded in producing Crookes' tinted lenses, now largely used in spectacles for cutting down ultra-violet rays.

ONE OF THE THINGS THAT "COULD NOT BE DONE"

Before the war practically the entire supply of glass used in the optical business was produced in Europe and was imported by us from England, Germany and France. Attempts to produce it in this country had not met with success and the efforts were finally given up; in other words, it was one of the things that "could not be done." Fortunately, at the outbreak of the war there was a fairly good supply on hand in this country and we were able to increase this supply in the early months of the conflict. Then came the time when imports stopped altogether, our supply began to dwindle and we faced a shortage of material absolutely essential for spectacle lenses, goggle lenses, scientific instruments, binoculars, field glasses, gun-sighting apparatus and numerous other things. It was a mighty serious situation and called for prompt action. It was not only a question of producing the glass, it was a case of learning how to produce it. With the aid of the United States Bureau of Standards and other governmental departments some of the large lens-grinding plants of the country started the work and after months of costly experimenting and research succeeded in producing glass for optical purposes equal to that which we formerly imported from Europe. While the supply is hardly adequate at present (due to labor shortage) we will never again be dependent upon a foreign country for optical glass. This is important from a safety standpoint, because goggle lenses are now made from this kind of glass.

Previous to the advent of the safety movement, comparatively little attention was paid to the tensile strength of optical glass, and the goggles on the market at that time contained, for the most part, very cheap blown glass, in no way adequate to the eye-protection needs of chippers, grinders, riveters, etc. The first attempts to improve this condition was the substitution of ground and polished plate glass. Next a ground and polished optical glass of uniform thickness was used. From that point various experiments were carried on to toughen the glass to prevent it from cracking when subjected to very heavy blows. These experiments have resulted in the production of glass whose strength is almost unbelievable, and which will stand an extremely heavy blow without cracking. The latest development is the re-enforced glass produced by welding a sheet of celluloid between two sheets of glass. These lenses are particularly adaptable for eye protection, because, as the United States Bureau of Standards says of them, "The relatively increased non-shatterability of laminated glass and its comparatively good transparency and rigidity after puncture give it great importance in devices for protecting the eyes and face." In a

supplementary report the same authority says: "In view of the tenacity with which celluloid holds glass and prevents it from shattering, the slightly lower light transmission of such a combination is probably compensated for by the superior protection offered to the eyes in case of accident to the goggles." The government, at the present time, is using very large quantities of this glass in both goggles and gas masks.

LENSES PLATED WITH PURE GOLD

Another interesting development has been made in the Pfund lens—used while welding, heating and pouring metal and other occupations where extremely bright light is encountered. In excessive light the ultra-violet and infra-red rays of the spectrum are the ones said to be more or less permanently injurious to the eyes. Through the use of various colored lenses it has been possible to keep a part of these rays from entering the eyes, as it was found that some tints or colors would, to a certain degree, prevent the transmission of these rays through the glass and into the eye. The principle of the Pfund lens, however, is not based primarily upon color or shade, but upon the fact that metals are the most opaque substances known for infra-red rays. This is true of pure gold, while in the visible rays of light (red, yellow, green, etc.) it has a high transparency. Therefore, by coating a piece of glass with pure gold it is possible to reflect from the surface of the glass 98 per cent of the infra-red rays and still transmit a large percentage of the useful rays through the gold plate and glass into the eyes. These lenses may be used under any degree of light by using tinted lenses in place of white on which to plate the gold, the amount of light passing through the glass being thus regulated and perfect safety provided for the operator. These improvements in lenses have done much to popularize the use of goggles.

Manufacturers have also exercised a great deal of ingenuity in improving goggle frames. Thus it happens that we have different frames for various needs—frames that may be sterilized, that may be rendered comfortable by easily made adjustments, that are covered with material to protect the face from heat or made of material which is a non-conductor of heat. The conditions under which goggles are used are so varied that new types are continually being developed to care for special needs, and manufacturers are always glad to receive suggestions which may be used to improve or develop new styles, and while some of the suggestions cannot be utilized, because of practical or manufacturing difficulties, they are always helpful.

A type of goggle which manufacturers are often asked to produce is usually described about as follows: "What we want is a very lightweight goggle, fitted with lenses that won't break; one that is airtight and dustproof, but well ventilated; it must be cool and the lenses must not sweat even during July in Alabama; it should be proof against acids, liquids or fumes; in fact, indestructible. The goggle should be so easy to wear that men will forget that they have it on till they start to wash up when the whistle blows." So you see we still have something at which to shoot, and should you chance some day to see a fellow in a padded cell drawing

pictures and making diagrams don't be surprised if you recognize your old friend the goggle manufacturer.

WORKMEN SHOULD WEAR GOGGLES

Just a word about another of those "impossible" things: Getting all workmen to wear goggles when it is necessary. No one wants to wear goggles, and few will wear them constantly unless convinced of the necessity, or unless forced to wear them. Where a man refuses to do so there are just two courses of action that may be taken. One is to force him to wear them against his will, and the other is to convince him of two things: *First*, of the gravity of accidents which may result in the loss of one or both eyes: *second*, that *he* can and very probably will, sooner or later, have an eye accident, unless he wears goggles. Many times a man recognizes the danger, but seems to think that it applies only to the other fellow, or he thinks the reason he is asked to wear goggles is to save the boss from paying compensation if his eyes are injured, and so he entirely overlooks the personal application. To force a man to wear goggles, for the time being, at least, sometimes is the only alternative, but this method is never permanently successful, because a safety idea cannot be completely effective while it is being combated by those it is meant to protect. It must be accepted and believed in if it is to prove entirely successful; therefore, overcoming the objections of workmen must come through convincing them of the gravity and personal phase of the danger. This takes unlimited patience and not infrequently real ingenuity, particularly when dealing with foreigners and the uneducated.

I was walking down a street in Montreal not long ago, when, coming toward me, I saw two robust-looking Canadian soldiers between whom a lady was walking, and she was holding a hand of each. As they came nearer I saw that they were blind and were being led along the street, dependent on their guide, and as I realized that all their lives they would be dependent on some one for guidance I thought what a horrible thing is war, thus to deprive man of his most precious possession and leave him helpless and dependent. Then I thought of the 110 men who were blinded in the industries of Ohio during one year and the 2,500 men who were blinded in the nation in a year and of the men who lost the sight of one eye and of other thousands who suffer painful eye accidents each year.

In upholding the cause they were fighting for, the sacrifice of the eyes of these soldiers was doubtless necessary, but what can be said for the needless sacrifice of a man's sight in the industries? If workmen do not realize the extent of eye accidents or their disaster, or do not care, they must be shown and convinced that wearing of goggles is for their personal benefit. I have talked with a great many workmen in every kind of industry in various sections of the country, and have found that almost invariably when I have convinced a man of his personal interest in wearing goggles a good deal of his prejudice soon disappears, usually if he is supplied with the right type of goggles the rest is easy.

In times past—in the days of cheap, poorly constructed goggles—he

had some valid excuse for not wanting to use them, such as the fear of the glass being broken into his eye, the discomfort of wearing poorly fitted goggles and the danger of infection caused by one pair of goggles being used by half a dozen different men, but the improvements that have been made in goggles and modern methods of using them have completely removed such objections.

NO MAN WITH POOR VISION THOROUGHLY SAFE

There is one other thing that will materially help in getting men to wear goggles and that has to do with the question of sight or vision. This question is destined to force itself more and more to the attention of employers and safety and welfare departments. No man can be a thoroughly safe employe who has poor vision—neither can he be 100 per cent efficient. Eye strain produces eye fatigue, dizziness and headaches and results in a drain of nervous energy. This means that other organs or functions of the body must suffer in consequence, and the vitality and efficiency of a man is lowered thereby. After the age of 35 to 40 years the near-point vision of most people begins to dim, and when this has started the only way to overcome it is to have lenses fitted, which, in a sense, restore the vision to its former keeness. In those below 35 years of age other defects of vision may occur which may be corrected just as easily by proper lenses. To give a man goggles fitted with plain glass and expect him to use them, regardless of the fact that he may have poor vision, many times places him under a handicap. Many complaints that goggles cause headache, dim vision or that they hurt the eyes can be traced to this source. Man is equipped with what we call binocular vision; that is, he uses both eyes to look at the same object at the same time, and by this method is enabled more accurately to tell direction and judge distance and the size of objects. The loss of an eye, therefore, upsets the whole scheme of his vision, and as a result he not only loses 50 per cent of his sight, but far more, as the remaining eye cannot properly function by itself, and so the ability to judge direction and distance correctly is largely lost to the individual with only one eye. Thus too many people who have normal vision in one eye and very defective vision in the other are not aware of the fact, and frequently very poor vision in both eyes is not detected. Such employes are a source of danger, not only to themselves, but to their fellow workmen. It pays to know that men in your employ have good eyesight, and it pays to provide goggles fitted with corrective lenses when you find a workman suffering from poor vision, because improved vision not only makes a more proficient worker, but it often overcomes the objection to wearing goggles. In the plant of the Goodrich Rubber Company, where 9,490 employes were tested for vision, it was found that 1,912—a little over 20 per cent—suffered from defects to such an extent that it seriously interfered with their work. Of the number tested it was found that the percentage of defective eyes in the office force was about 7 per cent, while that of factory employes was nearly 23 per cent. The Goodrich Company has the eyes of all applicants for employment tested, and employes are re-examined at regular

intervals thereafter. The importance of the question of vision cannot be too strongly emphasized, and the sooner employers make it their business to know the true condition of the eyes of their employes, just that much sooner will they secure a larger and higher degree of safety in their plants.

The manufacturer of safety devices realizes, as does every other manufacturer, that the real job on hand at the present time is the winning of the war, and is bending every energy to produce safety devices that, in a large degree, will safeguard the man at home while he is making things for the safety, the protection, the aid and the comfort of the man "over there." If safety ever paid it is now; if safety devices ever were useful it is now, and if it is the patriotic duty of every employer to see that the life of every man in his employ is adequately safeguarded, then likewise does the manufacturer of safety devices realize the importance of co-operation with employes, safety directors, safety committees and individual employes that he may render a service which has as its ultimate end the conserving of human life and happiness and welfare of all mankind.

GENERAL DISCUSSION

A general discussion of the papers presented and an interesting exchange of opinion occupied the entire session. Attendance was exceptionally large, considering the extremely busy industrial conditions of the iron and steel plants of the country.

[Owing to war conditions it was impossible to secure the services of a stenographer for this Section and the minutes of the meeting are necessarily confined to the papers presented.]

Steam Railroad Section

St. Louis, Mo.

Sept. 17, 18 and 19, 1918

H. J. BELL, Chairman
Regional Supervisor of Safety, United States Railroad Administration, Chicago, Ill.

T. H. CARROW, Vice Chairman
Supervisor of Safety, Pennsylvania Railroad, Philadelphia, Penna.

C. M. ANDERSON, Secretary
Regional Supervisor of Safety, United States Railroad Administration, Atlanta, Ga.

IN ATTENDANCE AT SECTIONAL MEETINGS

American Iron and Steel Institute—Thomas Darlington, Physician, 27 Washington square, Washington, D. C.

American Red Cross—Dr. W. N. Lipscomb, First Aid Division, Washington, D. C.

Atchison, Topeka & Santa Fe—Isaiah Hale, Commissioner of Safety, Topeka, Kan.

Atlantic Coast Line—J. 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.

Baltimore & Ohio Railroad, et al.—John T. Broderick, Supervisor Safety and Welfare, Baltimore, Md.

J. C. Morgan, Baltimore, Md.

Buffalo, Rochester & Pittsburgh Railroad—John S. Rockwell, General Agent, Rochester, N. Y.

Canadian Government Railroads—E. E. Stevens, Safety Engineer, Moncton, N. B.

Chesapeake & Ohio Railroad—L. G. Bentley, Secretary, General Safety Committee, Richmond, Va.

Chicago & Alton—C. P. & St. L.—J. A. Britlet, Acting Superintendent, Springfield, Ill.

S. P. Henderson, Superintendent, Bloomington, Ill.

D. C. Frederick, Superintendent of Safety, Bloomington, Ill.

Chicago, Burlington & Quincy—E. M. Switzer, Superintendent of Safety, Chicago, Ill.

F. B. Thomas, Safety Inspector, Chicago.

Chicago, Great Western—L. C. Espersen, Claim Agent, Clarion, Iowa.

G. O. Perkins, Chairman, General Safety Committee, Chicago, Ill.

Chicago, Indianapolis & Louisville—J. H. Holloway, Superintendent of Safety, Lafayette, Ind.

Chicago Junction Railroad—Jno. B. Green, Claim Agent, Chicago, Ill.

L. Podesta, Superintendent, Chicago, Ill.

Chicago, Milwaukee & St. Paul—J. F. Kane, District Safety Inspector, Cedar Rapids, Ia.

A. W. Smallen, General Supervisor, Safety and Fire Prevention, Chicago, Ill.

Chicago & North Western—Frank Bickford, Machinist, Missouri Valley, Iowa.

Chas. O. Bricker, Switchman, Chicago, Ill.

S. M. Galaty, Safety Inspector, Chicago, Ill.

R. C. Richards, Chairman, Central Safety Committee, Chicago, Ill.

James Sullivan, Safety Inspector, Chicago, Ill.

H. F. Thies, Locomotive Engineer, Chicago, Ill.

F. E. Valentine, Switchman, Green Bay, Wisc.

Chicago, Rock Island & Pacific—L. F. Shedd, General Supervisor Safety and Fire Prevention, Chicago, Ill.

Chicago, St. Paul, Minneapolis & Omaha—J. A. Doyle, Safety Inspector, St. Paul, Minn.

Geo. L. Wright, Superintendent of Safety Bureau, St. Paul, Minn.

Cleveland Railway—Geo. R. Radcliffe, Cleveland, Ohio.

Commonwealth Steel Company—L. W. George, Safety Engineer, Granite City, Ill.

Denver & Rio Grande—F. W. Curtis, Secretary, General Safety Committee, Denver, Colo.

Detroit Edison Company—George Ott, 516 Artillery Ave., Detroit, Mich.

Duluth, Missabe & Northern and Duluth & Iron Range—A. V. Rohweder, Supervisor of Safety, Duluth, Minn.

Elgin, Joliet & Eastern—C. M. & Gary—O. F. Gnadinger, Supervisor of Safety, Joliet, Ill.

Forth Worth Belt Railway—Ed. R. Henry Fort Worth, Texas.

J. M. Morrill, Locomotive Engineer, Pacific, Mo.

Georgia Railroad—J. A. Barnette, 702 Healey Bldg., Atlanta, Ga.

Great Northern Railroad—C. L. La Fountaine, General Safety Supervisor, St. Paul, Minn.

Gulf Coast Lines—San Antonio & Aransas Pass. et al.—H. M. Mayo, Superintendent of Safety, Houston, Texas.

Gulf & Ship Island and Miss. Central—W. P. Withers, Insp. of Transportation, Hattiesburg, Miss.

The Hurst Automatic Switch & Signal Co.—C. W. Hurst, 2163 Railway Exchange Bldg., St. Louis, Mo.

Illinois Central—G. E. Patterson, Superintendent, McComb, Miss.

S. S. Morris, Chairman, General Safety Committee, Chicago, Ill.

Illinois & Northern—H. L. Krum, Claim and Safety Agent, Chicago, Ill.

Interstate Commerce Commission—Thos. J. Hicks, Safety Appliance Inspector, Colorado Springs, Colo.

Kansas City Southern, et al.—D. B. Daley, Superintendent of Safety, Kansas City, Mo.

Kansas City Terminal—E. P. Cieslik, Safety Supervisor, Kansas City, Mo.

Lehigh Valley Railroad—Arthur E. O'Dea, Superintendent of Safety, Bethlehem, Pa.

Louisville & Nashville—R. L. Pilling, Supervisor of Safety, Louisville, Ky.

Minneapolis & St. Louis—O. F. Johnson, Inspector of Transportation, Minneapolis, Minn.

Missouri, Kansas & Texas, et all—J. L. Walsh, Superintendent of Safety, Dallas, Texas.

Missouri Pacific Railroad—N. McKernan, Superintendent of Safety, St. Louis, Mo.

Mobile & Ohio—A. L. Pollard, Safety Agent, St. Louis.

H. L. Wright, Supervisor of Safety, Mobile, Ala.

Nashville, Chattanooga & St. Louis—F. Whittemore, Superintendent of Safety, Nashville, Tenn.

New York Central Lines—F. H. Babcock, Safety Agent, Pittsburgh, Pa.

W. L. Boslooper, Safety Agent, Detroit, Mich.

A. R. Cooper, Safety Agent, Toledo, Ohio.

B. H. Dayton, Safety Agent, Albany, N. Y.

F. L. Diehl, Safety Agent, Elkhart, Ind.

Marcus A. Dow, General Safety Agent, New York City.

C. B. Floyd, Assistant to General Safety Agent, New York City.

E. B. Goodart, Safety Agent, Mattoon, Ill.

Chas. W. Hammond, Safety Agent, Cleveland, Ohio

A. C. Hartley, Safety Agent, Bay City, Mich.

F. A. Hruska, Chief Claim Agent, Cleveland, Ohio.

J. W. Johnston, Safety Agent, Chicago, Ill.

C. H. Lentz, Safety Agent, Bellefontaine, Ohio.

Arthur McBain, Safety Agent, Montrose, N. Y.

T. R. McCampbell, Safety Agent, Indianapolis, Ind.

Frank P. McGirr, Safety Agent, Buffalo, N. Y.

A. B. Richards, Safety Agent, Tipton, Ind.

C. D. Shaff, Safety Agent, Syracuse, N. Y.

E. P. Spangler, Safety Agent, Jackson, Mich.

J. P. Timley, Safety Agent, Ashtabula, Ohio.

William Van Gorder, Safety Agent, Springfield, Ohio.

C. J. Weber, Safety Agent, Buffalo, N. Y.

New York, Chicago & St. Louis—C. C. Winegardner, Chief Safety Agent, Cleveland, Ohio.

New York, Ontario & Western—N. L. Satchell, Safety Agent, Middletown, N. Y.

Northern Pacific—F. M. Metcalfe, Superintendent of Safety Section, St. Paul, Minn.

Oregon Short Line—Los Angeles & Salt Lake—J. C. Clark, Assistant to General Manager in Charge of Safety, Salt Lake City, Utah.

Allen E. Peterson, Safety Agent, Salt Lake City, Utah.

Oxweld Acetylene Company—Thomas R. Beebe, Welding and Cutting Appliances, St. Louis, Mo.

Pennsylvania Railroad—Thos. H. Carrow, Supervisor of Safety, Philadelphia, Pa.

E. S. Chapin, Jr., Safety Inspector, Philadelphia, Pa.

Pere Marquette Railroad—E. A. Klumph, General Safety Supervisor, Grand Rapids, Mich.

Pittsburgh Railways—G. E. Clarkson, Dormant, Pa.

Protective Signal Mfg. Co.—Archie M. Adams, Denver, Colo.

Railway Review—J. M. Lammedee, Chicago, Ill.

Roxana Petroleum Company—F. B. Stough, Superintendent Car Equipment, Wood River, Ill.

St. Louis & San Francisco—M., K. & T.—Geo. L. Ball, Superintendent of Safety, St. Louis, Mo

St. Louis Southwestern—E. Richards, Superintendent of Safety, St. Louis, Mo.

Seaboard Air Line—W. W. Fuller, General Safety Supervisor, Norfolk, Va.

Southern Railway System—D. H. Beatty, Superintendent of Safety, Washington, D. C.

A. C. Formwalt, Safety Supervisor, Knoxville, Tenn.

W. L. Singleton, Safety Supervisor, Ludlow, Ky.

C. R. Staples, Safety Supervisor, Lexington, Ky.

H. E. Tyrell, Engineer Maintenance of Way, St. Louis, Mo.

Terminal Railroad Association of St. Louis—H. A. Walter, Supervisor of Safety, St. Louis, Mo.

Texas & Pacific, et al.—O. B. Webb, Superintendent of Safety, Dallas, Texas.

Union Pacific Railroad—P. Groome, General Safety Agent, Omaha, Neb.

Wabash Railroad—Wm. Atwill, Division Superintendent, Carbondale, Ill.

Henry Brocker, Moberly, Mo.

C. E. Brown, Superintendent, Springfield, Ill.

J. W. Calley, General Car Foreman, Moberly, Mo.

Charles W. French, General Foreman, St. Louis, Mo.

H. A. McCoy, Chief Clerk to Master Mechanic, Moberly, Mo.

Fred. Meyers, Superintendent of Safety, St. Louis, Mo.

J. T. Sheahan, Engineer Maintenance of Way, Moberly, Mo.

L. K. Smith, Master Mechanic, Moberly, Mo.

H. P. Tead, Claim Agent, Decatur, Ill.

C. G. Williamson, Assistant Claim Agent, St. Louis, Mo.

Wheeling & Lake Erie—J. T. Briggs Supervisor of Safety, Canton, Ohio.

United States Railroad Administration—Safety Section—H. W. Belknap, Manager, Southern Railway Building, Washington, D. C.

A. F. Duffy, Assistant Manager, Southern Railway Building, Washington, D. C.

Regional Supervisors of Safety—C. M. Anderson, Healey Bldg., Atlanta, Ga.

H. A. Adams, 547 West Jackson Boulevard, Chicago.

H. J. Bell, 805, 226 West Jackson Boulevard, Chicago.

R. S. Jarnagin, Grand Central Station, New York.

F. A. Wightman, 2003 Railway Exchange Building, St. Louis, Mo.

TUESDAY AFTERNOON SESSION

THE MEETING was called to order by Mr. H. J. Bell, Chairman, at 2:00 o'clock, there being 131 persons in attendance.

CHAIRMAN BELL: The meeting of the Steam Railroad Section will please come to order. In view of our greater knowledge, as the war proceeds, of the value of man-power and the necessity for conserving it, I think our Congress this year is of more importance than ever before. We should all take the position that, at this meeting, we have an important duty to perform. That duty consists of our giving very close attention to the discussion, taking part in it whenever that seems proper, and getting out of it for ourselves and giving to others all of the good that we can. These conferences have always been representative, but this year, in view of governmental control of the railroads and the fact that the United States Railroad Administration is taking so much interest in the work, perhaps our attendance is larger than heretofore. We have in this room, no doubt, the foremost railway safety men in the country, and we want everyone to feel free to take part in the discussion, so that we shall get the maximum of good out of it. We will not really be doing our full duty unless we do that, and in these stirring times everyone ought to perform his full duty in anything he undertakes.

STEAM RAILROAD SECTION A SUCCESS

It is not my purpose at this time to make any extended remarks, because our program is so replete with speakers and subjects of interest that I believe we ought to take it up just as quickly as we can after the necessary preliminaries have been disposed of. The meeting is an open one and we want everyone to take part. It will be a success only to the extent that you gentlemen make it a success.

I desire to take this occasion to thank all of the members of the Steam Railroad Section for their co-operation and assistance to the officers and chairmen of the various sub-committees during the year and to bespeak that same helpful assistance to the officers who will have charge of the affairs of the Section during the coming year.

I believe there is no more appropriate and auspicious manner in which we might start this meeting than by asking Mr. Anderson to read a tele-

gram which was read yesterday before one of the general sessions. It is from the Hon. W. G. McAdoo, Director-General of Railroads, and addressed to the Council. Perhaps it was not heard by all the delegates and I feel sure that it will give us the inspiration and enthusiasm so necessary in order that we may get out of this meeting the very best results possible.

TELEGRAM FROM SECRETARY McADOO

SECRETARY ANDERSON: This telegram is dated Sept. 16, from White Sulphur Springs, and reads as follows:

> "Please convey following message to National Safety Council Congress: 'Conservation of the lives and health of our people an imperative national necessity. To arouse leaders of all industries and to awaken all workers to this necessity is a work of vital importance. The old maxim "The Safety of the people is the highest law" has new importance in these days of human wastage. Never before have enlightened men realized the world importance of safeguarding in a higher degree than ever before the broad interests of human beings and the right of all, even the humblest, to live in freedom and in security, not only from oppression, but also from injury resulting from controllable causes. Your organized influence and your vigorous work for the protection of the lives and the safety of economic workers has the complete endorsement of all farseeing people. Today man-power means so much to the safety of the Nation that the conservation of the health and promotion of safety not only of the workers on our railroads, but in all industries stands as a patriotic duty, as well as an economic necessity. Effective accident prevention work on all railroads under Federal control is, therefore, one of the important activities of the United States Railroad Administration. Please be assured of my earnest interest and sympathy in the important work you are doing and of my best wishes for a fruitful outcome of your deliberations.'
>
> W. G. McADOO."

(Applause.)

REPORT OF CHAIRMAN

CHAIRMAN BELL: The first item on the program calls for a report by the Chairman. The only report that I can make to you at this time is that the Chairman, in common with the other officers of the Section and the members of the Executive Committee, has tried to properly perform the duties of his office. We have had three meetings of the Executive Committee of the Section during the course of the year and kept in intimate touch with the affairs of the Council. The Chairman of this Section, as with other Sections, automatically becomes a member of the Executive Committee of the National Safety Council, and we have attended those meetings when practicable and kept in reasonably close touch with the affairs of the parent organization. The program speaks for

itself and the Chairmen of the various sub-committees will later on make reports to cover their individual activities.

The next item of business is the report of the Secretary.

REPORT OF SECRETARY

SECRETARY ANDERSON: The only report I have to make is that the Secretary has performed the usual duties of his office. I am reminded of the fact that actions speak louder than words. The Chairman has reported that we have had three meetings of the Executive Committee. I presume you have all received the monthly *New Letter*. That is all I have to report at this time.

CHAIRMAN BELL: The report which should come next is that of the Membership Committee, of which Mr. C. H. Blakemore of the Norfolk & Western Railroad is the Chairman. Mr. Blakemore this year, as in previous years when he has been Chairman of that committee, has done fine work. Unfortunately, he is unable to be present, but he has sent his report, which the Secretary will read.

REPORT OF MEMBERSHIP COMMITTEE

Mr. Chairman and Members of the National Safety Council: As Chairman of your Membership Committee it again becomes my duty, in behalf of that committee, to report to you upon its activities during the year just past and upon the results which have followed those activities. Under the authority given me by the Executive Committee I organized the committee as follows: C. M. Anderson, N. C. & St. L. Railway; J. T. Broderick, B. & O. Railroad; G. L. Wright, C., St. P., M. & O. Railway; J. B. Green, Chicago Junction Railway; A. A. Krause, M., K. & T. Railway; R. P. Kyle, El. P. & S. W. Railway; H. A. Rowe, D. L. & W. Railroad; J. S. Rockwell, B. R. & P. Railway; H. K. Relf, S. P. & S. Railway. I here take occasion to extend to my colleagues my grateful appreciation for the efficient work they have done in this connection.

The past year has been filled with such unexpected developments that it has been difficult to attract the attention of railway officers to the matter of memberships. For a considerable time it seemed uncertain to just which associations, if any, the railways would be permitted to belong, but recently, I am happy to say, Director Prouty of the United States Railroad Administration issued a letter, a copy of which is made a part of this report, placing the National Safety Council within that group of associations which are approved by the administration and from this time forward membership work can be carried on under the most favorable conditions.

NEW MEMBERSHIPS

Despite the discouraging situation membership work has been prosecuted as vigorously as under the circumstances seemed tactful, and with fairly creditable results, as the following new lines have been brought into the Railroad Section:

The Ann Arbor Railroad,
Atlantic Coast Line Railroad Company,
Bangor & Aroostook Railroad,
Bingham & Garfield Railway Company,
Chesapeake & Ohio Railway,
Chicago, Indianapolis & Louisville Railway,
Chicago, Milwaukee & St. Paul Railroad.
Chicago, Rock Island & Pacific Railroad
Cincinnati, Indianapolis & Western,
Delaware & Hudson Railroad,
Denver & Rio Grande R. R.
Detroit, Toledo & Ironton Railroad,
Florida East Coast Railway,
Fort Worth Belt Railway Company,
Fort Worth & Denver City Railway,
Georgia & Florida Railway.
Grand Rapids & Indiana Railway,
Gulf Coast Lines,
Kansas City, Mexico & Orient Railroad,
Lake Champlain & Moriah Railroad Company,
Long Island Railroad,
Minneapolis & St. Louis Railroad Company,
Missouri Pacific Railroad,
Mobile & Ohio Railroad,
Montour Railroad,
New Orleans Public Belt Railroad,
New York, Ontario & Western Railway,
Pacific Great Eastern Railway.
Pittsburgh, Allegheny & McKees Rocks Railroad,
Wabash Railroad,

At the beginning of the year's work the number of lines holding n berships in this Section was eighty-seven. Today there are 103 membe an increase of 18 1/3 per cent. One year ago the total memberships in Railroad Section represented about 139,000 track miles; today they resent more than 171,700 track miles—an increase of 23½ per cent.

You will have a Membership Committee during the coming year wh I have no doubt, will pursue efficiently its work, but to the membershi large I wish to say that the fullest fruits of the coming member: campaign must, in the last analysis, rest with you. Your committee distribute literature, write letters and by other means present to th concerned the advantages of our associations, but there will inevita be found many railway officers who will give little serious attentior these appeals, but whose interest can easily be aroused by a perso visit from some one of you; therefore, if you are really interested in success of our Section take the trouble to bring the Council and its vantages to the attention of such of your railroad neighbors as do already hold memberships. Conditions are distinctly favorable fo large increase in membership next year and if you give your Commit

that co-operation which they deserve, an amazing membership report will be offered you at the 1919 Congress.

C. H. BLAKEMORE,
Chairman Membership Committee

LETTER FROM DIRECTOR PROUTY

UNITED STATES RAILROAD ADMINISTRATION
W. G. McAdoo, Director General, Interstate Commerce Building
Division of
Public Service and Accounting.
Charles A. Prouty, Director

Washington, D. C., June 26, 1918.—Mr. David Van Schaack, President, National Safety Council, Chicago, Ill. Dear Sir: Supplementing my letter to you of May 29 last, and for the purpose of making entirely clear the ruling in regard to railroad membership in the National Safety Council, authority is hereby granted for all railroads under Federal control to take membership in the National Safety Council, provided the dues do not exceed those in the following schedule, which was in effect on January 1st, 1918:

Number of miles operated preceding year	*Dues per year*
1 to 100	$ 15.00
101 to 250	22.50
251 to 500	30.00
501 to 1,000	37.50
1,001 to 2,000	45.00
2,001 to 5,000	82.50
5,001 to 10,000	120.00
10,000 or more	150.00

A copy of this letter should accompany any assessment of dues and will constitute authority to the carrier to pay such dues and to charge the same to operating expenses. Yours very truly,

C. A. PROUTY, Director.

CHAIRMAN BELL: Is there any action you wish to take on the report of the Membership Committee?

MR. R. C. RICHARDS (Chicago & North Western Railway): I move that we accept the report, with our appreciation for the very efficient work of the Membership Committee for the past year. (The motion seconded and unanimously adopted.)

The next report is that of the Accident Causes Committee of which Mr. John T. Broderick of the Baltimore & Ohio Railroad is Chairman.

REPORT OF ACCIDENT CAUSES COMMITTEE

MR. JOHN T. BRODERICK: As Chairman of the Accident Causes Committee it has been my endeavor to obtain from the railroad members of

MEMBER ROAD	TRANSPORTATION DEPARTMENT																				
	Trespassing.	Highway Grade Crossings.	Coupling and Uncoupling Cars	Handling Freight, Baggage, etc.	Getting On and Off Cars and Engines.	Rough Handling of Equipment.	Eye Injuries.	Strains, Lifting, etc.	Falling Material.	Handling Material.	Using Hand Tools.	Falling from Cars or Engines.	Flying Rivets, Bolts or Chips—does not include eye injuries.	Falls—Slipping or Tripping.	Miscellaneous Unsafe Practices.	Fixed Obstructions.	Movable Obstructions.	Struck or Run Over.	On or About Trains—Miscellaneous.	Shunting Grates.	[illegible]
Atchison, Topeka and Santa Fe	X	X	X	X	X	X															
Bessemer and Lake Erie			X				X	X	X	X	X	X	X	X							
Chicago, Burlington and Quincy	Information not available: Train Accidents, Trespass																				
Chicago Great Western	Information not available.																				
Chicago and Northwestern			X	X								X			X	X	X	X			
Chicago, St. Paul, Minneapolis and Omaha			X	X	X		X					X		X			X				
Charlotte Harbor and Northern	No accidents in 1917.																				
Duluth and Iron Range							X	X		X		X		X	X						
Duluth, Missabe and Northern					X		X					X		X	X						
Elgin, Joliet and Eastern			X		X		X					X		X		X	X	X			
Hocking Valley			X		X							X							X		
Kansas City Southern			X		X															X	
Lehigh and Hudson River					X		X							X							X
Louisiana and Northwest																					
Missouri, Kansas and Texas			X	X	X		X					X		X					X	X	
Nashville, Chattanooga and St. Louis					X		X					X									
New York Central Lines				X	X													X			
Nevada Northern	X	X			X				X	X				X			X				
New York, New Haven and Hartford				X	X							X		X		X	X	X	X		
Pacific and Idaho Northern	No accidents in 1917.																				
Pittsburgh and Lake Erie			X	X	X																
Rutland Railroad	X	X	X	X						X				X	X					X	
St. Louis Southwestern				X	X		X					X									
Spokane, Portland and Seattle				X	X							X			X						
Texas and Pacific			X	X	X		X	X				X				X		X		X	
Toronto, Hamilton and Buffalo			X					X						X							X
Baltimore and Ohio			X	X	X					X		X		X		X		X	X		
TOTAL RESPONDENTS—27	3	3	13	12	17	1	10	4	2	5	1	14	1	12	5	5	5	6	4	4	[illegible]

Prepared by:
John T. Broderick,
Supervisor of Special Bureaus,
Baltimore and Ohio Railroad Company,
Baltimore, Md.
Chairman Accident Causes Committee, Steam Railroad Section,
National Safety Council.

MAINTENANCE OF WAY DEPT.																	MAINTENANCE OF EQUIPMENT DEPARTMENT																				
Motor and Hand Cars—Operation.	Handling Material.	Eye Injuries.	Use of Hand Tools.	Falling From Cars or Engines.	Flying Particles, except Eye Injuries.	Falls, Tripping or Slipping.	Miscellaneous Industrial Causes.	Struck or Run Over.	Strains—Lifting or Pulling.	Splinters, Sharp Edges, etc.	Use of Machinery.	Electric Shock.	Explosives, Hot Substances, etc.	Collapse of Structures, etc.	Train Accidents.	Other Accidents on or about Trains.	Eye Injuries.	Use of Hand Tools.	Operation of Machinery.	Strains, Lifting, etc.	Handling Material.	Falling Material.	Flying Chips, etc., excl. Eye Injuries	Falls—Slipping or Tripping.	Miscellaneous Industrial Causes.	Repairing Cars or Engines.	Violation of Rules.	Striking Protrusions, etc.	Splinters, Sharp Edges, etc.	Burns.	Getting On or Off Cars or Engines.	Shaking Grates.	Using Jacks.	Struck or Run Over	Electric Shock.	Electric Current.	Collapse of Structures, etc.	Explosive, Inflammable, Hot or Corrosive substances.	Train Accidents.
X	X																X	X																					
	X	X	X	X	X	X											X	X	X	X	X	X	X	X														
Grade Crossing Accidents Considered Most Worthy of Attention.																																					
	X						X	X																	X												
	X								X																	X											
X	X	X	X			X	X		X		X						X	X	X	X	X	X		X	X												
	X		X			X	X										X				X				X		X										
X	X	X	X		X	X		X	X	X							X	X		X	X		X	X				X	X	X							
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	X		X					X										X			X					X											
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	X							X									X	X			X	X		X													
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X	X																X				X				X												
	X	X	X			X	X					X					X	X	X		X		X	X	X									X			
	X							X									X	X			X	X		X													
X		X				X				X							X				X			X	X												
X	X						X														X				X												
X	X																X				X				X												
	X	X	X			X	X				X		X	X			X	X	X		X			X	X	X								X		X		X
	X																		X		X			X														
	X	X	X			X	X	X			X			X	X	X	X	X	X		X			X	X								X			X	X	X
9	20	7	10	1	3	9	6	5	3	2	4	1	1	2	1	1	14	14	8	5	17	8	3	10	9	5	1	1	2	3	2	1	1	2	1	1	2	1	1

the Council the ten most frequent causes of accident on the different railroads. We sent numerous inquiries along those lines to the member companies, asking for such information. The roads were rather slow in responding, for various causes, but we kept after them and finally succeeded in getting responses from twenty-seven roads. We compiled the information furnished and submitted it to the Chairman at one of the

Executive Committee meetings and as a result we struck off ninety-five copies in blue print form giving the detailed information. This was sent to General Manager Cameron and distributed by him to the various roads. This information was also given to the Chairman of the Accident Remedies Committee.

SECRETARY ANDERSON: This information was sent out with one of the monthly *News Letters*.

CHAIRMAN BELL: Thank you, Mr. Broderick. The National Safety Council, speaking specifically for the Steam Railroad Section, is only able to get results to the extent that you co-operate with it. It seems too bad that out of eighty-seven railroads Mr. Broderick received only twenty-seven replies; in other words, less than a 25 per cent results. Let us remember, next year, when we receive a questionnaire from the Council, or a request for information from any of the committees, to give that committee or the headquarters of the Council our best co-operation.

MR. RICHARDS: I move you, Mr. Chairman, that the report be accepted and the thanks of the Section be extended to Mr. Broderick for his efficient work. (The motion was seconded and unanimously adopted.)

MR. RICHARDS: I would also like to have the report published in the proceedings.

We will now be glad to have your report, Mr. Switzer—the report of the Committee on Accident Remedies.

CHAIRMAN SWITZER: The Committee on Accident Remedies found it impossible to carry out its work, and therefore has no report to make.

CHAIRMAN BELL: The next committee to report is the one on Grade Crossing and Trespasser Accidents. Mr. R. S. Jarnagin is the Chairman.

REPORT OF COMMITTEE ON GRADE CROSSING AND TRESPASSER ACCIDENTS

Mr. Chairman and Members of the National Safety Council: It has not been considered the function of your Committee to attempt to initiate any legislation nor to collaborate with others in such a work. Your committee does feel that you will be interested, however, in knowing of such legislation and accordingly has learned that during 1917, seventy-seven bills were introduced in the various State Legislatures in reference to railroad grade crossings, of which twenty-two were passed. During the same year there were forty-five bills regarding trespassers and trespassing introduced, of which twelve were enacted into laws.

Your committee is of the opinion that enactment of appropriate legislation will not materially reduce the trespassing evil, nor will the enforcement of such laws accomplish much towards an elimination of this dangerous practice without the support and assistance of the public at large. Vice President Marshall, years ago when Governor of Indiana, said: "No law is stronger than the public opinion which backs it up." Certainly this is true in regard to any legislation which will prohibit people from going upon railroad tracks, a practice they have indulged in with impunity for generations past. We must recognize that this is a

condition peculiar to our own liberty-loving Americans, many of whom even today do not distinguish as clearly as they should between liberty and license. The immediate task before your organization, it would seem, therefore, is the education of the public to the perils of trespassing on railroads. This can be accomplished by bringing vividly to their attention, by every conceivable manner, how fraught with opportunities for lifetime misery is such a practice.

We are led therefore to commend to you the following: *First*, Posting warning notices or laws prohibiting trespassing where same exist.

Second, Personal appeals to editors of newspapers along the road (this for the purpose of securing their aid through the press in setting before the public the facts pertaining to the evil and especially the necessity for parents to warn children and keep them off railroad tracks).

Third, Personal calls on representatives of firms, schools, corporations and employers of labor to secure their co-operation in keeping their employes off the tracks.

Fourth, Placing the subject fairly and carefully before the magistrates, so that they may be assisted in obtaining a thorough knowledge of these serious conditions and in applying the law without prejudice.

SAMPLES OF WARNING POSTERS

We are submitting with this report samples of a warning poster (*Exhibit A*) and personal appeal slips (*Exhibit B*) which might be distributed to trespassers themselves as well as employers of labor whose employes are in the habit of trespassing on the railroad right of way.

Exhibit A

FRIEND:—You have picked out a dangerous place to walk! Do you know that over 5,000 people are killed every year while doing just what you are doing now—using the railroad track for a highway? They did not expect to get caught in that way, either.

A Word to the Wise is Sufficient.. A WELL WISHER.

Exhibit B

IMPORTANT NOTICE

The Safety Bureau of the ——— Railroad has called our attention to the daily risks incurred by those of our employes who walk along the railroad tracks to and from their work.

The U. S. Government official records show that more than 5,000 persons are killed and more than 5,000 injured in this country each year while trespassing on railroad tracks.

In order to prevent these accidents and save human life the practice of walking the railroad tracks by our employes must be stopped at once. The interests of personal safety, and regard for those dependent upon you in your homes, require the strict observance of this request.

We would also call your attention to a pamphlet on trespassing written by Mr. Marcus A. Dow of the New York Central Lines entitled "A Nation's Neglect." This is commended to you as a good example of newspaper or magazine publicity. It originally appeared in *The Outlook* and has since been widely quoted in many newspapers.

TRESPASS ACCIDENTS INCREASING

Accidents to travelers on highway at grade crossings are probably increasing in greater proportion than any other class of injuries—largely due, undoubtedly, to the tremendous increase of automobiles. It is entirely possible that adequate legislation, properly enforced, will have a more salutary effect upon this class of persons than among trespassers. Even here, however, the importance of making the public fully recognizant of the fact that more than 1,500 persons were killed and more than 3,000 injured annually because they did not "*Stop, Look* and *Listen*" before going over a railroad crossing cannot be too strongly emphasized nor too widely advertised. Similar publicity methods can be employed to bring this condition about, as in the case of trespassers. Co-operation of automobile owners, through automobile clubs, chambers of commerce and other civic organizations should be solicited. Suitable placards should be distributed to automobile clubs, garages, hotels, railroad stations and to other places, showing how these accidents occur. Some railroads have also issued graphic charts showing location of fatal and serious injuries to trespassers and travelers on highway similar to this:

> Your attention is directed to the increased and improved use of the so-called "wig-wag" signal. In many instances this installation has proved highly satisfactory.

While I appreciate that statistics are always dry—dry enough, some one has said, to convert the Mediterranean sea into another Sahara desert—surely no report of this kind would be complete without some reference to figures. You are all familiar with the record previously quoted regarding accidents at grade crossings, you fully realize only too keenly that year in and year out, for twenty years past and more, that the annual toll among railroad trespassers is 5,000 lives and as many more seriously injured. Are we, however, diagnosing the causes of these accidents as closely as we might? This is a question each man must answer for himself—a problem each railroad must solve if we are to know the real conditions. With this in view your committee submits the following reports.

CROSSING ACCIDENTS

The first is a summary of accidents at crossings on one of the most important trunk lines in the Eastern region and covers all accidents reported to the Interstate Commerce Commission by that railroad during the year 1917:

	Total Accidents	Per Cent
**Protection at Crossing—*		
Unprotected	110	37.67
Flagman	49	16.78
Gates	37	12.67
Bell	31	10.62
Gates not operated nor flagman on duty (nights)	22	7.53
Gates out of order	3	1.03
Bell out of order	2	.68
Flagman failed to cover crossing	3	1.03
Gateman failed to keep gates lowered	4	1.37
Flagman or gateman failed to lower gates	20	6.35
Not shown	21	7.19
Engine Warnings—		
Headlight of engine burning	60	20.55
Not shown	45	15.41
Daylight, headlight unnecessary	187	64.04
Engine bell sounded and whistle blown	129	44.19
Engine bell not sounded nor whistle blown	1	.34
Not shown	109	37.33
Bell, only, sounded	38	13.01
Whistle, only, blown	7	2.40
Whistle not blown account ordinance	2	.68
Question as to bell and whistle sounded	2	.68
Switching movement, engine not involved	4	1.37
View—		
Unobstructed	172	58,91
Partially obstructed	17	5.82
Obstructed	45	15.41
Not shown	58	19.86
Weather conditions—		
Clear	226	77.40
Cloudy	39	13.36
Stormy	18	6.16
Foggy	9	3.08
Time—		
Daylight	192	65.75
Dark	100	34.25
Mode of Travel—		
†Pedestrian	95	32.53
Using automobile	105	35.96
Using other conveyance	94	32.19

*Ten more cases of protection shown than total accidents; account, some crossings are protected by both gates and bell or flagman and gates.

†In two pedestrian accidents, two individuals were injured in the one accident.

Driver—	*As to total of drivers*	*Per Cent*
Male	190	95.48
Female	9	4.52

Cause—	*As to total of accidents*	*Per Cent*
Struck by engine or cars	269	92.13
Collided with side of engine or cars	13	4.43
Stalled auto engine on crossing and struck	9	3.08
Collided with lowered gates	1	.34

TOTAL INJURED AND KILLED, 441

	Number	*Per Cent*
Killed	158	35.83
Injured	283	64.17

Extent of injuries (283 injured)—	*Injured*	*Per Cent*
Temporary total disability, fourteen days or under	105	37.10
Temporary total disability, over fourteen days	171	60.43
Loss of hand or arm	1	.35
Loss of leg or foot	6	2.12

The other is a detailed report of accidents to trespassers during 1914 on 231,000 miles of railroad, or nearly 90 per cent of the mileage in the United States. This report covers 10,785 accidents, classified as follows:

NUMBER OF ACCIDENTS, 10,785

Extent of Injury—	*No.*	*Per Cent*
Killed	4,746	44
Loss of one limb	826	8
Loss of two limbs	172	1
Other injury	5,041	47
Place—		
In country district	3,421	32
In city	3,482	32
In town or village	3,882	36
Residence—		
Near place of accident	4,994	46
Far from place of accident	3,876	36
Unknown	1,915	18
Was Injured Person Living at Home with Family or Parents?—		
Yes	4,914	46
No	4,303	40
Unknown	1,568	14

Extent of Injury—	*No.*	*Per Cent*
Sex—		
Male	10,224	95
Female	561	5
Domestic Status—		
Married	2,359	22
Single	4,618	43
Unknown	3,808	35
Occupation—		
None	1,846	17
Unskilled laborer	3,675	34
Skilled laborer	1,160	11
Profession	159	1
Merchant	99	1
Clerical	134	1
Housewife	281	3
Unknown	3,431	32

Regularly Employed at Time of Accident—		
Yes	2,391	22
No	4,346	40
Unknown	4,048	38
Nature of Accident—		
Walking on track	4,712	44
Riding on train	3,840	36
Other accidents	1,511	14
Unknown	722	6
Was Injured Person Known Tramp or Hobo?—		
Yes	1,313	12
No	6,326	59
Unknown	3,146	29
Age—		
5 years or under	145	1
10 years or under	339	3
15 years or under	565	5
21 years or under	1,608	15
30 years or under	3,437	32
50 years or under	3,048	29
60 years or under	627	6
65 years or under	247	2
Over 65 years	316	3
Unknown	453	4
Was Injured Person Intoxicated?—		
Yes	1,789	17
No	5,455	50
Unknown	3,541	33
Nationality—		
American	7,282	68
Foreign	2,086	19
Unknown	1,417	13

Your retiring committee desires to submit to its successor for such action as it may deem advisable the following resolutions adopted by the Eastern Claim Conference on June 19, 1918:

TRESPASSING

"That it shall be unlawful for any person other than duly authorized agents of the United States, State, county or municipal government, and employes of the carriers, when engaged in the performance of duties rendering it necessary for and requiring them to do so, to go upon, or be upon tracks, road bed, right of way, trains, equipment or other property of the railroads under Federal control, excluded from public uses, except for the purpose of crossing over the tracks, road bed or right of way within the limits of a public or private highway lawfully established and existing. Any person injured or killed while so trespassing shall be deemed to have contributed to the injury or death and there shall be no recovery of damage therefor.

GRADE CROSSING ACCIDENTS

"Any and all persons approaching a grade crossing of a railroad under Federal control must *stop*, *look* and *listen* at such place and in such manner as shall be effective to prevent accident before entering upon such crossing. If any person shall omit such precautions he shall be deemed to have contributed to the injury or death sustained and there shall be no recovery of damages therefor. The burden of proving compliance with this order shall be on the traveler of the highway."

Respectfully submitted.

RUFUS S. JARNAGIN, Chairman.

MR. MCCAMPBELL (New York Central Lines): I move you that the report of Mr. Jarnagin be accepted and made a part of the minutes of this

meeting and that this Section extend to him our thanks for his report. (The motion was seconded and unanimously adopted.)

We shall now be glad to hear from Mr. George L. Wright, of the Omaha Railway, who has done very efficient work as Chairman of the Program Committee.

REPORT OF PROGRAM COMMITTEE

MR. GEORGE L. WRIGHT: The results obtain by the Program Committee are due entirely to the co-operation of the different members of the Railroad Section. We have endeavored to prepare a program that will be interesting as well as educational to every one.

CHAIRMAN BELL: We will now hear from Mr. Wightman, Chairman of the Publicity Committee—the committee that "speaks its piece out loud" for the Steam Railroad Section in preparing the bulletins and other publications.

REPORT OF PUBLICITY COMMITTEE

MR. FRANK A. WIGHTMAN: I want to thank the members for the hearty co-operation they have given this committee during the past year. We have been able to maintain our bulletin service in fairly good shape and I trust you will give my successor the same support. You are just going out of the "bushers" and into the National League and you want to whip up and make your bulletins even more interesting. Give the committee a larger number of good photographs for their bulletin boards, as we are going to have a large increase in membership in the National Council. I wish you success.

REPORT OF NOMINATING COMMITTEE

CHAIRMAN BELL: That covers all the reports of sub-committees. We deemed it advisable at the last meeting of the Executive Committee of your Section, held at Chicago on July 30, to appoint a Nominating Committee in advance of the Congress, in order that they might cover the field and be sure of nominating, as officers for the coming year, the very best men available. The Nominating Committee consists of Mr. Blakemore of the Norfolk & Western. Mr. Jarnagin, Regional Supervisor of Safety for Eastern Railroads, and Mr. Wightman. With your permission we will have the report of the committee at this time, that we may all consider the matter and with the understanding that the election of officers will be held at 2 o'clock to-morrow afternoon. Mr. Blakemore is unable to be present, but he has performed a lot of work in connection with his position as Chairman of the Nominating Committee. Mr. Jarnagin will submit the report.

MR. JARNAGIN: This is a serious time in the life of the Steam Railroad Section of the National Safety Council and for that reason we felt that we ought to have the biggest, broadest and best man as Chairman that it was possible for us to obtain. For me to attempt to tell you why this man

should be elected Chairman of the Steam Railroad Section would be like attempting to paint the lily and for that reason I want to tell you now that we have nominated as Chairman for this Section for the ensuing year the father of the safety movement, Mr. Ralph C. Richards of the North Western. (Applause.) For Vice Chairman, a man whose activity and energy during the past year on the Executive Committee certainly qualifies him and is in itself all the indorsement he should need, Mr. John T. Broderick of the Baltimore & Ohio (Applause.) And for Secretary of your Section a man who has been of considerable assistance to us the past year, who is deserving of the office, and one who can fill it to your entire satisfaction—your Committee feels sure—Mr. F. Whittemore of the Nashville, Chattanooga & St. Louis. (Applause.)

GOVERNMENTAL ACTIVITY FOR SAFETY

MR. MARCUS A. DOW (New York Central Lines): As the Chairman of the Nominating Committee has just stated, the Railroad Section of the National Safety Council has reached a very critical period in its career. With the advent of government control of the railroads and the increasing membership in this organization we now have a large number of new safety men in our fold. With the work before us of making a record we can all feel proud of in accident prevention, during the coming year, and of giving the very best support that is within our ability and power to the manager of the Safety Section, and of having the very best brains at our disposal to guide the affairs of this organization and to see that only the most practicable and best methods of safety work on the railroads are sent out for our study and perusal, I believe the selections made by the Nominating Committee are everything that could be desired. Mr. Ralph C. Richards, the grand pioneer in safety work on the railroads of this country, should have been Chairman of this organization at its inception, but, for reasons best known to himself, he could not at that time entertain the nomination. It seems to me, now that this nomination has been put before us and the men selected to serve with him are well chosen, that we ought not to give Mr. Richards the opportunity to change his mind by waiting until to-morrow afternoon, but that we should, by a rising vote (and I would so move) consider the nominations closed and instruct the Secretary to cast the unanimous ballot of this organization for the officers named. (The motion was seconded and unanimously adopted.)

MR. T. H. CARROW (Pennsylvania): Last year the Vice Chairmanship of this organization came to me like a bolt out of a clear sky and I accepted it as a loyal member of the order. In small orders and in small affairs the practice of routine is in vogue, but when it comes to big matters, like running the United States of America or the Steam Railroad Section of the National Safety Council, we recognized no precedents and always select the very best men available. As the former Vice Chairman I am pleased and know, every one present is pleased to know and feel, that we have such an estimable, competent and capable gentleman as Chairman of the Steam Railroad Section for the coming year.

CHAIRMAN BELL: Mr. Richards, we will be very glad to hear from you.

PRESIDENT-ELECT RICHARDS

MR. RALPH C. RICHARDS: I heard a story the other day about a woman who came to a street car with six children. As they got on the conductor said: "Are they all yours or is this a picnic." She answered: "They are all mine, but, believe me, it's no picnic." (Laughter.) I know of no honor, with one exception, that could be conferred upon a safety man that is greater than that of being elected Chairman of the Railroad Section of the National Safety Council—and that is the Presidency of the Council. I am sure, gentlemen, no one can appreciate more than I how great an honor and how great a compliment you have conferred upon me. I can only say that if I have the co-operation and assistance I believe will be given me—if every man here, every one connected with the safety organizations of all the railroads of the country, will do a little more than his share,—we will show our friends that "something is doing" and the manager of the Safety Section of the United States Railroad Administration, at the end of the year, will make a report to the Director General that will tell him how much use the Railroad Section of the National Safety Council is. I thank you. (Applause.)

CHAIRMAN BELL: Mr. Broderick, may we hear from you?

VICE PRESIDENT-ELECT BRODERICK

MR. JOHN T. BRODERICK (Baltimore & Ohio): This is an honor I could hardly expect. What little I have done has been a great pleasure and an honor, and if, under the leadership of our worthy friend, Mr. Richards, I can be of further service to this Section, it will be something of which I shall be very proud and to which I shall lend my best endeavors. (Applause.)

CHAIRMAN BELL: Mr. Whittemore, may we hear from you?

SECRETARY-ELECT WHITTEMORE

MR. FRED WHITTEMORE (N. C. & St. L.): I sincerely appreciate the great honor you have bestowed upon me. It is a rare privilege to serve such a distinguished body of men, engaged in so great a work. I pledge my best efforts to make the Steam Railroad Section of this Council a success during the coming year. I also want to express my appreciation at being able to serve such a distinguished man as Mr. Richards. I offer him all the help possible and I will do everything I can to make his administration a complete success. I thank you. (Applause.)

CHAIRMAN BELL: We are now ready to proceed with our program. Mr. Kramer, Federal Manager of the St. Louis & San Francisco Railroad and the Missouri, Kansas & Texas Railroad, is here to address us on the subject of "Mental Safety." Because he has a 3 o'clock engagement Mr. Belnap has asked that Mr. Kramer come before us first. Mr. Kramer's presence is a fine demonstration of the interest which railroad executives are taking in this work. It ought to be a source of inspiration that men of his calibre are so interested in this matter.

MENTAL SAFETY

Safety to the individual is an inborn instinct. It is shown throughout the development of civilization from prehistoric days that the individual and in some cases groups of individuals planned for their own safety. They wrought crude weapons of self-defense and constructed rough houses or forts to protect themselves against the animal kingdom or invaders. Modern civilization, however, has developed the necessity of safety to others as well as to self and while we all have the instincts of our ancestors toward self-preservation it has been essential to educate the masses to the necessity for safety to others. This has required the exercise of mental effort, to develop the growth of human intelligence and understanding necessary to grasp the thought that what is best for all is best for the individual. Today, no special observation is necessary to realize that the ignorant man is an unsafe man, and, on the same line of reasoning, the higher the degree of intelligence the greater the mentality exercised in the protection of self and of fellowmen.

Without going into the many ways in which men can be protected against themselves, it is sufficient to say that as each individual has impressed upon his mind the importance of safe thinking, safe acting and safe living, just so much better will his life and the lives of his fellowmen be guarded. The man who thinks before he crosses a railroad track, before boarding a moving train, or before exposing himself to any risk is the man who makes the least trouble for himself. The man who thinks and does not leave an unsafe condition unguarded, one who does not violate ordinary rules for safety, is a desirable man to have on any property. But even this man is not free from danger while he is associated or comes in contact with men who have no forethought and who do not take all possible precautions to protect themselves as well as others. The man who does not give much thought to principles of safety and protection for himself, and to all individuals, is negligent in his duty toward himself, to those who are dear to him and to those who might meet with misfortune through his actions.

EACH MAN A CREDIT OR DETRIMENT TO SOCIETY

The subject covers not only injuries and loss of life, but also the application of the golden rule, living in accordance with moral laws and in harmony with all men. Each man is either a credit or a detriment to society as a whole. The man who becomes intoxicated is not safe and dependable, nor is the man who is not leading an honorable and upright life. The man who saves a part of his earnings is practicing a principle of self-protection and is gaining power to overcome misfortunes that may come to him and to his family.

Thoughtlessness is responsible for most carelessness, and carelessness is the cause of nearly all accidents. Examples could be quoted by the score of little, thoughtless things that have led to serious consequences. A little mental effort exercised at the right time, without the cost of one penny to the thinker, his company or fellow employes, will often save lives or maiming injuries.

Some men are paid for thinking alone, but most are engaged in employment where action as well as thought is necessary. Too frequently there is a great deal of action and too little thought. Each individual must decide for himself just what portion of any activity should be devoted to careful thinking, but in railroading, above all other occupations, it would seem that thought must first be applied to any action if it is hoped to avoid accidents.

No individual is the master of his own destiny, but a great organization, all thinking along safe lines, can prevent injuries, much suffering, loss of time, money and lives. If railroad men as a whole would exercise their minds as much as they do their jaws, and develop their mentality as well as their muscles, the claim departments could be abolished, the hospitals used only for medical cases and much human suffering would disappear from the homes of employes.

God gave you minds to think, use them.

CHAIRMAN BELL: We are very fortunate indeed in having as the next number on the program an address by Mr. Hiram W. Belnap, Manager of the Safety Section, Division of Operation, United States Railroad Administration. Those of us who know Mr. Belnap or of his work for many years as chief of the Bureau of Safety of the Interstate Commerce Commission, have some conception of the really valuable work he has been doing for the government for a long time. Since he became manager of the Safety Section of the Railroad Administration we have come to know him much better. Those of us who feel that we know him well, love and admire and respect him, both as a man and as an officer. And I want to take this opportunity, as the retiring Chairman of the Section, to bespeak for Mr. Belnap your very hearty, sympathetic co-operation in his desire and ambition to make safety a living, vital force for good on our American railroads. I hope everyone here will make a mental resolution to do so—certainly it is the least we can ask. We will be very glad to hear from Mr. Belnap.

WHAT THE UNITED STATES RAILROAD ADMINISTRATION EXPECTS OF THE DIFFERENT SAFETY ORGANIZATIONS IN THE PROMOTION OF SAFETY WORK

It is both an honor and a privilege to have this opportunity to address this body of representative men, active in accident prevention work on all of the great railroad lines in this country, which have recently been transformed into one great unified transportation system. The work that the National Safety Council has been doing to further the cause of safety is well recognized, and when your committee requested me to prepare a paper on "What the United States Railroad Administration Expects of the Different Safety Organizations in the Promotion of Safety Work" it was an imperative call to duty that could not under any circumstances be laid aside.

This occasion also gives opportunity to state briefly what is hoped and desired to be accomplished in accident prevention work by carrying out

the plans of the Safety Section in establishing well-organized and efficiently conducted safety committees on each railroad under Federal control.

The subject of railroad accidents, taken from whatever angle, is both an important and a serious one; their causes and means to prevent them have caused general discussion for many years. No railroad employe or officer wilfully does his work with an intent to cause accidents, for well they know that such an accident might result in manslaughter or suicide; on the contrary, they are vitally interested in any plan or method that will result in reducing the hazard to themselves and the ever-continuing number of casualties among their own ranks, as well as to the traveling public.

ACCIDENTS DURING FIVE YEARS

It is not my purpose to burden this discussion with statistics, with which all are probably more or less familiar, but I do want to call attention briefly to the record of the last five years, which clearly shows the tremendous importance of our problem and the necessity for real constructive accident-prevention work.

When we read this accident record, it seems almost incredible that in the peaceful operation of our railroads there is such an enormous loss of life and limb. In the five-year period ending Dec. 31, 1917, there was a total casualty list on our American railroads of 980,565. Of this number 48,801 were deaths and 931,764 were injuries. During this period 1,391 passengers and persons carried under contract were killed and 55,887 injured; 14,652 employes were killed and 815,897 injured; 32,879 other persons were killed and 60,080 injured.

As indicative of this loss of life and limb in the operation of our railroads, in 1916 in train accidents alone one employe was killed every three and one-half hours, one employe was injured every ten minutes; and taking into account all accidents, one employe was either killed or injured every three minutes during the entire year. You can readily see how vitally interested in accident prevention railroad employes should be, because it is they who are suffering the greatest loss on account of these accidents. Thirty per cent of all the killed and 90 per cent of all the injured on the railroads in the United States are railroad employes.

Then, too, there is an immense amount of money paid out every year on account of accidents. The amount reported by the carriers, which was paid on account of death to employes, passengers, trespassers and others, as well as the expense of settlements, including the expenses of claim adjusters and the like, as provided by the classification of operating expenses, averaged during this five-year period approximately $30,000,000 per year. While the records do not disclose accurately the amount paid on account of the deaths and injuries to employes alone, several roads have kept this item separately and an analysis of this indicates that about 50 per cent of this total expense is paid to employes on account of deaths and injuries.

Large as these figures are, they represent only the amount of money that has been paid by the railroads. For the purpose of indicating the

vital interest of employes in accident prevention, statistics were secured from several of the train-service organizations that insure their members and pay for loss of life or total disability.

The Brotherhood of Railroad Trainmen, in the year 1917, paid 2,055 claims, aggregating $3,004,390; 53 per cent of these payments were on account of accidental death or disability and 47 per cent on account of natural death or disability. One death or disability claim was paid for each 73 members; one claim on account of accidental death or disability was paid for each 137 members.

The Brotherhood of Locomotive Firemen and Enginemen, in the year 1917, paid 895 claims, 45 per cent of which were on account of accidental death or disability. The total amount paid was $1,223,225, and their records show that one death or disability claim was paid for each 115 members.

The Switchmen's Union, in the year 1917, paid 171 claims for death or disability, 62 per cent of which were on account of accidental death or disability. The total amount paid during the year was $203,250, and their records show that a claim was paid for each fifty-nine members in their organization.

These records of the amount of money paid by these brotherhoods to their members on account of accidents, independent of and in addition to that paid by the railroads on account of accidents, show the enormous financial loss sustained by the railroads and their employes and indicate how imperative it is that accident prevention work should be efficiently conducted.

Service and safety are the two prime requisites of the successful transportation systems. Each is essential if we are to do our full duty to the public and to the great army of employes that are engaged in the transportation industry. So rapid has been the growth of the railroad industry in this country that it has required the very best efforts of the builders and managers to provide sufficient tracks, cars and engines to meet the demand for transportation, which was constantly increasing in leaps and bounds. New lines were projected and new terminals sprang up over night and there was little or no opportunity for the consideration of anything other than moving traffic. This probably was the compelling reason that the prime consideration of safety has been subordinated to these other important matters.

WHAT EXPERIENCE HAS DEMONSTRATED

Experience has demonstrated that the two elements that have the most important bearing upon both service and safety are the mechanical and physical, which involve safe machinery, track and structures, and the human element, which involves the entire personnel from the highest officer to the humblest employe. The mechanical element presents much the easier problem to solve and it has already reached a high stage of perfection, as is evidenced by the improved safety devices of almost every character that have been and are being constantly installed and applied upon every railroad in this country. From the great advancement that

has been made during the last decade or more in the construction of tracks, bridges, locomotives and cars, and in the development and installation of improved signalling and other safety devices, one would naturally think that the number of accidents would be materially reduced, but such is not the case. The statistics of the last few years, such as those quoted, showing the extent of the loss of life and limb upon the railroads are causing grave concern, and one of the most serious problems that confront us is how to bring about a reduction in these casualty lists and save the lives and limbs of the many thousands that are annually killed and injured.

A study of these statistics clearly establishes the fact that the majority of accidents on our railroads, particularly to employes, are of a character that the most improved of mechanical devices will not prevent, and it is evident that the control and training of the human element is the great problem of the future. It is this problem to which the student of accident prevention must, in my opinion, devote the greater part of his energies, if effective results in providing greater safety upon our railroads are to be accomplished.

It has often been stated that the accidents which swell the total are caused by the negligence of the injured employe. A general assumption of that nature is absolutely unwarranted. Men cannot properly be charged with willful negligence in case of injury until it is clearly established that proper instruction and supervision have in each instance been given to the injured employe, and I am convinced if a careful study is made of each accident, it will be found in thousands of cases that this very lack of instruction and supervision has had an important if not a controlling influence in the occurrence of the accident.

Regardless of the fact that the men employed in railroad service are of an exceptionally high intellectual character, it is not proper to start them at work in this hazardous vocation without knowing in advance that they are carefully instructed as to the hazard of employment, and that they are competent and fully understand the duties they must perform. While frequently thoughtlessness, carelessness or even negligence is given as the cause of accidents, in many cases these are only excuses; the real, underlying causes being unsafe conditions and failure to instruct and constantly educate employes to the hazards of the position occupied.

Improvements in conditions can in a measure, be brought about on the part of experts, engineers and others who determine the nature of materials and equipment to be used. Machines and working conditions should be provided so that all employes may pursue in safety their normal activities. There should be safe standards provided and maintained in an effort to eliminate many types of casualties. When drawings are being made and specifications are being written, then is the time to think of safety and provide safeguards wherever needed, for such provision is a measure of real economy.

OFFICIALS MUST LEAD IN ACCIDENT PREVENTION WORK

In many instances foremen and workmen realize the danger to themselves from certain unsafe conditions, but it is often difficult to get

higher officials to recognize these hazards and take effective measures for their removal. Quite frequently recognition of the seriousness of a hazard is brought about only through sad experience.

Notwithstanding the old saying, "Accidents are bound to happen", accidents are not inevitable. Most of them can be avoided by proper education, supervision and care, and through well-organized, efficiently handled safety committees a great deal can and will be accomplished. How best to do this is our problem.

To accomplish results in any line of endeavor there must be a systematic plan or method of conducting the work. The better the system, the smoother will be its operation. Those departments that go to make up a railroad organization, such as operating, mechanical, maintenance-of-way, etc., have their functions well defined and are considered absolutely essential to the successful operation of the railroad. So it should be with the safety organization of each railroad. There should be a well-defined department functioning with the other departments, which should constitute an essential part of the organization for successful operation.

During the last five or six years safety work on many lines of railroads has been carried on by employing different methods. Very few railroads handled this work alike, and thus effected many different results. Some reduced accidents, while others, even though carrying on a so-called "systematic safety campaign", reflected an increase in casualties. Others kept no record of their safety work and could not tell whether they had accomplished beneficial results.

Immediately upon the creation of the Safety Section, a questionnaire was sent out to all Class 1 railroads, calling for information regarding the different kinds of safety organizations, their relative efficiency and the scope of their activities. From the replies received, it became apparent that, to a large degree, there was no uniform or well-defined method in vogue, and with the exception of a limited number of roads, safety work was supervised by no particular officer—the result being that "what was everybody's busines was nobody's business." On some railroads, after a trial, safety work was subordinated to something "more important." This created in the minds of the employes, in many instances, the thought that the effort was not sincere, and the general idea prevailed that safety work was prompted solely by selfish motives.

REAL AND CONSTRUCTIVE SAFETY CAMPAIGN ESSENTIAL

To overcome this apparent prejudice and to gain the confidence and good will of all officers and employes in railroad service, it is absolutely essential that a real and constructive safety campaign be energetically carried on, if accident prevention work is to be a success. For the purpose of standardizing this work as far as is possible and practicable to do, under date of May 27, circular No. 5 was issued, directing that each railroad under Federal control organize a General or Central Safety Committee, as well as safety committees on each division and in the principal shops and terminals, these later committees to be composed of both

officers and employes, the superintendent of the division to be Chairman of the Division Committee and the ranking officer in each shop or terminal to be Chairman of those committees.

This organization became effective on Aug. 1, 1918. The Safety Section expects and demands the loyal, hearty support of each officer and of each employe on every railroad in the United States, in its effort to bring about uniformity in the important principles of safety work, and to conserve and make more efficient not only the new employe who enters service but also those whose experience now makes their continuing at their tasks all the more imperative.

Under the plan of the Safety Section, each railroad has a General or Central Safety Committee, composed of general and division officers of the road, all the different departments of the service being represented on that committee. This committee has general supervision over the safety organization, the Chairman of which shall be the chief operating officer, or such other general officer as he shall designate.

In order to keep closely in touch with the safety work and supply the stimulus of active interest and frequent consideration, the General Safety Committee should meet at least quarterly. Its functions are to act upon items referred to it by the division, shop and terminal committees, and consider plans and methods for extending the scope and increasing the efficiency of the safety organization. Each railroad designates an officer or employe who is responsible for an effective and efficient safety organization.

Unless the officer in charge of safety work on a railroad is designated as Chairman of the General Safety Committee, he should act as Secretary of this committee. He should prepare the docket, send out notices of meetings, supervise the preparation and distribution of the minutes of meetings, and should see to it that recommendations and orders issued at the instance of the General Safety Committee are carried out. All matters beyond the authority of the Division Committee or matters of general practice affecting the entire system should be referred to and receive the attention of the General Safety Committee.

On each division there is a Division Safety Committee, composed of division officers with one or more representatives of each of the different classes of service as members of the committee. The superintendent of the division should act as Chairman of the Division Committee. The division officers should be permanent members of this committee; the employe members should be rotated in office, changes being made at least once a year.

In each large shop and in each large terminal, safety committees with the ranking officer as chairman, with one or more of the representatives of each of the different classes of service should be formed, the officers being permanent members on the committee and the employes rotating in the same manner as those on the division committees. This method of committee formation requires a change in the employe members on the committee at least once each year and permits other employes to be educated and to be brought in touch with the safety work, so that

eventually each of the older employes will have had service as safety committeemen.

DUTIES OF COMMITTEE OFFICERS

The Chairman should explain the purpose of the committee, the duties of members, the importance of making suggestions freely and the method of handling suggestions. He should impress upon all that all suggestions will be carefully considered and discussed with a view of adopting those found to be practicable.

The Secretary should supervise the preparation of the minutes of the meeting and list all suggestions fully on a form provided for that purpose, giving the names of employes offering same and numbering them in consecutive order. Action of the committee should be shown in full and any suggestions not finally disposed of should be carried under head of "For Further Consideration" to each succeeding meeting until adopted or rejected. Notice should be given sufficiently in advance to members of Safety Committees and their immediate superior officers as to date time, and place of meetings, and invitations should be extended to other employes to attend. The Chairman should require from members a valid excuse for absence from meetings such excuse to be included in the minutes of the meeting.

Minutes of all safety committee meetings should be sent to the Chairman of the General Safety Committee, the officer in charge of safety work and to heads of departments concerned. When shop, terminal, or other committees are under the direct supervision of the division officers, minutes of these meetings should also be sent to the Chairman of the division committees.

All suggestions made to the safety committee should be acknowledged by the Chairman of the committee to whom the suggestion is made, and the person initiating the suggestion should be advised of the action taken. If recommendation is declined, he should be informed of the reason therefor. Every agency should be enlisted at these meetings to urge employes to use the utmost care and discretion in the performance of their duties. Safety committeemen should always be alert for dangerous practices and conditions, making corrections themselves, when possible and at proper time rendering report of their activities. They should at all times so conduct themselves as to teach safety to all employes with whom they come in contact, by example as well as by precept.

The Division Safety Committee should be provided at each meeting with a list of accidents for consideration and discussion of causes and means of prevention. Also any data should be presented which would be of interest and tend to familiarize the members of the committee with causes of accidents and to educate them as to how they might be avoided. Accident statistics for the system, and of divisions, shops, or terminals interested, for the current month or year should be read and compared with previous records. Whenever possible a paper on some phase of accident prevention should be prepared and read by a member of the committee at each meeting.

At points where employes assemble in any considerable numbers safety bulletin boards should be erected and properly maintained. Such boards should contain safety bulletins, safety suggestion or recommendation cards, and such other reading matter as may be issued by the safety organization. These bulletin boards should be in addition to, and separate from, the operating and mechanical department bulletin boards. Bulletins, showing the common causes of accidents in railroad operation, should be issued from time to time and posted on these bulletin boards. In some instances it may be advisable to distribute copies to all employes interested.

Proper means should be provided by which safety committeemen and employes in general can readily make suggestions and recommendations to the various safety committees. A postal card form can be used to good advantage. A supply of these cards or other forms used should also be distributed to safety committeemen and others attending safety committee meetings, and every effort made to encourage their frequent use.

DIPLOMACY, TACT, PERSEVERANCE AND PATIENCE

If a thing is worth doing, it is worth doing well, and as the prime purpose of the work of the Safety Section is to bring about a substantial reduction of casualties, every possible effort must be made to bring about the desired results. As previously indicated, much depends upon the officer designated to be responsible for the safety work upon each road. He should be a person well qualified, not only in railroad experience, but in temperament. He should have an abiding faith in the necessity for the work, and in the methods and plans outlined by the organization with which he is to work. His greatest aids will be diplomacy, tact, perseverance, and, especially patience, for he will find need of that cardinal virtue in the slow response to his enthusiasm and his insistent efforts to change the mental viewpoint of many with whom he will come in contact. Upon him will devolve the duty of both planning and supervising the work, in order that accidents may be eliminated or at least reduced to that minimum which represents only the hazard of the occupation.

He should make a careful study of the accident record of his railroad, which will soon provide him with information as to the class of employes sustaining the greatest number of injuries, as well as the nature of the injuries. It is imperative that this careful analysis be made, because it is necessary before any real constructive accident prevention work can be done. If, after a study of these casualties, it is found that accidents are occurring in any given locality with greater frequency than at other places where the same work is performed, a special investigation and study of the conditions surrounding the method and manner of doing the work and of the employes engaged therein should be made, in order to eliminate the causes of these accidents or provide special precautionary measures, calling the attention of the employes to the particular hazard at the particular place.

He should make a careful study of the accident records, not only of

his own road, but of all railroads, as furnished in the accident bulletins of the Interstate Commerce Commission, in order to make comparisons with the records of other roads and ascertain the relative standing of his own railroad. He will be required to furnish to the Safety Section monthly reports of the activities of the safety organization under his jurisdiction. That report will reflect the progress made in maintaining an efficient and effective safety organization, and the work accomplished each month by the division, shop and terminal committees.

It has been said that, when an accident occurs, there is either something wrong with the machinery, the method, or the man. If this be true, and results in accident reduction are not forthcoming, the Safety Section will endeavor to find out the reason. This necessarily means that upon the supervising talent on the railroads will rest the burden of educating men in the principles of safety. When all officers and all employes finally realize that the government is in earnest about this work, and that it is just as much the duty of a supervising officer to supervise for safety as it is to get the cars out of the yard or trains over the road, I believe that we will have reached the high attainments expected in this work. To gain this, it is imperative that all shall give hearty co-operation and push with all energy.

In the suggestions I have made in this discussion of "What the United States Railroad Administration Expects of the Different Safety Committees in the Promotion of Safety Work" I found it manifestly impossible to cover the field except in a most general way.

SAFETY PROBLEM A GRAVE ONE

The safety problem is a grave one, worthy of the most thoughtful consideration of those high in authority in railroad management. It is realized that local conditions on the different railroads must be taken into consideration, and that they govern, in a measure, the plans and activities of each safety organization. What is expected briefly summarized is:

That all officers in executive positions shall give safety work their active co-operation; 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.

That the fundamental principles of safety shall be wisely and energetically instilled in the minds of the men who do the actual work of operating the railroads, and they all shall become imbued with the importance of safety, knowing that since it is they who get killed or injured, all employes must take an active interest in the work and understand from instruction and practice that proper observance of the requirements of safety is a work of the men, by the men, and for the men.

That the proper officers of railroads shall give attention to all reasonable and practical suggestions and recommendations made, in order that unsafe conditions and unsafe practices may be promptly eradicated. In each instance proper acknowledgment of suggestions and recommendations shall be made to the end that those making them may be ap-

prised as to their disposition and of the fact that due consideration was given to such suggestions or recommendations.

That officers and employes shall co-operate to the maximum and that proper effort shall be made to get all to realize that in Safety Committee meetings, officers and employes 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.

It has been an inspiration to note the enthusiastic manner in which the employes in all classes of the railroad service have taken hold of this work. Practically every employes' labor organization has already endorsed the Safety Section's work. Even now, in many of their lodges, a certain specified amount of time is devoted at each meeting to the subject of "Safety and Accident Prevention." In some organizations, it has been arranged that this be a regular part of their order of business. I sincerely believe and hope that this practice will soon be adopted by every lodge in every organization upon every railroad in this country. When this is done and when safety committees actively and efficiently perform their functions, I am satisfied that we are going to have a material and substantial reduction in accidents. If we can get men to talk safety, they will begin to think safety, and when they think safety they are always going to be on the lookout for unsafe conditions, which can and should be corrected, as well as the unsafe practices followed by themselves and their fellow employes, and which must be discontinued. These are the things, above all else, that are going to make the safety work successful on all railroads and which I am firmly convinced can and will be brought about.

VOTE OF THANKS TO MR. BELNAP

MR. MEYERS (Wabash): I move that a rising vote of thanks be extended Mr. Belnap for his splendid address. (The motion was seconded and a rising vote of thanks was tendered the speaker.)

MR. RICHARDS: I wish to offer as a motion that the Manager of the Safety Section of the United States Railroad Administration be requested to arrange with the Government Printing Office to print the address to which we have just listened with so much interest and instruction, and to have it distributed in quantities large enough so that all the members of the safety committees of the various railroads of the country may have copies. (The motion was seconded and unanimously adopted.)

MR. F. M. METCALFE (Northern Pacific): I was favored with an advance copy of Mr. Belnap's paper. It was my intention to ask Mr. Belnap if I could not have it printed and see that every man that gets a pay check on the Northern Pacific Railroad receives a copy of the paper. I shall ask our General Manager to let me print a letter from him to go with the document, making it not only a government matter but a railroad matter also from the highest operating official we have.

MR. BELNAP: The paper is yours, gentlemen. You can print as many copies and use it as you may desire. I am willing to stand behind every word in it because I believe it is the truth.

DISCUSSION OF MR. BELNAP'S ADDRESS

MR. DOW: Would it not be a good idea for the safety engineers present to ask questions while Mr. Belnap is here?

CHAIRMAN BELL: I had that in mind, Mr. Dow. I am sure Mr. Belnap will be glad to give us the benefit of his experience.

RECORDS OF SAFETY COMMITTEE DISCUSSIONS

MR. METCALFE: What is the best method of keeping a record of the subjects discussed by the various committees. We have had thirty committee meetings during the month of August or early part of September, and I am puzzled to know how to keep a record of each subject discussed; whether it has been properly disposed of, whether it is in abeyance, etc. One division may have a condition that is local and of interest to no other division. If we mimeograph the minutes of our meetings and send them to all committees and to all shops we will have a lot of subjects that are purely local. I started out with a card index, about 4 x 5 inches. This shows the subject and a number and before filing each will be marked. When the card is closed it will go into the dead file. Live subjects will stay in the live file until disposed of: I'd like ideas on that particular feature.

CHAIRMAN BELL: Mr. Dow, will you explain the matter?

MR. M. A. DOW: As I understand the question, you want to know whether it is good practice to distribute copies of the minutes of division safety committee meetings to other divisions?

MR. METCALFE: No, sir. We have twelve division meetings at the present time. Our Fargo division, for example, will discuss certain safety subjects, some of interest only to that division. Shall we send the same subject to the Mountain division? They probably haven't the same condition there. In other words, I do not want to burden the division safety chairman with a lot of matter that will cause him to lose his interest. I want to keep the work alive and do not want to give him anything that is not essential.

ACTION REQUIRED BY SAFETY COMMITTEES

MR. DOW: The only things we send out on the New York Central Lines for all divisions to discuss are certain specified topics, such as how to prevent accidents in hump yards while switching cars. That subject will be assigned to every committee for a monthly meeting. A member of the committee will be required to write a paper on the subject and read it at the meeting and the members will discuss it. That is the only information we attempt to send to all committees. We do not take information from one committee report and try to disseminate it to all the committees on the system.

MR. METCALFE: How do you know when the subject is disposed of?

MR. DOW: This is a topic sent out for discussion.

MR. METCALFE: I mean subjects brought up by employes.

CHAIRMAN BELL: Maybe I can help you, Mr. Metcalfe. The form for

the making of reports, gotten out by the Safety Section of the Railroad Administration, suggests that each item in the report be given a number. That item must be kept in the report of the committee until it is finally disposed of—either acted upon favorably or rejected. It is an easy task to keep track of the matter and to see that the superintendent or chairman of the committee does not renig and leave out items 72 and 86, for instance. It is a matter of supervision, it would seem to me. Of course, some roads, like the Norfolk & Western, keep a card index of every suggestion made by members of committees.

MR. METCALFE: You cannot keep in the minutes things held in abeyance nine or ten months.

CHAIRMAN BELL: Each report will retain every item until it is disposed of, regardless of how long it may be pending.

MR. P. GROOME (Union Pacific): On the Union Pacific we have the numbers of each suggestion on each division. Those that can be handled by the division committee are filed under those numbers. Those suggestions that cannot be handled by the division committee are taken up with the Central Safety Committee. For example Colorado Division No. 3,212, Central Committee, No. 1,111, carrying two numbers until they are finally disposed of. With our filing system we have no trouble in keeping track of our suggestions and those not disposed of at one meeting are carried along from meeting to meeting until they reach a final disposition.

ITEMS BROUGHT UP FOR CORRECTION

MR. BOSLOOPER (New York Central): Am I right in assuming that the gentleman meant items brought up for correction?

CHAIRMAN BELL: Perhaps you had better explain, Mr. Metcalfe, so we will be sure we have it right.

MR. METCALFE: In September I sent out fourteen general subjects for discussion. I got them started and they will be discussed, but twenty or thirty people are in attendance at a division meeting and some fellows will bring up other matters besides those listed for discussion. These will go into the minutes of the meeting and the minutes will go to the other division chairmen. What will they do with those items and how are they to be disposed of? For instance, the St. Paul division will discuss at their next meeting some items that appear on the Fargo division report.

CHAIRMAN BELL: Do you send the reports of the meeting on your Fargo division to the St. Paul division for consideration?

MR. METCALFE: Some of the superintendents have mimeographed them and interchange mailing lists.

CHAIRMAN BELL: That might be all right, but it would be out of the ordinary if you required the Fargo division to discuss something on the St. Paul division report, unless they wanted to fill out time or some unusual item was in hand.

MR. METCALFE: Some item presented by an employe on the Fargo division might have application on all the system.

CHAIRMAN BELL: That ought to be forwarded the central committee

and be handled by it. If the division committee brings up an item which is of general application all over the railroad then it is up to you, as superintendent of safety on that railroad, to get that information disseminated where it will do the most good.

MR. DOW: Our practice on the New York Central is to number all items: If item No. 5 on the division report of the Syracuse division is a matter of standards or of general practice the number on the outside cover of that item is also automatically placed among the items referred to the General Safety Committee. When the report reaches my office, as secretary of the General Safety Committee, I take up that item with the general committee and the action they take affects all the other committees and the information is transmitted by the secretary of the Central Safety Committee to the other committees. But we do not attempt to refer items that may be of general interest, when taken up by one committee, to all other committees unless the general committee takes an action which requires it to be so referred—this makes it a ruling on the road.

USE OF SUGGESTION CARDS

MR. METCALFE: That answers my question, but I want to ask another. We have a suggestion card, known as our form 837, but we get very few of them on a great many divisions—one division submitted one in 1917. The men will not submit the suggestion cards and we cannot get them to do so.

MR. GROOME: Do you mean safety suggestions?

MR. METCALFE: Yes, the suggestion card covers dangerous practices, violations of the rules or a dangerous physical condition. The reason we cannot get the men to file the cards on that division is because a claim agent got hold of one of the cards in a damage suit. A man was injured and the fellow on the stand said he did not know anything about the condition: then the claim agent produced the card in court. The men discussed this act among themselves and agreed that they would not submit the cards. How can we get the men to fill out the cards so they will be of service in correcting unsafe conditions.

CHAIRMAN BELL: We are getting away from our text, gentlemen. We are discussing the papers of Mr. Belnap and Mr. Kramer. The item Mr. Metcalfe speaks of is on the program for Thursday. I know there is much food for thought in these papers and I should like to confine the discussion to them.

ATTENDANCE AT DIVISIONAL COMMITTEE MEETINGS

MR. J. C. CLARK (Oregon Short Line): When business is very heavy we have difficulty in securing enough extra men to release our safety committeemen in road service. How far are we justified in going to secure the attendance of these members? There are times when we have absolutely no extra men and in order to get our committeemen to meetings it is necessary to delay trains or possibly to tie up trains for several hours. That matter has been left to our superintendents and it has caused con-

siderable confusion. I would like to know how the question is handled on other roads and what Mr. Belnap thinks about it.

MR. BELNAP: I think Mr. Dow has a case in hand on which I wrote him a letter. Have you the letter with you, Mr. Dow?

MR. DOW: Yes, sir. Here is a copy of a letter I am sending to all division, shop and terminal committees. It is marked "Personal."

"*Dear Sir:*—Reports of the meetings of a few of our safety committees show numerous absentees. Some reports indicate half the members absent from the meeting and the excuse invariably given is that they were too busy to attend. Excuses will not make up for the poor record of attendance which will appear on the monthly report made by this department to the Safety Section of the United States Railroad Administration at Washington. This report will not only show the number of men absent, but will also show the number of items reported for correction and the number of such items actually corrected. In other words, we are required to make a report that will show the percentage of efficiency of our safety committee work. This report will also show whether meetings were held regularly every thirty days, as required. Already one of our committees has neglected to hold its regular monthly meeting. One of the government inspectors reported this fact to Washington and we have been asked for an explanation.

"I also call attention to a practice which has been reported to me. In some instances the chairman of the safety committee has been frequently absent from the meeting and allowed the chief clerk to run the meeting in his place. This is not in accordance with the provisions of circular No. 3 of the Director of the Division of Operation. It is essential that the superintendent act as chairman of his safety committee and give his personal attention to its meetings. If, after a meeting of a committee is arranged, unforeseen matters of urgent necessity take the chairman away, the next highest officer of the division, shop or terminal present should act as temporary chairman.

"I am giving you this information that you may realize how strictly the government is checking our work and in the hope that we may be able to show the New York Central Lines' safety organization to be 100 per cent efficient. Kindly acknowledge receipt of this letter."

NECESSARY TRAIN SERVICE COMES FIRST

MR. RALPH C. RICHARDS: It does not seem to me that Mr. Clark's question has been answered. Suppose one of the New York Central committees is scheduled to meet tomorrow and that notice has been given of the meeting. They are short of men and they have a trainload of grain, a trainload of troops and a trainload of munitions suddenly thrust upon them at Buffalo that have to be in New York at a certain time to meet a transport. Are those men required to attend the committee meeting? Or, if they are the only men to be had, will they be excused and allowed to run the trains?

MR. BELNAP: We are working on the theory that men will attend safety committee meetings unless there is a good excuse for their absence.

MR. RICHARDS: That would be a good excuse?

MR. BELNAP: That would be a good excuse. I do not know of any better excuse than that you have a train that has to go and you have nobody else to take the men's places. Mr. Dow was raising another question—where a superintendent has been failing in his duty, and that is one of the things that I want brought home. Mr. Gray's circular No. 5 specifically states that the superintendent shall act as chairman of the Division Safety Committee, but if he has a good excuse I have no objection to accepting it as a reason for his failure to act; but when you find instances where, for months and months, he does not act, the excuse is worn out. He should do his part, as well as every other man.

START NEW RECORD FIRST OF YEAR

MR. RICHARDS: I would like to ask when the new forms will be ready'

MR. BELNAP: We will have the reports ready for the month of October I do not believe we will be able to use them in any statistical way that will be entirely complete this year, but I do expect, in the next three months—October, November and December—to have an opportunity to report on your activities, so that, beginning with the first day of January we can start with an absolutely complete record of the safety activities o every safety committee in the United States.

MR. BENTLEY: In compiling these new reports, begining Jan. 1, are we expected to start a new serial number on our suggestions or continue the ones we have been carrying for several years?

MR. BELNAP: My opinion is that we ought to start a new one and make each year complete in itself.

MR. SWITZER: Are we to have a form for central safety committee reports?

MR. BELNAP: No, sir; I have only prepared a report to be made to me of the activities of the entire safety organization. The report of the Central Safety Committee may be made a part of this report, but the report carries with it all of the activities of each committee—division, shop terminal and other committees—as well as the activities of every safety agent, the bulletins you issue, and other matters pertaining immediately to the work of the safety committees. I have prepared no form on which you could make special reports of the activities of the Central Safety Committee.

SAFETY SUGGESTION CARDS NOT TO BE MISUSED

MR. RICHARDS: (Cotton Belt): In reference to the matter of filing suggestion cards on rule violations. We are to use the suggestion cards for violations of rules and they are not to be made the basis of disciplinary action. Some roads have efficiency tests, or surprise tests, as they are called, and discipline follows. My understanding is that we are not to file reports that are to be made the basis of disciplinary action; and if efficiency tests are to be made they are to be under some other department If we are to secure the confidence of the men on the railroads they should not regard us as "snitchers." Anything that we report and suggestio

cards that come in are not to be made the basis of disciplinary action. Is that right, Mr. Belnap?

MR. BELNAP: The suggestions and recommendations contained in Safety Section Bulletin No. 3 state specifically that the reports made on safety cards for the correction of unsafe practices and unsafe conditions are not to be used for the purpose of disciplinary action.

CLASSIFICATION OF INJURIES BY CAUSES

MR. CLARK: Mr. Belnap touched upon the question of casualty reports. I have been working for some time on the classification of injuries by causes, but it is far from satisfactory. I used in preparing that form a suggested one gotten out a few years ago by the Railroad Section of the National Safety Council. I also used several forms secured from other roads, among others the North Western. I am wondering if the Safety Section of the Railroad Administration is going to give us a form or a list of causes by which we can classify our accidents; in other words, will they specify the number of causes that we shall use? The form I am using now has thirty-seven classifications—one form I examined very carefully had sixty-nine; another only twenty-seven and I do not know which is the best. If you have too many classifications you will spread it out too much; if too few, you cannot classify many accidents. I would like light on this question and to learn if the Safety Section is going to specify a list of causes for classification purposes.

MR. BELNAP: The Interstate Commerce Commission has prepared and is ready to issue, as I understand on the first day of October, a plan of classification that I think will satisfy pretty nearly everyone. Mr. Carrow is familiar with it, because he spent a great deal of time in assisting in its preparation. I would like Mr. Carrow to explain the classification in question.

ACCIDENT STATISTIC REPORT BLANKS

MR. T. H. CARROW (Pennsylvania): I do not know why it is, but somehow the railroads in the United States have not realized the fact that the Interstate Commerce Commission is about to adopt a very elaborate set of accident statistics. The theory on which the statistics are to be built is something like this: They have arranged eighteen or twenty headings, (called general headings) of accidents such as "Defective Equipment", etc., and under each class of equipment they will list all the defects. Then they go into negligence, each kind of negligence: for instance, if a violation of rules it will mention every specific kind of violation: They have gone into great detail. Take train service and train accidents: If you will get the bulletin sent to the various railroads by the Interstate Commerce Commission you will not be in doubt as to the comprehensive nature of the statistics. They seem to be very complicated at first sight, but if you examine them closely you will find they are so simply prepared that it is not difficult to understand them. For instance, you will have "Coupling and Uncoupling," and under that twelve or fourteen detailed causes; so, if you want to use that class, all you have to determine is the cause and classify according to the detailed cause. If you have a derail-

ment, due to a defective wheel, it will be under "Defective Wheels," which item you can readily put your finger on; if it is a broken flange that will be a detailed cause. If it is due to defective track, such as a chemical defect, it will so appear. If it is a door blown off of a car, it will appear accordingly. Any detail will be shown under the particular general heading and it will not be difficult to classify accidents under such a scheme. There is, however, no comprehensive system for classifying non-train accidents, and I think, after we thoroughly assimilate the train service accident causes, we will probably proceed to develop the non-train accident causes. There are, on some railroads, very comprehensive statistics covering industrial accidents, but I do not think the Interstate Commerce Commission contemplates attempting non-train accident causes in the near future.

ELABORATION OF PRESENT REPORTS

CHAIRMAN BELL: Does that answer your question, Mr. Clark?

MR. CLARK: Yes, sir. Do I understand the circular has been sent out by the Interstate Commerce Commission?

MR. CARROW: It has been published in a pamphlet and Mr. Belnap and I understand the causes will become official Oct. 1. The Commission is thoroughly equipped with the most modern devices for tabulating statistics; the accidents are compiled on cards and run through a machine. All you have to do is to say "Presto!"

MR. DOW: Will you require anything that will cause the present forms of classifying accidents used on railroads to be abandoned? We can still use those?

MR. BELNAP: The report to the Interstate Commerce Commission is to be made under oath and will be the basis on which we will check up accidents of various characters. You know, these are recognized by all statisticians as being the best accident records available. They have been carried on for almost thirty years, so that we know, from the reports that have been made by the carriers, what accidents have occurred and the way they have been classified. I think we can well afford to build up the plan of accident reports that is recognized as being official, rather than attempt some new scheme that would require several years' experience before we could get anything for the purpose of comparison. The new pamphlet that I speak about does not change the Interstate Commerce Commission scheme of reporting accidents. It simply elaborates the present reports and prepares a plan by which you can, by giving a sheet certain numbers, very easily and readily classify all your accidents in detail. The commission has not taken up the question of industrial accidents. That is a matter about which the railroads have different ideas. You will probably have to build up your own scheme of following that class of accident and of sub-dividing into different classes. I realize, that we can go too far in classification; at the same time we should not have a classification that is so simple that your largest number would be "miscellaneous." We must take advantage of the machinery we have for the purpose of comparison if we expect to show which way we are drifting in the work in which we are engaged. If you destroy or throw aside the

things we have had all these years it would be a step backward, in my opinion. A number of railroads (*e. g.* the Pennsylvania, Norfolk & Western, and the Chicago & North Western) have very fine schemes for classifying accidents. I have seen their charts and plans and if any are doubtful as to their present plan of statistical information it might be possible for you to take it up with those railroads and secure one of their blank forms and see exactly what they are doing.

The pamphlet of which I speak can be secured from the Interstate Commerce Commission by writing for a copy. It shows the revised plan of reporting accidents. The commission will send you a little book of the usual government size, about forty pages, which contains all the information relative to classification of accidents.

UNIFORM PLAN FOR SAFETY WORK

MR. E. S. CHAPIN (Pennsylvania): I would like to ask Mr. Belnap to tell us what the government is going to do with the safety committee reports. Whether the various railroads are to have the advantage of the information gleaned from them which may be of universal interest?

MR. BELNAP: We will gladly print the data in pamphlet form, the same as we do the hours of service reports.

MR. F. A. WIGHTMAN: I have had the question asked me in various gatherings and it has come up in the National Safety Council Executive Committee, what loss of time will be required before accidents are charged against a railroad?

MR. BELNAP: The Interstate Commerce Commission figures show that injuries involving a loss of more than three days in ten should be reported —that is the record you furnish under oath to the Interstate Commerce Commission as your accident record. We will try to work out a uniform plan for having all accident and safety work combined, so that it will work along a comparative basis with every road in the United States.

MR. GROOME: A great many members present, perhaps, do not know about the statistics the Interstate Commerce Commission get out each quarter—the bulletins covering all accidents investigated by the Interstate Commerce Commission. Any railroad man can subscribe for this accident bulletin. On our railroad, a short time ago, when I took charge, we were receiving 100 copies of each issue. I thought we ought to have at least fifty copies for each of our six divisions. Our general manager took this up with Mr. Calvin (now the Federal manager) and he subscribed for not only 150 for the Union Pacific but 150 for the Oregon Short Line and, I think 100 for the Salt Lake Route. The bulletins are very interesting. You can have this information and the reports of accidents from the inspectors of the Interstate Commerce Commission for your meetings and you will derive a lot of benefit from them. Have your different roads subscribe for the bulletin at 5 cents a copy.

ANNUAL REPORT SHOULD BE WIDELY READ

MR. BELNAP: I hold in my hand a copy of the Interstate Commerce Commission Accident Bulletin No. 65, for the months of July, August and

September, 1917. Bulletin No. 66, which will be the annual bulletin, of course, will be the most interesting, for in it they will compile the analyses for the year, and you can compare the figures with those for prior years. This pamphlet contains fifty-two pages; twelve contain accident records and the remainder is a summary of the accidents on the different railroads that the commission investigates and reports. The reports are interesting reading for division committeemen and I think there are a number of men here who have been in safety work and have taken advantage of these accident reports. If the reports or bulletins are very carefully read and discussed at division safety meetings there will be no excuse for similar accidents on that particular railroad. This is the pamphlet I mentioned in my paper that every man in charge of safety work should become familiar with, because it is the record of accidents upon all the railroads in the United States. I understand the pamphlets to be published hereafter are to have this record by railroads, so that you will be able to tell the record of each particular road.

CHAIRMAN BELL: Does not the pamphlet give the name of the public printer?

MR. BELNAP: Superintendent of Public Documents, Washington, D. C., Josiah Brinker.

MR. F. WHITTEMORE: If you will make a deposit of $5 or $10 with Mr. Brinker he will send you the pamphlets as they are issued and you will not be bothered every month or so when they get out those documents.

MR. G. L. WRIGHT (C., St. P., M. & O.): I subscribe for the bulletin yearly and it comes to me every three months. I use it as a lever at our safety committee meetings and discuss the accidents on the different railroads. It has had a wonderful effect.

CHAIRMAN BELL: Our meeting this afternoon has an international aspect, in the presence of Mr. E. E. Stevens, Safety Engineer of the Canadian Government Railroads, Moncton, B. C. We shall be glad to hear from him.

MR. E. E. STEVENS: I am somewhat new in safety work but was called upon to take the position of safety engineer of the Canadian Railroads some few weeks ago. I assure you that I take great pleasure in attending this meeting and have received a great deal of benefit.

CHAIRMAN BELL: We all ought to know Mr. Belnap's assistant, Mr. A. F. Duffy of Washington.

CLEAN UP THE SWITCHING YARDS

MR. A. F. DUFFY: I am pleased to have this opportunity of saying a few words to this large and representative body of men, engaged in this great humanitarian work. The manager has told you the story of our organization, and all that I desire to add is an appeal for your earnest and sympathetic co-operation. We must have it, and I know that you will give it freely. I have one thought that you should take back to the rank and file, to show the earnestness of your endeavor in starting a new drive for safety. For fourteen years I have been with the Interstate Commerce Commission as an inspector of safety appliances and my duties

have taken me from yard to yard in my territory. The greatest complaints that we receive from the railroad men in general are in regard to dirty and unsafe conditions in the switching districts. Why not, in all the large cities, at some particular season of the year, inaugurate a clean-up week—show the men you are in earnest in the drive for the conservation of human life? Clean up the drawheads, the old car doors and the car springs that are hazards to the life and welfare of the men. This is my only suggestion and I hope you gentlemen will designate such a week and let it be soon.

CHAIRMAN BELL: We will be very glad to hear from Major Thomas Darlington of the American Iron and Steel Institute. He is in the business of conserving life and limb, just as we are.

DISEASE MORE DEADLY THAN BULLETS

MAJOR DARLINGTON: The greatest work in the army today is that of trying to prevent men from becoming sick. During the war from 1861 to 1865, in the Northern army, 250,000 men died from wounds and bullets and 1,400,000 from disease—five times as many. That has been the record in nearly all wars, in some it has been very much higher. The great work today is to try and safeguard the recruit. When he comes into the army he is well, but he is placed in contact with other men who may be carriers of disease, some of one kind, some another. You all know, perhaps, of the woman I arrested in New York called "Typhoid Mary," she never washed her hands and she carried germs from her bowels. There are men who carry meningitis in their noses all the time, but we do not know who they are. Others are carriers of all kinds of disease which are spread broadcast. In Ladysmith—where General Buller's army was locked up—after a month typhoid broke out. It can only come from some person that has it—there was a carrier of the disease there. The great thing in the army is to find out who are the carriers, and if a man is so afflicted to get him out, because it will go right through the camp.

One of the great problems this winter will be that of the grippe—the influenza is coming here. It probably started in Russia, reached Germany in the summer, got into Spain, thence to France, and is now in this country. The unfortunate part of it is that Germany had it first. You see, when germs get into the body, after they have been through one person, they get stronger and subsequent cases are more severe, so when we have an influenza epidemic in March you find people dying of pneumonia very rapidly. It is a great pity it did not start in this country and get into Germany afterward, but it did not and we have to take it as it comes.

BATTLE TO CONSERVE LIFE

The great trouble with the recruit is that he is liable to have measles and mumps; with the measles there is lessened resistance and then pneumonia—that is when death occurs, or from meningitis. There is one chance in thirty-three of being killed by a bullet at the front—that is not taking so tremendous a chance. You may be killed while walking down the street and having an automobile hit you—numbers of people are in-

jured on the streets, on railroads and other places. I do not mean steam railroads entirely. I mean tractions of any kind. We are approaching a time when we will try to conserve life more than at present, and what I came here for particularly was not to talk about the army and the keeping of the recruit well, but about what we can do in industry, for there we have precisely the same thing as we do in war. We are here to prevent accidents and we have made a great start but five times as many suffer from disease in industry as are injured through accidents. We have got to stop this great waste for more reasons than one. Not only is there the idea of human brotherhood, we will have great problems to meet after the war—that of socialism and of bolshevikism. Russia has gone down and we see the destructive effect of things over there. Do not think that we cannot have trouble in this country. Do not lay the thought aside—we must do our utmost to conserve the lives of men. I can understand why the men of Russia shot their officers—I will not be surprised, when the war is over, if the German people do the same thing. It is not a question of education, it is a question of how you feel, and they will feel pretty bad after a while. In the German army the situation is entirely different from that prevailing in France. In the one case the officer says: "Go ahead or I will shoot you!" Nobody likes to be driven. In the other case, in the moving pictures, you see the man being decorated, and what does the Frenchman do? He kisses the other man. I do not know that I'd care for that plan myself but it has its advantages. I addressed an audience in New York known as the "mansheviki," a half-brother of the bolsheviki, but it does not go in for half so much as the other. After I got through a great, big fellow with whiskers came down and kissed me. I must confess that I did not enjoy it. But there is a feeling between the French officers and the men which is very different than between the others. One the love of the leader, the other is that of fear. You recall in Scotch history that after the death of Bruce his heart was put in an iron box and when it was thought the battle was going against them, the heart was thrown among the enemy:

> Pass, first in fight as thou were wont to do
> And Douglas will follow thee or die.

Because of love of the man and the respect they had for him, not because they were forced to do it. This applies in the army and in industry —it is all the same—we must be equals before the law; equal as a brother, as a human being. We forgot it for a long while in this country. I have known it for years and years, because, for a long time, in New York, I had a practice among some very poor as well as some very rich people—they were mostly the very poor because it is the poor that get sick, and among these poor people I had 2,000 confinement cases. You go to the house and perhaps you help get the supper, feed the children and put them to bed—you have to help. You sit with the woman and she is confined: you wash the baby; you help get breakfast—after you have done it more than a thousand times you begin to realize something about hu-

man life and about the other fellow and you begin to broaden out. I wish you could all have the experience of the country doctor! He knows the world and human beings better than anyone else and when we come to his point of view we will almost reach the millenium—the human brotherhood.

I know that the problems that vex us now
  Are sore to our erring view;
But we have gained the sight and gained the might
  That our grandsires never knew.

THE HUMAN ELEMENT IN RAILROAD WORK

CHAIRMAN BELL: We have with us the newest member of the staff of the Safety Section, Mr. Harry A. Adams of Kansas City.

MR. ADAMS: If ever a man was born unlucky, I was. I follow the assistant manager and then I am required to follow the doctor. and I am a Christian Scientist. That seems to me bad luck, but, nevertheless, it is a golden opportunity to get acquainted. While I am the newest member—I believe Mr. Wightman preceded me by eight days—I have had a great deal of experience in safety work. Before going with the Interstate Commerce Commission, about seven years ago, I had about eleven years. That put me in close touch with the public and the past seven years in the Division of Safety, or, as it is now known, the Bureau of Safety, under Mr. Belnap, has given me a great opportunity to see the faults and frailties of the human element in the railroad game. In wreck investigations many things have called our view to the frailty, the thoughtlessness of the man in service. To help our brother, in my opinion, is one of the greatest things in the world. I have always been interested in the brotherhood of man and safety work, as it is now inaugurated, seems to have installed a new era; we are beginning something entirely new; we are starting on a new plan and I know that we will get results. We cannot help but get them, because we are entering into it with the right spirit, along the right line, as laid down by the men who have had this work in charge. In my opinion, if we expect to get results, we must have the closest co-operation of even the most menial employe on the railroad. As you have been told today—as I know it from personal observation and I know it as coming to me from various men in the different divisions of railroad work—the men have regarded, in the past three or four years, most safety work with great suspicion. They have had reason for it, but, gentlemen, that day is past. There is not a man in this room but who has a new thought on safety and is glad of it. He has been released from bondage and he will carry out safety work in the manner it should be carried out—as man to man. on an equal basis. The questions discussed here today, relative to the different features of this organization, have been more than interesting, more than beneficial to me; and I hope, when I meet the superintendents of safety in my region that I will be able to work with every one of them as man to man, as brother to brother. I will meet every man on the level and together we will "put it over."

(A safety address was delivered by phonographic record, after which the Section adjourned.)

TUESDAY MORNING SESSION

THE MEETING was called to order by Mr. H.J. Bell, Chairman, at 9:45 o'clock, 100 persons being present.

CHAIRMAN BELL: The first paper on the program for this morning is by Mr. J. C. Clark, Assistant to the General Manager in Charge of Safety, Oregon Short Line Railroad, Salt Lake City, on the subject of "A Conductor's Part in Accident Prevention." In view of Mr. Clark's intimate knowledge of the train service proposition on a railroad I think we can all be sure of an interesting paper.

A CONDUCTOR'S PART IN ACCIDENT PREVENTION

Some time ago there was a head-on collision between two freight trains in which two persons were injured and several thousand dollars damage was done to equipment. These two trains had a meet at a siding located on a grade of about 1 per cent. The train going up grade had right of track, arrived at the siding first and stopped on the main line between switches. The train coming down the hill was unable to stop for the switch, and struck the train standing on the main line. The engineer on this train had made only a few trips over this particular piece of road. The conductor was a man of long experience, and he knew that the engineer was not entirely familiar with that district, so he was riding the engine. When about one mile from the side track, where the other train was standing, he told the engineer that he was running too fast, and that he had better begin to slow down for the switch. The engineer, however, drifted some distance farther before applying the air brakes, and as a result collided with the opposing train. The conductor could and should have prevented this accident, but he did not. Why didn't he? In my opinion, it was because the engineer had a stronger personality than the conductor. The engineer was an experienced man and thought he knew what he was doing, even though he was not very familiar with that particular piece of road. The conductor knew the engineer was using poor judgment, but he hesitated to exercise his authority as the conductor of the train, and a few seconds' hesitation in this particular instance resulted in a serious accident.

On a previous occasion I was riding on a circus train with this same conductor. He was making out reports at his desk, when the brakeman told him that sparks were flying from the train, about half way to the head end. Without an instant's hesitation the conductor opened the air valve in the caboose and stopped the train. In this case there was no conflicting personality to warp his judgment, and he acted promptly. To my mind, these two illustrations bring out one of the most prevalent

faults of conductors. All members of a train crew, especially if they are experienced men, are quick to see the possibilities of an accident, but there is a great tendency on the part of many of them to take a chance. It it up to the conductor, as the responsible man of a crew, to see that no chances are taken. As a rule, the conductor will act promptly to avoid hazards, but if his will or judgment is opposed by the engineer or the brakeman he is apt to hesitate too long. I think, in some cases, this hesitation is due to the fact that the conductor and engineer are held equally responsible for the observation of a large number of the operating rules. While this joint responsibility does not create as serious a condition as divided responsibility, I believe better results could be obtained by putting the responsibility of operating a train squarely up to one man.

In the first illustration there were some who said that the conductor fulfilled his duty when he warned the engineer that he was using poor judgment, but I say that this conductor should have stopped the train, even if he had to use force. Operating officials should never miss an opportunity to impress upon conductors that they are in sole charge of the train, and that they will be held responsible. Operating officials must then "back up" the conductor in any action he make take in the direction of safe operation.

DANGER OF TAKING UNNECESSARY CHANCES

In these times it is necessary to train a large number of inexperienced men as brakemen and firemen. A conductor can do more towards educating these men in safe practices and methods of doing their work than any officer on the road. There are hundreds of ways for the new man to injure himself or other members of the crew or to cause damage to property. A conductor is working with these men every day, and is in a position to know the faults of the individual and give instructions as to safe practices. A great many new men are incapable of taking care of themselves. I recall one man, in particular, whom I worked with for nearly two months, he could never seem to appreciate danger and persistently refused to follow safe methods of doing work. He was a young man of 22 or 23, very bright, and an athlete. I have seen this man board the front steps of a caboose moving eighteen or twenty miles an hour, with his arms folded. He was undoubtedly a good brakeman in many ways, but he was certainly not a safe man. He finally fell off a moving train and his leg was broken. A man of this type should never be retained in the service. He was cocksure that he would never be hurt himself, and when I would tell him that it was only a question of time he would merely laugh.

There is another type of man who should not be retained in the service, and it is up to the conductor in most cases to weed him out. I refer to the man who has no sense of organization or teamwork, and who thinks apparently only for himself. This type of man will give a signal to move without first looking to see that the other members of the train crew are in a safe position. He will move cars at a freight house without first seeing that other employes are out of the cars. It is up to the conductor

to see that his crew works as a unit and co-operates to the fullest extent and he will soon discover that a man of this type cannot be taught teamwork and co-operation. Men of this type are very often hard workers, and they remain in the service for this reason, but they are never safe men. They concentrate their attention on their own particular job, and forget everyone else. They are men who usually want to do all the work themselves, and would make a far greater success in life in private enterprises. In a railroad organization, teamwork and co-operation are the most vital factors and any man who does not appreciate this fact, or who cannot be taught it, has no place in the organization. I think this feature of train operation has been given too little attention by railroad officials. Not only the members of the train crew but all the train and engine crews on an operating district should work with the fullest co-operation.

In my school days I played football. I recall one man who was as strong as a horse and quick as a cat. In track work he used to win all the honors—in the hammer throw, the shotput, high jump and foot races—but he could never make the football team, although he tried it every year, because he could not accustom himself to teamwork. Instead of working with the team as a unit, he would always attempt to clean up the opposing team single handed, but he never succeeded. The same principle that holds a football team together and makes them work as a unit applies to the organization of train and engine men in railroad service. If the conductor understands this principle he will soon pick out the man who is clogging the machine, and it goes without saying that the smooth-running machine does not have many accidents.

SELECTION AND TRAINING OF MEN

The selection and training of men is the greatest game in the world. The conductor nowadays has very little to do with selecting men, but he does have a very important part in their training. To organize his crew and train his men so that they will handle any train safely and efficiently is a most important duty, but there are other features of a conductor's work in preventing accidents that are very important. One of these is looking ahead to see what might happen under any given conditions. If a brake beam comes down, he knows that it may cause a derailment and takes immediate steps to remove or repair the brake beam. If a journal gets hot, he knows that it must be given attention or it will break off and cause a serious accident, but there are numerous other conditions that may arise in the operation of a train, the results of which are not so well known. In these cases his action must be based upon judgment gained by experience. Any railroad man in train or engine service unconsciously learns by experience, but a great many do not obtain the full value of their experience, because they do not apply enough study to the relation of cause and effect. After an accident it is often very difficult to differentiate between cause and effect. Very thorough investigation by officials often fails to determine the cause, and I have known of cases where the effect of an accident was assigned as the cause. My experience has taught me, however, that the conductor can determine the cause in a

majority of cases, if he has been properly trained and if he will look into the matter carefully at the time of the accident. I once had a derailment of an engine backing up through a side track in which a fireman was injured. At the point where the first marks appeared on the ground a splinter was broken from the ball of the rail, about eighteen inches long and an inch or an inch and a half thick. As the wheel marks appeared on the inside of this rail it was apparent that the flange had climbed the rail on the opposite side. Examination of the engine disclosed that a spring hanger was broken on the left side, which was the side that climbed the rail, although it did not appear at the time that this was the cause of the derailment. After an investigation it was decided that the splinter breaking off the rail was the cause of the derailment, but some time later an engine of this same class had a spring hanger broken in the same manner and was derailed while backing up, and a number of cases since that time have confirmed my opinion that the derailment was caused by the broken spring hanger, and that the splinter was broken off the rail when the tread of the wheel dropped inside the rail at that point. My observation at the time convinced me that the broken splinter could not have caused the derailment. At the same time, I did not see how the broken spring hanger could have caused it, but experience has now shown beyond any reasonable doubt that the broken spring hanger did cause the derailment. Consequently, I have advised trainmen and enginemen to watch spring hangers very carefully.

There is a twofold purpose in investigating train accidents: *First*, to determine the cause, and, *second*, to place the responsibility. When the cause of an accident has been definitely established some means should be adopted to acquaint train and enginemen with the cause and point out the remedy, if the accident was avoidable. In this way all the men will be placed in a position to profit by the experience of one crew. It will also create interest among the men and be an incentive to pay more attention to causes and preventative measures. This could be accomplished by bulletins, but I think a better way would be to issue a pamphlet each month, describing in some detail the accidents and the causes with suggestions as to how the accidents could have been prevented.

MANY ACCIDENTS CAUSED BY SMALL DEFECTS

A great many conditions that do not look serious very often cause trouble, so I say that a conductor must be continually on the lookout and remedy conditions that his experience teaches him might cause trouble. It is far safer and cheaper to remedy small defects when they are found than to let them go without attention until an accident happens. It would take too much time to enumerate the many small defects that cause accidents, but a few will illustrate what I mean. Brakemen frequently remove brake shoe keys and use them for packing irons and very often fail to replace them. This results in the brake shoe coming off, and I have known of several cases where they stuck in a frog or guard rail and caused derailments. It frequently happens that carmen fail to put cotter keys in brake hanger bolts or brake pins, or it may be that cotter

keys work out, resulting in brake beams or brake rods coming down, causing derailments or damage to equipment. Small train pipe leaks are numerous, and should be remedied at once when found. A conductor should watch these defects and many others very closely and train his brakemen to be on the alert, as many an accident and personal injury can be traced directly to these small defects.

It would not be proper to overlook the question of train orders in a paper of this kind. Although accidents due to overlooking or mishandling train orders are comparatively few they are usually very serious when they do occur. A good conductor will form a habit of reading everything on a train order, from the number at the top to "complete" at the bottom, at the time he receives the order. It is very easy, especially when in a hurry, to get in the habit of reading the body of the order without properly checking the order against the clearance card and without seeing that the order is of the utmost importance. There should be absolutely no doubt in the mind of any member of a train crew as to the meaning of an order. The conductor must make sure that each member of his crew reads the order and understands it the same as he does.

A conductor should take an especial interest in safety work, and the man in charge of safety work should take an especial interest in the conductor, for the reason that the conductor is always an experienced man, and usually has a considerable sphere of influence. He also meets the public on passenger trains, and the freight conductor is often in very close touch with shippers and other patrons. The co-operation of all employes is vitally necessary in a safety organization, but I believe the co-operation of the conductor is the most important on account of his position. On the Oregon Short Line I find that a larger percentage of suggestions come from conductors than from any other one class of employes, and I also find that conductors take the most active part in safety meetings. I wish to make it plain at the same time that all classes of employes have taken a very active part in safety work, but the conductor is in a better position to discover defects and observe unsafe practices, and they are usually quicker to make suggestions than other employes in train or engine service.

In conclusion, I wish to express my appreciation of the very active and efficient manner in which the United States Railroad Administration has taken charge of Safety work. I believe that Mr. Belnap has the right idea and that he can and will accomplish a great purpose.

CHAIRMAN BELL: Mr. Clark's paper is to be discussed by Mr. J. L. Walsh, Superintendent of the Railroads under Federal Manager J. S. Pyeatt at Dallas, Texas.

DISCUSSION

MR. J. L. WALSH: The only point on which I fail to agree with Mr. Clark, in his excellent paper, just read, is in the fact that he counsels force on the part of the conductor in compelling the engineer to slow down his train on approaching a meeting point.

In the case mentioned had the conductor interferred with the engineer,

it is improbable that the accident would have been prevented and the responsibility could not have been definitely placed, as the engineer could reasonably have said that had it not been for the conductor's interference the accident would not have occurred. Strong-arm methods are undesirable from any standpoint, and should have no place in railway service.

A conductor's part in the prevention of accidents ranks above all others in that department of the service that produces probably the greatest number and the most serious accidents in train operation, and a conductor can do more by his direction and example to eliminate the large number of accidents that are occurring today than any other employe in train or engine service. His advice will probably be more effective with his fellow workmen than that of the trainmaster or superintendent, as the conductor has the opportunity of seeing the work as it is ordinarily performed.

CONDUCTOR IN ABSOLUTE CONTROL

Being in absolute control of his train (except under certain conditions) there would seem to be no occasion for a preventable accident, provided the conductor required the observance of all rules from those under his charge, and right here it may well be said that few accidents would happen if the rules were observed. The foremost duty of a conductor, as I see it, is in the education of those under his charge—not only train and enginemen, but all employes of the division on which he runs.

Passenger conductors, especially where furnished assistance in handling transportation, can prevent many minor injuries by a word of caution to passengers and especially to parents in charge of children, in keeping them from running through the train, leaning out of windows, and many other practices that are dangerous. He should see that baggage that is too large to ride safely is not left in hat racks from which it is liable to fall, or left in the aisles for others to stumble over. One of the most dangerous practices is that of passengers leaving their seats and standing in the aisle when approaching a station before the train stops. The activities of a passenger conductor toward safe practices has a beneficial effect on the traveling public.

In freight service, the education should begin with the student who is sent out to learn the work and whose first impressions of railroad work and practices are largely those of the conductor in whose charge he is placed in the first instance. If the conductor instills into this young man the principles of safe practice and observance of the rules he is laying the groundwork for a good brakeman and later on a good conductor, one who in his turn will educate the student intrusted to him in like manner.

SPLENDID OPPORTUNITIES FOR MISSIONARY WORK

The usefulness of the conductor need not be restricted to those under his immediate charge. His association with shippers and patrons of the road affords him a splendid opportunity to do missionary work among many who conduct their business on the right of way and who are,

therefore, placed in positions of more or less danger. Not a few of our accidents result from parties unloading cars while switching is being done at stations. The conductor can overcome this class of accidents by seeing that his brakemen notify all persons when cars are to be moved. His knowledge of the unsafe conditions over the division on which he runs makes him a valuable member of a safety committee and no division committee would be complete without him. Overhead or side obstructions, open stock chute gates, material piled too close to track and many other conditions dangerous to employes should also come under his watchful eye and be reported by him for correction. The greatest assistance to the company employing him is in his example, for the conductor who first observes the rules himself and requires the observance of the rules from those under him is the man who will advance the cause of safety where it is most needed.

Due to the good results of our safety appliance laws, promulgated by the Interstate Commerce Commission, and the inauguration of safety work by railroads, the maimed hand of the old railroad man is rapidly disappearing and we may confidently look forward to the time when the hazard of a railroad man's occupation will be reduced to a minimum.

CHAIRMAN BELL: Is there any one who would like to discuss informally Mr. Clark's paper or that of Mr. Walsh? In that connection, as you all know from the program, Mr. Dow is to be Chairman to-morrow of the round table meeting at which three assigned subjects are to be discussed. I feel safe in saying for Mr. Dow, however, that any subjects which are not fully discussed or discussed to your entire satisfaction as we proceed in the other meetings, or any subjects which are not touched upon in the meetings, will also be open for discussion at the round table meeting.

IMPORTANCE OF TEAM WORK

MR. ROBERT SCOTT (Atlantic Coast Line): There is one point in Mr. Clark's paper that struck me as being worthy of our earnest consideration, and that is in reference to team work. We all know railroad officers who have failed to make a success of their work because they tried to do it all themselves—it is entirely a team-work proposition. I am inclined to that idea and hope to get team work on our line. I hope to get the co-operation of everyone, because it is not a one-man job.

MR. R. L. PILLING (Louisville & Nashville): I noticed nothing was mentioned about Coca Cola bottles. If there is a road in this country that handles more Coca Cola bottles than the L. & N. I would like to know where it is. Some of our trains carry from twenty-five to thirty cases. If the bottles are not in the cars they are in the vestibules, and the passengers, after they dispose of the contents, set them on the window sills. If a window is open the bottle may fall out and hit someone. The bottle may fall on the composition floor of the car and be broken. The passengers kick the bottles out in the aisle and other passengers in walking through the aisle step on them. It is my opinion that war should be made against Coca Cola sold in bottles on trains. I do not think it is

safe for passengers. We are warring on the suit cases, things in the aisles, and also in the racks—one is no better than the other.

CHAIRMAN BELL: We are glad for the suggestion, Mr. Pilling, but, with your permission, I would prefer to make a note of it and bring it up at Mr. Dow's meeting to-morrow. I think it is rather irrelevant to the subject we have under discussion.

In order to give some one else the much appreciated opportunity of presiding over the meetings of this Section your Chairman will assume the responsibility of turning the meeting over to Mr. Fred Meyers, Supervisor of Safety for the Wabash Railroad at St. Louis. Mr. Meyers, please come to the front and take charge of the meeting.

MR. FRED MEYERS IN THE CHAIR

CHAIRMAN MEYERS: I assure you that while I am a little surprised I am very pleased to preside over a meeting of the Steam Railroad Section of the National Safety Council.

Our next number on the program is a paper prepared by Mr. T. H. Carrow, Supervisor of Safety, Pennsylvania Railroad, Philadelphia, on the subject:

FUNDAMENTAL PRINCIPLES OF SAFETY

The experimental stages of safety work have been passed, its fundamental principles have been established and the subjct now assumes the nature of a science. The great work of the future, therefore, will consist in the application of persistent effort along lines already laid down, with such modifications in methods and practices as experience may from time to time direct.

Recognizing these facts and also the fact that the Safety Section of the Railroad Administration has undertaken to establish a safety organization on every large railroad in the country and that, therefore, all railroads alike are interested in safety, it was deemed advisable to present for the consideration of the Steam Railroad Section of the National Safety Council certain general features of the subject that are basic or fundamental, with the view of suggesting an outline of procedure that may be employed by all railroads in accident prevention work.

The subject has been arranged under six heads, as follows "Organization," "Hazards of Employment," "Design, Construction and Maintenance," "Rules and Regulations," "The Physical Aspect," and "The Mental Aspect."

ORGANIZATION

Safety organizations on the American railroads are of comparatively recent origin. Prior to 1910 each department and sub-department looked after safety work independently of all other departments. The success in accident prevention, therefore, on any road, division or part of a division, was always in proportion to the interest taken and the attention paid to the subject, individually and collectively, by the higher officials, super-

intendents, their staff officers, agents, foremen and others intrusted with the management and supervision of the business.

The student of accident statistics found that it was a common thing for one division, station or shop to have a much better or a much worse record of injuries, whichever the case might be, than similar divisions, stations or shops, which clearly indicated that in some quarters more attention was paid to safety work than in others and that in order to accomplish uniform results a central agency should be provided to assemble and study all useful information concerning the occurrence of injuries in all departments and among all classes of employes for the purpose of directing the action that should be taken to remove conditions and eliminate practices, as far as possible, that cause injuries.

Thus a number of roads made experiments and the success they achieved prompted others to do likewise and it was not long before nearly every large railroad in the country established a safety organization and the order of the Railroad Administration, dated May 27, 1918, creating safety committees on Class 1 railroads, completed the evolution of the subject in respect to the universal adoption of safety organizations on American railroads.

HAZARDS OF EMPLOYMENT

All precautionary measures against injuries are introduced as a result of having recognized the hazards they are intended to ward against. It follows, therefore, that the first duty of a safety organization is to provide comprehensive statistics regarding the occurrence of injuries for the purpose of ascertaining whether the precautionary measures already provided are adequate and that they are enforced or whether additional measures should be introduced.

Statistics should be classified by detailed causes, occupations, nature of injury, length of service, divisions, general divisions and the road as a whole. They should be so arranged as to admit of assembling the figures for a particular shop, yard, station or subdivision. By such an arrangement it is possible to determine the class of persons most frequently injured, the specific locations where injuries occur and the results thereof. Such information leads to definite action and obviates lost motion.

The use of a code in classifying and mechanical devices in tabulating the information thus required renders the compilation of statistics, as above outlined, comparatively simple, particularly where large numbers of injuries are involved. The comprehensive system of train accident and train service statistics recently adopted by the Interstate Commerce Commission will be useful to the large and small railroads alike when the figures for a year or so have accumulated.

DESIGN, CONSTRUCTION AND MAINTENANCE

In the same degree that a keen mind and sound body are necessary to the individual, properly designed and well-maintained machines, tracks, rolling stock, structures and buildings are necessary to the general success of safety work. This feature of the subject is comparatively easy to handle, because science and invention have provided safe designs and

suitable material for all kinds of construction and the existence or development of dangerous conditions, as a rule, may be discovered by casual observation in the ordinary course of supervision. The greatest difficulty in this direction is in securing the necessary labor and supervision, either on account of lack of funds or labor shortage.

The progress that has been made, and is being made, in design, construction and maintenance of all kinds of equipment from a safety standpoint constitutes an important landmark in the progress of the safety movement and may be regarded as a sure indication that no reasonable effort in this direction will be spared in the future. Unsafe design of equipment, dangerous construction, obstructions around the track, dirty yards, unguarded machinery and the like should be tabooed, and I believe this will be the case in the future since there are thousands of railroad employes looking for just such conditions today who formerly did not consider it part of their duty to do so.

RULES AND REGULATIONS

Nearly every kind of work performed by human hands and every movement made in the transportation world, either on the land or on the sea, is governed by specific rules and regulations. Efficiency, which is closely related to safety, has gone so far as to determine the kind of movements that should be made in laying bricks, in driving nails and in other simple and commonplace work. The future will see a further development and refinement of safety rules, regulations and instructions, more particularly the latter, for the safety of workers.

This statement is predicated on the results that have already been accomplished in this direction. Think what we owe to the observance of Rule 99, Rule 26 and all the rest in the book of rules; to the rule that prohibits going between moving cars to couple, against "stemming" an engine, and to the first aid rules.

THE PHYSICAL ASPECT

Physical examination and classification of employes not only eliminates the totally unfit, but places those whose health and strength have been partially impaired at work they are able to perform without further aggravating their infirmities. Without physical examination the weak and the infirm naturally gravitate into positions they are unfit to hold and sooner or later find themselves, as a result of the labor they are required to perform, unfit for any kind of work, a drug on the labor market and a burden upon society.

The physical test of the army and navy has shown a large percentage of defectives. These have been left with us while the bulk of the young men of sound mind and body have been taken away. This, together with the fact that other industries have drawn large numbers of workers from railroad employment, makes it more imperative than ever before to utilize labor that under normal conditions might be considered unfit, and, therefore, increases the importance of paying proper attention to the physical condition of employes.

A machinist with a slight defect of the heart may perform his duty without danger to life or limb, but in certain other occupations a similar defect introduces a serious element of danger. Men afflicted with rheumatism, fallen arches, sore feet, weak backs, stiff joints and other similar infirmities, may perform certain kinds of light work safely and satisfactorily, whereas their infirmities are aggravated and their liability to injury increased by performing heavy labor.

One of the great advantages of physical examination is that it not only classifies men for work they are suited to perform, but the mere discovery of an infirmity may result in remedial measures being applied with little trouble and expense to the worker or to the employer. A man with a rupture, for example, is comparatively safe if provided with a truss; the proper kind of spectacles will correct defective vision while many other ailments yield to specific treatment and certainly no reasonable effort should be spared to correct such trouble.

THE MENTAL ASPECT

We are all differently endowed from a mental standpoint. Some are born with a natural aptitude for safety, others acquire safety habits through processes of education, while a comparatively few, either through mental deficiency or sheer perversity, are hopelessly unsafe. The first class should be encouraged, the second class should be taught and the third class should be excluded from railroad service.

The mind is the seat of ignorance, carelessness, thoughtlessness and indifference, the primary antecedents of the majority of accidents, and it follows that through the mind alone can such faults be modified or eliminated and the results that have already been achieved by the use of safety bulletins, magazines, moving pictures, oral instructions and precepts in preventing accidents should afford ample encouragement to put forth an ever-increasing effort along these lines. We live in an age of education and regulation and the possibilities in this direction with respect to accident prevention are large and constitute one of the most important features of the work of a safety organization. These, then, are some of the fundamental principles of safety. To successfully apply them in spite of the present tremendous labor turnover and the unsettled condition of the working forces is a difficult task, but one, I am sure, we will all do our best to perform.

CHAIRMAN MEYERS: I am sure we all appreciate the very instructive and splendid paper by Mr. Carrow, I know. I do. Particularly is this true because many of us are new in the work. It is just the kind of information we are looking for.

The next number will be a discussion of this paper by Mr. S. M. Galaty, Safety Inspector of the Chicago & North Western Railroad.

DISCUSSION

MR. S. M. GALATY: Whether we are successful in the prevention of accidents depends as much on our personality as on the character of the

organization which we formulate to carry on this work. This particular and important subject has been given a great deal of thought by the pioneers in the work of safety, for the reason that they recognized the importance of a proper organization if they expected any results in their efforts to conserve the lives and limbs of the workmen of this great Nation. As a result of their untiring efforts, safety committees composed of the supervising officers and workmen were formed on every division; also shop committees, local committees at important points and terminal committees at the main terminals, as well as a Central Safety Committee as a supervising body to whom these other committees report. I shall not take up your time discussing the personnel of these committees, inasmuch as the Safety Section of the United States Railroad Administration has adopted this form of organization and made it the subject of their Bulletin No. 3, with which you are all familiar.

When the safety movement first started the employe was skeptical and seemed to fear that it was a money-making scheme on the part of the employer. But after he saw the efforts made by the employer to improve conditions about the shops, the yards and on the engines and cars, all of which cost money, and realized that it was he and not the president or the stockholders that were being killed and injured, and the great reduction of accidents which followed, and all that was asked of him in return was his help in the effort to eliminate accidents, he was quick to respond. The result was that in the eight years the safety committees have been in existence on our railroads the record attained in the prevention of accidents has been very marked and greater results are in store for us.

DECREASE IN ACCIDENTS

Statistics for the road that I represent, for the eight years ending June 30th, 1918, as compared with eight years on the same basis for the years ending June 30, 1910, before the safety committees were organized, show 324 fewer employes killed and 17,035 fewer employes injured. The Interstate Commerce Commission report for the year 1916, as compared with the year 1910, shows a decrease of 26.5 per cent in fatal accidents and 28.7 per cent in injuries to employes. This does not include industrial accidents on railroads, but only accidents in train operation, as no record was kept by them of industrial accidents in 1910.

Next in importance to organization, and so closely related as to be a part of it, is co-operation. For any organization to be successful in its endeavors there must be co-operation of its members. In accident prevention work this includes both employer and employe. The benefits that are derived are mutual. Therefore, it is essential that the two lend all their efforts toward that end.

You will, no doubt, agree with me that accident prevention on a railroad is a great deal harder to accomplish than in any other industry. This is probably due to the fact that the work is not concentrated and in some instances is thousands of miles from the headquarters of the supervising office. This necessitates the employment of trainmasters,

foremen and yardmasters to direct the work on the road and in th yards, shops and roundhouses. If the men in charge of the work ar the right kind of men and in accord with the principles of accident pre vention we will have safe yards, shops and roundhouses and very fe accidents. But if, on the contrary, they are chance-takers and give n thought to the safety end of the work, we will have just the opposit results—demoralized conditions and, necessarily, accidents.

Let me illustrate this point by telling you of an incident which cam to my notice a couple of months ago. I met an engineer of one of th railroads, not the one I represent, although the same condition migh prevail there also, but if it does I am not aware of it. This man notice my safety button and questioned me regarding it. When he learne of my interest in safety work his attitude was that of one wh did not take much stock in it. I was curious to learn the reason fo this indifference on his part and asked him why he was not interested i a work that meant so much to him. He said that a few weeks prior t that time, while working on a switch engine, the trainmaster had aske him to use the main track in the face of a passenger train past du and when he requested flag protection had threatened to discharge hin He did not think there was much to safety when the officer in charg insisted upon unsafe practices. The action of that trainmaster not onl spoiled this man from a safety standpoint, but it will have a demora izing effect at that terminal. I simply mention this case to illustrat the damage that one man can do when he is not in full accord wit the work.

CHAIRMAN OF SAFETY COMMITTEE MUST BE TACTFUL

To secure the best results from safety committees all members mus be made to co-ordinate. The superintendent and master mechanic mus be on the same level as any other member of the committee. All ma ters brought before it at the meetings should be fully discussed an final action taken by vote of the committee. Much harm can be done b the chairman shutting off debate, because of the superintendent, ma ter mechanic, or some other departmental head belittling some su gestion or claiming that it is impracticable or that it would cost to much money. Every member of the committee should express himse and be encouraged to do so. Very often a suggestion which on its fac seems to be impracticable turns out to be a very good suggestion, or on that may seem to be out of the question because of the expense involve may be handled so that conditions can be changed to be made safe at moderate expense because of some other committeeman figuring out practical solution of the suggestion. The result of throwing cold wate on a suggestion is that you cause the committeeman to lose his enth siasm and thereby his value to the committee. Whereas, on the othe hand, the fact that some interest is taken in his suggestion and it i discussed, even if the decision is against him, causes him to be enthuse and encouraged and he will come back at some future meeting with othe suggestions which may be of great value. We have kept a record of th recommendations and suggestions made by the various safety committee

on our road from the year 1912, and in the six years ending December 31, 1917, there were 28,283 recommendations made, of which number 27,082 were adopted and put into practice and only 1,201 or 4.25 per cent rejected. This, to my mind, demonstrates not only the reasonableness of the suggestions but the value of co-operation between the employer and the employe.

Every act or duty which we perform carries with it a hazard in some degree. The extent of the hazard depends upon the class of work that is to be done. There is a reason for every accident and if we are wide awake and on the job, as I think we are, we will diagnose accidents in much the same manner that a physician diagnoses a disease—get to the root of the trouble and eliminate it before and not after another accident happens. For instance, not long ago one of our switch foremen was killed. He stepped in between the cars of his train to adjust a knuckle while the yard engine, which was making up the train, kicked some cars in on the train; he was knocked down and run over. He was an old employe and was familiar with the work and could have seen the cars coming if he had looked before going in between the cars. There was a reason for this accident. If I were to give the answer I would say that it was because he was not thinking of the work he was doing, or of his surroundings, but had his mind on other matters and was doing his work mechanically.

EDUCATION WILL SOLVE ACCIDENT QUESTION

The natural question arises: What can we do to prevent a recurrence of accidents of this character? It seems to me the thing to do is to give publicity to the accident and the causes which produced it, so that other men may profit from the mistake of the man who was killed. Together with our efforts toward eliminating dangerous and unsafe conditions in and about buildings, shops, yards and trains, we must carry on a constant and intensified campaign of education. We must teach men to think. An analysis of the causes which produce accidents will show that about 88 per cent of the men killed and 82 per cent of those injured are due to thoughtless and dangerous practices of the injured man or some other employe and less than 5 per cent is due to defective machinery, cars, engines, tools, tracks, etc.

Psychology teaches us that we are mainly controlled by habit, therefore we must reach the men through education and suggestion. Teach them the safe way to do their work. I will try to tell you the way we handle the matter of education. Whenever an accident happens the safety committee from that shop or yard makes a separate investigation from the one made by the claim department and sends its report to the chairman of the Central Safety Committee, also to the supervising officer, showing the cause producing the accident and its recommendations as to a remedy. These men are thoroughly familiar with the work being done at the time, as well as the method of doing it and also the surroundings: also as to how this work might have been done in a safe manner and the accident avoided. In a large majority of cases their

recommendations are of great value. A copy of their report is als posted on the bulletin board in that shop, roundhouse or yard for th benefit of the other men.

Every six months we get out a statement of the causes of accident: showing what it was that caused them, and the number of men kille or injured in the different classes of employment. These are furnishe to each safety committeeman and are also posted on all safety bulleti boards. We also compile, each month, a report called an "Avoidabl Accident Report." This is a statement of accidents which could hav been avoided, giving a brief outline of the facts responsible for then These reports are furnished to each committeeman, so that he can famil arize himself with the reasons which caused the accidents, disseminat the information among the men and look for similar conditions abou his particular shop, yard, station or train. In this way the men ar furnished with all the data we have regarding accidents and are in position to discuss intelligently between themselves the various cause and guard against a repetition. This method is also very often th means of getting valuable suggestions for eliminating dangerous co ditions and practices. Illustrated bulletins are gotten out frequentl calling the attention of the men to specific hazards. These are distribute to all the men who have to do with the class of work involved, as we as to all safety committeemen, and are posted on all bulletin boards. I this manner we aim to direct the minds of the men, as well as th supervising officers, in the channels of safety and to change their habit teach them to *think*, and when we get the men to *think* we will hav safer men and fewer accidents.

IMPORTANCE OF PHYSICAL EXAMINATIONS

Rules and regulations tending toward safety and accident preve tion are necessary to guide us aright, and are not only conducive to safet but to efficiency as well. We should be careful not to have too man rules, but should insist that there be no deviation from them.

The physical fitness of a person seeking employment, or of one alread employed, should receive careful consideration. Ofttimes a man or wor an who does not fit in one position by reason of some physical defec or because his or her mentality is not of a high enough degree, may b transferred to some other department to meet particular characteri tics, where they may become the most proficient workers, both in safe and efficiency.

While the prevention of accidents is our main line of endeavor, w must not lose sight of the economic value of this work. It is a know fact that whenever an accident happens, not only is the man disable but the fact that an accident has happened causes all others workir in that vicinity to get their minds off their work, thereby decreasir their production and efficiency. So that if we can keep a man at wo by accident prevention we make him a constant producer for himse and family and maintain the efficiency of the organization by keepir the force intact. Incidentally we save money which would otherwi be paid out as compensation to the injured workman, which prov that safety and efficiency are synonymous.

CHAIRMAN MEYERS: Our program is a little crowded and we will have to hurry. If there is no discussion which needs to be had at this time of the papers read by Mr. Carrow and Mr. Galaty, I suggest we postpone the matter until Mr. Dow's round table meeting to-morrow.

The next number is a paper on the subject: "Getting Close to Men: Intensive Training by Foremen," by Mr. C. W. Hammond, Division Safety Agent of the New York Central Railroad, Collinwood, Ohio.

GETTING CLOSE TO MEN: INTENSIVE INSTRUCTION BY FOREMEN

This subject is one on which much time could be spent and no further conclusion reached than that of explaining in a brief and concise manner the necessity of the foreman exercising care and caution in the handling of his men. Any opportunity to enlist his men in a safety organization, for the promotion of the same, should be welcome and enthusiastically met. The foreman in charge is really the hub in the safety wheel that guides his men in safe or unsafe directions. It may be that he is foreman of track employes. In this case it is especially necessary that he be able thoroughly to acquaint himself with safety instructions, so that he can interpret the same at all times to the men under his jurisdiction, both prior to going on the job and while at work. To hammer home safety ideas in the minds of his men must be uppermost in his mind at all times.

Conditions this last summer have been the means of causing many sleepless nights to more than one road supervisor. I have one foreman in my district, who had as high as four different gangs of men to supervise in one week. When Saturday night came he was the only man left to talk safety to. I have also seen forty-six new men arrive one night at one of our camps used for housing track employes and at 6 o'clock, after breakfast, of course, there were only seven men to go on the job. You hardly have a chance to talk safety to these men, for as a rule, they are a safe distance away. This is a serious handicap to safety, as well as to the operation of our railroads. I hope the government will take immediate steps to eliminate this national menace, for I believe that any man who will not do his part by giving his earnest support at this time to his government in the prosecution of the war, for the freedom of the world, is as bad or worse than the slacker who refuses to go forward on the selective service day to write his name, that we all may live under a true democracy and not under German kultur.

DIFFICULTIES MET BY THE FOREMEN

I also believe that the foreman of track employes should be a man who will not only be able to talk safety to his men, but be able to compel them to exercise caution at their work. This is sometimes rather a hard thing to do, as I have seen four different nationalities working under one foreman, he being the only man who was able to

speak the English language. This does not happen often but I belie it would be much better to separate the different nationalities th safer and more efficient service may be obtained.

Some of the different subjects that a foreman should talk about his men are the proper ways to handle rails, ties, frogs and other trac material. This work is especially dangerous to new men, as we find th many old and experienced men have become injured, more or less, b careless handling of track material. One bad practice that has come my attention is that often the foreman does not see that his men stan clear of all tracks while trains are passing and that they are on th same side of the track as himself. Especially is this a bad feature on son of our four-track system. It is a matter that I am constantly trying instill into the minds of all foremen, so that they may communicate it their men.

The day of the "hell-roaring" type of foreman has passed. There was time when the foreman who could swear the loudest was supposed be doing the most work, and for this same reason many good and tru men have fallen and gone down, poisoned by the slander that followe them from day to day.

The Bible tells us that a wicked man "walketh with a froward mouth This is absolutely true, for the most successful foreman that we hav today is not the abusive, overbearing kind, but the safe and sane on who shows by his deeds that a man's life should not be measured by h years but by what he accomplishes. If we stop and think, there is not ing more valuable than life, especially at this time when we are engage in this great world war. Life and the conservation thereof should b uppermost in all men's minds.

What applies to track foremen should also apply to all other classe of foremen, whether they be shop, yard or freight-house foremen. foreman should be able to teach safety, either by word of mouth by impressing his men with safety bulletins, such as are issued by th National Safety Council.

WHEN SAFETY LESSONS ARE BEST TAUGHT

I find that many men working in these different capacities are n able to talk or understand the English language and if an interpret is not available the bulletin, in conjunction with daily talks, will accor plish more than could be done in any other way.

There is, perhaps, no better time to teach safety than before the me start to work in the morning or at noon. If you want to touch a ma along almost any line you can get the best results when he has a fu stomach, therefore I find that noonday meetings are most successful carry home safety ideas.

A safe and efficient foreman is the one who has the respect and c operation of his men; he demands harmony and unity, that safety ar efficiency may prevail. While it is almost impossible for him to wat his men as closely as he wishes, at all times, with a good safety orga ization, of which he is the leader, it would not always be necessar Another way of teaching safety to groups of men is to talk to them

their respective lodge meetings. In this way you get a chance to talk to engineers, firemen, conductors, brakemen and switchmen at a time when their minds are away from their work. By bringing up specific accident and death cases, and the way to remedy them, you may accomplish in ten or fifteen minutes what would have otherwise taken days to do.

As a final summary: A foreman who demands safety at all times, in my opinion, is invaluable and should be retained at almost any cost. It is he that maintains friendly relations with every man on his payroll to the end that America's safety may not be diminished and American arms weakened.

DISCUSSION

CHAIRMAN MEYERS: We have without question been much benefitted by this splendid paper of Mr. Hammond. The next paper is a discussion of this subject by Mr. A. V. Rohweder Safety Supervisor, Duluth, Missabe & Northern and Duluth & Iron Range Railroads, Duluth, Minn.

A. V. ROHWEDER: The subject of Mr. Hammond's paper is one of vital importance in the successful carrying on of safety work.

I want to divide my paper into several parts and take up the various phases separately, with as much emphasis upon one as the other. For the first part, I think that every line should have a general get-together foremen's safety meeting at least once a year. At these meetings the heads of the departments should review the methods used in handling the work in their departments and lay great stress upon those that are proper. Educate the foreman. Then follow with a talk and illustrated lecture by the safety officer. He should review accidents—illustrate their causes and the remedies that can and have been applied. In other words, be sure your foremen know how to do a job safe, then you can expect them to impart this knowledge to the men.

Following this line, I would say that the greatest mistake made in most safety organizations and in safety work is the fact that the safety officer and the foreman think they have done well when they have talked to the men, put up bulletins, cautioned them and threatened discipline. In a sense they have only started. The real value of instruction along safety lines is accomplished where you have a foreman who will go in and show the man how to do the job safely. For example, a foreman will come along and say to Tom Smith, "Tom, why don't you mend your ways. 'Do it the safe way,'" then pass on thinking he has done his duty. Tom simply says to himself: "That 'gink' thinks he knows more than I do." Now, the point is this: If that foreman would show the man how to do his work in a safe manner and convince him that it was the best way in which to do the work, he would never have to worry about making a check to find out if he was doing it right or wrong. There is only one way to win a man from following dangerous practices and that is to *convince* him that your way is best and safest. You can dismiss, lay off or do any other thing you want, but you will never get the results that you will by *convincing* him.

MAKE FRIENDS WHILE DOING SAFETY WORK

The safety officer should not think that all he has to do is to call attention to dangerous things, practices, etc. His business is to follow each line of work and learn it. Study new methods that will tend to make the work safer, then get hold of the foreman, show him the idea, and, if the two think it's advisable, have the foreman so teach his men and see that his orders are carried out. The foreman is *the* man that can make or break a safety organization and if you can *convince* him that you are his best friend and help him and not censure him, I know that you will find your work very successful.

I will now turn to the methods we pursue in trying to get our foremen and men in line for safety work. We furnish each foreman with safety literature, write them personal letters and call their attention to the rules governing the work in their individual departments. The safety officer makes it a point to call on each one as often as possible. A foreman's safety record is kept and he knows it. The general manager has issued a letter to all foremen, stating that their safety record will be given consideration when their name comes up for promotion. Accident statistics are furnished them, showing the class of accidents that are happening in their line of work, not only in their own shop, section or part of the line, but on other parts of the line and in other Departments. An explanation from the foreman in immediate charge of men who are injured is required, with his suggestion for prevention of a similar accident.

We have a safety car that we send over the line, making about one complete trip every two months. We get every man employed to visit this car and show safety pictures, slides and give a lecture on safety.

I fully agree with Mr. Hammond in his remarks that noon-day meetings are the most beneficial. We are endeavoring to get all our foremen to hold such meetings as often as they can arrange to do so.

In closing, I would say that the most important feature in safety work is the convincing of the foreman, he in turn convincing the men, that safety work is a good thing. When a foreman will talk safety, practice safety and boost safety, nine chances out of ten he is the most efficient foreman on the line.

CHAIRMAN MEYERS: I believe the subject that has just been discussed, "Getting Close to Men," is going to be one of the best methods of getting genuine results in this work.

The next subject was assigned to Mr. Robert Holland, division roadmaster, St. Louis and San Francisco Railroad, Neodesha, Kas., "Accident Prevention for Trackmen." We received word this morning that unfortunately, Mr. Holland could not be here, and I will ask our acting Secretary, Mr. Fred Whittemore, to read for Mr. Holland the paper which he prepared.

ACCIDENT PREVENTION FOR TRACKMEN

1. Few track foremen place their handcars on the track properly. Cars run from tool house to the track at right angles: one end is picked up and

turned parallel with the rails—invariably this end of the car is held up until the other end is placed on the rail. This often results in personal injury. The turning end should be placed on rail, thereby avoiding any chance of injuring the hands of the men by coming in contact with the rail or causing any extra heavy lifting.

2. Track tools should be placed on motor or handcar in such a manner that when the car is in motion they will not jolt down against the wheels or cause men to rearrange them while the car is in motion, thereby resulting in personal injury.

3. In moving to point of work, all men should remain seated until the car is stopped. Often trackmen are injured on account of being allowed to stand on motor car while it is in motion

4. Motor cars or hand cars should not be started by pushing from the side—they should be started by pushing from the rear. This is the cause of a great many personal injuries. on account of men stumbling or making a misstep and car running over their feet.

5. Men should be placed on motor or hand cars in such a way that they have a clear view both forward and back, so as to observe train movements in either direction.

6. Motor or hand cars should not be run around curves where the view is obstructed—they should be stopped and flagman sent ahead, and not proceed until they get a signal from the flagman, thereby avoiding any chances of coming in contact with trains.

7. On reaching the point of work, the motor car or hand car should be placed to clear the nearest rail at least six feet.

CARE OF TOOLS AND HANDLING OF CARS

8. Sharp-edged tools, such as scythes and snathes, adzes and axes, carried on motor or hand car, should be protected by a sheath; scythes should always be carried knocked down, never fastened to the snath. It only takes a few minutes to attach the scythes to the snaths on arriving at the point of work, thereby avoiding any chance of personal injury to the men on the car.

9. Trackmen should never be allowed to jump from car while same is in motion they should remain seated until it has stopped. This applies also to motor cars, even if protected by railings.

10. Hand cars and motor cars should be brought under full control at all road crossings, street crossings, sidewalks, etc., until it is known the way is clear. There are a great many personal injuries on account of not observing this rule.

11. Hand cars or motor cars should never be attached to a moving train—this practice is very dangerous.

12. Hand cars and motor cars should be kept at a safe and sufficient distance apart while moving to and from work, according to the rules. This is very important. When cars are stopped, for any reason, a signal should be given to the cars following, and it should be known that the signal is understood before car is stopped.

13. Hand cars and motor cars should not be run to exceed fifteen miles

per hour, and should be run through towns, yards, over switches and crossovers at a safe speed.

14. Track foremen should carry proper flagging equipment, such as flags, torpedoes, etc., on hand and motor cars at all times, so that proper flagging can be done when necessary.

SAFE PRACTICES

15. *Cutting of Rails*—When possible to do so, rails should be cut with a hack saw; when cut with a chisel men engaged should not stand on the same side of the rail. The man holding the chisel should be on one side and the man striking the chisel should be on the opposite side.

16. All men engaged in cutting rails with chisel should wear non-glass goggles for the protection of eyes.

17. *Unloading Material, More Especially Ties*—A great many trackmen are not experienced in the handling of ties and distribution of cars, and it is a good practice to have one foreman on each car that is being unloaded, in order to instruct the men in the proper method of handling ties. This practice has resulted in avoiding a great many personal injuries on my division.

18. Trackmen should not be allowed to unload ties from cars while the train is in motion. It is dangerous. A great many railroads have adopted the plan of scattering the ties, making it necessary to unload them from moving trains; this in my judgment, is improper and unsafe.

19. *Unloading Ballast*—Trackmen or others should not be allowed on bottom-dump ballast cars while the train is in motion. Cars have been known to dump while the train was in motion, and men have been injured and killed.

20. In making long rides to point of unloading, men should not be allowed to ride on ballast cars, neither should they be required to ride in tie cars until they reach the point where the work is to begin—it is unsafe.

21. *Tools*—One of the best means of accident prevention is the proper supervision of track tools. Men should not be allowed to use battered-head chisels, sledges or spike mauls or badly worn-jawed claw bars, or track wrenches that are worn oval-jawed, permitting them to slip off the bolt nut. The track gang tools should be examined by the roadmaster at least once a month and all instances of improper tools should be brought to the foreman's attention, and turned in on the first store cars over the line.

2.. Trackmen should not be allowed to use track jacks that are not in proper working order.

23. Men in track gangs should not be allowed to work in groups too close together, as men are often injured on this account by tools in co-laborer's hands. This applies also to unloading of material from cars—men should be a sufficient distance apart to avoid personal injury to each other.

24. Trackmen should not be allowed to tighten bolts on high trestles by standing on the outer side of the rail. This has resulted in severe personal injuries, on account of wrenches slipping off the nuts and men

falling to the ground. They should stand on the gauge side of the rail while tightening bolts on trestles.

SPIKES, JACKS, METHODS OF LOADING, ETC.

25. Trackmen should not be allowed to pull spikes from the outerside of the rail on trestles with claw bars. Spike pullers should be used in connection with claw bars, so that the work can be done by men standing inside of the rail.

26. Trackmen should not place track jacks on the inner side of the rail when surfacing or leveling up tracks. The track jack should be worked on the outside of the rail, thereby avoiding any chance for personal injury; in addition, this results in doing the work better, as track jacks placed on the inside of the rail invariably throw the track out of line.

27. We had a personal injury caused by bridgemen, in constructing a pile trestle at the end of a span, driving spikes in the piling about two feet apart on each side, thereby making a ladder to climb from the ground to the deck. The bridge was about twenty-five feet high. Two years afterward, the piling becoming thoroughly dry, the spikes became loose in the piling, and the track foreman, going from the ground to the deck, used these spikes. When near the top one spike pulled out and he fell to the ground, breaking his arm.

28. We had an accident in which a car foreman was sent out to load a damaged pair of trucks by the use of skids. One axle and the truck frame were intact, one pair of wheels was detached from the truck frame. The men loaded the truck frame and the axle which was attached, but in loading the pair of wheels the foreman instructed the men to load it by hand, which they did. When near the top of the car the wheels slewed, falling between the skids, injuring for life one of our best track foremen. This accident could have been avoided by attaching a rope to either end of the axle and the placing of four men on the car to prevent the axle from slewing. The accident was the result of improper method of loading the wheels.

TRAINING OF FOREMEN IN SAFE PRACTICES

During the period of safety work on the St. Louis & San Francisco Railroad I have made quite a study of accident prevention to trackmen and others. So far as trackmen are concerned, I find that without the co-operation of every foreman handling track gangs it is a hard matter to reach success. One of the most important things is to educate the foremen with reference to the different causes of personal injury to trackmen and to get them interested in safety. When you have educated foremen properly to instruct men and to guard against unsafe practices and unsafe methods of doing work, personally instructing his men in what he is going to do and how he is going to do it, it is my opinion that personal injuries to trackmen, or a great percentage of them will be avoided.

The roadmaster must take an interest in his foremen and talk these matters over with them, and, in turn, the foreman must do likewise with his men; in this way the biggest percentage of injuries to trackmen can be overcome.

Each personal injury on my division is investigated thoroughly. I get all the data as to just how the accident happened and what the foreman did to prevent it, if anything, write up the accident, covering every detail; forward a copy to each foreman and have him advise me how the accident could have been prevented, and, in his opinion, what the cause of the accident was. In a great many cases it will be shown that it was by lack of proper handling by the foreman. After this information has all been filed the papers are sent to the foreman who had the accident, with a request that he be more careful in the future. We also instruct him how he should have handled the matter. I find that this works fine. Most of the foremen desire to do their work in a satisfactory manner and try to handle their men without loss through personal injury. By handling matters in this way a great many injuries are avoided and unsafe practices are discontinued.

DISCUSSION

CHAIRMAN MEYERS: We will now have a discussion of this subject by Mr. W. W. Fuller, Supervisor of Safety, Seaboard Air Line, Norfolk, Va.

MR. W. W. FULLER: I wish to say that my subject of discussion has been pretty thoroughly covered this morning in many ways and by the various papers we have heard. Therefore I feel that I can eliminate a great deal I had intended to say in regard to the subject of "Accidents to Trackmen."

On behalf of our railroads and the Steam Railroad Section of the Council, I wish to thank Mr. Holland for his timely paper, "Accident Prevention for Trackmen," a subject too often neglected, but one in which we are all thoroughly interested and from experience know to be difficult of solution. To this subject Mr. Holland has very ably contributed and interestingly presented his suggestion under paragraphs 1 to 28, thus permitting of ready reference to the various items, all of which are worthy of careful consideration, as each applies to a vital spot in the safety of employes engaged on track work. The items clearly indicate contributing causes to injuries and the remedy in each instance. The subject has, therefore, been thoroughly covered and defined through simple arrangement permitting of its usefulness in rule or pamphlet form by all roads desiring to make practical use of this paper, which differs in this respect from some others submitted. In this connection I will refer to a former paper by an official of the Erie, which was read in 1918, and if I am not mistaken this paper stated that during a period of twelve months 26 trackmen were killed and 428 injured on the Erie railroad: 22 out of the 26 were killed by being run down or struck by cars, trains or engines. These figures, however, are believed to apply to double or multiple track territory and therefore would hardly apply to single track conditions, such as we have.

EXPERIENCE DEVELOPED BY SURVEY

Therefore, it may be interesting for comparative value to know something about single track conditions, such as would apply to most of our Southern roads. Accordingly we made a survey of dangerous practices and dangerous conditions contributing to accidents to trackmen on our lines and herewith submit the data obtained from our experienced employes on the subject. But before proceeding to this matter I believe it will be helpful to review the most frequent causes of injuries to trackmen, as indicated on the Erie, in which it was stated that: Forty of the men injured were hurt while running or handling hand cars, racing them, running into the car ahead, loading tools on front of car so that they jarred off and derailed the car, etc. Sixty-two of the men were hurt while using track tools, striking their feet or fingers or the body of a fellow employe. Twenty-four were injured by being run down or struck by cars, trains or engines, nearly all on double or multiple tracks Seventy were injured while handling rails—got their fingers or feet mashed because they did not get them out of the way in time. Forty-eight were injured while handling or unloading ties—some other man dropped a tie on their feet or threw a tie out of a car and struck them. Twenty had their eyes injured, mostly by standing on the wrong side of the work while holding track chisels. The balance was made up of every conceivable sort of accident, and in conclusion the question is asked: "What are we going to do about it?" The foregoing, as furnished by the Erie, is submitted for what comparative value it may carry with regard to the following.

ACCIDENTS ON SEABOARD AIR LINE

Accidents to trackmen on the Seaboard Air Line, months of June, July and August, 1918: Total number of employes, 17,837; number of trackmen not known; 3,554 miles of single track line. Killed none. Fifteen accidents attributable to motor and lever cars. Fifteen accidents due to improper use of track tools, jacks, etc. One accident due to being run down or struck by cars, trains or engines. Eighteen accidents due to handling, loading, unloading and placing cross ties. Eye injuries none. Miscellaneous, eight. Total accidents, sixty-three.

While the figures for the Seaboard cover a period of three months and those of the Erie twelve months, if they are compared accordingly it is evident that trackmen killed in single-track operation as against double or multiple track service is a negligible matter. It is also evident that double-track operation is responsible for the injury of a large number of men being run down or struck by cars, trains or engines, which is not the case in single-track service. The same also applies to eye injuries, yet this should be common to single and double track service alike. A comparison of the miscellaneous items is largely in favor of single-track service, if the figures of the Erie are to be accepted as a basis of comparison.

Obviously, the only way of preventing accidents is through proper training, instruction and education, but we are confronted with the old turnover problem. In the South, like all sections, we have to contend

with this problem in its many phases and variations, including colored labor, but as all section foremen are white, experienced and excellent men, we manage to get results through their co-operation, which is the keynote of Mr. Holland's paper. I believe all will agree with Mr. Holland when he says that the most important thing is to educate the foremen as to the cause of accidents to trackmen and get them interested in doing work safely, and that foremen should properly instruct their men and guard against unsafe practices, unsafe methods of doing work, etc.

Another feature of Mr. Holland's paper, which is especially interesting and which seems to contribute largely to the success of his work, is the complete co-operation of all formen and the apparent interest even to every detail in the work of preventing accidents. This combined with careful supervision, backed by enthusiasm, necessarily makes for safety and efficiency. Further, his closing paragraphs almost completely cover the points of discussion and admirably so.

In conclusion, I am sorry that it will be impracticable to include here the many excellent suggestions and papers contributed by our forces to this subject, but it is hoped the foregoing will at least embody the valuable suggestions furnished me by my co-workers and thus accomplish the desired results.

CHAIRMAN MEYERS: I know that we all appreciate the very able paper prepared by Mr. Holland and its discussion by Mr. Fuller. They open up a world of thought in connection with safety work.

The New York Central has gone to considerable expense in preparing motion picture films pertaining to safety work and we are fortunate in having a machine and one of the films here for our entertainments and instruction. Mr. Dow has consented to exhibit the film "The House that Jack Built" when this session closes.

(After display of the films, the meeting adjourned at 11:45 a. m.)

WEDNESDAY AFTERNOON SESSION

THE MEETING was called to order at 2:30 o'clock by Chairman H. J. Bell; an attendance being registered of 105 persons.

CHAIRMAN BELL: The first number on the program is a paper on "Maintaining Interest in Safety," by Mr. J. A. Doyle of the Chicago, St. Paul, Minneapolis & Omaha. His paper is divided under two sub-heads: "(*a*) By Employing Officers" and "(*b*) By General Employes."

MAINTAINING INTEREST IN SAFETY: (*A*) BY EMPLOYING OFFICERS; (*B*) BY GENERAL EMPLOYES

As it is only natural to expect, employing officers aim to maintain interest in safety work—interest being the foundation upon which the safety movement must depend, if the co-operation necessary to procure results is obtained. Without a display of interest by employing officers,, by which I presume is meant department heads, division officers, foremen of gangs, etc., it cannot be expected to secure and maintain interest among the gen-

eral employes. My observation as to the interest shown by employing officers has been limited almost exclusively to those employed by the Omaha Railroad. The officers of our line give their fullest co-operation in safety work and it is, therefore, hard for me to conceive that the employing officers of any railroad company hesitate to give their entire co-operation in furthering the interests of safety. Being the direct representatives of the management, surely they are expected to maintain the same interest in safety that they would in any other feature of railroad operation. However, from what I have heard, some employing officers look upon the safety movement as a side issue, though I feel that, to be a success, it must go hand in hand with the general operation of a railroad.

Should any railroad be so unfortunate as to have employing officers who neglect to maintain interest in safety, I believe sufficient pressure should be brought to bear upon them to secure their fullest attention to the work. Department heads, division officers and foremen of gangs should be impressed with the fact that responsibility for accidents occurring to men over whom they exercise supervision rest principally with themselves. If officers are not active leaders in this work there will be few followers among the employes, and the number of accidents occurring will register their inactivity very plainly.

There may be many ways of maintaining interest among employing officers, but one method I would suggest is this: When the figures are compiled for the year's work, call together the employing officers for a meeting with the general officers and the safety agent; put before them the figures showing the number of accidents occurring to men under the supervision of each and see how they compare with the record made under a similar official in a different territory. Discuss the methods used to procure results, and if the accidents occurring under any particular officer greatly exceed those occurring under a similar officer or foreman, let him feel that it is an indication that his activities in safety work have been lax. On the other hand, the officer or foreman making a good showing should be encouraged in some complimentary manner, thus insuring a continuation of his interest in safety work. The general officers and safety agent could express themselves on this occasion by offering advice and suggestions as how best to carry on the work, with the result that officers and foremen would go back to their work fortified and stimulated to such an extent that they would maintain interest in safety for an indefinite period.

MUST BE NO LET-UP IN SAFETY WORK

Safety work is one in which there must be no let-up. Officers must keep continually pounding away at it so as to give general employes no opportunity of getting it off their minds. They should attend all safety meetings, at which they should be quick to show their approval of meritorious suggestions made by employes, and see that prompt action is taken to remedy dangerous conditions, thereby stimulating the interest of general employes.

I have always felt that the safety movement is likened to a wheel. The

safety agent is the hub, department heads, division officers and foremen of gangs the spokes, the rim being made up of the general employes. To have a good wheel it is first necessary to have a good, substantial hub around which to build; next, it is necessary to have proper connections between hub and rim in the way of good spokes. I am happy to be able to say that the Omaha Railroad's "safety wheel" is made up of good material throughout. A glance at our safety record will readily convince you of this fact.

Our superintendent of the safety bureau is the hub around which our organization is built. His boundless enthusiasm and tireless efforts have secured a spirit of co-operation among both officers and men which has made it possible to build up a safety record to be proud of. Officers and employes alike seem to absorb the enthusiasm which emanates from the hub and, as stated, the results have been most satisfactory. I have never thought the matter of maintaining interest among employing officers a serious one, as we have not experienced any difficulty of this kind. We do, however, find material to work on among the general employes. It is surprising, but nevertheless true, that there are still a number of men among the general employes who neglect to show interest in safety work. The question of how to win them over and secure their interest is quite a problem.

No doubt we all agree that the proper time to interest a man in safety is at the time he seeks employment. The practice on our line, and on a number of other lines, of requiring an applicant for a position to fill out a questionnaire referring to the principles of safety, is an excellent plan. It brings the matter to the party's mind at a time when he is willing to accept and agree to carry out the principles of safety in order to secure a position and he is made to feel that compliance is necessary in order to hold the position after he gets it. The questionnaire exacts promises from him that he will avoid certain dangerous practices; that he will at all times look out for his own safety, as well as that of his fellow workers.

INTERESTING NEW MEN IN SAFETY WORK

However, as regards the new employe, he must not be turned loose after his introduction to safety with the thought that he is a full-fledged safety man. Officers and members of safety committees must see that there is a "follow-up" in this matter, to learn if the man actually carries out the promises he has made. While it is urgent that he be corrected, if found indulging in any dangerous practices, at the same time nothing will secure and maintain his interest more than a compliment, should it be discovered that he is really carrying out the principles of safety. In addition to this, if you can get him to attend a safety meeting or two, in nine cases out of ten, he is won over to the cause.

The older men among the general employes are harder to win over. Nowadays they are of a "show-me" disposition, and, while the unconverted on our line are small in number, we are continually trying to "show" them. Their confidence must first be secured and all suspicion wiped out as to safety work being an annex of the claim department, etc.

On our line we feature the point that the principal benefactors are the men themselves. We also impress them with the fact that it costs them nothing, yet they derive all the benefits, and this line of argument has secured for us the co-operation of at least 75 per cent of them.

Our safety meetings are held at points convenient for the attendance of the greatest number. The visitors quite often equal in number the committee members. These meetings are the places where most men are won over to the cause, though I sometimes feel that interest is lacking at these meetings for different reasons. One reason is that the same lines are followed meeting after meeting; another is that often many who are present cannot grasp sufficient knowledge from the discussion to permit of their entering into the work intelligently. I think that if a novelty—something out of the ordinary—would be introduced occasionally, it would stimulate interest. Plan debates on safety matters. For instance, assign two members to each side of a question and let them come prepared to present their arguments at the next meeting. To make it possible for all present at safety meetings to understand fully the matter which might be before the meeting, why would it not be a good plan to have, in every meeting place, a small blackboard? Matters of close clearances, dangerous crossings, improperly guarded machinery, etc., which come up at every meeting could be made so much plainer to all present if a crude diagram were drawn on the blackboard. This, I am sure, would awaken interest and the combined discussion of all would bring out many valuable ideas with the general result of better attendance and more interest. Another novelty which might be worth trying at the meetings would be occasionally to place some one from the ranks in the chair. Let him feel that he has full authority as chairman and I think interest would be aroused.

METHODS OF REWARDING EMPLOYES

I understand that some roads have secured much interest among general employes by offering prizes, etc. This may be all right, but I believe that the interest shown in safety work by general employes, wholly for the reason of the benefits derived therefrom, is more substantial and lasting. Interest bought and paid for will wear only while the prize lasts; the employe then withholds his interest awaiting the offer of another prize. I am, however, heartily in favor of the practice of awarding a safety banner to a shop, yard or division as a whole. No one profits individually in this manner of rewarding merit and showing appreciation, and no false motives will be put forth to win such a pennant. Each employe will feel his personal responsibility, though all will share the honors as a body.

Individual acts of merit in preventing accidents should be rewarded by an acknowledgment in the form of personal letters to the party from his superior officer and the safety agent. This, in my opinion, will be more highly appreciated than any prize that could be given, and will bind this man's interest for all time to come. To maintain further interest among employes all safety suggestions should be acknowledged promptly and quick action be taken to remedy all dangerous conditions which they

report. If it is impossible to comply with suggestions made, pains shoul be taken to advise the employe fully, lest he feel that his suggestion wa met with indifference and his further interest be lost. All methods tha tend to deal direct with this individual are bound to get results. It is th only way to convert the careless and indifferent man.

The safety movement has now been in existence for several years an has demonstrated its benefits to mankind beyond dispute, and for thi reason I believe that it is high time for the railroads to set their foo down and say that the careless man must go. Yes, he will go, and it wil be over one of three routes. Route No. 1: He will go for the reaso that through his continued carelessness he is either killed or incapacitated Route No. 2: He will go, for the reason that his continued carelessnes has been considered sufficient cause for dismissal. Route No. 3: Th route I know you will all prefer—he will go for the reason that throug the efforts of safety men he is converted into a *bona fide* booster for th great cause.

A gentleman in going over this paper yesterday suggested that I fol low my statement with some figures. I will mention one item: Fo the period Jan. 1 to July 31, 1918, as compared to the same period i 1917, we show four less killed and 114 less injured—all injuries ar counted where over one day's time is lost. All of this is in spite of th fact that the line is covered by new men in all departments.

CHAIRMAN BELL: The discussion on this paper is to be by Mr. Pete Groome, Safety agent of the Union Pacific Railroad. Mr. Groome, wil you please take the floor?

DISCUSSION

MR. P. GROOME: Coming as I do from a railroad that has always main tained interest in safety I do not quite understand why I was chose to discuss the subject "Maintaining Interest in Safety." On the propert known as the Union Pacific Railroad there has been a permanent safet organization on divisions, at district terminals and at shops for th past seven years, and there are at the present time over fifty safety com mittees holding regular monthly meetings. The fact that our safety sug gestion numbers on our four old divisions are in the thousands is ampl evidence that employes and officers are displaying a great interest i safety work and reporting all unsafe conditions. However, it has no always been my good fortune to be connected with a property that ha kept the safety work to the front in the manner which our line conducts it

From 1912 to 1916, inclusive, or for five years, it was necessary fo me to travel in forty-one of the States of this grand and glorious countr of wealth, health and magnificent distances in the performance of m duty as an inspector for the Bureau of Safety of the Interstate Commerc Commission, under Mr. Belnap, who is one of two of the best "bosses" ever expect to have, the other being our operating general manager, Mr W. M. Jeffers. During my travels it was most interesting to note the dif ferent conditions in the several sections of the United States that effecte safety and especially the interest manifested in safety organizations About Jan. 1, 1912, there was, apparently, a big rush on a number of ou

railroads to organize safety on their lines, similar to the organization Mr. Richards had effected on the North Western, and apparently a great interest was manifested by a large number of operating officials in this movement. The North Western plan of organization for safety work being the only one then existing, it was quite natural this would be followed.

PLACING BLAME OF ACCIDENTS

Why this sudden awakening of interest in the safety movement? Was it because of the great results attained by the North Western Railroad in the first year of their work? Personally, I do not think that on Jan. 1, 1912, that line had sufficient statistics available to convince other lines of the excellent results of the good work accomplished in the first year by their safety organization, which necessarily had been much occupied by the preliminary work of organization, stimulating interest and choosing proper talent for members of the many different committees. It has always been my idea that the sudden and simultaneous conversion to safety organization in the early months of that year was not brought about so much because of the splendid results Mr. Richards had obtained, but rather because the great light of publicity had been thrown with unexpected brilliancy on some of the greatest railroad accidents of the preceding months.

This light started burning in 1911 when Mr. Belnap, the newly appointed chief of the Division of Safety of the Interstate Commerce Commission, was allowed to increase his force of inspectors to a number sufficient to investigate very thoroughly and to report in detail the entire facts as to the causes of accidents, placing the cause and blame squarely where it belonged—on man failure, track failure, poor observance or enforcement of operating rules, as well as failure on the part of railroad officials to correct dangerous conditions that had led to bad accidents. The rays of this light were the publicity caused by the published pamphlets, explaining in detail just exactly what caused these accidents and properly placing the blame. Right then, gentlemen, the first really great interest in safety work originated in the minds of many officials, for the reason that no man not in Mr. Carrow's class three cares to bask in the light of publicity when it concerns responsibility in railroad accidents.

I am familiar with the safety organizations on quite a few of the railroads west of the Missouri river. I saw them organized, in some instances, with the help of press agents, and to one who was really engaged with safety work it was not difficult to pick those that would succeed, through the determination of the operating heads to make Safety First what it really meant; or, in other instances, where they would fail, because those in charge were afraid that an organization of that kind would use safety as a lever to pry out some concession they would not care to grant.

POPULAR METHODS FOR PROMOTING SAFETY

My idea is that where safety committees are properly organized and conducted, where every member of a committee understands that he is on an

equal footing with every other member of that committee, and what he has to suggest or say will be received with interest and courtesy, there will be no complaint to offer about securing interest in safety meetings.

The employes on the Union Pacific Railroad and I believe I can also speak for my colleague of the Oregon Short Line, Mr. Clark, all understand what we are trying to do for them with our safety organizations and display every interest possible in the work. We do not, on these two lines, have to do any particular thing to stimulate interest, because the employes have had ample evidence of what the safety movement is accomplishing on the Union Pacific System and are all in the bandwagon, pulling with us. We feel we have the co-operation of every member of our big family, from Federal manager to call boys.

If I were called upon to stimulate proper interest in the safety organization of another line, and found on my committee some of those who are naturally timid in public gatherings, I would attempt to stimulate their interest by asking them to write a short article on the subject or work with which they were most familiar. This article should then be read at the next meeting, a candid discussion invited on its merits or demerits and it would be found in almost every instance that they would be vigorously defending their views before the discussion ended, realizing for the first time that it was possible for them to talk as well as to write.

SAFETY PROMOTES EFFICIENCY

An open invitation extended to all employes to attend future meetings, wherever held, should maintain interest. Many of the best talks and arguments at our safety meetings come from the non-members in attendance. Regular meetings, as are now required by the Safety Section of the United States Railroad Administration, to be held every month, will maintain interest, because employes making suggestions like to have them acted on promptly and to get quick results on their pet ideas. Regular meetings, prompt action on suggestions, a notification of the receipt of each suggestion and a democratic atmosphere, all will stimulate and maintain safety on every railroad without requiring a brass band to secure attendance.

In these trying hours, when hundreds of thousands of the flower of the land of the brave and the free are crossing the mighty ocean, there to fight shoulder to shoulder with other hundreds of thousands of our allies to make this world safe for all time to come, why should there be any lack of interest in the safety movement? And should not we, who are operating the great railroad systems of this grand old country, make them so safe that there will not be the slightest delay in the immense movement of troops, food, ammunition and supplies to the front—and let everyone understand that safety on the railroads is for the people, of the people and by the people!

CHAIRMAN BELL: The papers of Mr. Doyle and Mr. Groome are now open to discussion. The last paper on the program for the afternoon, that of Mr. W. J. Hills, of the N. C. & St. L., will not be presented.

MR. DOW: The topic referred to in the papers is included in the sub-

jects on the program for tomorrow. I would suggest that if you think there will be discussion on the papers to come that the discussion on this topic be deferred until tomorrow.

CHAIRMAN BELL: The suggestion is very thankfully received, Mr. Dow. We tried to work up this subject a little bit differently from that to be discussed tomorrow. We are approaching it today more from the angle of the worker; tomorrow it will be more from the angle of the officer. However, unless there is a real reason for proceeding with the discussion we will pass it until tomorrow.

CHAIRMAN BELL: I hope you will not forget the round table meeting begins in this room at 9:30 tomorrow and continues all day. Every one should get a lot of value out of that meeting. It is an opportunity for everybody to speak his piece: to receive information and to give it. The next number on our program is a paper by Mr. C. B. Floyd, Assistant to the General Safety Agent, New York Central Lines, on the subject of "Prevention of Accidents to Employes Falling from Cars or Engines, Especially in Hump Yards."

PREVENTION OF ACCIDENTS TO EMPLOYES FALLING FROM CARS OR ENGINES, ESPECIALLY IN HUMP YARDS

We all know that switching of cars in hump yards is classed as the most dangerous occupation in railroad operation, and falling from cars or engines in this operation is probably the most frequent cause of injury. The causes for falling are many and to prevent them is a big undertaking. However, we have this in our favor in working among switchmen, they are usually men of some railroad experience and not classed with those we term "new men". The New York Central, as a rule, make switchmen and hump riders out of switch tenders, and therefore get seasoned men, somewhat familiar with hump operation.

To prevent accidents in any operation you must deal with the individual, and there are many ways to do this. First of all, the man in charge should be the one to take the first step, taking time to instruct his men in their duties, keeping before them constantly the necessity of safe conduct and safe operation. In large yards, and most hump yards are large, special men—by special men I mean good, clean-cut, experienced and safe men—should be formed into a body to act as safety committeemen, to help spread the gospel of safety. These committeemen should be selected by men in charge who know their men, and know beyond doubt their feeling and attitude toward the safety movement. The next thing to do is to place before these committeemen safety work that will keep them interested. This can be done by means of literature, pictures, magazines, reports of accidents, locally and otherwise, and frequent safety talks.

The New York Central, on most of its operating divisions, have division safety agents who devote their entire time to accident prevention work, and in this way keep in close touch with committee members and

keep them quite well informed on safety matters generally. The safety agent, too, can work to some extent with the individual. Noonday meetings and meetings in restrooms or switch shanties are valuable. Safety agents can make their talks most interesting at these meetings by illustrating their remarks by the use of bulletins and by using accident cases with which the men are best acquainted. For the most part, personal interviews with employes have the most lasting effect. We all know that a large majority of injuries are due to carelessness. Nevertheless, we must not lose sight of the fact that some injuries are due to defects and other causes—some preventable, others not, and we, therefore, must take into consideration the equipment, supplies and general conditions. Employes are liable to criticise the safety movement if we are inclined to work with them entirely and not correct existing improper conditions.

TAKE EVERY PRECAUTION TO MAKE OPERATION SAFE

Men responsible for the general conditions of yards must be trained to the necessity of having the yards, as regards tracks, lights, obstructions, etc., in good order; every reasonable precaution against defects in equipment should be taken before cars are sent up to be humped; the rider should be assured as to the conditions of brakes, making personal test of same while cars are in motion coming up the hill before being cut off. Cut-off man should make sure the rider is ready before making the cut; no more cars should be cut off than there are men enough aboard to properly control, and numerous other precautions should be taken, of which we are all more or less familiar. One very important feature, I think, is the kind and make of club supplied. Every care should be used in selecting these, more particularly as regards the kind of material, shape, length, etc. A club used to quite an extent on the New York Central Lines I exhibit here for your inspection. This make of club we find to be to the liking of the majority of the men.

I feel, and I am quite sure most of us do, the greatest good can be accomplished by showing the men who actually do the work that we are with them heart and soul for their own good, the good of their future and their families; to do this we must meet them face to face with the facts and be up and above board with our arguments and requirements regarding conditions, etc.

To gain the confidence of our men we must set an example. The men whom we have in charge of other men, and men we select in the future to be placed in charge, should be men with all the necessary qualifications, the most important of which is *safety.*

CHAIRMAN BELL: The discussion of Mr. Floyd's paper is to be led by Mr. L. G. Bentley, Secretary of the General Safety Committee of the Chesapeake & Ohio Railroad. He came all the way from Richmond, Va., and we will be glad to have him come forward.

DISCUSSION

MR. BENTLEY: I not only came all the way from Virginia, but I came very unexpectedly and I am in exactly the same predicament as Mr.

Groome—not due to a misunderstanding, but to a change in officers. Mr. Floyd's paper was received promptly, I believe, but, owing to the fact that I was on the road doing committee work, it did not reach me until I arrived in St. Louis.

I have had a reasonable experience, in a superficial way, with the safety work on the Chesapeake & Ohio Railroad for some years, this being one of the first railroads that clasped hands with the safety idea when it was scattered broadcast by Mr. Richards. We merely clasped hands with it, however, at that time, and we have entertained a speaking acquaintance with it since then until recently, when, through the instructions of the Railroad Administration and Mr. Belnap's very encouraging position in regard to it, we decided to embrace the idea and enter the family. We are going to make it one of our very beloved children in the future and we are going to nurse it, we hope, to the time when it will be a grown person and capable of carrying on its own work in the world.

I am not prepared to discuss Mr. Floyd's paper to any great extent, for the reasons I have assigned. However, I have made some observations in regard to this particular class of accidents. I know that railroad men fall from cars and engines on the road as well as in terminals and such cases of this character as have come under my observation or that I have had a chance to investigate impressed me with the fact that they were due to the carelessness or thoughtlessness of the employe in not securing a firm foothold or a firm handhold. That refers to trainmen.

GREAT CARE NECESSARY BY TRAINMEN

All trainmen know, in these days of heavy tonnage and long trains, that the enginemen cannot handle their trains like baby carriages. There is slack running up and slack being taken out and unless the trainman is very careful not to place himself in a dangerous position he is liable to be jerked off the train and be hurt. Mr. Floyd very forcefully brought out the thought that accidents of this character are the most numerous. He neglected to say that they are also the most serious, for when a man falls from a running train it is more than probable that he will be seriously, if not fatally, injured.

When I first commenced thinking of this subject, trying to work up some ideas, I decided it would be a good plan to go to the officers on the hump as well as to the men and to get the opinions pro and con—I wanted the opinion of men who have fallen from cars. I found there was a very well-grounded idea in regard to these accidents; that they were almost always due to controllable causes—some little irregularity in equipment or to the fact that the hearty co-operation of the officers was not always accorded.

I shall refer first to irregular equipment. It was brought to my attention that slack brake chains, particularly if the chain guard is curved on the bottom, are liable to cause that chain, as it winds around the brake staff, to climb over itself and cause an obstruction. This obstruction reduces the efficiency of the brake and the car runs away. If

this does not happen, sometimes, by reason of a strong car rider, the obstruction slips by. I guess you have all drawn a bucket of water from the old-fashioned well and had the rope climb over itself on the windlass and finally slip down. You know the jar you got! That is what happens to the car rider. When the obstruction slips by he receives a very severe shaking up if he does not fall from the car. It was brought to my attention by one of our local surgeons, with whom I discussed this matter, that it is frequently claimed the reason men fall from cars on hump yards is because of the fact that they are not definitely informed as to the length of their ride. If the car rider is informed that he has a long ride, and is therefore slow in applying his brake, and he is suddenly made aware of the fact it is a short ride by coming in contact with cars already on the track, he is almost sure to be knocked off the car. I do not know what the different humps have in force as a method of advising the car riders as to whether their trip is short or long, but it seems to me that something definite should be done in that respect, leaving no chance for an error.

OFFICERS OFTEN ASSUME MISTAKEN ATTITUDE

The attitude of the officers, I am sorry to say, is usually that the men are careless. Regardless of what the conditions may be in the yards, they think that the men should exercise such extraordinary care that even though the conditions are dangerous they will not be injured. I think this is along the line of Mr. Floyd's paper and that of everyone else I have heard today—advocating the heartiest co-operation and the most prompt method possible of carrying out suggestions.

There is one other idea in regard to yards: I do not think all hump yards are the same, so far as the element of danger is concerned. For instance, a coal-carrying road that humps loaded coal cars has a much more dangerous condition than a road that humps box cars almost exclusively. Cars are now loaded particularly high, to get on all of the coal they can, and when the cars run together large lumps are knocked off and the car rider is very apt to fall from the car. Another dangerous condition is thus created: that is, that the coal accumulates between the tracks very quickly and it is almost impossible on large hump yards to keep the space between the tracks like a parlor floor. On one of our largest humps we have a clean-up train—an engine with several cars and sufficient men go over the yard as often as possible. When they finish one end of the yard they go back to the other. The most important thing we can do to keep switchmen from being injured is to keep our yards as clean between the tracks as we possibly can and in this way the terminal officers, yard officers, or hump officers will do a great deal to practice the extraordinary care which they must exercise to overcome conditions of this kind.

I am not going into the matter of encouraging the men to make suggestions and to exercise care that Mr. Floyd has covered so well. However, I hope there may be no failure on the part of the officers of the railway company and the local officers in charge of these conditions to handle their territory and to conduct their properties in such a way that

the men will be encouraged and will have confidence in their officers, so that the co-operation necessary will always be forthcoming. I firmly believe that when we shall have reached the day of universal safety brotherhood through mutual understanding, through mutual service and a mutual desire to aid and protect ourselves and our fellowmen, that we shall have done much to hasten that day when man's humanity to man will keep countless thousands whole.

RIDING CARS OVER HUMP

Mr. Dow: It is the general practice on the New York Central Lines in switching cars over the hump to require the rider to board the car before the engine is cut off, before the car goes over the hump, and give him an opportunity to get on top and test the brakes before the car is let go. A short time ago we discovered, in one of our yards, that this order was not being followed and that there had been local instructions requiring the rider to board the car at the foot of the hump, when going sometimes twelve or fifteen miles an hour. It seems to me that this is an extremely bad practice and I am wondering whether it is permitted anywhere else.

Mr. E. M. Switzer (C. B. & Q.): I think we are much indebted to Mr. Floyd and Mr. Bentley for the very able way in which they have presented this definite subject. I like a paper on a definite topic and this is a most important one, because more trainmen and switchmen are killed in falls from cars than from any other one cause. That may be a surprising statement, but you can verify it from the statistics of the Interstate Commerce Commission, and everything that can be brought out to stop such accidents is exceedingly important. I think we all know more about falls from cars and their causes than we did before, and we can do more effective work along these lines.

Mr. Floyd did not hold up the brake clubs he brought with him and I would like his permission to exhibit them. I suppose that is the New York Central brake club. Is it standard?

Mr. Floyd: No, it is not standard.

BRAKE CLUBS AND THEIR USES

Mr. Switzer: When I first took up safety work, five or six years ago, I found our men were using pick handles and that they were generally made of a very poor quality of elm—we did not pay any more money for pick handles than we had to pay. They were brash and had defects and in consequence every once in a while a pick handle would break and some man would go over the end of a car and be seriously injured or killed. This club is a great improvement over the pick handle. I do not know to what extent other railroads have attempted to adopt a standard brake club, but I think this is an important matter. On the C. B. & Q. we have adopted a standard club. It is about twenty-eight inches long and is made of clear second-growth hickory. Instead of being round all the way down, it flares out and has a square section; then it tapers down to a smaller end for sticking in the brake wheel. It was adopted as an

experiment in our hump yards. We got the opinion of everyone poss and finally adopted it as standard. Our accidents from falls on acc of broken brake clubs have stopped—they practically do not happen more.

MR. DOW: We have another style of club; it has a knob on it, sc thing like a baseball bat.

CHAIRMAN BELL: I understand Mr. Hammond has humped cars f good many years—has actually done the work. Would it not be a g plan to ask Mr. Hammond to tell us about this matter?

MR. C. W. HAMMOND (New York Central): That has been calling and I believe that every man should know his trade. In the Cl land territory we do not use this brake club—we have a club that h larger end to it. We find that the wear on a brake club comes al eight to ten inches from the end; therefore we think that it is impera that it be of larger dimensions.

Our club is thirty inches. While I think the club shown here is a g one, it is a little too round. Let a man put it in a brake wheel and i is an experienced man and puts his knee on it it is bound to turn sc Some of our men prefer a knob, so their hand will not slip off. They m their own clubs. As I say, though, I believe that brake clubs should standardized. I think there are good and poor clubs and I am here to condemn this club—being a New York Central man. Mr. Fl has brought it here for your inspection and it is, no doubt, a good c but if I were to pass judgment on it I should say it is not the clu would like to ride cars with.

CLUBS SHOULD BE STANDARDIZED

MR. FLOYD: I do not think we have the right kind of a club. I th it should be standardized.

MR. METCALFE: I would like to ask if you use the same club on pra work that you do on mountain work and with the same success?

MR. HAMMOND: You mean a flat job?

MR. METCALFE: Straight road work; whether on prairie track or mo tain track.

CHAIRMAN BELL: Mr. Metcalfe has in mind the braking they have to on mountain grades in the Western country.

MR. HAMMOND: I cannot see that it would make any difference.

MR. H. A. ADAMS (United States Railroad Administration): I mi say, for the information of the gentleman who has just spoken, that br clubs are not permissible in train service, regardless of whether it is a grade or not. It is a violation of the safety appliance act. Sc cases are now being seriously investigated on a certain railroad o certain big grade. I would like to have you bear that in mind.

MR. FLOYD: The fact was brought out of a rider being advised as the distance the car would go. I know that in one of our yards the n bers are on the cars and the men go down there frequently enough know the position of the cars.

MR. HAMMOND: I will answer that by saying that we use S red lig at night at the ends of our tracks. I have the position of the track by

location of the red light between the tracks—on the east-bound always to the right, on the west-bound always to the left. You have a distinguishing mark at all times.

MR. BENTLEY: The switchman tells the rider the number of cars he has?

MR. HAMMOND: The switchman tells the rider the number of cars he has. Here is a thing, perhaps, lots of men do not understand. It is much easier to ride twenty cars on the hump than it is four. I do not know that you realize why that is, but if you take four cars they are all together and you have them all on the hill at the same time, whereas if you have twenty cars your head end is on the level track practically before you are cut off. I would much rather take twenty cars off than four and I can do it more safely.

MR. BENTLEY: Alone?

MR. HAMMOND: Alone; except at night I would want a man on the end. He would not have to touch a brake; I would handle it alone.

SIGNAL LIGHTS IN HUMP YARDS

MR. MCCAMPBELL: We have had a number of injuries and the men have told me that they sometimes, especially at night, do not know whether they have to ride the cut ten car lengths or thirty. We do not have the red light system; the results are they go down and are on the cut before they know it. It seems to me that is an excellent practice—to give the rider some information as to whether he has to go onto a track ten car lengths or forty. If there are any other systems using any plan of that kind I would like to be made familiar with it, because I believe in the territory I represent we can use the information to good advantage.

MR. HAMMOND: Much loss and damage is caused by the fact that some men are indifferent and they will not get up and try their brake in time. It is imperative that a man try his brake.

MR. J. C. CLARK (Oregon Short Line): I want to ask Mr. Hammond a question as to how they handle the red lights—I presume a rider picks the red light up and carries it back to the rear end of the cut.

MR. HAMMOND: Exactly.

MR. CLARK: There is another question that has not come up here, but it has in our safety meetings on the Short Line at least three times, and that is the construction of the brake or small end platforms on box cars. A great many such platforms are short and the brake staff comes through the platform possibly ten inches from the end. There is not room enough for a footing and the switchman or rider in setting the brake—in order to get the proper purchase—very often is put on the short end of the platform. While I realize that it is a very difficult question to handle—to change the standard on practically all the roads in the United States—I would like to know if you have had any accidents by men falling from that cause.

MR. HAMMOND: Yes. I want to answer your first question: Suppose, for instance, I am riding a cut on the hill and the wind is blowing—I am riding an empty cut—and my car does not run up to the red light. I have to have some protection for that car while going down for the red light, therefore I leave the car with my white light and go down to get the red.

I am with you on the deck-step proposition; any number of our me have slipped while using the platform brake. I am not in a position : change any of the standards of the United States, but if I had the plea ure of doing so I would have all my brakes up on deck, as I believe a brakes should be deck brakes.

MR. CLARK: The Railroad Administration is ordering large numbers (cars. It is possible a resolution by this body might have some effect i doing away with the old platform brakes and providing for deck brakes. am in favor of the deck brake; I do not believe the platform brake is safety proposition.

PLATFORM BRAKES AND DECK BRAKES

CHAIRMAN BELL: In Mr. Belnap's absence, I would like to ask M Adams, who put in a great many years with the Interstate Commerc Commission, to explain to us the contention as to the practicability of th platform as opposed to the deck brake. I know there must be some ver good reason for the standard.

MR. ADAMS: As these matters will be discussed at the round table t morrow and Mr. Belnap will be present, I would suggest that Mr. Be nap, who assisted in creating the standards some ten years ago and i entirely familiar with all these subjects, answer that question. From practical standpoint of many years in train service, I can hardly acqu esce in the statements of these gentlemen that the deck brake is a saf brake. While on the floor, I would say that in making my statement tha the brake club was used in violation of the law I meant to say hand bral ing was a violation.

MR. HALE: On the road or in the yards?

MR. ADAMS: On the road. Of course, you have to use hand brakes i setting cars out.

MR. CHAPIN (Pennsylvania): We have a standard brake club; it i shaped more like a baseball bat, but does not have the square end. I would be very much like the club shown if it had a knob on the end. am not a transportation man and only speak from my observation whil working around the railroad; I cannot give the length, dimensions and s on.

CHAIRMAN BELL: We have with us a switchman from the North Wes ern, Mr. Valentine. I quite agree with what Mr. Hammond said about man knowing his trade and if Mr. Valentine will speak on this subjec we might get some information of value. We want him to tell us abou hump yard work or about the general proposition of switching as applie to graded tracks.

MR. F. E. VALENTINE: I am fortunate in that I work in a level yard. O course, I use a brake club. When I use a club I want one with a squar end, so as to engage the brake staff. This club might twist. It ought t be strong here (indicating), because that is where the leverage come against the outside of the brake beam. Otherwise, the club is all right as far as I can see. (Referring to the club used by Mr. Floyd as an ex hibit to his paper.)

As far as a search light in the yard is concerned, it is all right if yo

work with the light, but you cannot do anything against the light. The red light protection really should be the proper thing, in my estimation; that is, a man who rides the cut must be responsible for the red light. I think it is much better than to have the yard lit up, because you cannot see a hand lamp any distance against an electric light. You may run right over a switch stand. For that reason we would like to have all electric headlights shut off when engines get into the yard.

As far as the step brake is concerned, I believe any man here can figure out the situation of a man getting out on the step in the winter time and finding it frozen in. He would require a certain amount of time to rap the ice and snow off before it could be used, and in rainy weather a man would have to get down on his knees on the deck in order to get his foot on the step. Most men would hesitate before they wet their knees. Therefore, this would lead them into a position where it would be dangerous. It is human nature to do that—he will try to set the brake some other way. I believe the deck brake should be adopted and think the platform brake is a relic of the past.

CHAIRMAN BELL: Perhaps you can succeed in convincing Mr. Belnap tomorrow.

MR. BRIGGS: I understood Mr. Valentine to say that he worked in a level yard and used a brake club. What is the reason for that?

MR. VALENTINE: At some time during my experience, but not now.

SAFE PRACTICES FOR CAR RIDERS IN HUMP YARDS

MR. BRIGGS: Mr. Hammond, what is your idea of using a brake club in level yards?

MR. HAMMOND: We do not have much occasion to use them.

MR. BRIGGS: Isn't it a fact, you find eight out of ten brakes set—you have to use a brake club to set the slack?

MR. HAMMOND: You cannot set a brake on the top of a car and set it anywhere near tight.

MR. BRIGGS: What kind of inspection do they give the brakes on the average box car—do you ever find an inspector going on top to find out if it is right or not?

MR. HAMMOND: We have no deck inspection in Cleveland territory, except at interchange points.

MR. MCCAMPBELL: Mr. Chairman, I find by observation that there are two methods of using brake clubs—some yard men or road men are inclined to push the club, others are inclined to pull it towards them. I would like to ask Mr. Valentine or Mr. Hammond, or both, which way they think is safest to use the clubs.

MR. HAMMOND: You refer to one car, or four, or twenty?

MR. MCCAMPBELL: I refer to using the club, it matters not whether one car or forty.

MR. HAMMOND: I try to discourage the sitting down proposition, because if they have one car they want to sit down; with four they want to sit down. From a safety standpoint I will say it is safer for you to sit down. If I have four cars I am sure I want to stand up, and it is go-

ing to keep me mighty busy, too, getting the proper braking on four car: you cannot do it sitting down. You are bringing this up from the saf standpoint?

MR. MCCAMPBELL: Safety and operation, both.

MR. HAMMOND: Lots of the men will sit down and do a good j others will sit down and break them up. I always had a practice of sta: ing up, whether I had one or four cars.

MR. FLOYD: Does it make any difference whether you are sitting standing, whether you should pull or push on the club?

MR. HAMMOND: You think if the brake beam should break and I v shoving I would be more apt to fall off?

MR. MCCAMPBELL: Which do you think is the most dangerous, pushi or pulling the club?

GETTING LEVERAGE WHEN SETTING BRAKES

MR. HAMMOND: I have got by a great many years by pushing the cl The majority of men today, if they sit, pull the club.

MR. VALENTINE: I have always pushed. The only thing a fellow l to guard against is that when he lets the brake off it may get away fr him and hit him in the ribs.

MR. BOSLOOPER (New York Central): I believe the handling of yc brake club depends upon the position of your rachet, whether you hav deck or a platform. In my own experience I have done as have th other gentlemen, pushed with the left hand and pulled with the rig hand, to get all the braking power I possibly could, both with the club a my right hand. As to sitting down on the car, I believe it depends up whether you have one car, four, five or more cars. We have had men the territory I come from fall from cars. Some were seriously injured in fact, several were killed, but I will say that most of them fell off ca that had platform brakes. A great deal depends on the position a m takes on top of his car, especially on box cars. If a man is pulling on l club he should face the way he is going; in case the club breaks he w fall back on the car. Some stand sideways and if the club breaks th will go on their heads. The point I would like to find out from roa that have hump operation is whether or not instructions are issued to m who ride cars as to the proper method of riding? I mean as to holdi their clubs and the positions they shall take when braking on their ca

CHAIRMAN BELL: Mr. Wright has handed me a photograph showing man braking a car with a platform brake and inasmuch as there are ma people in the room interested in this matter it may be well to pass around.

MR. CLARK: Another point I want to bring up in the round table d cussion tomorrow, when Mr. Belnap is present, but I would like to me tion today so he will think about it, and that is the type of brake whe A great many brake wheels have curved spokes and I consider a bra wheel with a curved spoke to be a menace. I do not think they are safety proposition any more than the platform brake. I think a bra wheel should have straight spokes, with a round corner where it fits t

rim of the wheel. I think that is important. I have seen a great many brakes and you cannot get the proper leverage with the curved spoke because it will pinch your fingers and with a good many of them you cannot get a grip on the rim of the wheel. I think that is something we should think about and discuss tomorrow.

CHAIRMAN BELL: Can you answer Mr. Boslooper's question, Mr. Clark, as to whether instructions have been issued on the proper way to use brake clubs in hump yards?

MR. CLARK: We have no hump yards. We have three small yards that are on hills where we use clubs, but no instructions have been issued as to the proper method of using the club.

CHAIRMAN BELL: Has any company that has a representative here issued any instructions on that matter? (No response.)

KEEP AIR LINES IN REPAIR AND SAVE COAL

MR. J. M. LAMMEDEE (Railway Review): I believe you safety men have a chance to kill not only two birds with one stone, but three. This has to do with the speed of switching. I know well enough, from my observations, that the mechanical department is very much interested in the speed with which freight cars come together—go into freight yards and you can guess how much repair work is due to switching operations. I have seen switching operations that I think would introduce probably 99 per cent of the repair work done in the yards. Not more than two months ago there was a fuel meeting in Chicago and Mr. Eugene McAuliffe invited the air men to participate in that meeting. They brought on a committee of probably twenty men who presented a series of recommendations having to do with air brake work in its relation to the fuel problem—they wanted to save fuel. One of the recommendations was to cut down switching speed to three miles per hour. Possibly that is taken care of in hump yards, but it is entirely up to the engineer, and sometimes they go pretty fast. The air brake men are interested in the fact that when cars come together unduly hard it damages the air brake equipment and you have air leaks. They say now that it takes 90 per cent of the compressor capacity on a good many trains to take care of the air leaks and that means a lot of coal. If you men will advocate slower speed in switching operations you will save fuel by keeping up the condition of your air equipment and I know you will save a lot of work in the repair yard. Go after this question of speed in switching, if it is practicable. These gentlement can tell you more about that than I can. I would be very glad to hear from Mr. Hammond on this matter.

MR. HALE (Santa Fe): I will not be here tomorrow, but when you discuss the matter of the brake wheel, if you make any recommendations to the I. C. C., I hope it may also embody the I. C. C. grab irons. A man with a lantern at night—a train moving in the dark—does not know whether a straight handhold is coming to him or a curved one. We have gone on record with the Interstate Commerce Commission—Mr. Story did so two or three years ago—as unalterably opposed to the straight handhold. It seems to me that if we can do something to have the curved

irons put on both sides of our way car doors we will take a long s forward.

CHAIRMAN BELL: We shall be glad to make a note of the subject a take care of it tomorrow.

DERAILMENTS CAUSED BY IMPROPER SETTING OF BRAKES

MR. PHLANS (L. & N.): When the discussion comes up tomorrow ab coal. I want to mention the switching of cars. Speaking of br clubs, we have all our trouble on mine tracks. Some mine operat use an axle from coal dump cars. I think it is about three and a h feet long. We have all kinds of derailments, that is, running over railers, and in investigating the accidents we find the brakes are set up an iron axle from coal cars. Some of the mine operators have an i rod, it has a little hook on one end, and they put it down through spokes of the wheel, grab it around the brake staff and swing on it. will not fall off, on account of the chain. The car goes off the track a they say it was caused by a defective chain or brake, when there is no ing to it. The coal operators give us much of our trouble. We load in neighborhood of 5,000 cars a day on the L. & N., and I guess we ha 200 or 300 derailments on the system on the coal mine tracks.

MR. H. M. MAYO (Southern Pacific-Atlantic System): I want to mak suggestion regarding the speed of switching: The Railroad Administ tion, about two weeks ago, I believe, issued a general order or circu calling attention to the damage done in yards by switching.

MR. ADAMS: Just another word on the subject of switching over hum It has been my observation, these many years, that most companies wa all the cars possible put over the hump. They want to do their switchi at as low a cost per car as is possible, and from that standpoint they ha always hurried the job. I have failed as yet to find a yardmaster in t country who does not endeavor to do just as much and just as qui switching as he can. There is no question but what that has meant ma injuries to the men. It seems to me, on the hump situation, if the sup intendent of terminals would direct his general yardmaster and the g eral yardmaster direct his assistant yardmaster, who is probably in rect charge of the hump or the foreman of the crew, that he should s that the rider on the cut of cars had made the proper test of his ha brakes before the pin was pulled, it would reduce the number of su accidents. Again, the question of hurry has to be done away wi When you are putting cars over the hump—some engines have forty fifty and I have known of seventy-five—it is no easy matter to try yo brakes before you give the signal to make the cut. It seems to me the ought to be some understanding along the line that warns the yard fo man or general foreman that the man has made the proper test of t hand brakes before the cut is made.

CHAIRMAN BELL: We have another very important paper on the p gram. Before proceeding, I want to ask Mr. La Fountaine, General Safe Agent of the Great Northern Railway, if he will relieve the Chairman f the rest of the afternoon; not that I want to shirk my duties, I want y

to get acquainted with Mr. La Fountaine and have him get acquainted with you.

MR. LA FOUNTAINE IN THE CHAIR

CHAIRMAN LA FOUNTAINE: It is very pleasant to have an opportunity to preside over a body of this kind. The work is entirely new but if you will bear me I will do the best I can.

The next paper will be by Mr. E. M. Switzer, Superintendent of Safety of the Chicago, Burlington & Quincy Railroad. The subject is "Prevention of Accidents Due to Coupling and Uncoupling Cars."

PREVENTION OF ACCIDENTS DUE TO COUPLING AND UNCOUPLING CARS

Accidents due to coupling and uncoupling cars constitute a sharply defined group, characterized by their severity, their clear-cut causes and their preventability. For brevity we shall here designate them as "coupling accidents."

To begin, let us examine into the importance of the whole group, as compared with the total volume of the work which comes to our hands, so that we may approximately gauge the time and effort to give to it. In the five years ending June 30, 1917, these being the last five years for which complete figures are now available. 735 railroad employes were killed and 12,702 were injured in the United States in coupling accidents. This is 6½ per cent of all accidents to men in train service, including train accidents. In every 100 accidents of all kinds and degrees to train service employes six or seven are coupling accidents, and in every 100 accidents to these men resulting in death eleven are coupling accidents. These figures are interpolated from the accident statistics of the Interstate Commerce Commission covering the five years in question.

It is evident that coupling accidents comprise a considerable proportion of all accidents to train service employes and that a larger proportion of them result in death, and, no doubt, in total disability, than is the case with accidents from most other causes. It is, therefore, fitting that an important part of the time and effort which railroad superintendents of safety devote to the prevention of all accidents to trainmen should be given to the prevention of coupling accidents. At least one in every ten of the safety bulletins intended for trainmen should deal with this subject; at every safety committee meeting the practices which cause these accidents should be discussed; the instructions to regulate these practices should be reissued often and followed up; each train service member of a safety committee should be encouraged to make a definite effort each day in the interest of safer coupling practices, and our officers, safety committee members and best railroad men should constantly, by word and act, keep the attention of all on this subject.

DISOBEDIENCE OF SAFETY RULES

Precisely, what are the words and acts with which the superintendent of safety must familiarize all these safety workers for their fight to pre-

vent accidents of this kind? Exactly what must be done? The most important thing of all was done before we took up this work, namely, the substitution of the automatic coupler for the link and pin arrangement. Yet with this great safety device in practically exclusive use now these many years, accidents keep on happening.

In the five year period before mentioned as ending June 30, 1917, 1,016 men were injured *because of adjusting coupler with foot.* In other words, one-thirteenth of the total number of coupling accidents happened because men kicked draw bars while cars were coming together. This dangerous practice was one of the first to attract the attention of railroad safety committees. Probably every railroad having what we now know as a safety organization has issued instructions forbidding it. Officers and men are agreed, almost without a dissenting voice, that this is unnecessary and reckless. Is it disheartening that the accidents keep on happening at about the rate of four each week? On the contrary, there is reason to be encouraged with the results of intensive work. In 1913, 259 accidents happened from this cause; in 1914, there were 231; in 1915, there were 177; in 1916, there were only 169; in 1917, with number of cars handled and new men greatly increased, there were 180, which is about 25 per cent fewer than for the same period five years before. The methods which brought about this result should be continued, only more intensively if possible. Instructions against kicking draw bars should be reissued and followed up, bulletins about it should be displayed frequently, the men should be informed that these accidents are happening, and we should urge our safety men to demonstrate by example and warning that this bad practice is in disfavor.

Adjusting coupler when cars or engines accidentally started caused, in this period, the death of 94 men and the injury of 228. Here is presented an issue not so clear cut as is the practice of kicking couplers, since definite instructions, the observance of which would positively avoid the accidents, cannot be issued. As might be expected, the number has not shown a corresponding decrease. It seems the more important, therefore, that we should remind men on every possible occasion, and perhaps oftener than we have been doing, that before going between cars to adjust couplers a stop signal should be given and the man giving it should know that it is understood.

Pulling the pin by hand, i. e., without using uncoupling lever, resulted in 21 deaths and 1,044 injuries. Some of these accidents happened with cars that had defective pin-lifter riggings, but in a large proportion the uncoupling lever could have been used and the man was in between the cars unnecessarily. Obviously, of first importance is good car inspection, with prompt discovery and repair of bad-order pin lifters, but it is also important to use every means at our command to impress on all the thought that it is always dangerous to go between cars, and anyone finding it necessary to do so should first stop the cars and handle himself so as to avoid being knocked down or caught in any way when the slack is given. It will be rare when a man who is acting with this in mind gets hurt.

ERRORS OF JUDGMENT

Misjudging speed of cars when opening or closing knuckles caused 94 deaths and 965 injuries. The prevention of such an accident rests with the man doing the work. The figures show that while deaths from this cause have become somewhat fewer the total accidents are not decreasing in number. We have constantly been reminding men, in a general way, to be careful when coupling cars, but have we pointed out often enough and clearly enough this specific danger of misjudging the speed of an approaching car or of not realizing that it is in motion when a knuckle is being opened or closed for making a coupling? Unless we draw attention often to this, men will not know how frequently these accidents happen and will be less keen about avoiding this particular danger than would be the case if they had more precise knowledge. Prevention lies in spreading this information.

Chaining cars resulted in 47 deaths and 433 injuries in this period, and the figures show that accidents of this type are happening with undiminished frequency. Yet it is so obviously possible to chain cars in a safe manner that we should recognize here a great opportunity to save life and limb. These accidents most often happen when men go under the cars to be chained without giving the slack in the train time to adjust itself. Even experienced men do not always foresee the full extent to which the slack may run, and to a new man the situation is especially full of danger. This fact should be so thoroughly advertised that every time a car is to be chained the trainmen will think of the danger of the slack running and will act accordingly. There are certain precautions to take that will occur to every practical trainman, and I do not think we should attempt to specify how the work should be handled. It is a practical question which each safety committee should discuss frequently and instructions suited to local conditions may be issued, if advisable. Results depend upon co-ordinating two ideas, namely, chaining cars and movement of slack, in the minds of the greatest possible number of men.

Slack of train running in unexpectedly and catching men (not while chaining cars) causes accidents of a class closely related to those which result from chaining cars. Fifty-seven deaths and 1,064 injuries happened this way, and, here, too, there has not been a satisfactory reduction from beginning to end of our five-year period. It would seem that the danger of failing to reckon with the adjustment of slack in a standing train should be more thoroughly agitated. Too often it has happened that a new man's first knowledge of this adjustment is learned in an accident or by a very close escape from one. Let us see to it that the older men are unfailingly encouraged to teach the inexperienced ones about this thing.

Riding cars to uncouple and slipped off caused 38 deaths and 333 injuries. Constant warning about the danger of riding with foot on the brake beam has brought reward, and it is encouraging to record that the number of accidents from this cause has been declining from year to year, and now appears to be at a rate one-third lower than at the beginning of the period under discussion. Riding on the brake beam should

be prohibited and efforts made to break up the practice should be continued vigorously.

EDUCATIONAL WORK MUST BE PERSISTENT

Uncoupling moving cars and losing footing is the cause of accidents quite different from the foregoing, since here is not an opportunity to discourage a specific dangerous practice. Indeed, with nothing more tangible to work on than the possibility of men stumbling while uncoupling cars (accidents caused by falling over obstructions not included here) we can understand why the number does not decrease, but fluctuates in sympathy with volume of business. Sixty-one men were killed and 881 were injured in this way in five years, and accidents in the last year for which we have statistics were more numerous than ever before. The thought is forced on us that the importance of the matter should be called to the attention of all safety workers and be made the subject of discussion as widely and frequently as possible.

Going between cars unnecessarily and contrary to rule caused 77 deaths and 597 injuries. That these accidents can be avoided is shown by the fact that they are happening less often than formerly. One hundred and ninety-nine occurred in 1913, since which time they have been gradually getting fewer year by year. In 1917 there were 96. This result has been brought about by the recognition on the part of officers and men that going between moving cars is dangerous and unnecessary and that prohibition of this practice is reasonable. The chief difficulty which we meet in carrying this out lies in the fact that when a man runs between moving cars he usually is trying to save time. He actually does save it in most cases—and the temptation of ambitious men to do this comes very often. We must keep at work, steadily discouraging the practice, until everyone realizes the absurdity of taking a great risk for relatively so small a gain.

The foregoing classifications cover the majority of coupling accidents and while many happen from a variety of other causes not touched on here, these are less important numerically, and may be grouped as miscellaneous coupling accidents without further discussion.

Probably there is nothing new in the methods set forth here, for these are the old, familiar efforts we have all been making more or less thoroughly. The aim has been to present the steps which have reduced coupling accidents of certain kinds, while pointing out that other kinds are still occurring as often as ever and require the actions here outlined. It is our opinion that appeals of a general nature to be careful when coupling and uncoupling cars are less important than information and reminders about the specific dangers of the work. The average man knows the importance of being careful, gives considerable thought to it, and does not intend to take unnecessary risks. He is in sympathy with safe practices in the abstract, but what he can actually make use of is specific information to put him on guard against certain dangerous situations in which he sometimes gets in a moment of thoughtlessness.

CHAIRMAN LA FOUNTAINE: Mr. Switzer, I feel I am voicing the sentiment of the meeting when I say that the very interesting and instructive

paper you have prepared on "Prevention of Accidents Due to Coupling and Uncoupling Cars" is a subject which is well deserving of all of our consideration.

The next business will be a discussion upon this subject by Mr. L. F. Shedd, General Safety Supervisor of the Chicago, Rock Island & Pacific Railway.

DISCUSSION

Mr. L. F. Shedd: The paper just presented by our worthy colleague in the great and broad field of welfare and safety activity merits particular attention and serious thought, referring, as it does, to a class of accidents still apparent among railroad men in an age when every precaution from an appliance standpoint has been employed to overcome them. Accidents from coupling and uncoupling cars and engines, all conditions taken into consideration, furnishes for safety advocate and worker an open avenue into which his best efforts might be trained and from which, if such efforts are successful, noticeable reductions in personal injury and fatality lists are possible.

Installation of modern safety coupling appliances (admitting that they have done much to reduce the hazard of trainmen and others engaged in that class of service where coupling and uncoupling of cars and engines play the larger part) has not solved the problem of accident prevention in that class of employment, to verify which we need only to refer to the figures given by Mr. Switzer, taken from the reports of the Interstate Commerce Commission—a most reliable source. I shall not repeat the statistics given except to call attention to the magnitude of the accidents to which they refer. Seven hundred and thirty-five railroad men killed and 12,702 injured in five years ending June 30, 1917, while coupling and uncoupling—an average of 147 killed and 2,541 injured each year—is proof enough that something should be done and must be done to learn the cause and to overcome it.

EMPLOYES ENTITLED TO SAFE PLACE TO WORK

The law imposes upon common carriers the duty of giving employes a reasonably safe place to work and reasonably safe appliances to work with, and it is my opinion that in the majority of instances, if truly not in all, those upon whom this lawful duty primarily devolves are endeavoring to perform it, but we as railroad men know that despite every effort and desire to attain 100 per cent equipment safety, we at times fail and it is well known that frequent instances present themselves where injuries occur while coupling and uncoupling engines and cars where "defective equipment" enters into the investigation and final judgment, when in reality there was no defect, or if a defect, it had absolutely nothing whatever to do with the accident referred to—it was used simply to hide a thoughtless or a careless act.

On the other hand, the equipment sometimes becomes "bad order" and under conditions and circumstances when to refuse to handle, or if placed on the "rip track" or in a repair yard, serious loss and inconvenience might be occasioned (probably to our government at this particular time)

and at times like these chances that it is not desirable to take are taken nevertheless, and through such movements accidents and injuries are recorded.

From my point of view there are *three important* steps necessary to be taken in our efforts to prevent this particular class of injuries, their importance being in the order named: *First*, Intensive and painstaking inspection of all equipment, locally and in transferring, is necessary. If such inspection is given, many defects can be noted and remedied that will remove every occasion for men going between cars and engines for the purpose of coupling or uncoupling and, through such careful performance, great reductions will come. *Second*, Every trainman and switchman should be an "inspector" of the equipment he is called upon to handle, insofar as his duties will permit, so that he may know for himself that coupling appliances are in condition to perform their required function, and, when defects are discovered, refrain from taking chances that are now apparently taken under such known conditions. *Third*, but not the least, let every railroad man resolve to be his own judge as to whether or not it is safe for him to go between or to work between cars, and resolve each doubt in safety's favor. In other words, let us inculcate in the minds of trainmen and switchmen the advantages of "self-preservation" over "chance-taking." It can be done, it must be done, but it can only be done when the mind that decides the issue is in a position to decide that issue on the side of safety, and when this is done injuries and accidents will be lowered to that irreducible minimum so earnestly sought.

SAFETY RESOLUTION ADOPTED BY SWITCHMEN

At the switchmen's convention, recently held in St. Louis, a resolution in which splendid food for thought appears, was passed, pledging the convention to the cause of safety. It was a real stimulus to the cause to note such concentrated action taken by that body of men whose duties are naturally of a hazardous nature, but who nevertheless are open and above board advocates of humanity's greatest friend—the safety movement.

It is not my intention to refer to any particular railroad's achievements in accident reduction work for the purpose of bringing that railroad particularly before you, but in view of the fact that we are now *all* in the same railroad family, all working for Uncle Sam and the "boys over there," I take the liberty of giving an instance of remarkable performance among the switchmen employed on the Chicago, Rock Island & Pacific Railroad in the Kansas City terminals. During a period of twenty four months, July, 1916, to June, 1918, inclusive, there occurred but twenty-six injuries to switchmen employed, eighteen of these occurred during the last six months of 1916, four during 1917 and four during the first six months of 1918. During this twenty-four-month period these switchmen worked 48,976 days, an average of 1,884 days worked for each injury occurring. For a period of seven consecutive months, from April to October, inclusive, 1917, not one injury occurred to the switchmen mentioned. These accomplishments are mentioned with no other thought than to prove that those whose duties are almost wholly confined to coupling and uncoupling cars can take good care of themselves if they

will. To get them interested, as these men admittedly are, is the real solution of the problem confronting us.

Real live interest in accident prevention among the class of employes under consideration, and in fact among any other class, in my opinion, can never be attained through the enforcement of hard and fast printed rules, but can be accomplished through personal contact between the representative of the Safety Bureau and the "man on the job," by a real demonstration on the part of the former that he is interested in the latter and that it is their mutual duty to reduce the hazards of the employment to the lowest possible mark. Get the man who couples and uncouples cars interested in his own personal safety and he, in turn, will get another interested in the same way and when each man takes care of himself, the problem will be solved.

OILING COUPLERS

MR. CLARK: I would like to ask a question: Is there any road that makes a practice of oiling couplers? They do not work easy and we have found great benefit in some cases by oiling them so that they will open easily when the lift pin is pulled. I would like to know if there is any road that makes that a practice.

CHAIRMAN LA FOUNTAINE: I can answer for the Great Northern, Mr. Clark; they do not oil their couplers: I understand they are made in such a manner they are not intended to be oiled. They leave sufficient room and I do not know that oil would do any good except in extreme cases where something was bent.

MR. CARROW: I'd like to ask the two gentlemen who have spoken what is the specific objection to adjusting with the foot as compared to adjusting with the hand?

KICKING COUPLERS

MR. SWITZER: I would like to answer the question. Kicking couplers is dangerous, it is proven so by statistics. Take the Interstate Commerce Commission statistics, look through them and see the number of men hurt in that way; take the statistics on your own road and see the number that are hurt that way. It is both unnecessary and dangerous and I thought there was very little argument on the question. I have talked with a great many officers and switchmen and trainmen, and it has seemed to me for several years to be the unanimous opinion that it is unnecessary and dangerous and ought to be cut out.

MR. ADAMS: I'd like to reply to Mr. Carrow by saying that of all the dangerous practices in railroad service, especially in yard service, the most dangerous I know of is kicking the coupler with the foot. It is not only discouraged by every official in railroad service, but it is discouraged almost monthly by the various magazines that reach the membership of the train service organizations. I believe there are more disability claims paid by the Brotherhood of Railway Trainmen for accidents occurring in that manner than from any other manner in switching. On many lines, I have found in getting over the country, that it means dismissal from the service for a man to kick over the coupler. Of all the things we

ought to bring to bear on the minds of the men handling the cars it i never to kick over a coupler or even to adjust it by hand until the ma: knows he is absolutely safe.

MR. CARROW: I did not mean that I had a suspicion the practice wa safe, but as a general proposition I would assume a man that would pus the coupler over with his foot would have previously assumed the car were not very near together. It follows, therefore, that a man who get his foot mashed would get his body mashed under the same conditions.

MR. ADAMS: If you are standing up you can certainly get away from : quicker than you could if you had your foot against it.

MR. CARROW: I would take the opposite view.

A DELEGATE: Let Mr. Valentine answer that.

MR. VALENTINE: The idea is this: A man would not attempt to pus the coupler over until he sees the operation is going to fail. They woul be about that far apart (indicating) before he could tell. Then he woul not have power to slip it over with his hands, but would have the powe to shove it with his foot by a quick movement—just to adjust the dra bars to half an inch. That might make the coupling a success, otherwis it would fail. It would be just one-half minute he would have to wa until the slack runs out. He takes a chance for half a minute.

MR. ADAMS: Rather than back up again.

MR. CHAPIN (Pennsylvania): Maybe it looks as though the Pennsy vania was not alive to that danger, but I know that the practice h been consistently discouraged by our operating officials for many year I think Mr. Carrow's question was probably to broach the subject.

KEEP FROM BETWEEN MOVING CARS

MR. CARROW: I thought I might be misunderstood on this matter. is not the difficulty of pushing the coupler with the foot; it is because t man gets in between the cars when they are coming together. As I ha observed men it is much preferable at times to push the coupler with t foot than to push with the hand—to avoid getting delicate hands soiled and you have more energy with your leg than you have with your ar Doesn't it resolve itself into keeping out of the way of moving cars—ca about to come together. If you say a man should not move couplers wi his feet what do you mean? Are they to quit moving them with their fe entirely?

MR. VALENTINE: The idea would be that the man could put his foot the drawbar when the cars were coming together, providing he did n get it between the drawbars. He gets his foot a little too far over, it go between the two drawbars and he can not move it out quick enough. If could keep his foot outside there would not be anything to hurt him.

MR. CARROW: Under such circumstances, when a man gets caught wi his foot between the couplers, he has gone between the cars, hasn't h

MR. VALENTINE: Yes.

MR. CARROW: The initial trouble is that he violated the rules?

A DELEGATE: Is not it true also, in such a case, a man is at a dis vantage, inasmuch as he is standing on one leg?

MR. SWITZER: I am wondering, gentlemen, what we are really strivi

for in this argument: Whether it is safe to adjust a drawbar with the hand or the foot as the cars come together. If there is a man in this room representing a railroad where the employes are permitted to go in between moving cars to adjust them with hands or feet I'd like him to stand up.

MR. BABCOCK (P. & L. E.): I think Mr. Carrow's idea in bringing up the question is the material difference of adjusting a knuckle with the hand or the foot. In my observation and experience I am inclined to believe that it is immaterial whether a man uses his hand or his foot, so long as he has ample clearance between the cars. On the other hand, if a man can see and realize that the cars are about to come together—that is when these accidents occur—his first duty is to look out for himself and get out from between the cars and not attempt to make a coupling. It very often occurs that a man is ambitious to make the connection when he sees the couplers out of alignment and he will attempt to kick the coupler into alignment with his foot and that is why we have these accidents. I think that is Mr. Carrow's question.

MR. CARROW: If you say to a man that he must not move a coupler with his foot, it seems to me you are putting restrictions on a lot of intelligent people with whom it will not work. There are many times where it is perfectly proper to move the coupler with the foot. It might be dirty and I might not especially care to get my hands full of rust. If a man stands up and pushes the coupling with his foot, if he knows it has to be moved one way or another, what is the objection? The fundamental thing to consider is that the man must keep out of the way of moving cars.

BE SAFE BEFORE STARTING OPERATION

MR. CLARK: It seems to me this is largely a question of habit. We operate under a good many different conditions and I believe that most accidents of this nature happen where a man is backing up on an engine. He is riding on the sill step on the rear of the tank and when he gets probably fifteen or twenty feet from the car to which he is going to couple he will drop off and run and open the knuckle with his hand; then he will stand back and give the engineer the sign to come on back and just about the time they come together he will stick his foot up and give the coupler a shove. I believe, with Mr. Carrow, that you can move a coupler easier with your foot than you can with your hand. I worked in train and yard service fifteen years and it is my experience it can be done easier with the foot than with the hand, but it should not be done when the coupling is about to be made. If the couplers are not in line the only safe practice is to stop the engine until you have them in line. There is another condition that comes up: Take the coupling up of a long train, a man may be fifty, sixty or even seventy-five cars from the engine. It is very difficult to see signals that far. The man will have the knuckle open, he may give the signal to back up, and when they are five or ten feet apart he may get a notion they are not going to make a good coupling because they are not quite in line; he will stick his foot up and give it a shove, and about that time the knuckle will close and turn a little and his foot slips around the end of it. It is a question of judgment. It was

is employed, to work continually and to work carefully, we will, perhaps, do more than anything else to back up those splendid boys of ours who, at this very hour, are so unselfishly and so gloriously defending the cause of liberty in France.

I want every one to get into the spirit of this meeting. We are entering a new era in safety work. I wonder if you men realize what an opportunity there is before you? I wonder if you realize what an opportunity there has come for you in this safety work under the management of Mr. Belnap, of the Safety Section of the United States Railroad Administration? I wonder if you have caught the full significance of it and if you understand what is expected of you in this work? I wonder if you realize that you are expected to make good? I wonder if you realize that today, no matter what your experience, no matter what your success has been in the past, that today you are all on trial? That is the thought that I want to implant in your minds and I want every man here to take part in this meeting, to give us his best thought and his best experience in safety work, in order that he may go back to his property and help put into practice the things that the government expects him to do.

The first topic that is up for discussion is "Maintaining Interest Among Safety Committeemen." I am going to call upon our old friend, whom we all love so well, a pioneer in this work, to open the discussion on the subject, Mr. Ralph C. Richards.

MAINTAINING INTEREST AMONG SAFETY COMMITTEEMEN

Mr. Richards: This is a matter of getting people into the band wagon and we want to get them all in. Just how we are to go about it is the matter for discussion. After attending the meetings of the Railroad and one or two other Sections of the National Safety Congress this week, and going to the banquet last night, which must have been an inspiration to everyone there, I wonder if all of us have not answered that question in one way? Isn't it the best way to increase interest in the safety movement among the men on the road, among the committeemen, to bring them to these meetings? Is there anything that we could do in carrying on the safety movement that would create greater interest in the organization, among the men in danger of being killed or injured, among the men that are doing the work, among the men who are putting a stop to dangerous conditions and dangerous practices, than to bring them to these meetings, letting them hear these discussions, letting them go to such a banquet as we had last night? Wouldn't they go home with a story to tell to their fellow-workers of what safety really meant, of what was done in these safety meetings, and how much good they got out of it? I cannot think, gentlemen, of any one thing that any of us could do that would create more interest in the safety movement than to bring some of the workers—I do not mean the safety inspectors or the chairmen of central committees—but some of the engineers, conductors, brakemen,

trackmen and shopmen, and let them see what safety really means and get the inspiration that we must all get by coming to these meetings. Of course, there are many other ways by which we can help increase interest in the safety movement and one of the principal ways is by getting results. If we cannot get results by the safety movement, if we cannot demonstrate by our statistics—the men know whether they are right or not, you cannot put anything over on them—if we cannot show that the safety movement decreases accidents, it ought to go down. But if we can show, as nearly everyone can, that since the safety movement started the deaths and injuries to the men that carry on the work are decreasing, and publish those results, so that everybody can see them, publishing them in a simplified way, not by ratios or proportion to number of men, but just show what your accidents were before and what they are now; isn't that going to increase interest in the safety movement, by showing that you get these results?

MAKE COMMITTEE MEETINGS INTERESTING

The meetings of our committees ought to be made interesting; it ought to be the business of the men running the safety movement on the various roads and in the industries to see that they are interesting and not mere formal meetings where the men get together and talk a few minutes and then say: "Oh, hell; let's go home; I move we adjourn." We want to have someone run the meeting that is really interested and not turn it over to the chief clerk or someone else, because the minute the officer of the division, of the terminal or shop fails to attend the meetings the other men say: "The boss doesn't come; why should we?" There isn't any reason. Another way is to really solicit suggestions and recommendations for the removal of dangerous conditions and dangerous practices and then acknowledge those suggestions and recommendations. Every time a suggestion is practicable or reasonable, carry it out and show the men that you have carried it out; show how many recommendations you have had during a certain period; how many have been rejected and how many have been accepted. Nearly all the suggestions we get from safety committees are reasonable and proper and should and can be carried out.

In the minds of some men the safety movement means, as they have been told, just a matter of saving dollars. Can't we make the men that are new to the safety movement, that have not taken an interest in it, understand what the movement must accomplish before it can save dollars? That is the last thing it does. It has to save human life and limb, it has to stop making widows and orphans, it has to bring the men home safe and sound, at the end of the day's work, it has to make the operation of the road, the shop, roundhouse or track, or whatever it may be, safer, before any money can be saved. I think if we can drive that home in the minds of the men that are coming into the service, who have not been connected with safety organizations, we can make them see that they will be the principal beneficiaries of the safety movement, and that it is not a question of dollars and cents.

USE OF MOVING PICTURES

Another way, it seems to me, that the safety movement can be mad more interesting, can attract more men to it, is by showing safet moving pictures. I think it is a good plan to show on the screen slide of the causes of the principal accidents, your statistics; what proportio of accidents result from dangerous practices and from unsafe conditions how many of them come from defective equipment and how many fron thoughtless men. We all do things many times when we are thinking abou something else that brings about an accident—that is the cause of mos of our accidents. In America we are all chance-takers. We will take chance all the way from a dog fight to some other fellow's wife and som times, you know, we are caught. Sometimes we get hurt.

I think that the safety moving picture business is a thing that th government might well go into. I do not see any reason, if the governmen of the United State is spending all the money it is for the pictures tha George Creel is sending out—"Pershing's Crusaders" and "America's A swer"—why they can not do something for us in a general way whic will put the stamp of government approval on it, by getting up the pi tures themselves and furnishing them to the railroads and other indu tries, showing what the safety movement is and what it is intended accomplish. I believe that a picture issued by the government (and the have facilities for doing the work that none of us have) would hav more effect than anything gotten up by a railroad or private individua We all know that if we can put the stamp of government approval o anything nowadays we are going to get it over and that is what we wa to do.

We should take more trouble in furnishing information as to the caus of these accidents, because we have to diagnose these things. We wa to furnish information to the men regarding avoidable and preventab accidents, and nearly all accidents are preventable. If we could te how many accidents we had from a certain cause and give them t actual accidents, where they occurred, how many people were killed a then explain the cause, aren't we going to get the men interested in r moving the cause?

REWARDS FOR MERITORIOUS SERVICE

Some of the roads award safety banners to the shop or division terminal that has the best record for the year in reducing accident in addition to awarding a banner give the men a week's vacation wi full pay—something like that. They want the vacation, they want t honor of belonging to the division or committee that has really do the best work.

There are so many ways, gentlemen, by which we can increase intere in the Safety movement that it is rather difficult for a man to talk abo it. I read a wonderful story a few days ago in the bulletin published Washington by George Creel, called the *Official Bulletin*. I do not kn of anything that has touched me so much during the war as that lit story. It was after the first battle that our men were really in, at C

teau Thierry, and a number of our marines had been injured: many of them, unfortunately, killed. The French General in command of the brigade decided that he would decorate with medals some of those men who had done the wonderful, courageous, daring things that had stopped the Germans on their way to Paris. So one morning—just such a morning as it was when we awoke today—the men were gathered together, half a company of the marines and half a company of French soldiers. They marched to the appointed place in the woods and gradually the little body got together. Thirty medals were to be awarded the American marines and soon the French commander came, and the American commander, and the men were lined up. Only eleven of the thirty Amercans were there to be decorated; the rest had paid the price, some were in their graves, most were in the hospital. The French General pinned the medals on the breasts of the eleven American marines who were able to be there, and then, after the ceremonies the men marched away. Now, suppose the United States Railroad Administration should decorate some of our men—some of the brave fellows who are running the engines, the men on our trains, in the switch yards, in the shops, or the tracks, the men who have done their utmost to further the greatest cause in the world, except the one we are fighting for to-day—what effect do you suppose it would have on the rest of us? Is there a man here, is there any man on any railroad in the United States or on any railroad in the world, that would not be proud to be decorated by the United States Government for helping to conserve the lives and limbs of American workmen? I thank you.

CHAIRMAN DOW: Mr. Richards, your remarks are of great educational value and most inspiring. I am going to call on another man who has been in safety work for a long time, Mr. John T. Broderick of the B. & O.

REACHING OFFICERS AND OBTAINING THEIR CO-OPERATION

MR. BRODERICK: The best way to reach officers and obtain their co-operation in safety work is to ascertain the cost of injury to employes and others on the railroad, as the result of unsafe practices and conditions: bring this plainly to their attention in order that they may realize and understand the economic side, both in loss of manpower and cost for claims, as well as the humanitarian side of the question. The average railroad official is quick to see the practical side of things, and if you can show him what the loss of manpower is (that is, turnover) plus the cost of educating men, and add to that the increased chances of the raw substitute for becoming injured, we are pretty certain of arousing and maintaining the co-operation of employing officials, because they are more interested in production than anything else.

In order to appreciate what the loss of manpower actually means, executive and employing officials should be informed as to what it costs to teach raw substitutes how to fill positions efficiently. The cost of education is an enormous factor and is testified to by employing officials

of the various industries in the United States as ranging anywhere from $20.00 to $200.00 per man. The cost of spoiled material during the term of educating a raw employe must be taken into consideration, as well as the time consumed in teaching him.

The money loss and the grievances and labor controversies which so frequently follow in the wake of accidents, of law suits, of long-drawn-out settlements with the claim department, etc., should be considered. These matters are vital factors and should by no means be neglected when speaking of the value of safety to employing officials.

FOLLOW-UP CAMPAIGN

To further maintain the interest of employing officials, every case of gross carelessness resulting in a train accident or personal injury should be forcibly and directly brought to the attention of the official in whose department the accident or injury occurred. This means a carefully worked out and energetic follow-up campaign. In addition to this, records should be kept to show the cost of personal injuries by divisions each month. A statement covering the system showing the total number of accidents by divisions should be circularized among divisional officials, for the purpose of arousing competition among them to curtail accidents. If a comparative statement of costs chargeable to accidents could be made in conjunction with the above statement, showing the percentage of increased cost or decreased cost of accidents in comparison with previous months and by divisions, it would strengthen the value of such statements.

The humanitarian side should not be ignored. However, the average railroad official is either too busy or else not sensitive enough to this particular phase to obtain the greatest results, and matters of production and cost appeal more strongly, as does also the placing of the burden directly upon the shoulders of the responsible official for results.

All such matters as motion pictures, attendance at meetings of Federal managers, general managers and other officials, stimulate the divisional officers to take an added interest. Safety should be always discussed at staff meetings and should be featured prominently in the employes' magazine. Short papers prepared by division safety committeemen, which often bring out their personal views forcibly, will help materially to stimulate the divisional officers to greater efforts.

Tell the officers what other railroads and industries are doing in safety work; what you are doing that will help in reducing accidents. Lose no opportunity in bringing this question before their attention, invite them to speak at safety meetings and impress them with the fact that their co-operation is vitally necessary to insure success in the work.

Inspire them with confidence regarding safety work, let them see that you are deeply interested in your work and convince them that their attitude in the matter will immediately reflect itself in the manner in which the employes generally will become interested and conduct themselves in the future, the same as the actions of the General of the army will be reflected in the actions of his men. Let them understand that

indifference on their part is likely to mean the sacrifice of many lives of employes which could have been saved had these men been properly drilled and impressed with the importance of the work. This can be done in no better way than by the interest that they, the officers, manifest in this work and the encouragement they give to employes by their example.

MOVING PICTURE MACHINES AND FILMS

We have found the moving picture one of our greatest aids in safety work. It creates a receptive mental condition and the man forms his own ideas and draws his own conclusions. A man may be very eloquent and speak by the hour, but the moving picture, from our experience, has produced more good results than any medium we have tried. We are using pictures every day on our railroad, from one end to the other, as fast as the man in charge can get over the road. The schedule is prearranged and he goes to certain points at certain times. Where it is possible to do so the families of employes are invited to attend. I think that you gentlemen who have not had experience with motion pictures will find them one of the best means of creating interest in safety work.

CHAIRMAN DOW: How do you use the pictures? Will you explain your method and what machine you use?

MR. BRODERICK: We are using a small, compact machine called the DeVry. We formerly used a Powers machine, similar to the one your company uses, but we found it too bulky and troublesome to transport from one point to another. It meant the packing of the machine in a couple of large trunks, it meant the use of an asbestos booth to take care of fire underwriters' requirements in the different cities, and it meant expense, of course, in hauling the trunks and booth to and from stations. Our present machine can be put in a case not much larger than a suit case.

A DELEGATE: Spell the name, please.

MR. BRODERICK: DeVry, headquarters, Wells street, Chicago. Our success is very marked and the government is using a great number of the machines.

CHAIRMAN DOW: What size reel do you use: do you use our (New York Central) pictures?

MR. BRODERICK: Yes.

CHAIRMAN DOW: Does only a 10-inch reel go into that machine?

MR. BRODERICK: Yes. It takes standard sizes and is a very satisfactory machine in every way; that is the principal feature, it is easy to get around with it.

MR. SHEDD: It requires non-inflammable films, doesn't it, if you transport it on trains?

MACHINE SAFE IN OPERATION

MR. BRODERICK: No; the films are not non-inflammable. We do not carry the films in a passenger car; they are shipped in the baggage car. I am speaking of the machine itself, the films are carried separately.

CHAIRMAN DOW: This machine, as I understand it, can be connected

to any incandescent fixture and it will not ignite the film. You can stop the picture and leave it stationary if you desire.

MR. BRODERICK: Yes: you can pull out a bulb and connect your machine: it is an easy matter. In most cases the authorities have not even required us to use a booth.

A DELEGATE: What is the cost of the machine?

MR. BRODERICK: Two hundred dollars. It is the most satisfactory machine we have come across.

MR. SCOTT (*Atlantic Coast Line*): Mr. Dow, what is the size of the reel used in "The House That Jack Built?"

CHAIRMAN DOW: Two thousand seven hundred feet. It is shipped in either two twelve-inch or three ten-inch reels as preferred.

A DELEGATE: I would like to ask Mr. Broderick at what distance he gets the best results with that machine? We have three Y. M. C. A.'s on our line where the auditoriums are very small; others are much larger. In some cases it is necessary to come in close contact with the screen, but in others we have to get back quite a distance in order to accommodate the crowd and throw the picture large enough so that all can see it.

MR. BRODERICK: We have used it under varying conditions, say from twenty to fifty feet: I have seen very little difference in results.

MR. FRANK WIGHTMAN (United States Railroad Administration): Same as the Educator machine?

MR. JARNAGIN (United States Railroad Administration): You focus it the same as a camera, using the same principle?

NOONDAY PICTURE EXHIBITIONS

MR. BRODERICK: Yes. In meetings where we use the pictures we take the machine right into the shop, generally during the noon hour. We give the shop foreman or master mechanic advance notice and ask him to fix up a little corner for the machine—put shades over the windows or something of that sort, that we may show the picture to advantage. We take about forty minutes, but this gives the men time to eat their lunches—a lot of them eat their lunch during the exhibition of the picture. It is surprising how much interest is shown by the men and you get closer to them than in any other manner. In the evening they would have to go home and change their clothes and come back so they would much rather see the picture at the noon hour in the shops. We also arrange, on many occasions, to have meetings in the evening in the larger towns. We engage a hall for that purpose and send out tickets and notices to the men, so that they may bring their wives and families. That is a very important point: Get the family interested, get the good wife, the mother and sister, to see the pictures, talk about it and take it up in the home circle: you will find it a great advantage. They will talk about it at mealtime and on all occasions. We have had the wives of our employes come to us and say: "We are very glad of this opportunity: it is bringing accidents home in a way that we never understood before." You really cannot measure the benefits of the moving picture meetings.

I think the personnel of the committees is a vital factor. Select men interested in the work, men who will take an interest and spread the gospel to their fellow-workmen. It takes a good deal of effort to arouse some men, so I think great care should be exercised in selecting men for this purpose. Our aim is to secure men from each of the occupations. We have men on our division committees from every branch of the service, that is to say every operating branch. We go so far as to select a passenger engineer, freight engineer, freight conductor, passenger conductor, freight fireman and passenger fireman. We give the men in every branch an opportunity to serve on the committee, so that they not only will derive the benefits themselves but will talk about it to those with whom they come in contact from day to day. I think that is very important.

MORE DIFFICULT TO EDUCATE EMPLOYER THAN EMPLOYE

There is a great deal of work to be done, perhaps more in educating minor officials in the work than in educating the average workman. I have found in many cases, where our officers knew more or less about safety, that they were interested to some extent, but did not practice it—they have an idea they are too busy and delegate it to some one else. That is a very bad thing to do; in fact, it is a serious mistake—the officer is the one you want to reach. Get him interested, get him to do the things that should be done, and his actions will be reflected by the men.

CHAIRMAN DOW: Referring to the suggestion of Mr. Richards regarding the government sending out films over its approval, I might say, for your information, that Mr. Belnap now has that subject under consideration and is taking up the matter of obtaining authority to send the two films, "The House That Jack Built" and "The Rule of Reason" to railroads. They will be an introduction: "This film exhibited by the United States Railroad Administration" and probably carry a personal message from Mr. McAdoo.

We have quite a number of good talkers on our program. Let us hear from Mr. L. F. Shedd of the Rock Island.

MR. SHEDD: About the middle of July, 1912, a certain man, younger than myself, was out on the Rock Island, doing hard laps, when he received a message from the Chicago office that they would like to see him: or, rather, one of the officials would like to see him. His mind turned to what he had done that he ought not to have done, and what hadn't he done that he should have done. Some of his partners got close to him and wanted to know the same thing, they even got so personal as to ask the man whether he stood conscientiously right so far as the rendering of his expense account was concerned. However, the gentleman was met, the meeting held and the two separated, the first fellow just as much in a quandary as to what was wanted as when he received the telegram. But in two are three days the first vice-president sent for your humble servant and wanted to know if he would take a safety job. I said "Yes," I was so nervous.

The safety movement on the Rock Island Lines was outlined and

planned and ready to execute without any interference or any suggestions on my part, and I say it frankly and candidly that the outline they handed me that day, Aug. 1, 1912, is the one that we have strictly adhered to. I was very happy when Bulletin No. 3 came out and we turned to page 7 and read the same request to all of the railroads that we had carried. (No ego about this; we were simply lucky.) Other railroads did the same. We need to make very few changes to have our organization just as the Director General wants it, so far as the personnel of the committees is concerned. Whatever success we have had we attribute in a large measure to the arrangement and the handling of our committees, both from the standpoint of their personnel and the manner in which they are handled.

PUTTING "KNOCKERS" ON SAFETY COMMITTEES

I do not propose to advertise the Rock Island Railroad; it does not need it. One of the things I have gotten a great deal of relief from is the fact that our committees, for a long, long time, have been on a ball-bearing working basis. The superintendent has always been the chairman of the committee; that is, we expect him to be in attendance unless conditions are beyond his control. We realize that every department must have a head and the safety committees are no less a department than any other, if we look at it from that viewpoint. We have left the selection of committeemen entirely to the men in charge. The superintendent is the man in charge of the division, responsible for the net results thereon, and he is the fellow that ought to have all the say. If he wants to consult someone regarding the members of the committee that is all right, but we leave it entirely with him and have always done so. The thought went out a moment or two ago that the safety committees were good places to put interested fellows. I want to add that it is a mighty good place to put some fellows if you know they are disinterested. One of the greatest things in the world for a safety man, as well as for a fellow who is not a safety man, is to make a committeeman of him: he will have his eye teeth cut in a meeting or two and see what you are trying to accomplish. We have done a lot of that on our railroad—men who were not antagonistic, perhaps, but lukewarm, came to the meetings when appointed and got an entirely new grip on the subject.

Let your superintendent select his committee. He knows his men. After you have the committee let the men understand what you are trying to do. One of the great things is to make your committee an important body. That good man, Mr. Belnap, came into my office some time ago and talked to me, as he has talked to all of you. Among other things he asked: "How are you holding your committee meetings?" "Every sixty days." "We would like you to hold them every month." "All right." "How do you arrange your dates?" "We have a calendar arranged the first of January that holds good for the year." He was surprised. He said: "Is that so?" "Yes, sir." I took out my little book and there they were, every date from January to December, inclusive, and we hold to them religiously. I am only claiming that we are about

93½ per cent perfect, not 100 per cent, but we make a business of our committee work. We do not ask our men to watch the mail and wonder when Superintendent Jones is going to hold a committee meeting. If he cares to he can have his calendar in his pocket. He knows it will be the first Tuesday after the first Monday in December and he knows where it is to be held.

MEN RECEIVE PAY WHILE ATTENDING MEETINGS

Of course, our men are not always free; we move our traffic. We expect our committeemen, officers as well as others who are absent from the committee meetings, to let it so show on the minutes and, believe me, we get after them with a hot stick when they stay away from committee meetings. It means a lot to have the men there, but it means more to have your superintendent there. Another scheme we pursue, if one of the shop men or any of the other men for any reason cannot come we ask him to send a substitute, to bring the message and to take the message away. We never have held committee meetings on Sundays and we hold none at nights; we hold no meetings on the time of the men at all, unless we pay them for their time coming and going and while they are there. If a man's run is out tomorrow and the safety meeting is to-morrow he lays off today—of course, provided we can release him, and we are not always able to do that. We must move our traffic, but we make a business of it; there isn't any question about that.

A DELEGATE: Mr. Shedd, suppose you have a telegraph operator on your committee and he works the first trick, from 12 to 8 the next morning, and he attends your meeting, is he is paid for a day's time, even though he loses none?

MR. SHEDD: I do not handle the details of how the men are paid. That is handled by the superintendent.

THE DELEGATE: What do you think of it, Mr. Dow?

CHAIRMAN DOW: I do not think we pay men who do not lose time on our road.

MR. BRODERICK: We pay a man for the time he really loses.

MR. F. A. WIGHTMAN: That is covered in Circular No. 3.

MR. SHEDD: One of the things I think retards the progress of meetings is this: A man makes a suggestion and immediately you go into debate about it, whether or not it is the right kind of a suggestion. A good, live superintendent will have a man at his hand to say "Refer this to So-and-so" and get it off his hands. My theory is this: Make you suggestions at one meeting and discuss them at the next. Many a man has had cold water thrown on his efforts because some fellow took exception to what he said and made it known too quickly, whereas if it had gone until the next meeting maybe they would have gotten together and modified the whole thing.

CHAIRMAN DOW: You said a moment ago that you hold your meetings on a regular day every month, so that the men know they come on that date; in addition to that, don't you have your superintendent send out a notice?

MR. SHEDD: Yes, sir.

MR. J. C. CLARK: Mr. Shedd, in connection with handling your suggestions, are your meetings formal; that is, do you follow parliamentary practice?

MR. SHEDD: Yes, indeed.

MR. CLARK: In other words, you do not permit the superintendent, acting as chairman, to say: "Refer this to such and such a committee"?

KEEPING ABREAST WITH SAFETY SUGGESTIONS

MR. SHEDD: No. For instance, a suggestion is made to do a certain thing, say a pile of ties to be moved; the superintendent will authorize someone to move the ties. That goes into the minutes, but something that it will take some work to do, as an addition, tearing down, or something of that sort, goes into the minutes just the same. It will be referred by the superintendent to the proper authority, but we do not want to debate the matter at that time. The minutes of the meetings are kept in a scientific and systematic way, we record each suggestion and we keep tab of the back suggestions. For instance, if we have to go back, in July, to the January meeting, we can do so as every meeting is a complete record of everything that has been done to date; that is, that has not been taken care of before. In reading the minutes of the July meeting I know exactly what is outstanding, if there is one subject or twenty, it does not make any difference. The minutes are kept by my secretaries, with the assistance of the superintendent.

MR. WRIGHT (C. St. P. M. & O.): Does a copy of the minutes go to the different members of the committee?

MR. SHEDD: No, sir; we have not done that.

MR. WRIGHT: I find that is a very good idea. Each member gets a copy of the minutes.

MR. BRODERICK: On a large railroad I think that would be burdensome.

MR. RICHARDS: We have not found it burdensome on the Chicago & North Western.

CHAIRMAN DOW: Do you mimeograph the copies, Mr. Richards?

MR. RICHARDS: Yes, sir.

CHAIRMAN DOW: Some of our committee reports cover fifteen or twenty pages.

MR. SHEDD: At the next meeting we tell the fellows what happened at the last and they, as committeemen, take the word to the men. In that way we handle it without the use of so much mimeographing and so forth.

MR. MEYERS (Wabash): Do you post the minutes on the bulletin boards?

MR. SHEDD: No, sir.

A DELEGATE: Do you read the minutes at your committee meetings?

MR. SHEDD: Always. We start with a roll call. We want the fellows who are there to answer "Present" and to hear the names of the absentees.

MINUTES OF SAFETY COMMITTEE MEETINGS

MR. CLARK: We have had minutes that covered thirty-five pages and to read them in a committee meeting takes too much time. We send the minutes to every member of the committee.

MR. SHEDD: Does he take time to read them?

MR. CLARK: You bet he does. We put them on the bulletin boards, too. We do not always read the minutes in the meeting, but we refer to the minutes in handling the business. The great majority of the men read them and know what they contain.

MR. SHEDD: We endeavor to handle the minutes the same as any other meeting: have the minutes recorded at one meeting and read them at the next. We do all we can between meetings to get the suggestions ready.

A DELEGATE: Do you use the superintendent's chief clerk for secretary?

MR. SHEDD: We leave that to the superintendent or the general foreman of the shops. It is all a question as to who the man is and how he can handle it. That is a matter they arrange locally.

MR. MEYERS: How do you handle the central safety committee meeting minutes with reference to your division, shop and terminal committees?

MR. SHEDD: For instance, something comes up in a division committee meeting; that is, we had gone Bulletin No. 7 one better before it came out in that we had a ranking committee on each district—we have the division, the district and the system. We had a committee that handled, as a district matter, things that were brought up that were pertinent to that district that the minor committees could not handle. If they could not handle it, it was referred to the general committee, but we only pick out such things in the minutes and refer them as are necessary. Everything else is handled locally, taking it as I say, to the assistant general manager of the district, if it is in his province to handle it. If not, it goes to the general committee; very much the same as our courts—the justice of the peace, and on up. One of our slogans is "Bring a Visitor" to the meetings and it has worked out very well. We expect the committeeman to be there and, we hope, the visitor.

A DELEGATE: Does the visitor take part in the discussion?

TAKING TIME TO DO WORK WELL

MR. SHEDD: Yes, sir. The meetings are not between the superintendent and those "under him"—I use the words "under him" in quotations—they are meetings of the safety committee the chairman and his committeemen.

Here is a thing that is away down in my soul: The labor commissioner of one of the big states—this is a little personal—stood before a body of industrial fellows in one of our great cities (I happened to be present) and said, "Men, on the Rock Island Railroad they have a safety movement that amounts to something and I want to tell you why"—he took out his watch as he continued—"the superintendent does not come in and grasp his watch and say "Fellows, let's get this out of our systems; I have a meeting with the general manager in about five minutes.' He greets his men and says: 'Fellows, I am glad to see you!' He makes them feel at home, looks around a little, takes his time and gets his papers. Then they hold a real meeting." I tell you that, not

to take any glory for my railroad, but it is the spirit that all our superintendents ought to have. We have a couple on our railroad that do not handle the subject that way, I am frank to tell you. It is the tempermanent of the men; they mean well. We have other fellows who ought to be doing something else, they are not good mixers.

CHAIRMAN DOW: Who has a question on this important topic to ask Mr. Shedd? Please make your question very brief and to the point.

MR. MCCAMPBELL (New York Central): We have been trying to reach the night men in my territory and we have appointed a man who is employed at night as a member of the committee. We do not require him to attend committee meetings during the daytime and so break into his rest. We have found that he sends in more cards than any other member of our committee. I would like to know how it is being handled on other properties. We might improve the plan of reaching our men who are employed at night.

MR. SHEDD: If we have a man on our committee who works at night—for instance, if he works tonight and comes to a committee meeting tomorrow, he lays off the next night.

MR. MCCAMPBELL: If a man cannot be spared from his duties, for that reason we do not require him to come to the committee meetings in the daytime at present, considering the labor situation.

PERSONAL RELATIONSHIP MAKES FOR SUCCESS

MR. SHEDD: We are getting into a proposition that was brought out the other day. We must handle the work of our railroad It might be that particular man could not be spared at that particular time, but if he runs along for the next month and the next something is wrong. We ask this question: "What would you do if that fellow died? Would you shut up your shop?" There is the opportunity: If he is a man that cannot be spared, give him a substitute and let some other fellow bring his message. There is something that you get from a committeeman, in the grasp of the hand, the exchange of a smile, that you do not get in any other way, and it behooves us to get every member of the committee to the meeting. You will find that some of your members, some of your foreman, are always too busy to do things that they do not want to do or that they think some one else can give a little preference. It is disappointing to go to a committee meeting and find men are absent, particularly an officer. After while the men think you are fooling. The handling of committees, after you have selected them, is not a delicate thing, but it requires fine machinery, and I am firmly convinced that every iota of success we have had on our railroad we owe to the way we have handled our committees. Those committees, gathered together for that purpose, 700 or 800 men, are meeting every month, if you please, have one paramount idea: How to better conditions and better things generally—you would be surprised what root it takes and how the idea goes out. You cannot see it in an individual meeting, but you will see it when you sum up. My advice to all men is to stick to your knitting and take care of your committees.

CHAIRMAN DOW: Mr. Switzer of the C., B. & Q. can give us something very interesting.

MR. E. M. SWITZER: Mr. Shedd has gone into the importance of handling the safety committees in a right manner. That is the main thing, keeping safety committeemen interested. It is necessary to have good safety meetings, and the first thing, if we are to have successful safety meetings, is to secure good safety committees. Mr. Shedd has touched on the value of getting good men to these meetings; it seems to me that when it is time to select committeemen (on our railroad we do it once a year) it ought to be an important part of the duty of the superintendent of safety, or the safety agent, or whatever his title is, to see the superintendent, the man that has to handle the committee, and give him such help as he can in the proper selection of the men. It is up to the superintendent to select his own men: he knows them, we do not, but I make it a practice to tell the superintendent that I would like to meet him in his office and would like to see his train master and master mechanic there. We have a little meeting and go over the men that the superintendent has already selected and see whether, in our opinions, they fill the bill; as a result a good many changes are made. The superintendent first selects his men, then, as a result of having our meeting, we find we can select even better men for the safety committees, more representative men. After we have our men selected we hold monthly meetings and we bear in mind that the division superintendent is a man who has been selected for his position, not necessarily because he is a man well qualified to hold safety meetings—he is a good operating railroad man. Some division superintendents are not qualified by nature to hold meetings well so we have to get around and help them.

DO NOT ALLOW WORK TO BECOME ROUTINE

The great danger is that a safety committee meeting will get to be a routine matter if we leave it in the hands of the division superintendent or the master mechanic or the shop superintendent or whatever officer is the chairman of the committee. I believe that the superintendent of safety ought to make it a point to get out on the road as often as possible and attend safety meetings, because if he does not they will not run successfully and they will become routine. The superintendent will go through a routine mass of business month after month and everyone will be glad when the meeting is over and glad that it does not come again for another month. We must get out on the road and go to the meetings and we must always have something important and interesting to say, something that will give the superintendent and his committee a new view of the matter, something they had not thought before, something to put a little "pep" into them. Not only should we do that, but our safety inspectors and our assistants should do so. I was very glad to hear, a little while ago, that the Interstate Commerce Commission inspectors are going to attend safety meetings whenever possible. I was very glad to hear it because I am sure those men can, in their own way, put "pep" into the meetings. We cannot get around often enough; I have thirty-four safety committees and it is impossible for me to get

around every month or every two or three months to each one. Let us get around all we can, gentlemen, let us encourage visitors and outsiders to come—anyone that will inject something new into our safety committees and make the meetings interesting. We ask our safety committee members to be safety inspectors and if they are to be good safety inspectors they must see and meet our safety inspectors out on the line. Our safety inspectors ought to make it a point to meet committee members as they go around and to guide them in their inspections—show them what we want inspected and what the dangers are.

Another thing we can do to hold the interest of these men is to see that our bulletin boards are kept in good shape. You have all seen safety bulletin boards and operating bulletin boards that were so full of bulletins that some of the old ones were dropping on the floor. Every once in a while the trainmaster gets around and pulls out some of the old bulletins and cleans up the board a bit, but I think our safety bulletins ought to receive a good deal of attention. We ought to make it a point to have a clerk, wherever there is a safety bulletin board, take care of that board. It should be the duty of some one man: he ought to put up the new bulletins and pull out some of the old ones. There should not be more than half a dozen bulletins on the clip, but if the board is not given constant attention you will find it in very poor shape and not working for us the way we would like.

SPECIAL TOPICS FOR DISCUSSION AT SAFETY MEETINGS

It is important, in running a safety meeting, to have a well-understood order of business. The superintendent, I think, should read the minutes of the former meeting. After he has disposed of all the old subjects he ought to take up the accidents that have happened since the last meeting—go over the accident reports and have them discussed. Every meeting should consider some special topic assigned to it by the superintendent of safety. For instance, we might think it advisable for all our meetings to discuss our relations with new men, how we are attempting to instruct them in safety matters—making a drive on that topic. Just at present it is of very vital importance, because we have so many new men. There ought to be a special topic for discussion, and we should wind up by asking every man on the committee what he has to bring up, what he has seen. Gentlemen, we will find several men on a safety committee, usually, who will say, "Well, everything is going all right: I haven't seen anything: I don't think there is anything dangerous in my department." If you are to have a good safety committee you must make the men see the absurdity of making such remarks: every man on your commitee should be a worker.

To sum up, it is my opinion that it is our personal attention, the personal attention of the superintendent of safety and his ability to get out on the road and among the safety committee members and into their meetings, that is going to make a success in this matter.

CHAIRMAN DOW: Mr. Switzer referred to the matter of assigning subjects or topics to safety committees for discussion. I think that is very important. It not only helps to maintain interest, but it brings out

talent among your employe members on the committee that will be most surprising. We followed that practice on the New York Central for quite a long time and I have here a list of some twenty-two topics that have been assigned in the past two years to the committees on the New York Central. I will read them:

TOPICS DISCUSSED AT SAFETY MEETINGS

"How to best interest the employe in the safety movement.

"What are the best methods to adopt to correct unsafe practices on the part of employes?

"What am I doing to promote safety and what more can I do?

"How to prevent injuries caused by the handling of traffic, material, supplies, etc.

"Accidents to employes while coupling or uncoupling cars or engines and how to avoid them.

"How can members of safety committees and other employes assist in preventing accidents to trespassers on the railroads?

"In what way can members of safety committees and other employes assist in preventing accidents at grade crossings?

"What are the most effective methods of inculcating the safety idea into the minds of new employes entering the service?

"The importance of organized safety work.

"What is the relation of the Safety First movement to operation?

"What can and should a conductor do to promote the safety movement?

"How can foremen or other officials charged with supervision best promote the safety movement?

"How to make meetings of division and shop safety committees interesting and of value to the members.

"Injuries due to defective hand tools, such as hammers, chisels, etc., with burred or mushroomed heads. What is the best method of inspection and repair of tools to prevent such injuries?

"How should an employe who has violated one or more of the safety rules be approached in order to bring sufficiently forcefully to his attention the necessity of complying with the safety rules?

"Accidents to passengers.

"How can members change the mind of a 'knocker' on safety?

"What can and should an engineman do to promote the safety movement?

"How may accidents resulting in injuries to employes engaged in train operation, outside of collisions and derailments, be prevented?

"Safety effort and good service as a means of helping to win the war.

"In what way can members of safety committees and other employes assist in preventing fires to company property or property adjoining the right of way?

"Motor car accidents and how to prevent them."

BULLETIN BOARDS AND THEIR USES

Mr. Switzer also referred to the safety bulletin board. We have recently standardized the safety bulletin boards on the New York Central

and I will pass out for your inspection a photograph of our board. At the top is "Safety" in green letters. Underneath, in green letters, "This board is for safety bulletins only." The board will accommodate four of the standard size National Safety Council bulletins.

Mr. WIGHTMAN: Is the board covered with glass?

CHAIRMAN DOW: Yes, sir; to protect the bulletins.

MR. CLARK: How are the bulletins fastened to the board?

CHAIRMAN DOW: Our arrangement calls for pasting the corner, but some of our men are trying to work out a clip or fastener.

MR. CLARK: We have had trouble keeping the bulletins in the board because no fastener is provided.

MR. WIGHTMAN: The board is made for four bulletins. Do you allow one to be pasted over the other?

CHAIRMAN DOW: We require bulletin matters to be handled by our local safety agent. Of course, we have been at this work quite a long time and have grandually built up an organization on the New York Central Lines. We now have twenty district safety agents and their territory is confined to an area which will permit them to supervise the bulletin boards, to see that when the bulletins are changed the old ones are removed and the new ones put in. They give this work their personal attention.

MR. MCCAMPBELL: I have a suggestion: That possibly only one bulletin should be posted.

CHAIRMAN DOW: That is a matter of opinion, Mr. Babcock of the Pittsburg & Lake Erie has a board that displays only one bulletin at a time; they hang on a spindle and you can turn them over and read the old ones. He thinks that is a good idea and I do not say it isn't. Ours is a plan we have worked out and believe it will produce good results.

MR. METCALFE: On the Northern Pacific we have a bulletin board with four places for bulletins. We have one lettered "Injury Bulletins" for bulletins issued with a red border. Another space is headed "Death" and all death bulletins go there. Another space is for miscellaneous bulletins, this has a green border. The fourth space is reserved for a little case that holds safety suggestion cards and wherever a bulletin board is located the cards can be obtained by the man reading the bulletins. If he has a safety suggestion he takes out a card, writes his idea and mails it. We require the card cases to be filled at all times; the men cannot say they did not have an opportunity to submit a card.

BUTTONS FOR SAFETY COMMITTEEMEN AND OTHERS

MR. CLARK: We use safety buttons on the Short Line and whenever a committeeman is appointed I write him a letter and send him a safety button. I believe it has had good results in creating interest: if you get a man started right it is not very hard to keep up his interest. I would like to know what some of the other roads are doing with safety buttons.

MR. SWITZER: We use a safety button.

MR. WIGHTMAN: I know of one road that has a button that it supplies to each of the men. It is a heavy metal button with the designa-

tion of the road across the center and around it "Member of Safety Committee." They have another button, made in a good deal the same form, which they get in 10,000 lots and furnish to all employes. The plan has often had favorable comment.

MR. BENTLEY: (Chesapeake & Ohio): I am impressed with the importance of the bulletin with the black border for death notices and also with the importance of giving publicity to preventable accidents. As a matter of information, should we include in those two types of publicity accidents that result from unsafe conditions as well as unsafe practices?

CHAIRMAN DOW: I should say, absolutely, yes.

MR. BENTLEY: What is the attitude of the claim department?

CHAIRMAN DOW: I do not think that should be considered in the matter of preventing accidents.

MR. CLARK: There is one other point I would like to bring up, if we have the time: The sole object of safety work is to get results. If the suggestions handled by the safety committees and approved and work ordered done are not followed up to see that the work is done; that is, in case of change in equipment or anything of that kind, the men soon lose interest. I have found the quickest way to dampen a man's interest in safety work is for him to make a suggestion, have it acted on by the committee and then get no results. I would like to know if it is the practice for safety agents to check up all the suggestions that are handled in this way to see that the work is actually done. I have found that is the biggest part of the work on the Oregon Short Line. I do not mean by that that our officials do not want to do the work, but in the stress of busy times and shortage of labor it is often difficult to get the work done. Unless you keep after it, even though the work order is signed by the general manager, the work will very often slide along for months. It seems to me that is the most important point in keeping up interest.

CHAIRMAN DOW: I agree with you perfectly. On the New York Central we follow the practice of checking up every item that is reported, not only by the committeemen, but by the safety agents—we have a follow-up system. When the safety agent reports an unsafe condition he fills out a safety work card, sending the original to the superintendent of the division on which the correction is to be made and a duplicate to the safety department. If within thirty days the superintendent has not followed the instructions written on the bottom of the card and sent it to the safety bureau, indicating that the work has been done, we send out a form letter checking the matter. Safety committee items are carried over on the reports from one month to the next until finally disposed of.

GIVE CREDIT WHERE CREDIT IS DUE

Another point, before we leave this topic: Something has been said about giving a man credit when credit is due. One of the most important things in connection with safety work is not to confine your efforts and work to criticising men or to reporting unsafe conditions, but, when a man does something that is creditable, something that deserves a compliment, give it to him. I will read one or two sample letters I have written upon reports made to me either by the superintendent or the safety

agent in the district of some officer or employe in his territory who has given him especially fine assistance in safety work. There isn't anything that I know of that will help boost the *morale* of the safety committeemen more than by recognizing their work.

"Dear Sir: Attached to the minutes of the Division Safety Committee of the Ontario Division, held on Sept. 9, we note your paper on the subject 'Motor Car Accidents and How to Prevent Them.' I would like to personally compliment you on the care with which this paper is prepared and upon the effectiveness of the arguments contained therein. I am sure if every employe could be impressed with the need of conserving manpower, for the reasons outlined in your paper, that a great service to the Nation at this critical time would be rendered. We thank you for your co-operation and if there is anything further that you can do among the employes to impress them with the necessity of carefulness as a national asset at this time it will be equally appreciated."

Here is another: "Safety Agent T. R. McCampbell advises me that you have been giving excellent co-operation in connection with safety work and that there has not been an injury to an employe in your department during the present year to date. This is a splendid record and one of which you ought to feel very proud. I am sure that every member of your department will feel the same if advised of it. I wish to personally thank you for the interest you have taken in accident prevention and assure you that by so doing you are rendering a distinct service to your country at this time, because it is important that every man shall be kept on the job and not be incapacitated either through injury or other cause, if it can be avoided."

MR. CARROW: Do you write direct to the man, Mr. Dow?

LETTERS OF APPRECIATION FOR GOOD WORK

CHAIRMAN DOW: Yes, sir; I do not care whether he is a section laborer or who he is. It does not make any difference whether he is a superintendent, trackman, or what.

MR. HALE (Santa Fe): Mr. Shedd says they feel they have accomplished something. We feel the same way on the Santa Fe. Some one asked me if I would not mention the fact that with 11,000 miles we went ninety-three consecutive days this spring and summer without the loss of an employe and that during the same days last year twenty-one men were killed. I confess I would get goose flesh at what we might accomplish if we had the *morale* on our road these gentlemen claim they have on their lines.

We give a celluloid button to everyone who will wear one and we have a button of another color which indicates that the wearer is a member of the safety committee. We have a safety committee on the line out of Albuquerque: it is a local committee, and, by reason of being its ranking officer at this point, the agent has been its chairman since its inception six years ago. This agent died recently and before his successor was appointed our general yardmaster at Albuquerque, a little Irishman, became ex-officio chairman of the committee. He has adopted

something you gentlemen might be interested in: At the first meeting over which he presided he had the mayor of Albuquerque, the chairman of the Chamber of Commerce and three or four ministers; he also had a dozen representative merchants of the town. He told me that at the next committee meeting he expected to have 100 of the very best people of Albuquerque. I offer that as a suggestion.

Picture projecting machines were also discussed. We have gone into the picture business quite extensively during the six years of our safety work. On my first trip I took a big Edison machine, but it was cumbersome and heavy and you have trouble with the fire marshals. After investigating all of them, we think the one Mr. Broderick spoke about, the DeVry, has certain merits. During the last two years we have been using a Victor Anomatograph. It has a Mazda lamp and a very small pencil carbon, about as big as a slate pencil. Mr. Broderick spoke about showing a picture ten to thirty feet. With this little machine (you can pack and carry it in two suit cases) I have put on a throw of 110 feet. At Topeka, last year, where we showed to 5,700 people in two nights, a great many people asked what machine I used—they had never seen a picture so brilliant and with the lines so clear cut. If you are contemplating buying a portable machine, possibly the Victor Anomatograph, which is made in Chicago, might be of some help to you. You can change from an incandescent to the carbon light by the snap of a finger.

RESOLUTIONS OF APPRECIATION

Mr. Arthur T. Morey, a gentleman whom you all know and love, made a suggestion to me last night which seemed to be very admirable. The Executive Committee will acknowledge by wire the very cordial message of greetings from Mr. McAdoo and Mr. Morey thought it would be appropriate if this Section would send a message signed by its Chairman and the Secretary, thanking Mr. McAdoo for his cordial greetings and for the co-operation, the help and the backing he is giving us.

MR. RALPH C. RICHARDS: I would suggest a resolution directing Chairman Bell to send such a message. (The resolution was seconded and unanimously adopted.)

MR. RICHARDS: I would like to suggest a resolution of thanks to the Chairman and members of the Entertainment Committee for the very fine entertainment we have enjoyed and the many courtesies extended to us. (The motion was seconded and unanimously adopted.)

CHAIRMAN DOW: We have had a wonderful discussion. I am sure I got a lot of good out of it, and if the new men got nearly as much out of it as I have it will be of great benefit to roads just beginning safety work.

RAILROAD OFFICIALS AND SAFETY ACTIVITIES

To conserve time the two topics, "Reaching Officers and Obtaining Their Co-Operation" and "Duties of a Safety Agent" will be handled as one subject. Let me say a word about maintaining the interest of the railroad official. We have heard much about the carelessness of the employe

causing a large percentage of the injuries and deaths to railroad and industrial employes—about carelessness or thoughtlessness. Let us stop and consider the question. It is true that a large percentage of the accidents to railroad and industrial employes are of a character which can only be prevented by the exercise of the greatest care and thoughtfulness on the part of the men involved, but you will find, nine times out of ten, the cause goes back further than that. It goes back to the question as to whether or not the foreman, the yardmaster, the trainmaster, or some other officer in charge fulfilled his whole duty in instructing and showing the man how to do his work safely. It seems to me that is a vital thing in connection with our safety work.

The attitude or the frame of mind of the superintendent on the subject of safety is reflected in the mind of the yardmaster or foreman, and the attitude of the foreman or yardmaster is reflected in the men under him. The yardmaster or foreman, as the case may be, is in close personal touch with his men, he is constantly with them and he should know whether or not his men are indulging in practices that are unsafe. There is where the work of the safety agent, in my opinion, is of the utmost importance—reaching the foreman or the man in charge and selling the safety idea to him. Do not be mistaken, do not rest on your oars and say, now that the government is back of the safety movement, there is nothing to it. Of course, government control of the railroads and instructions in regard to safety work have put a wonderful kick into this thing and will carry it along, but you will get better results if you will go to the man in charge and educate him, sell the idea, and show him where it is up to him to get back of the movement to educate his men and show them how to do their work the safe way. If you do not do this you are not going to get the full measure of success we are all after.

A SUPERINTENDENT THAT DISCOURAGED HIS MEN

I recall a certain superintendent on a certain railroad who was apparently a good safety man. He held his safety committee meetings and was usually in attendance; apparently he was right there with the goods. But out in the yard, in the principal terminal, on a certain day he wanted to know why a bunch of cars could not be moved along a certain track. The yardmaster informed him they could not get that track because the safety agent had arranged to have a work train put on there for an hour or so to clean up the rubbish that was lying along the track—a safety item. The superintendent went up in the air; he lost his head and said: "To hell with the work train. They are carrying this safety work too far." The ill-timed remark destroyed the spirit and *morale* of safety in that yard for a long time. That is the point I wanted to bring out.

Another example, of the opposite character: A certain vice president of one of the railroads that I represent was out in the yards one day and he saw a drawhead lying alongside the track. He was with some officials—the general manager, general superintendent and a number of others. He went over to the section foreman, he wasn't far away,

and asked: "Why has not that been removed?" The section foreman said: "We have been pretty busy and have not gotten around to it." The vice president took his watch out and looked at it, then he said to the section foreman: "Take the other end." He helped the section man pick up the drawhead and carry it over to a safe place. Then he took out his watch and said: "Thirty seconds; perhaps we have saved a man's life!"

Any number of proprietors of industrial plants, members of this organization, have not achieved all the success they desired in safety work because they have not been good safety men at heart. The spirit of safety did not pervade their plants, because they were not good leaders. They seemed to think all that was required was to shout "Safety First!" post a few bulletins in their plants and let it go at that. Safety work is not based on pretense—success will only come to those who compel it. We achieve success because we believe we can achieve it and you have to educate the man in charge to believe in the work and get back of it heart and soul before you get the full measure of success.

In opening the discussion on this topic I will call upon Mr. A. W. Smallen, General Safety Supervisor of the Chicago, Milwaukee & St. Paul.

MR. SMALLEN: This is my first meeting with this Council as a member. In summing up the subject laid out for me I want to mention a few items in regard to the things that led me up to this talk. I have watched Mr. Richards for the last six years, or ever since we have been in this movement, with a sort of a I-couldn't-quite-understand-what-his-object-was attitude. A man whose life has been spent in helping the maimed and the killed, whose past living had been made by the kind of business that was brought to his office through carelessness, and I wondered why he bent such strong efforts to discourage that business from his office. Last night most of you heard Mr. Schermerhorn cite the remark of Grant "Let us have peace!" and I readily saw the object of, as we all call him, "Daddy" Richards. Let us have peace! Let us get away from the demoralizing condition we have been in. He possibly knows better than any of us and appreciates more than any of us the importance of the one thing we are all hoping to attain, the reducing of accidents. Let us have peace! The more peace we have the more happiness we will have and the better results and better conditions will exist on our railroads. That is one of the important factors in interesting our officials and when I speak about our officials I mean the highest officials. The Federal manager of the railroads is responsible for the acts of his general manager, the general manager is responsible for the acts of his general superintendent and every man that reports to him; if he is not a thorough Safety First man, in the true sense, you can not expect much from his cabinet.

MEN ELECT THEIR OWN COMMITTEEMEN

How are we to accomplish this? In my six years as head of the safety organization of the Milwaukee Railroad—we have a fairly large railroad; we employ about 70,000 men, we cover about 11,000 miles of track, we run from the shores of Lake Michigan to the shores of the

Pacific Ocean—we have had a great many conditions to contend with We go partly through a warm country and party through some ver; severely cold countries in the winter time: conditions differ. I want t impress upon you that I believe that most of us have half of our battl won if we are connected with a man who has come through the servic from a water boy to president. a man who appreciates the suffering o the men whom he knew, that could have been prevented had they don the work that their own consciences told them should be done. Just a soon as we can get our accident list down to a figure that will attrac the attention of the entire world just that quick are we going to hav greater privileges in taking care of some of the suggestions that to-da are prohibitive on account of the necessary expenditure of money by ou officials.

The question came up to-day as to selecting committees. I think tha subject is just as important as is the selection of the president of th railroad. I heard the discussion and I believe I am safe in saying tha we are the only railroad in the country that follows our method of select ing committeemen. You do not know a man until you live with him an the man who knows the best man on his division, with all respect fo the superintendent, is the fellow that is in contact with him daily The superintendent as a rule is. or. should be, a very busy man. He gets to see the individual man probably once a month—not oftene than that; but the fellows that are in contact with him continually know him, and when we hold a meeting for the selection of committeemen the superintendent has nothing to say about it. We have a meeting o probably 200 men and they select every committeeman. There is n odium about our selection of committeemen. The men tender him the highest honor within their gift—to be selected by his fellowmen to serve as their guide in the safety movement. If they make a mistake, they can always recall him, but, thank God! in six years we have only found one man who did not appreciate the office, and he resigned. Out of some forty-two committees, in six years. we only discovered one mistake. If the employe is not able to select a man capable of representing his interest, I do not know who is. There is always this condition to contend with, blood is thicker than water; we have our friendly feelings about different men and we may be partial in our selection. The superintendent may see something in a fellow that he feels is much better than in another one and neglect to appoint the fellow that he does not see the good points in for the simple reason that he has not seen him daily at his work—we contend that the employes will. That is one of our assurances to our management: that is one of the reasons why on the Milwaukee railroad we have secured co-operation from our officials. Another is through our large reduction in accidents. We are not throwing bouquets at ourselves. we are all brothers here and talking facts; we are trying to help one another, but in six years we have never shown an increase in accidents or deaths. We have always had a decrease and to-day we have reduced our accident list 25 per cent and our death list 40 per cent.

MR. CARROW: This year?

CONCRETE FACTS WANTED

MR. SMALLEN: Yes, sir. I do not believe we could cite proof to better gain the interest of an official. A man of good, sound business principles will be slow to commit himself on the success or the failure of anything —he wants concrete facts. I do not believe there is any other way you can convince a man that the money he has expended and the time that he has allowed employes to attend meetings, with pay, has been amiss when he realizes that every year for six years there has been a reduction in accidents and a reduction in deaths. We sometimes feel that the presence of a Federal manager at a meeting would be a stimulant to the employes. I want to tell you a little story I heard from Dr. Lipscomb the other day. I may be stealing his fire and you probably have heard the story, but it fits in pretty well with the safety committee proposition and with the official end of our family. Dr. Lipscomb was in the State of Washington, in the woods, a short time ago, and they brought a lumber jack in with his head split open, caused by gross carelessness. In examining the man's head Dr. Lipscomb said: "That is an elegant head." The fellow replied: "It ought to be. It hasn't been used in over thirty years."

All we have to do in our organization is to follow the instructions Mr. Belnap gave at Milwaukee at our joint meeting with the North Western. Let us use our heads. Let us go to our meetings, as Mr. Switzer recommends, and interest the employe: make him understand that it is not a movement of the officials of the railroad, but of the employes, and when we insist that we will have nothing to do with the appointing of a committeeman the proposition is put strictly up to them and success must follow. I say success, for the simple reason that we do not know anything else on the Milwaukee Road in safety work but success. While it has not been as great as hoped for, and while we realize there will always be accidents on a railroad, I firmly believe that we have reached a point where we are beginning to remove at least 40 per cent of the thoughtless and careless accidents that happened in years gone by.

CHAIRMAN DOW: In the Union Station are parked the safety exhibit car and one of the motion picture cars of the New York Central Lines. Any of the delegates that have time to visit them will find the exhibit in the safety exhibit car well worth while.

We will deviate for a few moments from our own little party and listen to a man who has done wonderful things in connection with safety work outside of the railroads; a man who began his safety experience with the International Harvester Company some fifteen years ago. He was the safety expert of the Industrial Commission in the State of Wisconsin for four or five years and during that period made a remarkable reduction of industrial accidents in that State. For the past few years he has been the Field Secretary of the National Safety Council. I am going to ask this gentleman if he will give us ten minutes of his inspiring talk on the subject of "Maintaining the Interest of the Employer in Safety Work," Mr. C. W. Price.

EXPERIENCE IN A THOUSAND PLANTS

MR. C. W. PRICE (Field Secretary, National Safety Council): It has been my lot in the five years I was in Wisconsin and the two years I have been with the National Safety Council as Field Secretary to visit plants in which they were not getting results. They built a few guards, to comply with insurance and State requirements, but they were really not getting hold of the safety idea, and in every case, of course, I called upon the manager or "big boss." In every one of the thousand plants I visited only about one plant in ten—in cities like Detroit and Pittsburgh, strange to say—are really doing efficient safety work. In every plant, without an exception, where I found they really had not grasped the safety idea and were not getting results, I have found one thing the matter, always and without an exception: The manager, the "big boss," did not believe in it. He had never put it on the map, as he had put fire protection, for instance, or production.

Why didn't he believe in it? I do not think anything has interested me more, or surprised me more, friends, than to find that very few general managers are acquainted with the remarkable results achieved through the safety movement. You would be amazed at the remarks made to me after I have given a talk in regard to the Steel Corporation or the Harvester Company. I have had managers tell me how surprised they were to learn what had been accomplished. In every case—in every one of those thousand plants I have visited—the fundamental difficulty was that the manager does not believe in it. He did not believe in it because he was mean—I meet very few men who are mean or indifferent to human life; they are just about as white and decent as we are and about as ethical. But they are not informed—I would not have believed it had I not met so many of them.

What are we to do? You talk about reaching the superintendent and the foreman, but I tell you that it is impossible to reach the superintendent and foreman until you have reached and convinced the manager you can not organize a plant and get results until the manager believes in it, until he gets back of it and stays back of it so unmistakably that there isn't a foreman or workman in the plant but knows to a dead open-and-shut certainty what the manager thinks about safety and what he expects him to do. He must put it on the map and give it a dignified position in his organization., just as legitimate as fire protection or production, or anything else that saves waste, take it out of the baby class and put it into the business class and make it a part of his organization.

THREE-FOURTHS OF ALL ACCIDENTS PREVENTABLE

In order to convince the manager—I have found there is just one little story that convinces them. I tell them what we have demonstrated—that it is not a theory, but a fact and it can be proven—in the last ten years that we can absolutely eliminate three-fourths of all deaths and serious injuries, and then give them figures to prove it.

I find they are always interested in the experience of the Steel Corporation when I tell them, as I always do, that during the first eleven

years of safety work they saved 19,813 human beings, as compared with 1906, saved $11,000,000, and tell them what Judge Gary thinks of safety. I tell them of what the Illinois Steel Company has done—that in face of the fact that they had already reduced serious accidents and deaths in their three plants near Chicago over 80 per cent. and in the face of the most abnormal labor situation ever known in Chicago, last year they made the largest reduction over the previous year ever made. I say to them that is a demonstration of a thing we did not know ten years ago: that we not only can make those reductions, but we can actually get control of the human element and keep control of it. That is all new to the manager and I usually give him three or four figures of that kind. I give him the inside figures of the Harvester Corporation: Last year it cost them only 25 cents on $100 of pay roll to pay all compensation, which is 10 cents less. Mr. Dow, than the premium you have to pay on liability on a clothing store. That interests him.

"I happen to know. Mr. Manager. that the Harvester Company has made a larger dividend on that investment than in making mowing machines." Then I tell him this: "Do you know that two-thirds of all that has been done has been accomplished outside of mechanical guards in your plant and the majority of the plants that have complied with the law and with the insurance companies requirements? As a matter of fact, if you make an analysis of accidents, as I have many times, you will find that not more than 5 per cent (I found the other day that the Solvay people say only 2.9 per cent) of the accidents could have been prevented by mechanical guards."

Reach your foremen, absolutely convince them and get them on the job, and through your foremen reach the workmen. Unless the foreman is convinced you cannot reach the workman, but you cannot reach the foreman unless you put safety on the map—not only put it on the map, but stay behind it actively.

WONDERFUL SAFETY RECORD OF SAFETY WEEK IN ST. LOUIS

CHAIRMAN DOW: Gentlemen of the Railroad Section, I want to present to you the Chairman of the Arrangements Committee which has given us such a fine Congress.

MR. ARTHUR T. MOREY: I am going to tell you something that will make you happy. We talk about Safety First being *thinking first*. That is all it is—Safety First is simply a study of the right way of doing things. We put on a safety campaign in St. Louis. What have we done? I just met Coroner Vitt, who, with all the city departments, has joined heart and soul in this effort. He said that during the four days of last year—corresponding with Sunday, Monday, Tuesday, and Wednesday of this week—twenty deaths were reported to his office—of course, all accidental deaths are reported immediately to the coroner's office. The bulletin board announced three deaths last Sunday; he says that was not so, they were inquests of deaths that occured Saturday. Since 8:30 o'clock last Saturday night he has not received a single report of an accidental death. That shows what can be done.

MR. PRICE: In two years they have never before had a day in St. Louis without a death to report to the coroner.

MR. MOREY: Accidents that were not fatal have been reduced in proportion.

CHAIRMAN DOW: We have heard many splendid ideas and thoughts from the safety men of the various properties, and there are others I shall call on before we adjourn, but I think we should hear from one or two of the men of Mr. Belnap's staff. I will ask Mr. Duffy, Assistant Manager of the Safety Section, to speak at this time.

THE SAFETY SOLDIERS' DUTY TO HIS COMMANDER-IN-CHIEF

MR. A. F. DUFFY: I am glad to have this opportunity to address you on "How to Interest Committeemen." The best way to interest committeemen is to have the chairman of the committee present. What would this particular Section amount to if the officers failed to be present? It would be a blank failure. The stage is set right. orders have been given by Mr. McAdoo to Mr. Belnap to organize a Safety Section, and this has been done. There is no question as to why this has been done, every man present this morning is actuated by the thought as to what he can do and how best he can serve the illustrious Commander-in-Chief of the Army and Navy, President Woodrow Wilson. Your answer and my answer as safety men will be to save men. In the final analysis that is what must win the war—man-power. Then what more can you go back and tell your safety committeemen than that the work they are engaged in, the work to win the war, is to save human life?

After visiting many States and talking with the regional supervisors and the general managers and the general superintendents of railroads they have all said: "We are with this movement." There is no question in my mind. if the big men in charge of the properties are with this movement, where must the superintendents be. the men who are to act as chairmen of the safety meetings? What would it mean to us, when we go to Washington, if we found the manager was not present? There is always a lack of interest; there is no question but that is the strong point in holding the attention of the men. If the superintendent of the division does not show a spirit of patriotism and loyalty to his men, to whom he is constantly preaching for their co-operation. and he is not willing in return to give some of his time to show that he is trying to put safeguards around them by at least his presence at these meetings, he is not the man for the job. That is my feeling in the matter.

I heard a discussion this morning as to what should be worn as a safety emblem for this organization. When the final decision comes for an emblem, there is but one that has always been a safe emblem and that is this (a small American flag). Wherever this flag floats there is safety. This flag is carried by your sons and my sons. the flower of the Nation, on the bloody battlefields of France and Flanders to make this a safe country to live in. Why not adopt the flag as an emblem of safety in the industrial world—to save human lives and to win the war? I thank you.

CHAIRMAN DOW: Our next speaker will be Mr. Harry A. Adams, Regional Supervisor of Safety in the Central Western Region.

SAFETY SERVICE A PERSONAL DUTY

MR. ADAMS: After seven years of work under the manager of the Safety Section, Mr. Belnap, with the Interstate Commerce Commission, I become every day more imbued with the idea of safety. All of the work of this particular division, the Bureau of Safety, is along the lines of helping employes, not only in preventing accidents but in the way of bettering his financial condition and thereby bettering the corporate interest. All of it goes together and, of course, the salient point is the saving of the employe, the man that is facing the danger.

When this position was tendered me I gave it considerable thought. There were many reasons for this. I felt that I was established with the government and had possibly reached my pinnacle. I knew it was a position for life. I had been in a district in Missouri and Kansas for seven years and I had formed the acquaintance not only of practically all the officers of the railways but of the employes, and I had many friends. My home was in the district and, taking all things into consideration, it was a serious question for me to decide. Finally, while on a vacation in Denver, Mr. Belnap wrote me again, saying: "Come to Washington before you decide." I went to our national capital and after he talked to me in the manner in which he did, not holding out alluring prospects or anything of that kind, but talking of the work I was to perform, the work I was to assist in, I gave him my hand and said: "I am with you!" I resigned from the government service in that particular branch and entered this, and since coming here I have received the same inspiration that I received the day I decided to lead a better life. That was one of the happiest moments of my life, when I went from worse to better in spiritual things.

The many brilliant things, the many instructive things that have been said, the many things that have come to our attention here that say to us "We are our brothers' keeper!" mean a great deal, gentlemen. I do not believe that anyone could be more thoroughly inoculated with the safety fever than I have been.

CHAIRMAN DOW: Another Regional Safety Supervisor, Mr. Frank A. Wightman, will be our next speaker. He will tell us something of his idea of what a safety agent ought to do.

DRAFTING A CAREFUL MAN AS AN OFFICER

MR. WIGHTMAN: You have built your committees, you have perfected your organization, your standard to work to, now you will go out and watch the activities of the individuals on your committees. You will find a roadmaster that has the cleanest division on your entire railroad, it is freer from hazards. The station grounds are kept clean, the stockyard gates on his territory are locked back, the containers of chats, sand and other material belonging to the company and to commercial concerns are out of the way of the employes in the performance of their duties. These are all covered in the transportation and maintenance of way book of rules and have been observed by this roadmaster. He has brought this condition about by having monthly or bi-monthly meetings with all of his section foremen, at which time he has instructed them in

the safe manner in which to guard employes in the performance of their duties. He has, you will find, the tools, such as spike mauls, in perfect condition. You will find his chisels without cauliflower or mushroom and crystallized heads—conditions that have destroyed the eyes of so large a number of section men. You will find the decks of his push cars in perfect condition, material will not fall through and injure his men. You will find that his handcars have, according to instructions, the water tank or cooler on the side, instead of at the end, where in using the handle bars, his men might mash their fingers.

Probably, as soon as your work develops, you will want a supervisor of safety to help your superintendent of safety in the performance of his duties on the road and in looking over the field you will find this man standing out in bold relief and the management's attention will be called to him. He will say: "Why aren't all our roadmaster's divisions in the same safe condition?" You go to your claim department and you will find that day after day accidents are occurring to the men on other divisions, but this roadmaster has worked eighteen, twenty or twenty-two months without a personal injury to the men on his division. You will find, when you investigate a derailment, that it was due to other things than weak track—you want your other division roadmasters to put their territory in the same shape. So you select that man for safety supervisor in the maintenance of way department on your railroad. You arrange an itinerary for him with the other roadmasters, reporting direct to the superintendent of safety. He is a man that has the right temperament; he has shown the right interest in his men. He has shown the proper observance of the rules of the company and he goes out to preach the gospel to the men: he is a convert to the cause and his territory shows the results of his conversion.

HOLD TIGHT TO THE GOSPEL OF SAFETY

You will find the same thing in your shops, in your transportation department and in your division committees; in other words, as is the father, so is the son in safety work. When you go over the division with the superintendent and you call his attention to a car extending over the clearance line he immediately wires and finds out who is responsible for the position of that car; if you find stockyard gates swinging open, trains moving out of the station without trucks being in the proper safety zone, and he investigates by wire, I assure you that is the division superintendent in whose history you will find the smallest number of accidents. You select men who have made a success on their divisions or in their shops as your supervisors or inspectors of safety. Their duty will be to educate other employes, especially the foremen and assistant superintendents, and call the attention of the men to the hazardous manner in which they are performing their duties—convert them to the cause of safety.

After a large meeting a number of the men will come up and shake hands with the speaker and say: "I have been converted to the cause; I am going to protect myself and will try to protect the men who work with me." Those men need a little encouragement. How many of you fel-

lows—I often liken it unto you—have been unfair to yourselves and to your families—have disregarded everything but what would not keep you out of jail? You have drank and gambled, spent your money and time away from home, and given just enough service to be on hand when your pay check came the next time. One day you dropped into a religious meeting and were converted to the religion of Jesus Christ. You start anew, but you have the customs and habits of a lifetime to overcome. The first thing you know you find yourself looking for a crap game or a saloon, but catch yourselves just in time and say: "I have formed a new resolution." You step along but stub your toe or fall down and you start off with "God——" "Hold on; I promised myself I was going to discontinue those things and live a better life."

The fight comes when you go back among your old associates and there is no preacher, no fellow from your church, no brother members to come around and take hold of your hand and say: "Bill, how are you getting along with your good resolution? Isn't there something I can say to you, isn't there something I can do for you to strengthen you in your new cause? Is the fight too hard for you? Let me talk these things over with you." You often find the fellow in the church that is just ready to slip; you often find the fellow that your inspectors or assistant to your superintendent of safety meet up with. Tears will come into his eyes and he will appreciate more than can be told any words of kindness or any words of advice that are given him in the right manner. You will often find a fellow that you cannot reach—it might not be that fellow's fault; it may be that you are not a good teacher. Find someone who has a disposition and a manner that will appeal to that fellow; don't stop, don't think that he is no good; remember, we are all students in our chosen profession. Most of us are students in our work and whenever we think that we are 100 per cent we are slipping back. There are many things that we cannot do that we can encourage other fellows to do—that is the work of the safety inspector.

ENTHUSIASM THE GREATEST SINGLE FACTOR

On the road I formerly represented we had 356 committeemen. To them the work was only a side issue and that is true on every railroad since safety work first began. Put a safety inspector under each division superintendent where you have a committee, or a shop where you have a committee of twenty to thirty men, and I will say without fear of contradiction to any man in this audience that your safety inspector, by his perseverance, by constantly contriving and constantly keeping in contact, will accomplish as much for you every month as was formerly done by your entire committee. He will send in more safety cards, in his territory, than your entire twenty-five or thirty safety committeemen. I hope to see the day when every railroad and every railroad official will get together in this movement, as we have gone into it here, and discuss it heart to heart and face to face. God will give the reward. I thank you.

MR. SHEDD: It was my great privilege to grasp the hand of a great, big superintendent—a 'Frisco man. I know this Section would like to hear from Mr. Charles H. Baltzell.

CHAIRMAN DOW: Let us hear from Mr. Baltzell.

MR. BALTZELL: The inspiration I got from the National Safety Council meeting at New York last year is still with me. Of course, I had a great deal of it before that meeting; I had been working in a way of my own previously, but we must remember the old saying: "Results are what count." My division won the Safety First prize three years in succession, simply by getting the co-operation not only of the employes on the line but of the people along the line as well, working with the boys and young men—the biggest asset of America today, as you well understand.

A few days ago a fellow came to my office door—it always stands open at Fort Smith—a big, fine looking man in uniform. I immediately recognized one of our railroad firemen named Draper, who had left five months before to go to a training camp. The first thing I said was: "Draper, how you have improved!" This is what we notice in our boys after going to the training camps—their improvement, physically, mentally and otherwise. "How much did you gain in weight?" "Forty-five pounds." "You seem to be taller." "I haven't grown any taller, I simply straightened up." He weighed 195 pounds and was six feet tall. One hundred and fifty men from my division alone joined the colors—only eighteen were drafted, all the other boys enlisted.

WITHOUT DISCIPLINE ALL FAILS

"Draper, what have you been doing in the camp?" I asked. He told me about being in the aviation camp and one thing was this: He was taken 3,500 feet up in a captive balloon. Then they strapped a big belt around his chest and the commanding officer said: "Now, Draper, jump!" I wonder how many of us would have jumped, 3,500 feet up in the air, when the officer said "Jump!" Draper said: "I am afraid." "Don't talk back to me; jump!" The parachute was located in the top and the folds were separated with tissue paper. When he jumped overboard everything cracked, popped and slipped and he thought the whole top was torn out. The parachute gradually checked his descent and he settled down to the ground, safe. He said: "I stood there until someone came and took it off." The point I want to make is that our railroad men are brave—bravery and safety go together. The poster the Council issued recently about Walter Flannery, the fellow that wore the goggles two years ago, proves this. Recently, at the Marne, he was fighting with French soldiers against the Huns. A Frenchman was captured and taken across the river—Flannery swam the river and brought him back. He was presented with the highest honors on the field of battle. Flannery lost his goggle eye—*not his own eye*—in the Ford automobile factory. (He had worked for a railroad previous to his automobile experience.) Here is a fellow who followed safety rules and principles and saved his eyesight; this saved him for his gallant adventure.

Write to the boys—you have boys over there—don't hesitate to write to them. I have thirty-five correspondents in this country and in France. I am about as busy as anyone, but I take time to write to all the boys.

New men are coming in and a great deal has been said about the foreman and his duties. See that the men are properly instructed in safety

work: get them to talking safety and thinking safety daily and we will get along splendidly with our safety work.

CHAIRMAN DOW: I will ask Mr. F. M. Metcalfe of the Northern Pacific to be our next speaker.

INTELLIGENT SUPERVISION MOST IMPORTANT FACTOR IN SAFETY

MR. METCALFE: I think Mr. Dow touched the keynote on reaching the officers and securing their co-operation when he spoke on supervision. When I first went on safety work, about four years ago, I had an idea that all employes were careless. Reports on injuries from superintendents indicated (rather, they charged) that injuries very generally were due to the negligence of employes or fellow-employes. After I had been on the work a few months I began to suspect that it was not quite so much the employe's negligence as it was lack of supervision. Touching on that feature of our work, I prepared a circular to all our supervising officers which I will read:

"Some one is responsible for preventable accidents, which are largely in the majority. Are you sure you are doing all in your power to prevent them by unceasing vigilance and by intelligent education of your men? Have you examined yourself to determine whether you have a thorough understanding of the company's rules and requirements which you are endeavoring to enforce? Do you get a thorough understanding of how each accident to your men occurred and study how to prevent a repetition? No class of work is highly efficient which has many accidents. To secure efficiency requires much patience and often work and time; it is well worth it. Judgment, too, is necessary to guard against selecting slow men for jobs where light, quick men are required. Hazard is increased by failure to do so. Slow-thinking, untrained men should not be placed around machinery or in places where presence of mind and experience are required.

"Men learn to work safely through you, who are one of the most important factors in accident prevention, and the necessity for your enthusiastic co-operation is therefore self-evident. Do not let your laxity be the price of accidents. Do not be bashful about sending in suggestion cards for improvements which you are not authorized to make. Be on the constant lookout to see how your department can be operated safer. Make safety not only your motto, but your watchword. Remember, the prevention of accidents is one of your chief duties, not only to the company which employs you but to your fellow man, whose safety is more important than the work upon which he is engaged.

"Each new employe should be watched, to determine whether he is inclined to be careless. When such is discovered he should be warned against the dangers which may result. A careful man is essential to safety. Get acquainted with your men; you will thereby get more service, harmony and co-operation, and the company fewer claims from injured employes. The human element enters prominently into your success—personality predominates.

"No educational code of rules can be written that will as quickly and efficiently produce desired results as will time spent in oral explanation

of the work in hand. Personal talks bring out many things of benefit to workmen. Supervision is to assure the correct performance of details. There are two ways to do work—a right one and a wrong one. The right way is the easiest, ultimately, and it obviates investigation and explanation.

ANALYSIS OF FOUR CAUSES OF ACCIDENTS

"Most accidents are due: To not knowing what is right. To doing what is known to be wrong. To not caring whether the act is right or wrong. To not stopping to think whether it is right or wrong. Of these

"The first is *ignorance.*

"The second is *disobedience.*

"The third is *indifference.*

"The fourth is *carelessness.*

"*Ignorance* is an injustice to employe and employer and inexcusable when displayed in the performance of regular duty. You should be the remedy.

"*Disobedience* deserves reprimand, suspension or dismissal, according to the gravity of the offense and attendant circumstances. Here is where your judgment is tested.

"*Indifference*—This is a serious condition—it is disloyalty and akin to crime. The man who does not care if he causes an accident is worse than a disobedient one. Acquaintance with your men will detect the indifferent.

"*Carelessness*—This originates more avoidable accidents than any other known cause. What is the remedy? It is to induce men to *think.*

"*Think* before acting. *Think* which is the safe way. *Think* whether it endangers them individually. *Think* whether it imperils their fellow employes. *Think* whether it risks the company's property.

"*Think Safety*—Soon safety thinking will become habitual. *Sow the safety habit and you will reap a safety man* and he will evolve into a *safety booster* and make *others think safety.*

"*Remember: Safe Men+Safe Methods+Safe Appliances=100 Per Cent Safety.*"

I sent this circular to all supervising officers and just touched on the word "supervision." I was pleased indeed to get instructions from the government regarding safety committees. The accomplishment of safety depends very largely upon supervision and education. The division superintendent and his staff officers are just as much subject to supervision as are the men under them, and if the staff officers, and even our general officers, know there is to be supervision by the United States government they will get busy and get busy quickly.

To show the interest in the Safety Section's work, I had the pleasure of meeting our former president, Mr. J. M. Hannaford, now our Federal Manager, when I was on the coast a short time ago installing safety committees. He has known me since I was a boy—I have been with the road twenty-seven years. He said: "Fred, I wish you would come into my car and tell me in detail about safety work. I am a traffic man and do not know as much about operating details as I might. Have supper with

me tonight and tell me about it." I told him all about it and after I got through he said: "Remember, you have three bosses now and you will have to be good. You have the general manager, to whom you report; you have me, and you have Mr. Belnap. I want you to impress upon all the officers of this company that they are working for the United States government in safety work. Tell it to the committees and any time the officers do not come across the way you think they should tell them what I have said. If they are not good then tell me personally and I will apply the remedy."

REACHING OFFICERS AND OBTAINING THEIR CO-OPERATION

MR. J. S. ROCKWELL (B., R. & P.): The Chairman has asked me to say something about the subject of reaching officers and obtaining their co-operation. Theoretically and from my experience no effort along the line of reaching officers and obtaining their co-operation should be necessary. Certainly under present circumstances and at this distance in time from the pioneer work of our father in safety, Mr. Richards, any railroad official who is not heartily, actively and energetically engaged, or at least greatly interested, in safety work is not fit to hold his position.

From experience, it seems to me that about all that is necessary to accomplish the end sought is to get the chief executive of the company interested in safety. If he can be reached and the word goes down the line every official will take an interest, perfunctory at first, possibly, but this will grow by use into a real and active interest. I do not think there is any railroad executive today who is not heartily in favor of this work. They are in the main broad-minded men and only need to have the importance of the work brought to their attention to secure the desired result.

Much can be accomplished with the lesser officials by putting them on safety committees. The actual working of a live committee, including the best of the rank and file, can but impart zeal and interest to all who come in contact with it. The friendly rivalry sure to arise among the different committees will add to the interest of all their members, officers and employes.

If the safety superintendent confers with the officers frequently, asks their advice and follows their suggestions he will get them every time. It is only necessary to get before the officers, whose minds are filled with transportation, engineering and mechanical problems, the relative importance of safety work, to make them the most enthusiastic workers. An assistant superintendent, a man of great ability and devoted to his work, said to me the other day he had so many irons in the fire that he could give little attention to his work as a member of a safety committee. He stated specifically that just then he had the duty of seeing personally fifty men in an effort to bring about fuel economy. It was only necessary for me to call his attention to the fact that his efforts with these men would only result in the saving of coal, a much desired and important result at the present time, while a like effort with his men along the line of safety might result in the saving of life and limb, the man-power so necessary now, to convince him that the safety iron was the most im-

portant one he could have in the fire, and deserved attention even, if necessary, to the neglect of all others.

If all else fails to get our officials interested they can now surely be reached by the patriotic argument, which perhaps should be the first to be urged. Many of the lesser officials, and some of the higher ones, would be taken by the selective draft, if a wise government had not decided that they could best serve the country by remaining at their posts, to speed up and maintain efficient transportation service. They should realize fully that their duty is now to the Federal service in their line, just as the soldier's duty is to fight, and if they feel this they will also recognize the truth that the safety of their men, the conservation of the man-power of the Nation, is the most important, the most sacred service they can render.

CHAIRMAN DOW: I have asked Mr. Isaiah Hale, of the Santa Fe, to say something on this subject.

BATTLES CANNOT BE WON BY LISTLESS SOLDIERS

MR. HALE: I seldom burst forth in a safety roundelay without saying, as a preface, that the safety movement is based on the none-too-well-known fact that economically the most valuable thing in the world is man. With that fact firmly fixed in mind one automatically becomes a convert to the gospel of safety and is kept there—one becomes a missionary in the evangelization of the industrial world.

I shall not trespass on your time or good nature by reminding you that war, as carried on by the giant nations of the world today, is a costly and fearful business; nor remind you of what we over here owe those over there. I shall leave all that for more gifted tongues, but taking your reasonable indulgence for granted, because of your patience in other years, I want to touch only and briefly on a subject I have played up strongly in my recent efforts among our men.

The war has rapidly resolved itself into a war of production and maximum production can only be accomplished by the maximum number of men showing their maximum efficiency, individually and collectively. Battles cannot be won by listless soldiers; maximum production cannot be accomplished by listless workmen; *morale* and enthusiasm are not lacking in our armed forces and they must not be lacking in we stay-at-homes.

While I grant you there has been an improvement since the Third Liberty Loan was floated, yet it is still largely true that as much of a menace to our national existence today as the German army is the lukewarmness and indifference of the American people to the whole war proposition; of a lack, and in instances an entire absence, of a proper sense of personal responsibility. Most of us are waiting for our resourceful and assumed to be ever-willing friend "George" to do whatever must be done.

A TIME FOR UNSTINTED SACRIFICE

In all my railroad experience I have never seen so much time wasted by men in all departments as is now being wasted, and what is true on our lines is true to a greater or less degree on yours. The solution of the present shortage of labor lies not in the direction of our enticing men

away from other nearby industries, which probably need them as badly as do the railroads, but rather it lies in being able to keep in service the men we already have and then accomplishing the Herculean task of getting each and every man to realize *his* personal responsibilities and cheerfully and loyally giving 100 per cent plus of his efficiency. Too few have any conception, or seem to care, what our present war effort means in men and material and without which intimate knowledge there cannot be that whole-hearted co-operation and unstinted sacrifice through which most of us must radically change our mode of living, and in many cases actually begin life all over again.

I am reminding our men in a kindly way, yet in language not possible of misuderstanding, that the industrial slacker, whether he be the man who criminally wastes his time, or the coward who hides behind an injury which he ought to be ashamed to have, is today the sharpest thorn in the side of our industrial life; reminding them they are no longer working for the stockholders of our corporation, they are working for the American government, and that they and I are the government; that if they waste my time I have a right to waste theirs and that if every man exercised the right which many of us accept as our own there would be nothing done and everything would go to the bowwows. In that event we could count on the man who had actually done the least to avoid such a catastrophe to be the first to drop back on his haunches and bewail the misfortune which had come to him.

Physical fitness, both in our army and in our industries, is the first essential towards winning the war; this alone will not suffice unless there is *morale* and enthusiasm to back it up. And so, if I might make so bold as to offer a suggestion to you safety men, it would be that your efforts to bring about a reduction in injuries to railroad men be supplemented by an endeavor to bring about a development which will make every man bend his every energy to keep his productive efficiency at top notch. This should not only be your privilege, but your duty; one can work safely without being efficient, but one cannot be efficient without working safely —we must make safety and efficiency as closely co-ordinated in fact as they are in principle.

CHAIRMAN DOW: We will now adjourn for lunch.

THURSDAY AFTERNOON SESSION

ROUND TABLE MEETING

MR. MARCUS A. DOW, Chairman, eighty persons were present. The session was called to order at 2:00 o'clock.

CHAIRMAN DOW: While waiting a few minutes for late arrivals I would like to call your attention to the use we make of illustrated bulletins in addition to posting them on safety bulletin boards. I have supplied each one of the safety agents on the New York Central Lines with a portfolio containing the bulletins relating to railroad and shop safety which we

receive from the National Safety Council. When the safety agent talks to groups of men, in cars, at meetings, in the yards or shops, or wherever he gets them together, he makes these bulletins the subject of his safety talk. He calls the men's attention to the specific unsafe practices illustrated in the bulletins—he has the finest kind of ammunition to shoot right at them. They use them even when riding in cabooses between stations on freight trains; it gives them something to talk about and helps advertise the bulletins. When the bulletins are posted the men, having heard the talk of the safety agent, are interested and study them.

MR. METCALFE: Are they your own bulletins or those of the National Safety Council?

CHAIRMAN DOW: Both. Our bulletins are often reproduced by the National Safety Council for general service and we use their bulletins as well.

I will ask Mr. Peter Groome of the Union Pacific to say something on the subject of interesting the employer and the duties of the safety agent

DUTIES OF SAFETY AGENT

MR. GROOME: Mr. Price sounded the keynote of safety this morning when he spoke about starting in with the general manager and working down. It has been my experience that on the railroads where we had the best success with safety we had the hearty co-operation of the general manager. The superintendent who knows that his general manager is behind him, or rather is backing up the safety movement, will see that his committees meet regularly and will not make excuses for not acting as chairman. We have heard a good deal about the superintendents and the chief clerks in these meetings and some may have gained the impression that the superintendents are not all they should be. I think I have as wide an acquaintance with operating officials west of the Missouri river as anyone in this room; I traveled over that territory for a long time and found almost every one of them trying to co-operate in the safety movement and in the enforcement of laws—the hours of service law and the safety appliance law. I think we have as good a bunch of superintendents on our railroad as anyone ever had. You may find one or two who are not so strong in enforcing the rules and administering discipline as the rest; in a way it is hard for them to do so. In the safety meetings I have attended (I have not been a safety man very long, but have attended every division safety meeting except one since I have been on the work) we have tried to impress everyone that it is their meeting; not the officials', not the chief clerk's, because we never allow the chief clerk to preside at our meetings no matter how capable he may be—the chairman must be an operating official.

The superintendent, you know, is a very busy man on most railroads and has lots of things to look after besides safety. Some one brings up a matter with not much merit in it and he may fly off the handle, but that is no reason for saying he is not interested. On our railroad, not long ago, I received a paper that was turned in at one of the meetings. It

was so well written and covered the point so thoroughly I wondered who it came from. On looking it up I found it was written by a section foreman by the name of Sam Wilson, in the Rocky Mountains, at a little place you would have to look twice to see. I began an investigation to find who Sam Wilson was and learned he had been there a number of years. When the Third Liberty Loan drive was on he subscribed $5,000 for Liberty Bonds—that is the kind of a man he was. I further found that in this little place there wasn't quite so much loyalty as he thought there ought to be—one man who owned a great deal of land and cattle and was worth probably $300,000 had told someone, when he went in to buy a War Savings stamp, that he did not have time to sell them; that he was busy. Wilson did not hesitate. He sent word to the United States District Attorney (where it would do the most good) and that man probably has a better idea of the feeling of this country toward Liberty bonds and War Saving stamps than he formerly had.

MANY USEFUL SUGGESTIONS OFFERED BY MEN

We heard a great deal yesterday about the Rock Island being 100 per cent. It was a fine showing, but on the division I speak of, in the Rocky Mountains, they went 100 per cent and the average subscription per man was something like $98 to the Third Liberty Loan. When you consider that we have all kinds of labor—Mexicans and a great many Japanese—it indicates the kind of men they are. Those are the men that are coming to our safety meetings. We have better meetings in that country, where it is thinly populated, than we do in Kansas City or Omaha. The men come in with ideas in their heads and they are not afraid to get up and tell you what they are. The superintendents out there ask everyone to bring in a suggestion—every committeeman is asked to bring in a suggestion to every meeting and in that way we have very interesting meetings.

The Federal manager of the Union Pacific, and that includes Mr. Clark's line, some time ago got a letter from France. The boy was not hearing from home often enough. Mr. Calvin was writing a letter every week and he began to think if this boy was hungering for information what about a lot of the other boys who only got a letter once a month, so he started the War Service Club and every employe is asked to contribute a small amount, from 10 cents to $2 a month. The money is not used to pay clerks' salaries, every cent is used to assist the boys over there and their families. The entire legal department of the road is placed at their service; so is the medical department, and if any of the boys' families are sick or injured in any way the Union Pacific Hospital Department takes care of them and it does not cost them one cent. Most of us are paying in at the rate of 50 cents a month and we never miss it as it is taken out of our pay checks. The War Service man has been traveling around with me, and after we hold our safety meetings—we generally get through in four or five hours—he holds his meeting. We are having very good results.

To some of the new men in safety work, no doubt there are a number of them, I would say: "Do not do your business with the chief clerk. Make him believe he is a good fellow, but talk it over with the superin-

tendent, not the chief clerk." I do not know how the general managers are on some railroads, but on ours it is no trouble to talk to him. If I am in Omaha on the third floor and he is on the twelfth floor (and the telephone on his desk is not connected with the chief clerk) all I have to do is ask for the general manager and he will tell me when I can see him; I do not have to wait in the anteroom either. We talk it over, then I leave and give somebody else a chance.

CHAIRMAN DOW: Mr. F. H. Babcock of the Pittsburg & Lake Erie will talk to us for a few minutes.

VALUE OF ACCIDENT REPORTS IN FACILITATING SAFETY WORK

MR. BABCOCK: I made a few notes and listened very attentively to the remarks of the men who have spoken and as safety agent on the Pittsburg & Lake Erie, having been engaged in the work for the past five years, I feel that, as a pioneer in that division of the work, I am very familiar with our safety activities. We have quite an organization and try to keep in the front rank. Our people are willing to take up any question that might prove meritorious; at least, we are willing to try it.

When I refer to the duties I advocate on the part of a safety agent I am specifying those actually being carried out under my supervision on the Pittsburg & Lake Erie Railroad. In the first place, the safety agent, when he enters upon his morning's work, should make out a daily report of his activities. I think he will find that very beneficial to him as well as to his superior officer. There are many times when we have occasion to refer back to our daily activities and the report will prove very important in many respects. Second, from my experience I am convinced the safety agent should receive a personal injury report of every accident occurring on his division.

MR. CARROW: Are you speaking of the safety agent in charge of the whole railroad or the division?

MR. BABCOCK: The division. For instance, Mr. Dow has quite a staff of safety agents and I do not mean that Mr. Hammond should receive personal injury reports from Mr. Tinley's district and so on, but as safety agent on the Pittsburg & Lake Erie I represent the whole division. I receive daily accident reports of every injury, it keeps me in touch with the various characters of injuries. Further than that, we get the benefit of the accident experiences and it gives us material to make up bulletins for the benefits of other employes. We try to issue a local bulletin every two weeks.

This morning we discussed various types of bulletin boards and Mr. Dow spoke about our board. We have about three hundred and fifty bulletin boards, located in various places. The board was designed by myself about five years ago, when we started safety work, and of course we thought it was a cracker-jack. Because we were in a hurry to get into the game and get the work started—we wanted to stop our accidents—we decided on this kind of a bulletin board. I agree with Mr. Dow that the bulletin board with the glass cover is quite an improvement over the old ones where we only exhibited one bulletin at a time. We try to locate our boards in places where the wind will not catch them and disturb the

bulletins and tear them off. Of course, it depends upon the location of the board how clean it is possible to keep it, but our men are very careful about handling the bulletins and oftentimes they like to refer to previous ones.

Another duty of the safety agent is to be familiar with the location of every bulletin board in his district; he should check up the bulletins periodically, keeping a record of the ones that go out and know they are properly placed. I do not mean that the safety agent should put them up—I make the distribution of the bulletins through my office and sometimes post them personally, but generally have them posted by a foreman or the man in charge of the district in which the boards are located.

The safety agent should attend all meetings of safety committees in his district, if possible. We have sixteen committees on our road and I attend all of their meetings, except when business of importance prevents.

MR. CARROW: Are you the only safety agent?

EXPERIENCE OF SAFETY AGENT GIVEN TO COMMITTEEMEN

MR. BABCOCK: I am the only safety agent. Since under Federal control Mr. Yohe, our general manager, has been appointed manager of the Monongahela division and also of the Lake Erie division. At the last meeting of the central committee it was decided that these roads would be included in our organization, so that will add to my duties. We will organize new committees within a very short time on these two roads. The safety agent should keep well posted on matters concerning accidents, recommendations, etc., brought up by these committees, and thereby be in a position to give the benefit of his knowledge and experience to the other committeemen. I have noticed at some committee meetings there has been a tendency to lag, due to the fact that there was not very much to talk about. A safety agent has an opportunity to get in good work by keeping posted on matters brought up by other committees and showing what they are doing, stimulating interest in that way, so that he will be able to start a discussion of some kind in which all members of the committee may participate and thereby avoiding what we might term a post-mortem or funeral. I believe in commending men for speaking up.

The safety agent should also make periodical inspections of machinery. That is important, and I am following it up very closely. In our main shops at McKee's Rocks the machines are equipped with portable guards and I have found where men have had occasion to change the gears, on lathes especially, they do not replace the guards. I try to make weekly inspections and when I find a guard out of place, where a passerby is apt to catch his finger or his clothes, due to its being exposed, I offer an object lesson by asking the man to shut off his machine, pointing out the oversight on his part. We are getting good results in that way. Our little conversation has a wonderful effect on the men working close by.

Our meetings, I think you will agree, are wonderfully successful. If you get the men right off the job and have a little heart-to-heart talk with them it does a lot of good. The safety agent should always make himself one with that body and not try to hold his head higher than the man on the job.

I had a little meeting at Monaca station about two weeks ago. A bunch of section men were sitting down to lunch under a tree. I went over and admired a new aluminum dinner bucket of one of the men. He seemed to take a good deal of pride in it and I felt that he would be pleased if I said something about it. I got into the good graces of these men and led up to the point of safety; before I got through those fellows knew my mission. I have every reason to believe that we get good results from these little meetings. We have rallies and of course it is one of the duties of the safety agent to drum up enthusiasm and also to open the meetings. We have had quite a number and have used Mr. Dow's pictures with great success.

I happen to be a first-aid man, having taken the course and receiving my diploma. We now have three classes and about seventy men have taken the course and received diplomas. We are taking in women and they seem to be very enthusiastic about the work. It would be a good thing if we could make every employe on the railroad a first-aid man, so that he would know the importance of caring for his own body. We all have more or less trouble in educating our employes to wear goggles. We are doing everything we can and are gradually getting there, but it takes time.

MR. HARTLEY (Michigan Central): May I ask Mr. Babcock about the daily accident reports from the claim agent to the supervising officials?

ACCIDENT REPORT WHICH REMEDIED AN UNSAFE PRACTICE

MR. BABCOCK: Our general manager gets a copy of the telegraphic reports. The head of the boiler shop, the machine shop, or whatever the department is, sends a report to the general office and copies are made for the general manager, the superintendent, the claim agent, the safety agent and so on. Of course, they are of no use after they have been read over and the proper procedure has been taken as to the cause of the accident and so on, except that the claim agent retains them in his files. It is just as easy to make six as it is to make one copy and I think the safety agent ought to have them.

MR. HARTLEY: I believe so, too. What I wanted to know was whether he waited until it had gone through the claim agent's hands.

MR. BABCOCK: While sitting in my office one morning, analyzing these reports, I ran across one which showed that one of our engine wipers had been burned very severely on both hands. I was very curious to find out how that accident occurred so I immediately got on a train and went to Newell, fifty miles away. In investigating the accident I discovered that this fellow, just recently employed, had conceived the idea that by wrapping a piece of waste around each arm and tying it in a knot, in wiping overhead, the waste on his wrists would absorb the oil and stop it from running down his sleeves. So it developed that on this day—all the other fellows thought it was a brilliant idea and had followed suit—this man had been standing on the running board of a locomotive, reaching up and wiping over the boiler fixtures. A boiler-maker had been working in the firebox at the time and had placed his torch—we use torches sometimes in these outlying districts where we do not have electric lights—on the

top of the boiler. Accidentally this wiper reached up and got a little too close to the flame and the waste on his arm, saturated with oil, had ignited. In his effort to remove the burning waste he had brought his other hand over and the band on the right arm had ignited. There he was, burning. He couldn't get it off—he was helpless. He shouted for assistance and the other fellows, with waste wrapped around their wrists in the same manner, tried to help him. One fellow managed to get the waste off his arms, but only after the man had been severely burned. He spent two or three months in the hospital, where it was thought he would practically lose the use of one hand, but he is coming around all right now.

As a result, I investigated the accident and held a noon-hour meeting immediately. We stopped the practice right there. It is very important, I think, that each safety agent receive reports of all accidents on his division.

MR. METCALFE: Do you go to where every accident occurred and make an investigation? What would you do if you had a big railroad and had a couple of hundred accidents a month?

MR. BABCOCK: I pick out the accidents where we can possibly find material for building up a bulletin or something of consequence enough to merit a noon-hour meeting.

A WORK TO CONSERVE LIVES AND PROPERTY

CHAIRMAN DOW: On the New York Central the telegraphic reports of the claim department on accidents come to my desk and we pick out certain ones that are illustrative and they are sent to the claim agent for his information.

Mr. B. F. Lane, a conductor on the Missouri Pacific, is attending this meeting of his own accord, to get what benefit he can out of it. I am going to ask him to give us about three minutes of his time.

MR. LANE: I thank you for this privilege of expressing to you my gratitude for your association and for what I have heard in the last two or three days. I am deeply interested in democracy and safety—you can better understand the fact when I tell you that my boy gave his life for our noble cause in the recent Chateau Thierry fight, with the United States Marines.

I was honored by being a representative of the conductors on the first safety committee created on the Missouri Pacific System, representing the Eastern Division. My interest in this work began then and it will end only when I am unable to participate longer. Having railroaded since 1886, I have been continuously in train and yard service since that time, I have helped pick up I would say seventy-five fellow employes that were maimed for life or the mangled remains of men that were crushed to death. I do not think I could enlist, outside of service under my country's flag, in a more noble cause than the conservation of life and limb and property. It occurs to me that Safety First in railroad service means what the slender needle of the compass means to a ship and I see in the future, by the scientific development of this work, not only the promotion

of Safety First but those great Christian influences that will develop men as well as mechanism into the highest efficiency.

I have seen the time when drawheads came over the top of each other—I have helped couple them by the use of a crooked link—and I have worked when there was no uniformity or standard of equipment. To see the development that has been made in just a few years, and to watch the splendid results is so gratifying to me that I wanted to get before this meeting and give you a personal testimonial and to thank you for the benefit I have derived from it. I want to go back to the rank and file strengthened to do more for my fellow-men. Mr. Chairman, I thank you.

CHAIRMAN DOW: This has been one of the most inspiring moments of the day. Now, to proceed with our program, I will ask Mr. Carrow to talk on the duties of the safety agent for a few moments.

THE FUNDAMENTALS OF SAFETY WORK

MR. CARROW: It is infinitely more important that we be right at heart than that in any other respect, because if we are right in that way we will be right where safety is concerned; we will be actuated by proper motives and realize we are all brothers, fighting for a common cause—our safety. That is the main desideratum. The subject does not admit of discussion; it is like any aspect of the subject of safety. We have had it from all angles today and yet the subject is hardly touched. While listening to the other speakers I made a few notes which may be interesting:

1. Learn the fundamentals of safety.

2. Learn the division (a division safety agent is the person to whom I refer). You may call him an inspector, agent, supervisor or any other name you choose. He may be employed by the general office, or by the division, but he is the man on the division looking after safety work exclusively.

3. Learn the division organization.

4. Keep familiar with operating conditions—do this and you will not criticise the superintendent so often.

5. Be familiar with labor turnover.

6. Analyze accident statistics for the division and for the whole road.

7. Provide bulletins and arrange to disseminate instructions in a general way.

8. Make formal inspections of and reports on large yards, shops and stations. I firmly believe a record should be made of your inspection at least once a year.

9. Make general and specific observations and inculcate safety habits by personal appeals to the men.

10. Investigate personal accidents. That is a simple thing, as one of Mr. Belnap's men pointed out in the investigation of wrecks. You see how men's minds operate when they give personal statements.

11. See that first-aid rooms are well maintained.

12. See that injured persons receive proper medical treatment. This is one of our biggest fields.

13. See that proper means are provided for instructing your men.
14. Analyze and study all safety committee recommendations.
15. See that safety rules are observed.
16. Meet the division superintendent and his staff officers individually and collectively when necessary, more particularly at regular intervals. In other words, keep in touch with them.

QUALIFYING FOR HIGHER POSITIONS

There is one other point that will take one minute to explain and I think it is of infinite importance—that the safety job is just as big as a man can make it. He has to be familiar with all angles of railroad operation; if he is not he will talk about things with which he is not at all familiar. He will accuse officials and others with not being interested when he is not familiar with the subject himself.

The hope of reward brightens labor and it ought to be understood by railroad officials that if safety agents qualify themselves—the young men particularly—for bigger jobs—they ought to receive them. My own feeling is that if a man persistently avails himself of safety work, with an efficient and safe management, he is in a better position than in any other vocation on the railroad to become an expert railroad man.

CHAIRMAN DOW: Mr. O'Dea of the Lehigh Valley, will you please come forward and speak to us for a minute or two?

MR. O'DEA: I am comparatively new in safety work. I have been connected with it indirectly for a number of years, but directly for about one month. The Lehigh Valley has had a safety organization since June, 1912, and they have done a whole lot of good work, but, like a great many others, they had no one directly responsible and as a consequence the work sometimes dragged. The one great thing I will have to do is to revive and maintain interest. I have received a great deal of good from the Safety Congress meetings and I am going back loaded to pick up the interest and to keep it going. Our organization coincides with the plan laid down by Mr. Belnap, except that we had no terminal committees, and I feel that the ones we have organized are going to be a great help. We have three on the Buffalo division and they each had a meeting in August; from those three meetings we got more good suggestions than from the meetings of six months prior held by the division committees.

It seems to me the one big duty of a safety agent is to educate. Of course, it is all a matter of education, but I think he can do a whole lot through personal contact with the men. We are putting on several safety agents; one was taken from the trainmen. He was a yard conductor and is located on one of the smaller divisions. He has only been on duty two or three weeks, but he has done a lot of excellent work. He is out in the larger yards, both day and night, and is giving particular attention to hump yards—he is right there with the men. If he sees a man taking a chance he has a friendly talk with him and tells him he ought not to do so-and-so and why. He tells him the better may to do it, the safer way, and, as I say, I think he is going to do more good than all the bulletins and all the meetings put together. We intend to put on more safety agents and I expect great things from them.

GETTING AT SOURCE OF HAZARDS

MR. CHAPIN (Pennsylvania): One point has not been touched upon here which I feel presents an opportunity for accident prevention; I mean getting at the source of hazards before they occur. That is, in watching the specifications for buildings, machines and equipment, to see that they are right when they are put up. On our road it is the practice for requisitions for certain types of machinery to be approved by the superintendent of insurance and safety: he must know before he gives his approval that the requisition requires the proper guards on the machine. The same practice might be extended, with reasonable limits, to the construction of buildings, the layouts of yards, arrangement of machinery in shops and so on. I think, if we could reach our executive officers through the proper channels, that they would refer plans and specifications to the safety department in the same manner as they do other work to the chief engineer or general superintendent or motive power.

We have not dealt with the machinery for safety work which already exists on the railroads, such as the Master Car Builders, the Master Mechanics' Association and so on. I feel that as a national body it is proper that our Railroad Section should send delegates, or at least present a memorial, to these associations at their regular conventions, asking for their co-operation: possibly we could indicate a point upon which they could be particularly helpful.

CHAIRMAN DOW: So much has been brought out and so much of value has been said that I have sacrificed a little of our program. I will now cut my part of the meeting short and turn it over to another delegate who will act as Chairman. In conclusion I desire to thank you for your splendid co-operation in "putting over" this meeting today. It has been an inspiration and a help to me and if you have gotten one-half the help out of it that I have I am sure you have been amply repaid. Every one of you is on trial and your future lies before you. The opportunities for service that have come into this work with the advent of government control are almost incalculable. Today you received a wonderful message from the lips of men experienced in the work. What are you going to do with the message? Are you going to carry it to the place where it will do the good that the railroad administration expects you to get out of this work?

CARRYING THE GOSPEL OF SAFETY TO THE MEN

We have a wonderful opportunity to be ministers of the gospel of safety and to carry its message into every corner of the land where we carry on our day's activities—into the railway yards, into the shops, into the offices—and if we do it conscientiously and with a heart interest we are going to help build a monument for constructive safety work that you will be proud of as long as you live.

Mr. R. C. Richards is known as the father of the safety movement on our railroads and since he started it we have had varying degrees of success in carrying it along. On a number of roads it has almost died out and now, through the advent of government control, there has come

among us to guide and to manage this work, to carry it along, a man who it seems to me is the revivalist of the safety idea—a man who is bringing it back to life, putting the punch into it and giving it the medicine that will put it on its feet everlastingly. It gives me great pleasure to turn this meeting over to Mr. H. W. Belnap, Manager of the Safety Section.

MR. H. W. BELNAP, CHAIRMAN

CHAIRMAN BELNAP: If I can only do one-tenth as much as I feel you think in your heart is going to be accomplished through the efforts of the Safety Section of the United States Railroad Administration, I shall feel that this work will leave for me a monument that will be more enduring than granite and a name and a heritage that I can turn over to my children, when I pass into that great unknown land, that they may never be ashamed of, and that those who follow in my footsteps will have a record to maintain. Probably my greatest difficulty is pessimism; sometimes I think I can see more dark sides in life than any other living man—it seems that nothing goes right and that no effort of mine moves fast enough. This work has been just like all other work I have followed; when I was in railroad service the cars never moved fast enough when we switched. Since I have gotten into the real heart of the safety movement I have been convinced, down in my soul, that the greatest cause of accidents on railroads is that same disposition toward constant hurrying. It robs us of a thinking frame of mind. I do not mean that men should not hurry; I mean that men should couple thought with their haste. If there was one word that I could print and scatter all over this land, where we could see it every place we turned it would be the one word "*Think!*" because when men think they will be governed by their thoughts. In our accident work, if we will analyze the casualties, we will find that many, many times the only excuse offered is that "I was not thinking about what I was doing!" It is our problem to carry this message, so that every man will be a thinking man, and that while he will try to expedite his work he will do it in a thoughtful frame of mind.

INSPIRATION DRAWN FROM SAFETY CONGRESS

No man can attend a meeting of this character and listen to the expressions of men of experience in safety work without being inspired and without feeling in his heart that he is in a great work, a work worthy of the best efforts of any man. When our good brother spoke of his experience as a safety committeeman and of his experiences in later days, when his dear boy gave up his life for our country, tears came to my eyes because I have a boy of my own over there, but if I had a hundred boys I would want every one of them "over there." While these gallant lads are fighting our battles to make the world safe you and I have a duty to perform to make this country safe, to make the great transportation systems of the United States safe; because our men cannot fight unless the transportation systems are worked to their maximum capacity. To work them to their maximum capacity every man in service must do

a little bit more than his part. When we take into consideration the fac that this great government of ours is now asking each ablebodied mar from 18 to 35 to give up his vocation and to fight for our flag, it only makes our duty all the more imperative, because every man who works for a railroad, if he is injured or if he is killed, is out of commission, and there is no great reservoir to draw upon from which to fill the vacancy We must save what we have. We must conserve those who are here. We must make those who are carrying on this industry just that much more efficient and I do not believe anything greater can be done to carry on the work right than to make it safe. so that every man can do his work every day.

I was much impressed with a telegraph bulletin Mr. Hale of the Santa Fe Railroad posted on his bulletin boards. He showed, first, that for two months, then three months, then by weeks, then by days, that on that great system of railroads there had been no fatality among its employes until it went up to ninety-three days. I can imagine how, on the Santa Fe, men interested in this great work would look forward to finding out whether or not another day had passed without an accident. I was equally impressed with what Mr. Shedd told me in the lobby of this hotel, that in their Kansas City terminals for seven months they had not had a single accident among their switchmen wherein a man lost a day's time, although the work performed, if I remember correctly, represented something like 28,000 working days. I know that if I were Mr. Shedd every bulletin board on the Rock Island Railroad would have that message, so that every one might know that for seven months there was a yard as busy as the one in Kansas City where men had so inculcated in their minds the habit of safety that not a single accident had occurred that cost a day's time.

EXPERIENCE OF A PRACTICAL RAILROAD MAN

These are the appealing things that reach me and I know they reach the rank and file of railroad employes, because I have been through the mill and I have worked many long, weary days behind a switch engine, and on a local freight train, and behind a long drag of cars. I know how interested men are in such things.

It is the same thing that prompts me to read the bulletin boards after an election. We like to see how the figures go up or down and how interested we are if the man we are boosting is winning. In this game we are boosting safety and if we can show we are going along without accidents our side is winning.

In the carrying on of safety work my thought is this: Every man has a certain amount of individuality, every man in charge of safety work has a certain amount of initiative, and I want to help him develop that initiative and help him make the work on his particular railroad better than his neighbor's work. By a friendly spirit of competition along proper lines every man on the railroads will develop the spirit of loyalty that has been lying dormant for years.

It is difficult, after listening to the many good thoughts that have been

expressed here, to advance anything new. I know how difficult it is to study out a plan for new things when you feel that the field has been well worked, and when Mr. Dow asked that I take the chair this afternoon and act as your Chairman for awhile, it was to answer certain specific questions that had been raised from time to time during these interesting discussions relative to safety appliance laws and to the things with which I am, perhaps, about as familiar as any man in the United States, because for seven years I was chief of the Bureau of Safety of the Interstate Commerce Commission and had under my jurisdiction the enforcement of all Federal safety laws.

I do not know which matter you wish to discuss first, but I will be glad to give you the benefit of my experience and my judgment. I am sure that whatever point you may raise we will thresh it out so that all will be in the same frame of mind relative to each of the particular propositions that seem doubtful. The first item that appears to have been left over is the question of the arrangement of the hand brake on the ends of cars, whether it should be on top of the car, or whether the car should be equipped with a platfrom brake step.

MR. DOW: The item was brought up by Mr. Clark of the Oregon Short Line, the contention being that the platform is not as safe a place for the location of the brake as the deck; the theory being the platform is sometimes covered with snow and ice. No one seemed to be quite clear why the government permitted platform brakes on the cars.

COMMITTEE OF FIFTEEN FIXED SAFETY STANDARDS

CHAIRMAN BELNAP: I can answer the question. The history of the safety appliance law is rather a long one and brakes of almost every possible design were placed on cars, because there was no law requiring any specific kind. In 1910 Congress passed a law giving the Interstate Commerce Commission the authority, after a hearing, to designate the number, location, dimensions and manner of application of all the appliances mentioned in that law—and mentioned in that law was the hand brake. Now each car is required to be equipped with an efficient hand brake and a committee composed of five safety appliance inspectors, five representatives from the labor organizations and five representatives from the railroads spent the greater part of the six months permitted to be taken under the law in perfecting standards and going into the question of detail as to how all the different appliances should be placed on cars. We found that a large number of cars were equipped with platform brakes—some railroads had practically every car they owned so equipped. The reason for this was that the boxcars were so high that you could not put a hand brake on top of the car and have it effective on account of tunnel clearances. That is one of the reasons why brake steps today are on cars and if you will go down with me through parts of the busy eastern country I will soon convince you that it is impossible to equip all boxcars with hand brakes, the dog and ratchet wheel of which shall be on top of the car. The clearances will not permit and that means that some cars must be equipped with brake step boards.

Another thing is that a car is just about so wide. Taking ten feet as the maximum measurement for the width of a car, there are a number of things along safety lines that must be considered in equipping the car. To begin with, the car must have a running board; the committee fixed the maximum width of running boards at twenty inches. That takes up ten inches of one-half the car. The law requires that the brake must be not less than seventeen nor more than twenty-two inches from the center of the car and that the brake wheel must be not less than sixteen inches in diameter. Place a brake mast twenty-two inches from the center of the car and it would permit the use of a sixteen inch brake wheel without infringing at all upon the running board, leaving it its full width.

Each car must have a ladder. The minimum dimension for end ladders, in clear length, is fourteen inches, and that fourteen inches was made by the surrendering of two inches so as to get it on that car and permit the use of a twenty-eight inch brake step board, because the ladder can be placed not less than eight inches from the corner of the car. You see, every one of these things were very carefully considered by this committee when they were fixing these standards. It is unsafe to have the ladder fouled by a brake step board and it is unsafe to have the running board fouled by the brake wheel. If we are to have the maximum of safety for the men you must use this equipment. That is the reason why these dimensions were fixed.

DIFFICULTY OF SECURING ADEQUATE WORKING SPACE

The narrower your car the greater your difficulty and all cars are not ten feet wide. The question as to where was the safest place to put this brake—whether on top or on a brake step board—was very carefully considered by the committee of fifteen. There was a diversity of opinion—there is a diversity of opinion yet—but under the conditions that confront us in the handling of equipment it is a necessity to have brake step boards on some classes of cars, for the reason that we cannot have a brake on the car that will clear, and fix it so that it will always be handled by a man from the top of the car. Does that answer the question?

A DELEGATE: How about gondola cars?

CHAIRMAN BELNAP: The reason brake steps were placed on gondolas was, where they were high side-gondolas, they made it so high that men could not handle the brake without a step. Take a fifty-six or sixty inch gondola, if you have the dog and ratchet on the end sill the wheel will be so you cannot handle it and get the maximum braking power—for that reason brake step boards were placed on some cars. A great number of cars have brake step boards that do not require them, but they were on the equipment at that time. There was no disposition to require that they should be taken off, because the fact was brought out in the hearing that the fixing of these standards meant, if I remember right, something like an expenditure of $60,000,000.

MR. ANDERSON (United States Railroad Administration): The question of grabirons on way cars was brought up by Mr. Hale yesterday and, if I

understood him correctly, he said that on some cars on one end was a straight grab iron and on the other end a curved grab iron, so a man catching a car like that in the dark might be expecting a straight grab iron and it would be equipped with a curved one. He had known cases where men had missed them.

MR. HALE (Santa Fe): The point I made was that on side-door way cars, which we use exclusively on our system, there is, under the safety appliance law of the I. C. C., a standard which fixes straight grab irons on one side of the door and curved grab irons on the other. Trainmen complain that at night, with the car moving at the maximum speed at which they ought to get on and with no more light than afforded by their lanterns, they cannot always tell long enough before the car gets to them whether it is a straight or curved grab iron and that they not infrequently get bad falls because of this. I was wondering if a recommendation from this Section might not be placed with the Interstate Commerce Commission which might seek to modify that standard by putting a curved grab iron on each side.

CHAIRMAN BELNAP: Are not these cars equipped on one side with ladders?

MR. HALE: Yes, sir.

CHAIRMAN BELNAP: The only reason a curved grab iron was not placed on both sides is that one side had a ladder.

A DELEGATE: That is a side-door caboose?

CHAIRMAN BELNAP: That is a side-door caboose. A lot of caboose cars have no cupolas. If they had no ladder by the side door the man could not get out until the train stopped.

STANDARDS OF SAFETY FOR CABOOSE EQUIPMENT

MR. HALE: Our men would be willing to go through the window of the cupola if we could put up a ladder on the end of the car and put a curved grab iron on each side of the car.

CHAIRMAN BELNAP: That was carefully considered and we had to take into consideration the fact there were twelve or fifteen hundred railroads and they had a good many different kinds of cars. We were required under the law to fix standards and we attempted to fix the safest we knew that would be standard on all railroads. The question of whether or not curved handles could be used on side-door cabooses received a great deal of consideration by the committee, but they were unable to see how they could equip each side with a curved handle and still maintain a ladder at the side of the door.

MR. LANE (Missouri Pacific): I believe I am voicing the sentiment of the majority of trainmen in saying that if a standard of caboose is adopted the platform standard would most nearly reach the plane of safety, for this reason: If you got out of the cupola on a caboose to go over the train and the car next to the caboose is a flat car you would have to make some arrangement to get down on it. Our line has adopted the platform caboose to a great extent and we have found them safer and more preventive of accidents.

A DELEGATE: Isn't it a fact that a trainman can tell whether it is a straight or curved handle from noting the direction in which the train is going?

CHAIRMAN BELNAP: The committee thought that a caboose car was so much a brakeman's home that he could almost find it in the dark. It is not like an ordinary car. The ordinary car goes on everybody's railroad and the question of uniformity of standards has been fixed, but with the caboose car men are assigned permanently to them. I can also say very frankly that this matter was carefully considered and gone into fully at the time these things were considered by the committee dealing with them and the consensus of opinion of the committee, when the standards were finally adopted, was that we had the safest possible arrangement for the equipment of cabooses and still keep in service both the side-door car and platform car.

MR. CHAPIN: Might I ask Mr. Hale why his road considers the side-door car better than the platform car?

MR. HALE: They have been standard on our line back to the time when man's memory runneth not to the contrary. We regard the straight grab irons as so much of a menace that we considered some time ago of turning our way cars and have them always headed in one direction, but on account of the expense and time that was not considered to be feasible.

MR. BOSLOOPER (New York Central): We use them in yard service but do not allow them out on the road.

LADDERS ON OUTFIT CARS

MR. GROOME (Union Pacific): Some time ago, at a safety meeting on my railroad, when I was a member of the committee, a bridge and building foreman put in the suggestion that all outfit cars be equipped with a side ladder. The master mechanic informed him it was against Interstate Commerce rules to equip outfit cars with ladders; that the Interstate Commerce Commission inspectors would order them off. I made the contention if the outfit car was equipped with a ladder and step and handle, the same as the caboose, that it would be correct.

CHAIRMAN BELNAP: I do not know what kind of car your outfit car is.

MR. GROOME: An ordinary box car.

CHAIRMAN BELNAP: Is it equipped with a ladder at the corner?

MR. GROOME: Yes.

CHAIRMAN BELNAP: The bridge men wanted them alongside the door also?

MR. GROOME: Yes.

CHAIRMAN BELNAP: I know forty-two inspectors and I know forty-two men that would not take exception to them.

MR. ADAMS: I would like to answer that in another way. Is not it a fact that the Bureau of Safety always desires to co-operate with the carriers in this respect: That so long as they comply with the safety appliance law and desired to add additional safety appliances they were permitted to do so?

CHAIRMAN BELNAP: No objection has ever been made.

MR. GROOME: The men thought any additional safety appliances they wanted could not be put on the cars because of the safety appliance law. I tried to dispute this belief.

MR. WRIGHT (Mobile & Ohio): Is the standard on a caboose two steps?

CHAIRMAN BELNAP: A box step; each caboose must be equipped with a suitable box step.

MR. WRIGHT: There was a discussion in one of our committees about a week ago. Some of the men wanted three steps, two steps are pretty high; one of our mechanical men made the statement that two steps was the Interstate Commerce Commission standard.

CHAIRMAN BELNAP: The standard says each car shall be equipped with a suitable box step.

MR. ANDERSON: Having had experience with safety committees for two or three years I have run up against that proposition—where the mechanical officer would get around a suggestion by saying the Interstate Commerce Commission regulations would not permit an addition.

MR. CLARK: In regard to the curved-spoke brake wheel: I have set a good many brakes and I could never set a brake with curved spokes as efficiently as one with straight spokes. It seems to me it might be discussed with some benefit. There is no standard.

STANDARDS APPLIED ON NEW GOVERNMENT EQUIPMENT

CHAIRMAN BELNAP: I do not remember whether the brake wheel spokes are plain or curved on the new government equipment. At the time the committee discussed brake wheels the only thing definitely fixed was that they must be at least sixteen inches in diameter. The reason for the curved spokes in the wheel was to take care of the extra heavy tonnage handled in the East, so that a man might more readily use a club with that kind of brake wheel in hump yards.

MR. CLARK: Let us go back to the brake platform for a moment. A great many cars have platform brakes that are not furniture nor automobile cars and the boxcars are low enough to permit the ratchet to be placed on top of the car. To my mind that is a great deal safer—from actual experience I know it is safer—than the platform brake, and while I appreciate the fact that clearances will not permit deck brakes on all cars I think we could do a great deal of good by having deck brakes on all cars that operate where the clearances will permit.

MR. CARROW: You mean to have the platforms taken off?

MR. CLARK: Have the platform taken off and the ratchet and pawl put on top. I have inspected hundreds of our cars where there is plenty of clearance for the deck brake and they still have the platform brake.

CHAIRMAN BELNAP: I do not know how you would handle that now. All the new United States Railroad Administration equipment have platform brakes.

MR. CLARK: Did the height of the car permit the deck brake on those cars?

CHAIRMAN BELNAP: I do not think so, because they are good sized cars.

They are 100,000 capacity cars and tunnel clearances in the East are pretty close.

MR. CLARK: The Union Pacific have 100,000 capacity box cars that will permit the deck brake.

CHAIRMAN BELNAP: I think the Union Pacific have some cars that would better have a brake step on for safety.

MR. CLARK: I will admit that.

CHAIRMAN BELNAP: I can see that we might drift into this thing a good way and not get very far in regard to it. When you begin to talk about the standards of equipment on any particular railroad you must remember that your equipment goes everywhere. I am of the opinion that the standards fixed by the government are recognized as about the safest standards and the safest application that it was possible to secure and at the same time have uniformity or practical uniformity in the application of all these safeguards on equipment.

MR. HAMMOND: I do not think that the brake wheel has been clearly defined. We have gone into the subject as to the exact diameter of the wheel. The curved spoke in a brake wheel, if it is curved in the right direction, is all right, but we have a square fit on top of our brake staff that requires this brake wheel to be put on in a certain position. If the square fit is so that it works to the advantage of the man setting a brake, all well and good, but if we have to turn that brake wheel over, we find the reverse condition to exist.

CHAIRMAN BELNAP: How are they built? Have you found that you had to turn them over?

MR. HAMMOND: Yes, sir.

CHAIRMAN BELNAP: The taper of two and twelve has been put into the brake wheels on some railroads one way and some railroads another way? You will not find that in the government standards, because they have just one kind of brake wheel.

Are there other questions in regard to any of these matters?

NEW EQUIPMENT IS INTERCHANGEABLE

MR. METCALFE: Is there any standard for high-steel gondolas in the tripping device?

CHAIRMAN BELNAP: That is not covered by law. Nothing is a fixed standard on cars that is not covered by law, except that the equipment the government is now building is standard. Along that line I might say it is interchangeable; in other words, you will find that they can have four different kinds of trucks under one car, because in the building of this new equipment nothing is considered unless it will fit into the place of the material taken out. If you take a Simplex truck out you can put an Ajax back in. In fact, the whole scheme of building the new equipment for the government was that everything should be interchangeable and the repair part of a railroad in California will be the same kind of repair part as on the Boston & Maine or the Florida East Coast.

MR. METCALFE: One gentleman mentioned outfit cars. I know several roads, including our own, where they put gangs of men in outfit cars they would not use to haul cattle across the country. Are we going to do anything to improve the safety of those men?

CHAIRMAN BELNAP: I think that is a good job for the safety agent of the railroad to go into.

MR. METCALFE: I got into it and got into thousands of dollars of expense immediately. We have gone to the expense of improving our outfit cars for telegraph men, signal men and bridge and building men—I have forgotten the figures, but the total was so enormous we had to split it up into years. We got an appropriation—I forget the amount—and split it to cover a number of years in order to improve the outfit cars for those men, but our poor old extra gang men, that live in them the year round, are still worse off than a lot of cattle.

CARS ALWAYS SUBJECT TO SPECIFIC CLASSIFICATION

CHAIRMAN BELNAP: That only exemplifies my statement, that it is work for the safety man to go into, and I would suggest that you keep at it. We will not be able to turn the world upside down in a day; we must keep at it consistently and do the best we can and one of these days the bad cars will be out of service and better cars will be there for the men. I believe I see the dawn of a new day in safety work.

MR. BOSLOOPER: Do I understand that all waycars should be equipped with box steps?

MR. BELNAP: No, sir. All way cars with platform ends shall be equipped with box steps.

MR. BOSLOOPER: Does that apply to cars mainly in yard service or to those that run in any service on the road?

CHAIRMAN BELNAP: It applies to any old car that is used for that service. Whatever you may use a car for does not take it out of its class. A boxcar may be loaded with coal, but it is still a boxcar. You might say further, that a passenger car may be used for a caboose car, but it is still a passenger car.

MR. SCOTT (Atlantic Coast Line): As a matter of relaxation, getting away from technical questions, I would like to know if some kind friend in the audience will give us an idea as to how to disseminate information to employes and committee members out on the line of road with reference to the distribution of statistical data. I am not altogether satisfied with the work turned out on the mimeograph as most copies of reports so produced are rather illegible. I would like to know if anything short of a regular printing press has been discovered for handling that work?

MR. BRODERICK: I would recommend the multigraph machine.

CHAIRMAN BELNAP: I saw some statistics furnished by the Pennsylvania Railroad that were as clear as print. I think Mr. Carrow can give us the information you desire.

MR. CARROW: The printing depends on the character of the work. I would suggest that it frequently happens that statistics have to be prepared on large paper and it might be necessary to insert pen and ink figures on typewritten statistics.

MR. METCALF: You can photograph them.

MR. CARROW: You can prepare statistics on sheets, insert the fatalities or anything else in pen and ink and have them photographed. There is

some work you cannot do with the multigraph. For example, it is difficult to make certain lines. If any of you gentlemen happen to be in Philadelphia I will arrange to show you our mechanical device department, where we have a number of people employed who do nothing but turn out reports and statements. There are various devices used that might be of interest to Mr. Scott and I would be glad to have him see them.

MR. SCOTT: The matter of statistics is one of great importance and practically every paper presented at this meeting has dealt with the subject. Mr. Price, I believe, told us today that we have to show results. That is the only way you can show results, by putting them down in black and white and distributing them among your officials and employes to show that you are killing and injuring less people today than you were some years back. That is why I am so much interested in getting the information to the men in an attractive form.

EMPLOYMENT OF WOMEN ON RAILROADS

MR. SHEDD: I have not heard a word said at this Congress regarding woman's rights. How far have we gone in considering the employment of women on our railroads generally? It might be well to talk a little about it if the Chairman will permit. That is, how they should be clothed, etc., and whether or not anything definite has been undertaken by any railroad. We have gone into it just on the surface, but one of the things that will confront us, and confront us seriously, is the problem as to where to employ women and how to take care of them. We all realize we must employ women more now than ever before.

MR. CARROW: The questions of dressing them properly and a safe place to put them are going to enter into our safety work considerably. There will be the questions of high heels and flowing hair, and wearing loose sleeves—the very things we have talked to our shop men about—and where to put them. We all realize that some of the foreign women are stronger than the American man, but we will have to be careful where we put the women. If we do not we will experience a lot of women degenerating. because we put them in wrong places—I mean, physically degenerating.

CHAIRMAN BELNAP: I think the Division of Labor has placed a woman in charge and is creating a section to look after the welfare of women workers on railroads.

MR. CHAPIN: Aside from that, I might say that the Pennsylvania has appointed a matron for each place where there are women employed, also as members of the first aid teams. There are two women first aid teams, under the charge of our medical examiner. The instructions given them are along the usual first aid lines. In making my regular inspections I always check up the kind of clothing worn by the women, the facilities afforded for rest, and so forth, and where I find it necessary I make special recommendations in regard to their protection. I have seen women in every kind of job, from a stenographer to a turnsmith, and I have found them wearing high heels in the car yards and wearing rubber soled shoes in the scrap yard. The field is large and we should do everything we can before the Department of Labor gets around.

SAFETY AND WELLBEING OF WOMEN WORKERS

MR. BRODERICK: The Baltimore & Ohio has gone into this matter in a very careful way. We have in preparation a circular of instructions about the various classes of work in which women may be employed. We have something like 3,000 women in various occupations and we anticipate, when the present draft is in full force, that we will have several thousand more. We are making provisions for their safety and wellbeing. We have in effect, and have had for more than a year, a standard garment for the use of women engaged in shops and yards and freight houses where they are employed outside of clerical positions. These women are also required to wear a standard flat-heeled shoe and also a standard cap to protect their hair from coming in contact with machinery. The uniform is a one-piece garment and we have found it a very efficient piece of clothing for that purpose. We consider that women can be employed in almost any position that a man formerly filled, unless it requires technical knowledge. We do not believe in putting women in positions such as on track gangs, or doing heavy lifting of material—things for which they are not physically fit. Our company is giving the matter great consideration and our Federal manager expects in a short time to have instructions issued regarding the matter.

There seems to be a tendency toward not employing women. It is not a question of what we want to do; it is a question of what we have to do. We are encouraging the employment of women in all occupations where it can properly be done and we have a woman representative on each one of our divisional safety committees. We expect also to place a woman supervisor in each general superintendent's district, covering the same territory as the safety agents, for the purpose of supervising the work of women and to see they are properly housed, their comforts properly taken care of and that they are not engaged in labor they are not properly fitted to perform. I think all railroads are confronted with the same problems and the sooner we make these provisions the better.

CHAIRMAN BELNAP: I have no doubt that the things Mr. Broderick has so ably discussed will be done on every railroad. We may expect to find thousands of women in the employment of railroads, because there are not men enough to take the jobs. Our men are going to be in the trenches and the women will do their bit here, just like the women of France are doing their bit over there.

WEARING OF GLOVES AND SAFE CLOTHING

MR. ANDERSON: About four months ago, with the *News Letter* our Secretary issues each month, I sent a full description of the uniform Mr. Broderick has described.

MR. CLARK: We employ about fifty women in our Pocatello shops, and they are required to wear a tight-fitting cap, although we have not specified any standard except that it must be tight fitting. We require them to wear the "cover-all" uniform and we discourage the wearing of high heels. We also encourage wearing thick-soled shoes. We experienced our greatest difficulty on the question of wearing gloves. You

cannot get the women working on machines to work without gloves and a great many wear canvas gloves; it is impossible to get a canvas glove to fit a woman. The gloves are manufactured mostly for men and on account of the woman's smaller hand the ends of the fingers of the gloves stick out. We had a serious injury not long ago on that account. A woman working at a lathe on a bar of iron placed her hand on the bar and the part of the glove that extended beyond her fingers caught and it wound her hand around the bar, breaking her arm. The kid glove is no good. The wearing of gloves is a safety matter and we should endeavor to find a glove that can be worn by women which will fill the bill.

MR. DOW: What is the necessity for wearing gloves while operating a machine?

MR. CLARK: Most men do not wear them, but we cannot get women to work at the machines without gloves as they get their hands dirty. They insist on wearing gloves.

MR. CHAPIN: I met the same condition in one of our shops. A woman was wearing gloves while running a drill press. I said to her: "I know you want to keep your hands clean, but if you wear gloves you are liable to have an accident and lose one of the hands of which you are so proud." She saw the point and took off the gloves.

MR. METCALFE: I would like to ask a question regarding the handling of explosives. There is an explosives bureau in New York and their men travel around making inspections. These men send a copy of their reports to me and I investigate all violations of Interstate Commerce regulations. Is the Safety Section the proper place to handle such reports?

PLEDGE OF SUPPORT TO SECRETARY M'ADOO

MR. RICHARDS: I would like to submit for the approval of the Section a telegram I was requested to send to Mr. McAdoo: "Hon. W. G. McAdoo, Director General, Washington, D. C.—The Railroad Section of the National Safety Council, by resolution unanimously adopted today, directs me to express to you its appreciation of the inspiring message received from you and to say that all of its members will make a greater effort than ever to preserve the life and limb of passengers entrusted to their care. Also to assure you of their collective support by their undivided effort to make the transportation service safer and more efficient than it has ever been."

MR. DOW: I move that the message prepared by Mr. Richards be approved and sent to Mr. McAdoo. (The motion was seconded and unanimously carried.)

PROPOSAL TO ESTABLISH TRAINING SCHOOLS

MR. RICHARDS: I would like to bring the matter of educating new men to the attention of this Section. Our statistics show that during the last eleven months from 20 to 25 per cent of all our employes who have been killed or injured have been men who have been in railroad service less than six months. There never has been, on the railroads, any systematic effort to educate men before they are put into train switching or station

service. Today our government is raising a great army and before they think of sending those men to the first-line trenches they train them from six months to a year, teaching them how to fight and how to live. It seems to me it is as essential that the government, which is now operating the railroads and is responsible for the safety of the passengers and property carried, as well as the lives and limbs of the men doing the work, to educate the men now going into this hazardous occupation. The present method is to hire any inexperienced man for a brakeman or fireman or switchman, talk to him a little, give him a switch key and a book of rules and let him go. If he is placed with a good, safe foreman or conductor or engineer he learns how to railroad comparatively well—if he gets a "dub" switchman or yardmaster or engineer he is always a "dub" man. It seems to me that it is as much the business of the government to educate the new men who are coming into the service as it is to teach others how to be good sailors and soldiers. I would like to have the Section give the matter a little consideration.

MR. BRODERICK: The Baltimore & Ohio has a plan for handling the subject. We expect to appoint committeemen on each division, utilizing wherever possible the men on the safety committees—the older men—to instruct and show the new men how to perform their work properly and safely. The scheme is not yet complete, but that is the nucleus around which we are working, having in mind the necessity for some work of that character. The idea is to appoint a certain number of committeemen on each division and have one man in charge of the system to give the work general supervision, getting the co-operation of all the men on the railroad; the thought being to have the older men undertake the task.

THOROUGHLY TRAINED MEN IMPORTANT ASSET

MR. RICHARDS: On the North Western we have what we call an examining board, the members of which are supposed to instruct the new men in the larger terminals, such as Milwaukee and Chicago. But in the outlying districts we have no facilities for doing so and the men who come for instruction are on their own time. We cannot make a railroad man by two or three weeks' instruction; it takes months and even years to make a first-class railroad man. Why shouldn't there be a school where a man would have to take a regular course, given by men experienced in that line of work, and have a wage fixed so that the man could live comfortably during that time? Why not require everyone to have a week or two weeks, or whatever is necessary, of instruction before he is put to work? I do not think a temporary arrangement like the ones on the North Western and the Baltimore & Ohio will accomplish the desired results, although the Baltimore & Ohio may have a better one than ours.

It seems to me that it is the duty of the United States government to do something of this kind. The government today is responsible for the safe operation of the roads, just as it is responsible for the safety of the country, and if it is necessary to educate a man to become a soldier, how much more necessary is it to educate a man in the technical work of railroading. Why should not a government that is willing to spend bil-

lions of dollars in the education and care of our new soldiers and sailors spend a few million in the education of the men who are to perform one of the most necessary services in the carrying on of the war—that of transportation? This is a matter we ought not leave to an individual carrier. It is a matter in which the government owes a duty not only to the new men, but to the people they are to transport. They owe it to the owners of the property we are carrying and to the families of the men going into our service and I do not think they should shoulder it onto an individual road. There ought to be a uniform system, the same as in the army. They have the wonderful personnel division that has done so much to make the army better than any army we ever before thought of raising and it has all been done because some man had a vision. A professor from Northwestern University originated the plan for the personnel division. At first it was very generally opposed by the regular army officers, but now the general staff approves it and every large cantonment is doing wonderful work under its direction.

If the government is willing to pay all the money and spend all the time necessary to organize an army along the right lines, why shouldn't we be able to induce them to spend a little money—not much, but a little—to organize the railroad service in a way it has never been organized before—in the way we ought to have done it thirty years ago? If we had done that, it would not be necessary to have a Railroad Section or Safety Department, because the men would have been educated how to do the things right and to know the value of the lives and limbs of their fellow workers and the people entrusted to their care. It is a work the government ought to do and I do not believe the Manager of the Safety Section of the United States Railroad Administration could do anything that would bring him so much fame and so great a reputation as having done this real service for the world and for the railroad people as to insist upon the government doing something of this kind.

PAY FOR STUDENT TRAINMEN AND FIREMEN

MR. CLARK: I heartily agree with everything Mr. Richards has said. The most important problem before the country today, the railroad part of it at least, is the training of new men. Every railroad should have a department of labor to look after the employment and training of the men before they are put into actual service.

I would like to say a word about the system we follow on the Oregon Short Line as I had something to do with starting it about a year ago. Formerly, in train and engine service, we employed a student brakeman or fireman, gave him a letter signed by the superintendent and turned him loose. He went on his way and picked out any conductor, if he was a brakeman, that he saw fit. He would make a trip over one division and back, then he would get on with another conductor and make another trip. Usually the conductor would O. K. the man to get rid of him. He would then take his letter back to the office and go out as a brakeman. The same course applied to firemen. About a year ago we selected a certain number of conductors and engineers whom we considered especially fitted to train new men. We talked to these men personally, explaining

what we wanted; that the men should be instructed in their duties, that they must talk to them in the proper way, give them every chance in the world and also explain safety work to them. Now when we employ a brakeman or fireman, we give him a letter to a particular conductor or engineer. He goes out with his instructor and stays with him until the conductor or engineer considers him competent to perform the duties of a brakeman or fireman. They often take six weeks or two months—in some cases a man has made good in two or three weeks—but I think about six weeks is the average. We pay the students, as we call them, $2.00 a day. That covers his expenses while he is learning his duties.

MR. CARROW: Do they take the place of other men?

MR. CLARK: No; they are in addition to the crew. They are simply there to learn how to be a brakeman or fireman.

MR. CARROW: How long are they with the conductor or engineer?

MR. CLARK: Some men pick up the work quicker than others—about six weeks is the average. In the shops, when we take on new men, it is put up to the apprentice department. We have an apprentice school at Pocatello which is practically the only shop where we take on new men. One of the apprentice instructors takes hold of the new man and instructs him in the work he is to perform. It usually takes two or three weeks to give him proper instruction.

MR. METCALFE: If a student does not make good in two months what do you do with him? What is your limit as to time of training?

STUDENTS PLACED IN CHARGE OF EXPERIENCED MEN

MR. CLARK: We have not put an exact limit on them. We consider that the conductors and engineers we select to train these men are competent and allow them to use their judgment. If a conductor says that a certain man will never make a brakeman we tell the new man we are afraid he has picked the wrong job.

MR. CARROW: Did I understand you to say that when you put on a student fireman or brakeman at $2.00 a day, he is paid in addition to the wages of the regular members of the crew?

MR. CLARK: Yes, sir. It's the best money we ever spent, if you are thinking of the expense.

MR. CARROW: I am thinking about how long a man would work at $2.00 a day.

MR. CLARK: We have not had a great deal of trouble. We are short of men all the time, but we only take on the men we can handle at one time. They understand they are learning their work and will not be paid their regular schedule wage until they have been O. K.'d.

A DELEGATE: Mostly local people, are they not?

MR. CLARK: Yes. I have spent considerable time going to the high schools and small colleges on our system, making it known that we want men who are willing to go into train and engine service. We have not had any trouble in recruiting our forces.

A DELEGATE: What about the age limit?

MR. CLARK: Formerly we took men up to 25, now we take them up to 35.

A DELEGATE: What is the youngest limit?

MR. CLARK: Nineteen.

MR. BRODERICK: Does the company provide for their maintenance in addition to the $2.00.

MR. CLARK: They pay for their own meals and board. Brakemen, however, sleep in the cabooses.

MR. CARROW: This is the most important subject we have discussed. This is certainly an innovation as practiced on the Oregon Short Line. If there are any other specific practices like it I would like to hear of them.

MR. HAMMOND: That might work out on the Oregon Short Line, but at the Cleveland terminal of the New York Central, with the labor turnover we have there, it is hard to get men to work for $7.00 a day. They want to work every day, too. We could not work that proposition there.

A HEAVY TRAIN AND A GREEN FLAGMAN

MR. LANE: I would like to relate a little experience I had with this proposition. I was recently in charge of a train of seventy-five cars and when we left our home terminal we had one experienced man who was used as the rear brakeman or flagman, but later was assigned to the head end of the train as brakeman. We had occasion to double a hill between St. Louis and Kirkwood, a distance of fourteen miles, and at that time I found that this man was not acquainted with the signals: that he did not know how to couple an air-hose, so I judged from those things he would be an improper party to flag a train.

I gained the nickname of "Safety Ben" by service on the first safety committee the Missouri Pacific organized and I felt very proud of it. In order to overcome the difficulty I have described I sent the flagman to the head end of the train and I suggested to the new man that he go along with him and watch him. I also suggested to the brakeman that he give him the benefit of his experience, as much as he could. In order to make out reports and cover the different work assigned to me I tried to perform both the duties of flagman and conductor.

This is a round table discussion of safety matters. I believe we are all so patriotic that we would not do anything to embarrass the government, especially at this time, and I am willing to do all I can—but I do not believe it is safe to put a crew in the position where we have only two experienced men to handle seventy-five cars. One reason men are so anxious to get into the service and begin performing their duties is the fact that they are at their own expense while they are learning. They have been told that railroad men are overpaid as a class and that all they had to do was to ride.

Some men have entered the service with that idea in mind. I do not think it reflects discredit on our division officials, because these men have been sent out with crews that were instructed to teach them their duties. They have a mimeographed form that each conductor is supposed to sign, recommending the man's qualifications, or in case he is not qualified to say so.

MR. CARROW: Are they paid while learning the work?

MR. LANE: No, sir. That part of the work is undeveloped in our territory. In some cases a man has made a student trip on a through freight train, has returned and gone out on a local train; in some cases he has learned the duties of a brakeman on a through train but is unsatisfactory for the duties of a flagman on a local train. I think it would be a good idea to adopt some method by which these men would not lose their personal expenses while learning their duties, especially such duties as flagging.

MR. SCOTT: Referring to the thought that has been so clearly brought before us by Mr. Richards, I would like to say that I have heard that in the Southern region, schools of instruction have been provided so that ticket sellers at the various stations might become acquainted with their new duties. I am inclined to believe it is entirely feasible to have a school of instruction for each class of labor connected with railroads, but I do not think we can settle the question this afternoon in the brief time that is allowed. I am heartily in accord with the idea.

PRESSING NEED FOR MORE SECTION MEN

MR. GROOME: The Union Pacific has a very thorough examination for men by which they are not allowed to go to work until they do know all the signals, but I am afraid that most of the men, when they get out of the office, forget half of them.

There is another subject that is interesting to me and one that we have not touched on in this meeting: The matter of track conditions. We cannot run a train unless we have a brakeman; we cannot run an engine unless an efficient crew is on it, but on all the sections over the country there are not sufficient men, and have not been for the past two years. On almost every railroad there isn't one-third of the section force that the railroads have authority to employ actually working. If someone had built a foundation that would only maintain this hotel for a few months and then it had to be repaired, and if it was known the labor could not be had to repair it, the hotel would not be here today. That is the condition we are in on the railroads. The foundation we run these railroads over is liable to go to pieces in sixty days if we have a wet, rainy season like we have some falls.

MR. METCALFE: I do not think there is much opportunity for discussion, because the railroads would be glad to get the men if they were available.

CHAIRMAN BELNAP: I have received this note: "Please have Mr. F. B. Thomas, safety inspector, tell us of his work on the Burlington." I would like Mr. Thomas to take the floor and tell us about these matters.

MR. THOMAS: I have had the pleasure of working with Mr. Switzer for the past six years. My work has covered the usual activities of a safety inspector, but I have gone outside of what is supposed to be my regular work and taken up quite a number of things. I spent two years going about with the Burlington safety car, showing pictures and giving lectures to our employes and in that time about 32,500 of our employes visited the car. It will comfortably seat about fifty people, but at times we

had as many as 100 crowd into it. I figured up one day that if all the people who attended the meetings in the car, an average attendance of fifty, had come at one time it would have taken between six and seven miles of coaches to accommodate them. A great many safety pictures have been shown on railroads, but perhaps we went further in showing lantern slides than anyone else. We gave up the lantern slides because that method seemed to be obsolete. Moving pictures have taken the place of the stationary slides, but I think we did a great deal of good in showing them and many times the men ask when the safety car is coming around again. My idea in showing the pictures in a car or anywhere else is that it makes more of an impression on a man to look at a picture than it does to hear a speaker. You can tell how that would be if you went out into the Rocky Mountains or some place where there is a great deal of fine scenery and you wanted to tell your friends about it. You would have to write many pages describing the scenery to bring the matter before their eyes, but if you sent them one little picture it would bring the vision before them much better than your long letter.

REDUCING THE TRESPASS EVIL

Another work I have had a part in is that of going around and talking in the moving picture theatres where our pictures are shown—we have had a great many meetings of that kind. I have also organized, in our large yards, a plan for breaking up the trespassing evil. Safety should not be confined to saving accidents among railroad employes. You know as well as I do that every year a great many more outsiders are killed and injured than railroad employes, so we have done a great deal of work in trying to break up trespassing. The thought came to us that perhaps somewhere there was a sort of fountainhead we might reach to break up trespassing—not to break it up at once, but to instill an idea that perhaps in the future would bring a good deal of fruit. So I went to a schoolhouse, called on the principal and asked if I might talk to the scholars on the subject of the dangers around railroad tracks. He was agreeable and in a short time the scholars were assembled that I might talk to them ten or twelve minutes.

I made many such talks, but in the work we had to do only a short portion of the time could be assigned to work in the schools. I visited eighteen high schools and forty or fifty grade schools. Of course, it was necessary to grade the line of talk to meet the intelligence of the scholars. I sometimes wonder if a man can do more good with the young scholars than the older ones; I think the little ones are more receptive.

When you started safety work you had a lot of adults to deal with; you did not have children with receptive minds. You had to deal with them at a time when their minds were not so open to argument, so open to the matters you attempted to bring to their attention as at present, and that was a drawback. In going to the schools and talking to the scholars about safety there is a wonderful field for accomplishing results. It seems to me that this is a matter well worth the attention of Mr. Belnap and those associated with him. I have spoken to 80,000 or

90,000 scholars and have heard the principals and teachers of these schools say that it was a splendid plan.

It seemed to me rather remarkable that I could visit the schools without authority, oftentimes not having gone to the school authorities for permission, and be given an opportunity to speak. The children think it is a part of the regular program and listen attentively. I tell them about some instances of injury and death to boys and girls around railroad tracks and talk along general lines. You can do your best work with anything you are enthusiastic about and I presume that I was so enthusiastic I did better work than I had ever done before. It is a splendid work and the interest of the children repaid me for the efforts I made.

INSPIRATION DRAWN FROM CONGRESS SESSIONS

MR. DUFFY: I regret that the hour is approaching when I must leave old friends and new acquaintances. I am going away from this gathering with splendid thoughts to impart to the railroad men wherever my travels and duty may take me. The papers that have been read by the men who are foremost in the work of safety have been revelations to me and have interested me very much. I was particularly impressed by Mr. Richards' remarks relative to railroad heroes. He realizes that heroism on the railroads is not lost sight of by the government. Many railroad men know of course, of great deeds of heroism that have never been brought to the notice of the Interstate Commerce Commission, but I recall in my fourteen years of railroading that since the law to recognize bravery was passed twenty-three medals of honor have been given to railroad men for doing things out of the ordinary in saving the lives of their fellows and it is well to remember there is a President's medal of honor for bravery for those who distinguish themselves. It is true also that Mr. Carnegie, in his wisdom, has placed $10,000,000 on interest to do something more substantial for those who distinguish themselves along lines of bravery; that such instances are carefully investigated and if the men who do brave acts are killed or injured their families are cared for during their lifetime.

About five years ago my brother, an old railroad conductor, was standing at a little country station where a train, westbound, had discharged its passengers. An old lady who could not wait for the train to go on, because she was nervous, passed around the rear of the train and right then a fast express, which did not stop at the station was going to the east. My brother, realizing her danger, rushed around the end of the train and pushed her to safety, only to lose his own life. That his brother has given up his life in that way is a proud thought to a man, just as it would be for me if my son must perhaps give up his life to save his country. It may be a new line of thought to impart to the people to whom you must go in this great work and try to save and save what is needed most.

REWARDS FOR BRAVERY IN RAILROAD SERVICE

MR. RICHARDS: Mr. Duffy has rather misapprehended my suggestion. I am aware of the laws for awarding medals for special acts of bravery—

they are wonderfully good laws—but what I want to bring to the attention of the Manager of the Safety Section is not the giving of medals for special acts of bravery, but the awarding of some recognition to the men who are working on the various safety committees of the various roads for assisting in remedying dangerous conditions and dangerous practices. These men do not get a chance to come before the public in any way; no one knows anything about what they have done except the committees with which they are associated. My idea is that many of these men do much more in a general way, quietly, than the man does in one act of bravery, because sometimes it is braver to call attention to the dangerous practices of their fellow workmen, to call the attention of a superintendent to improper conditions on his division, to call attention to matters that ought to be remedied, than it is to do a physical act of bravery. My thought is that the men who are doing these things in the committees among their fellow workers, without any physical act of bravery, should have some recognition, and if they had it I am very sure there would be more of those things than are done to-day.

CHAIRMAN BELNAP: Several thoughts have been brought out. First, relative to the work referred to by Mr. Thomas. This has been done on a number of railroads. I think Mr. Young, now manager of the Norfolk & Southern and the Virginian, has by pamphlets, dodgers and other work through the schools and other places in his territory, reached a great many people. In fact, I do not see any reason why the men in charge of safety on every American railroad, cannot get busy on such work. Your job will be as big as you make it and it seems to me the things we are discussing that deal with this whole proposition of safety are very wisely brought to the attention of men in charge of safety on these railroads that you may carry them to the managements of your properties and elaborate on them. You can secure results in the way of providing greater safety to the employe, to the traveling public and everyone else who comes in contact with the railroads. Of course, I realize that a body of this character is without authority and while these discussions give opportunity for an expression of opinion, no particular and definite action that this body might take will be binding in any way.

I heard the thought expressed awhile ago that we might take up certain matters with the Master Car Builders' Association and Master Mechanics' Association. I think the government of the United States is running all that and anything of that character could be taken up with the director of the United States Railroad Administration in charge of mechanical matters. There has been a sort of passing away of some of the things we have dealt with all these years and a new era is here. The things we are discussing will give food for thought and after the record is made up and I can study it carefully, it will lead to a good many things being done or attempted or suggested that have never been attempted before, even though they may have been thought of. I know that the best place to teach safety is with the children, and I believe more good can be accomplished by inculcating safety habits into

the minds of the future generation in the public schools than in any other way.

MANY DUTIES DELEGATED TO SAFETY AGENTS

MR. DOW: For a number of years we have carried on an intensive campaign against trespassing on the main line of the New York Central between New York and Buffalo. Mr. C. W. Gregg's principal work was to talk to the children in the public schools, getting in touch with the manufacturers and the various plants along the right of way, and distributing circulars to their employes. That was before the general decrease in trespassing accidents of the last year or so had been noted. After the first year of his activity we showed a decrease of 19 per cent in death cases and 17 per cent in injury cases to trespassers. The National Safety Council has also taken up the question of educating school children and through a committee that has been appointed a plan of education—including circulars, questionnaires and so forth—is being prepared to submit through the Educational Commission at Washington to the schools of the country.

MR. SHEDD: We have prosecuted this matter vigorously. Mr. Stillwell, one of our safety supervisors in the first district, talked to about 85,000 school children without interruption to his other work at all. I have done a great deal of it myself. I went into both the white and the colored schools and one of the most enthusiastic rewards I have ever received was through talking on this subject. The children and teachers as well seemed to look on us as persons who had sought them out and they did not hesitate to say we must be interested in them because of our work.

CHAIRMAN BELNAP: I was much impressed by Mr. Dow's paper on the subject of safety rallies. It has been printed and it will be worth your while to take copies home with you. You will find it very interesting and it will materially help you in handling safety rallies.

MR. METCALFE: Can you tell us about the explosives bureau?

CHAIRMAN BELNAP: The matter of handling high explosives is in charge of Colonel Dunn. It is a matter, of course, in which I have no jurisdiction. Whether or not a report should be made to the supervisor of safety of a railroad is a matter which appears to me largely one for the organization of that particular property.

MR. METCALFE: What I was trying to get at was the organization of the Safety Section. We are all anxious to do what you want us to do. That work has been delegated to me and I have been doing it quite awhile—there is considerable work connected with it. A lot of inflammables and explosives are transported on every railroad and if it is a Safety Section matter I would like to know it.

CHAIRMAN BELNAP: If that matter has been placed with you as part of your duties, I do not see why you should not handle it. The thing I want to impress on you is this: The work placed upon me is the handling of matters directly in charge of the Safety Section and I do not feel that I have the authority to interfere with the business of a section that is properly, by law, the handling of explosives, the conserva-

tion of fuel, or the handling of the women's welfare bureau, that is under Mr. Carter; or the handling of fire hazards, which is now placed under Mr. Rambo. The government is fixing certain sections to do certain specific work. I feel that everyone connected with the Safety Section is a lifter and not a leaner; we want to do our bit in every way we can in assisting the government in each of these activities. Safety work is probably the broadest field of activity, because the others are within well defined limits, but they nearly all dovetail into the Safety Section's work to some extent.

MR. METCALFE: The principal reason I brought the question up was because of a conversation I had with an Explosives Bureau inspector. On hardly any two railroads is the work handled in the same manner; some report to the general superintendent, some to the superintendent of transportation, and the work has gone by default. If it is as important as it appears to me to be there should be some clearly defined action on the part of the Safety Section in regard to compliance with the rules of the Interstate Commerce Commission in the handling of explosives.

CHAIRMAN BELNAP: That may be true, but I haven't any authority to tell them how they shall do their work. I must confine the work I am trying to handle, and that I want to so strongly lean upon you to help me handle, as nearly as possible to the lines outlined in Circular No. 7 of the Director General, Circular No. 5 of the Director of Operation, and in the suggestions and recommendations relative to the uniform methods of organizing safety committees that the Safety Section suggested in Bulletin No. 3.

MR. BELL IN THE CHAIR.

I will ask Mr. Bell, Chairman of the Steam Railroad Section to take the chair.

MR. DOW: I would like to offer as a motion that the members of this session, by rising vote, pledge to Mr. Belnap their sincere and wholehearted co-operation in safety work during the coming year. (The motion was seconded and carried by a rising vote.)

MR. BELNAP: Thank you, gentlemen, there is no question in my mind but that we will go over the top together.

CHAIRMAN BELL: Mr. Cameron, General Manager of the Council, asked that we bring up for your discussion the matter of bulletins. I will read what he has to say:

BULLETINS FOR STEAM RAILROAD SECTION

"*To the Members of the Executive Committee of the Steam Railroad Section*: Gentlemen—Since the organization of the Steam Railroad Section of the members of the National Safety Council, at the Annual Congress in 1915, both the National and Sectional officers have hoped that the time would come when a full and complete interchange of experiences and information could take place between the member through the Council. This has been done in part through the weekly bulletin service, the

answers to questionnaires, and the monthly *News Letters*, but it seems to me that the one hundred steam railroads now members of the Council should have provided for them an extended service, presenting all of the information obtainable upon accident hazards upon the railroads. In other words, neither the Sectional nor National officers should wait for a railroad member to request special information on a well known accident prevention problem. The success of the Council has been based upon its readiness to take the information it has directly to the members. The Council must be assertive, aggressive and enterprising, and not assume the passive position that the member must come to its headquarters for such information as he desires. The duty of the Sectional and National officers should be to anticipate the needs of the Steam Railroad Sectional members—we should force upon them, in the most attractive form, the collected experience of all the railroads upon methods and means of preventing accidents, as this information comes to us.

"Our plan is as follows:

"1. That the Executive Committee of the Steam Railroad Section make a memorandum, or program, of the subject or topics upon which special information or experience might be gathered. This memorandum needs only to indicate in the briefest form that there is a need for collecting and disseminating information upon a particular topic.

"2. With this program in the hands of the national organization, the engineering and editorial staff could investigate by visits, questionnaires or other means, the experience of the various railroads, and by adding it to the information available through printed matter, could present in draft form the information available for distribution to all of the railroad members.

"3. The form in which this information could be presented would be determined by the length of the data accumulated. It would be presented in the form of a Service Series bulletin when the data could be condensed to one page of printed matter. When it seems necessary to print say four pages, to include illustrations, the data might be gotten out in a leaflet or pamphlet to resemble in form our *Safe Practices* publications.

"I have already explained to you that our Accident Prevention Division is now developing *Safe Practices* pamphlets for the paper and plup industry, and I believe that plans that have been talked about for several years will be consummated in as many months. Can we not work together for a similar service to the Steam Railroad members at present enrolled, and perhaps to all of the railroads of the United States which we are hoping to enlist in the Council's co-operative work? See the attached sample Service bulletin and *Safe Practices* pamphlet.

"Sincerely yours, GENERAL MANAGER."

IMPOSSIBLE TO SEGREGATE ALL BULLETINS

The Council regards the bulletin service as a very important part of its work. I had a discussion with a member of the Council this afternoon regarding the fact that the Council sends out a good many bulletins

that do not seemingly concern us. The Council sends each week one set of bulletins for each $7.50 of membership dues paid. This consists of four general bulletins and one referring specifically to the Steam Railroad Section. This member states that he threw away a lot of bulletins. Perhaps some of the rest of us do the same thing. It seems to me that it is an impossibility for the Council to segregate the bulletins and send to the railroad member just the bulletins he wants. With that explanation, and adding a mention of the two-color bulletins with which most of you are familiar, I would like to ask the members present whether they have any specific recommendations to make as a bulletin service of the Council in its entirety; whether the bulletins are right, whether they came frequently enough, whether they cover in a general way what you want them to cover.

MR. DOW: It seems to me there should be at least one Steam Railroad Section bulletin each week, referring absolutely to railroad practice. There has been a Bulletin Committee of the Steam Railroad Section for the past year, and I am sure that the incoming Chairman, Mr. Richards, will appoint a Bulletin Committee also—they will see that we get bulletins that are practical. The National Safety Council now has on file fifty or sixty railroad bulletins that have already been published and I am sure new members can get a complete set at the cost of printing by taking it up with the General Manager of the Council.

MR. SHEDD: I realize that the Council has its way of doing this, but I think the Railroad Section is big enough to be set aside and have their own issue, as far as the bulletins are concerned. It goes against the grain for me to get sixty-four bulletins and put forty-eight of them in the waste basket. It seems to me that if we are entitled to sixty-four bulletins we might have sixty-four bulletins pertaining to railroad work and thus get the use of the forty-eight bulletins we are now throwing into the waste basket. I would dislike to have to say, if my general manager asked me how many bulletins I got each week: "I get sixty-four." "What do you do with them?" "I throw away forty-eight of them and use sixteen."

BULLETINS RESULT OF CO-OPERATIVE EFFORT

CHAIRMAN BELL: The Council, in the course of the year, sends out seven million bulletins and it is pretty hard to segregate them. They realize, as well as you and I, that a lot of them are not appropriate for certain sections. However, your suggestions will appear in the minutes of this meeting. Whether we can get anywhere in a plan such as you mention, it is difficult to tell. The question is a many-sided one.

MR. ANDERSON: I do not suppose the Council is contemplating a change in size of the bulletins. They are issuing letter-size bulletins and also the ones they designate as poster size. I take it they are not going to change the size.

CHAIRMAN BELL: I do not understand that any change from the present size of bulletins is contemplated.

MR. ANDERSON: In my territory, the roads south of the Ohio and east of the Mississippi, very few of the men have handled safety work

and a great many are asking me about bulletin boards. I have advised all I came in contact with that the bulletin board should be patterned after the photograph shown by Mr. Dow. They will hold four standard size bulletins or one poster size bulletin. As long as they get out bulletins of the present size we are all right. The board shown by Mr. Dow is very attractive.

MR. SCOTT: May I suggest, for the consideration of the Bulletin Committee, that they undertake to get up some bulletins illustrated somewhat along the lines that Mr. Bradshaw has done in unsafe practices in the transportation department of the railroads?

CHAIRMAN BELL: I have a note to speak on that matter. The biggest difficulty, if there has been a difficulty, in getting out bulletins for the Railroad Section has been the absolute lack of co-operation on the part of the men sitting around this room and talking about bulletins. The sooner you realize this is your Section and that the work must be handled entirely as a co-operative proposition the quicker you will perfect your bulletin service. I don't know what plans Mr. Richards, the new Chairman, may have, but no doubt he will have a Chairman of the Bulletin Committee and for heaven's sake put him on your mailing list. If Mr. Wightman would take the time, he could tell you a story longer than this room about the difficulty he had in the past year getting out bulletins for your Section because you did not co-operate and help him. The same is true with the *News Letters*. Your Secretary is charged with gettting it out monthly, but he has a mighty hard time, because no-one helped him. The same is true of the other committees. Mr. Broderick, Chairman of the Accident Causes Committee, sent out a letter to eighty-seven members of the Council. He got twenty-seven replies. The sooner you realize this is your Section and that it does not belong to the officers or to the Executive Committee, the better we will get along. Let's all resolve to take hold of this thing and make it a success.

The Council last year answered 3,000 inquries from members for special information. I would be willing to wager they did not get ten inquiries from the Railroad Section because we had not learned how to use the facilities of the Council and get full value from our memberships. Many times a man has a bulletin, or material for a bulletin, but he does not know how to proceed with it. Instead of sending it to the Chairman of the Publicity Committee he does nothing with it. Frequently the problem that is bothering you is bothering some other fellow, too. If you will get it to the Chairman of the Publicity Committee, and it has any merit, he will issue a bulletin. For a very small price you can get a thousand copies of it. if you wish. Speaking again of the Information Bureau: Don't forget to use it, because the Council intends to have, and largely has now, an answer to pretty nearly any problem you may submit to it for advice and information. They have three librarians drawing pay for doing nothing else.

MR. METCALFE: When we belonged to the National Safety Council I got sixteen copies of the bulletins and I had three hundred and fifty bulletin boards. Every time I wanted to send a bulletin out it cost $10.00. They used to be a cent apiece.

CHAIRMAN BELL: Half a cent apiece. You could scarcely get a proof from your printer for ten dollars.

COST OF BULLETIN SERVICE

MR. METCALFE: The men I worked for did not think so. They said: "The National Safety Council gets that bulletin out. They have the cut and the type set up, all it costs is the stock and a man's time to feed the press. Does it cost half a cent to do it?" I am frank to tell you that while I got a lot of good out of the National Safety Council, that is all I did get because I could not use the bulletins. My superior said: "Every time we want to send out one of those bulletins we spend $8.00 or $10.00. Your membership is costing too much now." I hope I am not digressing, I am telling you the reason I do not belong to the Council this year. The manager said: "Your membership in the National Safety Council costs more than any other membership we pay for and if you want anything from them you have to buy it. You can print the bulletins for the money." You gentlemen on the Bulletin Committee should get down to actual cost—don't try to make money on the bulletins.

CHAIRMAN BELL: The National Safety Council does not make any money from any source. They charge you for bulletins what the bulletins cost them.

MR. RICHARDS: I understand the United States Railroad Administration authorizes membership in the National Safety Council.

CHAIRMAN BELL: That is correct.

MR. WIGHTMAN: You have ten or sixteen bulletins sent to you, depending upon your membership. They are the best material available from that sent by the members to the Chairman of the Bulletin Committee. They are paid for with your membership dues. When you select two or three bulletins that you think will be effective. take the number of those bulletins and write a letter to Mr. Cameron. You can get as many as you want for a half a cent apiece. Where can you do any better?

MR. MEYERS: The point made by Messrs. Shedd and Metcalfe is well taken. We joined the National Safety Council a few days ago and I received three or four sets of bulletins. I can appreciate their argument from the fact there are so many we cannot use. We can save the Council a little money, because every industry receiving these bulletins has to destroy or throw into the wastebasket the bulletins that do not concern their particular work.

MR. DOW: There isn't much left to be said on the subject. The whole thing is as Mr. Bell has tried to impress upon you—if you will all cooperate and send in your ideas to the Bulletin Committee and give them your assistance you will receive a greater diversity of bulletins. As to the matter of expense: On the New York Central we have been taking advantage of the National Safety Council bulletin service for six years. We have ordered thousands of extra bulletins, paying the extra expense without a murmur and we considered that we have gotten our money's worth. On the strength of the service we have had I went to Washington with Mr. Richards. We went before Mr. Prouty and

obtained authority for the railroads to join the Council and to pay the increased schedule of dues.

BULLETINS SHOULD APPLY CLOSELY TO INDUSTRY SERVED

MR. SHEDD: The question of expense in the ordering of extra copies of bulletins is not what I have in mind. I am getting forty-eight bulletins which I throw into the wastebasket. There is no doubt that the Eastman Kodak or the Illinois Steel are getting some bulletins with which they do the same thing. But I think the Railroad Section of the Council should be recognized sufficiently to have bulletins appropriate for the use of railroad men sent to the members of this Section and not burden us with a lot of stuff we have to throw away and not inflict the same penalty on the other fellow. Half a cent apiece looks pretty good to me, but it seems wrong from a business standpoint. I have twenty-one divisions and get sixteen bulletins. I throw the other bulletins away and I am five short. The matter should be presented to the Council and remedied in some way, so that we can go before the men who employ us and say we are getting our money's worth. I am not depending on the bulletins to get my money's worth, but I would like to have bulletins I could use. I am not kicking about the price. I would simply like to have a few more of the bulletins I could use and I thought it might be arranged. As Mr. Meyers said, there isn't any use sending my bulletins to Schenectady and Schenectady's bulletins to me and have them both put in the waste basket.

CHAIRMAN BELL: The problem you speak of is a matter of great concern to the Council. They are trying to straighten it out, and I think we can depend on the Council's staff to work out the situation satisfactorily. At the same time I think we should remember that a large number of bulletins issued for the general membership or for other Sections apply to our Section because of the diversity of the railroad business. A careful study of the weekly distribution will save throwing away a good many bulletins.

MR. ARTHUR T. MOREY (Member Executive Committee, National Safety Council): This matter of waste of bulletins has been a very serious question with the Executive Committee from the start. The sectionalizing of our activities—having a Steam Railroad Section, an Electrc Railway Section, Textile Section, Iron and Steel and Foundry Section, and so forth—was a step in the direction of specializing in our bulletins and serving the particular needs of specific members. Let us not forget that our Council is purely a co-operative institution. The Executive Committee has tried to make the Sections autonomous. Your service depends on what you make it. The Council is not like a dry-goods store, where you can go in and look over the shelves and ask for something, and if they do not have what you want go out dissatisfied. We ourselves create the wares on our shelves with which to supply ourselves. We are a clearing-house and what each Section wants it must itself create; it is the only creative power there is. In the Section itself lies the only possibility of producing what they want.

I think your discussion has been most wholesome, because as we each contribute what we have to the common good, all will participate in the discoveries we make. Take a railroad. What doesn't a railroad do? It has machine shops and a most diversified list of activities. Mr. Cameron will send whatever you ask for, and if there is waste let us prevent it. If you are getting something you do not want let him know what you do want. The matter of paper alone is a serious thing at this time; let us not waste a single sheet of paper. We need the closest co-operation to see that we get what we want and create what we want, all co-operating and combining to develop a perfect condition for yourselves.

ALL BULLETINS SERVE USEFUL SERVICE

MR. CHAPIN: In looking over the bulletins issued during the past six months I have not seen any that could not be used somewhere or were not applicable to some point in railroad operation. It is like the nigger said about whiskey: "There ain't no bad whiskey, only some is better than the other." There are no bad bulletins.

CHAIRMAN BELL: Mr. Cameron, no doubt, will be glad to discuss this matter with you at length whenever you happen to be in Chicago.

Is there any other matter that you care to take up at this time? Does anyone care to speak about the size or the value of two-color bulletins?

MR. SHEDD: Was the standard settled? There is no plan to change the size from eight and a half by eleven is there?

CHAIRMAN BELL: I understand no change in size is contemplated.

MR. MORRIS: I prefer the two-color bulletins. I think they are more attractive and receive more attention. I believe that the poster bulletin is a waste of paper.

MR. METCALFE: What about lights on motor cars?

CHAIRMAN BELL: Write Mr. Cameron and he will send you a copy of some information which he has looked up in detail, I believe, on that subject. I think it was handled by a questionnaire some months ago.

We have had a wonderful meeting. It is probably the best we have ever had. I hope we will all carry away some of the inspiration that men like Mr. Dow and Mr. Belnap and Mr. Richards have given us. If we secured half the good out of this Congress that we should have obtained from it we are going to put safety in the forefront on American railroads.

Before adjourning, I wish to ask Mr. Richards, the newly elected Chairman, to come forward and take charge of the meeting. In turning over the meeting to my successor I desire to thank all of you for your part in making our Section during the year which now closes the success it has been and to bespeak for the new officers your co-operation and assistance which are so essential to the successful conduct of the affairs of the Section.

MR. RICHARDS IN THE CHAIR

CHAIRMAN RICHARDS: Gentlemen of the Steam Railroad Section, the success of this Section does not depend on me, it depends on you indi-

vidually and collectively. You remember, perhaps, a little phrase that made the rounds of the country when they started solicitation for the sale of the War Savings Stamps. It made a deep impression on my mind: "If each of us will do a little, all of us will do a lot."

I have accepted this position for the next year, and it isn't going to be an easy one, with the express understanding that I am to have the individual and collective assistance of every man that belongs to the Steam Railroad Section. I shall expect that when we send out a letter asking for information of any kind that we will get an answer. We will want it quickly and not be obliged to waste paper and postage stamps that cost 3 cents now to ask three or four times for your answer. I do not think there is any excuse for a man running a safety organization not to reply to inquiries that come from any member of this body—I think we will have to keep a record of men that do not answer and report them to the Section.

A NEW ERA ON RAILROADS

We are starting on a new era. We have what no other body connected with the National Safety Council enjoys—the endorsement and approval of the United States government, the greatest and best government in the world. As loyal Americans you owe it to the government—you are all working for the government; it is paying you and taking care of your families—to do everything possible to make this Section the success it ought to be. What we want to do next year, when we meet in annual session, is to say to Mr. Belnap, manager of the Safety Section, and to say to the "big boss," Mr. McAdoo, that we have really accomplished something—that we do not meet just to get off a lot of hot air; that we come here to get ideas and when we go home we disseminate them. We must show results. We must show a reduction of accidents and I do not mean 10 per cent—we ought to reduce accidents 50 per cent. We want to place our mark high.

Remember, we all are starting on a trip and the trip leads to the station that is called "Conserving Human Life." That is our destination and every man here and every man connected with the safety organizations of the railroads you represent wants to his share; more than has share, because there are bound to be some slackers. None of you gentlemen should allow yourselves to be put in that class. When we come back next year let us return with a report that will surprise not only the other Sections and our National Council with what we have done but will surprise Mr. McAdoo.

PROUD OF MEMBERSHIP IN SAFETY ORGANIZATIONS

We have the greatest work before us we have ever attempted. I have always been a member of the Council. I have always been proud to be a member, just as I am proud to be a member of the safety organization of the railroad I am connected with, and what we want to do is to instill into the minds of the men associated with us in this work that our business is more important than any other business on the railroad,

because it relates to the saving of human life and limb. Every man who occupies a safety position or who has any connection with the safety committees of the different railroads, to my mind, is occupying the most honorable position there is on the railroad, because we are devoting ourselves to the service of mankind. When the war is over, and God pray it may be over soon—I believe it will be—service will be the thing to be recognized. It isn't money; it isn't clothes, it isn't position; any man in this country who cannot say that he has done some service to the community in which he lives, to the State that gives him a place, to the great country that we all belong to, has no business in the National Safety Council and certainly no business in the Steam Railroad Section. Every man must render some service, that must be our watchword. Let it be, gentlemen, a greater and better service than we have ever rendered before. Let us go home with that idea fixed in our minds, that we are going to do something: that we are going to be real men: that we are going to tell our sons and our brothers and our fathers, some of whom who are "over there," that we have done all we could to help bring this war to a successful conclusion.

I do not think there is any feeling a man can have when he goes home at night that will bring him greater joy, greater contentent and happiness, than the feeling that during the day he has saved some man's life: that he has saved some one from being a widow or an orphan; that he has saved some man from being a cripple, and that he has helped our great country in conserving its greatest asset, the men and women of America. I thank you.

THANKS TO RETIRING OFFICERS

Mr. Carrow: I am absolutely sure that no man on the railroads of the United States has worked harder during the last year to make the National Safety Council a success than Harry J. Bell and I offer as a motion that we give him a rising vote of thanks. (The motion was seconded and unanimously adopted amid applause. The same action was also taken in the cases of Messrs. Anderson and Mr. Wightman.)

Chairman Richards: As there is no further business to come before this meeting we will stand adjourned until the next session of the National Safety Council.

Industrial Division—Mining Section

St. Louis, Mo.

Sept. 17 and 18, 1918

B. F. TILLSON, Chairman
New Jersey Zinc Company, Franklin, N. J.

H. G. DAVIS, Vice President
352 Rutter Avenue, Kingston, Penna.

W. H. SHEARMAN, Secretary
New Jersey Zinc Company, New York City.

SYNOPSIS OF MEETINGS

WEDNESDAY, SEPTEMBER 18

MEETING called to order at 9:45 a. m., September 18, by Chairman B. F. Tillson.

The Chairman delivered his annual address.

Verbal report made by Secretary W. H. Shearman.

Verbal report made by R. Dawson Hall, Chairman of Membership and Publicity Committee.

Verbal report made by J. P. Reese, Chairman of Program and Publication Committee.

The Chairman appointed the following as a Nomination Committee, to report at the last session: R. Dawson Hall, Roy A. Cook and R. H. Seip.

Frederick L. Hoffman made an address on "The Dust Hazard to Health in the Stone Industry." Discussion by R. Dawson Hall, Dr. Bacon and H. D. Mason.

A synopsis of the paper "The Effects of the Use of Pneumatic Tools," by Dr. F. M. Barnes, Jr., was read and discussed by Dr. Hoffman, Mr. Hall and Major Darlington.

A summary of the paper by W. O. Borcherdt on "Abatement of Dust from Drilling Operations by the Use of Water Drills," was read by the Secretary. Discussion by Dr. Hoffman, R. H. Seip, B. F. Tillson, A. Tallon, Mr. Cook and Prof. Raymond.

Paper by Lt. Col. C. H. Connor on "Standardization of First Aid Methods" was presented by Dr. Wm. N. Lipscomb of the American Red Cross. Discussion by Dr. L. A. Shoudy, R. H. Seip and R. A. Cook.

It was voted to postpone Prof. Raymond's paper until the afternoon session.

The session adjourned at 12:30 o'clock. Attendance, 52.

WEDNESDAY AFTERNOON, SEPT. 18

Meeting called to order at 2:10 o'clock.

Paper by Albert H. Fay on "Suggested Methods of Keeping Mine Accident Records; Results Which Have Been Obtained," read by the Secretary. Discussed by R. D. Hall, B. F. Tillson, J. W. Reid, H. H. Matthieson, Mr. Friendewald and S. Rolle.

Paper by Robert Johnson, "What Relation Has Labor Turnover to Mining Accident," read by the Secretary. Discussed by J. W. Reed, A. Thacher, B. Cummings, R. H. Seip, B. A. Sine, W. F. Boericke, C. H. Wilson, S. Rolle and R. D. Hall.

Prof. R. M. Raymond presented his paper on "Standardization of Mine Cars in Metal Mines." Discussed by B. F. Tillson, B. A. Sine, R. H. Seip, A. Tallon, G. C. Nelms and A. Thacher.

Paper by D. K. Glover, "Hazards and Safeguards in Coal Breakers and Washeries." Summary read by Secretary.

Summary of paper by J. S. McKaig on "Hazard in Ore Dressing Plants" read by Secretary and following discussion was on both. Discussion by G. C.Nelms, Jos. W. Reed and R. H. Seip.

Paper by C. A. Mitke on "Practice of Mine Ventilation" read by the Chairman. Discussed by A. S. Richardson.

Session adjourned at 5:55 o'clock. Attendance, 41.

THURSDAY MORNING, SEPT. 19.

Meeting called to order at 9:50 o'clock.

Summary of H. M. Chance paper, "Acetylene and Electric Cap Lamps from a Safety Standpoint," read by the Secretary. Discussion by W. F. Boericke, J. P. Reese, B. A. Sine, A. S. Richardson, R. D. Hall, B. F. Tillson, A. Thacher, H. D. Mason and R. H. Seip.

Paper on "Hosting Ropes" presented by M. W. Reed. Discussion by B. F. Tillson, A. Thacher, W. S. Hart, A. A. Bawden, J. P. Reese and B. A. Sine.

Paper on "Handling and Storing of Explosives" by Arthur LaMotte, presented by R. H. Summer. Discussed by J. P. Reese, H. D. Mason, B. F. Tillson, R. A. Cook, W. F. Boericke, Prof. Raymond and A. S. Richardson.

Paper on "Handling and Storage of Calcium Carbide," presented by P. S. Case. Discussion by R. H. Seip and B. F. Tillson.

The report of the Nominating Committee was made by R. Dawson Hall, recommending the following for officers of the Mining Section for the ensuing year: Chairman, B. F. Tillson; First Vice Chairman, H. G. Davis; Second Vice Chairman, Charles W. Goodale; Third Vice Chairman,

A. J. Moorshead; Secretary, Wm. H. Shearman. A motion was made and seconded that the report of the Nominating Committee be adopted.

Meeting adjourned at 1:40 o'clock. Attendance, 50.

DELEGATES PRESENT AT MEETING

N. W. Anderson, Union Carbide Company, Niagara Falls, N. Y.
John E. Bacon, M.D., Inspiration Construction Copper Company, Miami, Ariz.
A. A. Bawden, Pickands Mather & Co., Hurley, Wis.
L. W. Bevan, Hazard Manufacturing Company, Wilkes-Barre, Pa.
T. W. Blake, Union Carbide Company, Niagara Falls, N. Y.
W. B. Blakey, Atlas Powder Company, Tamaqua, Pa.
Wm. F. Boericke, Mineral Point Zinc Company, Galena, Ill.
Jas. Boston Superior Coal Company, Gillespie, Ill.
C. G. Brehm, Oliver & Synder Steel Company, Uniontown, Pa.
B. H. Burgess, St. Louis Smelting & Rfg. Wks., St. Francois, Mo.
Geo. P. Cady, Hazard Manufacturing Company, Chicago, Ill.
H. H. Carmon, Hog Island, Pa.
P. S. Case Union Carbide Company, Niagara Falls, N. Y.
A. N. Chase, Atlas Powder Company, Landing, N. J.
Roy A. Cook, Hecla Mining Company, Burke, Idaho.
Byron Cummings, Ocean Ac. & Guar. Corp., New York City.
R. E. Curry, Union Carbide Company, Niagara Falls, N. Y.
Thomas Darlington, American Mining & Steel Inst., New York, N. Y.
B. B. Dimmick, Hudson Coal Company, Wilkes-Barre, Pa.
N. Duffett, Union Carbide Company, Niagara Falls, N. Y.
A. Duncan Toronto, Canada.
Grant Earl, Primos Chemical Company, Boulder, Colo.
C. H. Eddins, Aetna Life Insurance Company, St. Louis, Mo.
G. H. Evans. Hecla Mining Company, Burke, Idaho.
Thomas Feeney Union Carbide Company, Niagara Falls, N. Y.
C. P. Fiske, The New Jersey Zinc Company, Palmerton, Pa.
B. S. Foster, St. Joseph Lead Co., Bonne Terre, Mo.
T. H. Garnett, The Empire Zinc Company, Gilman, Colo.
W. E. Goodman, Pittsburgh, Pa.
R. Dawson Hall, McGraw-Hill Co., Inc., New York City.
W. S. Hart, Hazard Manufacturing Company, Wilkes-Barre, Pa.
H. F. Hecker Monsonto Chemical Works.
F. L. Hoffman, Prudential Insurance Company, Newark, N. J.
Robert L. Hood, St. Louis Smelting & Refg. Wks., St. Francois, Mo.
J. H. Hurst, Aetna Life Insurance Company Louisville Ky.
J. D. James The New Jersey Zinc Company Palmerton, Pa.
H. L. Johnson, U. S. Metals Ref. Company, E. Chicago, Ill.
F. S. Jones, Union Carbide Company.
D. P. Kennedy, Pittsburgh Plate Glass Company, Pittsburgh, Pa.
L. J. Kern, Broderick & Bascom Rope Company, St. Louis Mo.
S. H. Kershaw, Safety Engineer, Hercules Powder Company, Wilmington, Del.

R. J. Lauder, The Consolidation Coal Company, Jenkins, Ky.
W. N. Lipscomb, M.D., American Red Cross, Washington, D. C.
H. D. Mason, Jr., Mine Safety Appliances Company, Pittsburg Pa.
H. H. Matthieson, American Smelting & Refining Company, Garfield Utah.
F. X. Meehan, St. Louis Smelting & Refining Works, St. Louis, Mo.
F. E. Morris, American Rolling Mill, Middletown, O
H. C. Morrison Monsanto Chemical Works.
J. P. Mosier, St. Louis Smelting & Refining Company, St. Francois, Mo
Geo. C. Nelms, Mine Safety Appliances Co., Pittsburgh, Pa.
C. E. Pettibone Pickands Mather & Company, Hurley, Wis.
W. B. Plank U. S. Bureau of Mines.
W. F. Rawson, St. Louis Smelting & Refining Company, St. Francois, Mo
R. M. Raymond, Columbia University, New York, N. Y.
M. W. Reed, American Steel & Wire Company, Worcester, Mass.
John P. Reese, Superior Coal Company, Gillespie, Ill.
Jos. W. Reed, Consolidation Coal Company, Fairmont, W. Va.
A. S. Richardson Anaconda Copper Mining Company, Butte, Mont.
L. R. Roach, Wisconsin Steel Company, Benham, Ky.
J. K. Robinson, Jr., Atlas Powder Company, Wilmington Del.
Sidney Rolle, U. S. Metals Refining Company, Chrome, N. J.
L. M. Rue, American Steel & Wire Company, Worcester, Mass.
R. H. Seip, The New Jersey Zinc Co., Franklin, N. J.
W. H. Shearman, The New Jersey Zinc Co., New York, N. Y.
Loyal Shoudy, Bethlehem Steel Company, Bethlehem, Pa.
B. A. Sine The Associated Companies, Johnston City, Ill.
R. H. Summer, E. I. du Pont de Nemours & Co., Wilmington, Del.
B. S. Tale, Aetna Life Insurance Company, St. Louis, Mo.
A. Tallon, Old Dominion Company, Globe, Ariz.
Arthur Thacher, The New Jersey Zinc Company, 900 Security Bldg. St. Louis, Mo.
R. H. Thiess, *Coal Industry*, 1460 Monadnock, Chicago, Ill.
Benj. F. Thomas, Jr., United Railways Company, St. Louis, Mo.
R. J. Thompson, Air Nitrates Corp, Muscle Shoals, Ala.
B. F. Tillson, The New Jersey Zinc Company, Franklin, N. J.
R. C. Varble, United Railways Company, St. Louis, Mo.
C. H. Weaver Union Carbide Company, Niagara Falls, N. Y.
C. H. Wilson, Utah Copper Company, Garfield, Utah.

WEDNESDAY MORNING SESSION

THE SECTION was called to order by Chairman B. F. Tillson at 10 o'clock.

CHAIRMAN TILLSON: The Mining Section will please come to order.

The Chairman greets you and hopes there will be an increased number in attendance at this and subsequent sessions. It seems unnecessary to say much in regard to the work that has been accomplished during the

past year as it is well exemplified by the program before you. The membership of our organization is growing and the bulletin service developing, details will be touched upon in the report of our committees.

Secretary Shearman will now report for his committee.

SECRETARY'S REPORT

MR. W. H. SHEARMAN (New Jersey Zinc Company, New York City): I have acted as Secretary of the Section only about three months, so my report is rather limited. The membership at present time consists of: Coal mine members, 160; metal mine members, 95; a total membership of 255.

CHAIRMAN TILLSON: None of the Vice Presidents are in attendance this morning, but Mr. R. Dawson Hall, Chairman of the Membership and Publicity Committee, will tell us something of the work that his committee has accomplished this year.

REPORT OF MEMBERSHIP AND PUBLICITY COMMITTEE

MR. R. DAWSON HALL (Associate Editor *Coal Age*): *Mr. Chairman and Gentlemen*—I am afraid that most of my efforts have been devoted rather to the general publicity in the National Safety Council than to the special publicity in the Mining Section. We have been trying and I trust whoever is Chairman of the committee this year will continue to try to increase the amount of publicity which is being received. This year at least three papers, all of them mining papers, have given large publicity to the National Safety Council. I cannot tell how many have done so, but there has been an appeal to all of them to have convention numbers, and the *Coal Age*, *The Engineering and Mining Journal* and the *Coal Industry* have all run special convention numbers. I think that nothing will aid the National Safety Council more effectually than these convention numbers. But far more important in the question of membership is not merely the driving for membership, it is the deserving of it, and it seems to me that while so far we have deserved a great deal, we could deserve more, and the work Mr. H. H. Robertson is doing in Western Pennsylvania, in which he gives actual service, actual personal service—he sends a man around in an automobile with pictures and a line of talk and gets close to the men—is about the only way in which we can do real constructive work. Much of the work has been admirable, but what we need above all is the spoken word, and it is to be hoped we will manage to get that spoken word across. It is much more fruitful than the written word or the picture bulletin.

It is my hope and trust that the convention numbers will be progressively better. They are not as good now as they should be, the reason being that while the papers were prepared early by the authors some of them were not received in time by the publishing houses. I think it an important matter that the whole industry set aside one week for the publication of material in the interest of safety and welfare and all the problems connected with these two matters.

CHAIRMAN TILLSON: Thank you, Mr. Hall. Mr. Reese, Chairman the Executive Committee of this Section, has been in charge of the pr grams and publications and is responsible for the excellent series of mi ing bulletins produced this year.

REPORT OF BULLETIN COMMITTEE

MR. J. P. REESE (Superior Coal Company): I have been so busy, everyone else has been, during the year, that I have not been able give the business of the committee the time it deserves. I am sor I have not been able to do something really worth reporting. The litt I have done has been a question of stealing some time from either m family or from the boss. During the coming year I hope the bullet service will be improved. We think a great deal of the bulletins and feel that this organization needs a paid Secretary or field worker to g in personal touch with our members. There is no reason why all practically all of the coal companies of this country should not belong the Council. The question of membership should be properly put up them and I think in that manner we can make it a better organizatio That is the only way to do it; you haven't time and I haven't tim A lot of my neighbors do not have the bulletins and I feel sure the would have them if some one had the time to go after them and e plain the matter. Every movement, however, has to have a beginnin and I feel. considering all the circumstances, that we have justified o existence. I hope means will be found to extend our information an extend our membership and if it is possible to secure a Secretary or fiel worker to devote his whole time to the business I believe the results i increased memberships will more than pay for the service.

CHAIRMAN TILLSON: The Accident Statistics Committee will be repr sented by a report from Chairman Fay later in the session. The pape on the "Abatement of Dust" will be by Dr. Lanza of the Committee o Hygiene and Sanitation. Dr. Clarence H. Connor is Chairman of th Committee on Standardization and Dr. Lipscomb is here to represent Co Connor. He is to present a report of "Standardization of First Ai Methods."

APPOINTMENT OF NOMINATING COMMITTEE

The Chairman is required to appoint a Nominating Committee to co sider officers for the Section for the coming year. These officers will b voted upon at our final meeting, on Thursday morning. The function o the Nominating Committee is merely to insure the placing of a com plete list of names before you; it does not in any way infringe upo your rights to nominate additional men for office and to consider the on your ballot. I will ask Mr. Hall, Mr. Cook and Mr. Seip to serve o this committee, and would suggest that at some time during the day yo canvass the situation of prospective nominees.

Our first paper is by Dr. Frederick L. Hoffman of the Prudential Insur ance Company of America.

THE DUST HAZARD TO HEALTH IN THE STONE INDUSTRY

DR. FREDERICK L. HOFFMAN, THIRD VICE PRESIDENT AND STATISTICIAN, THE PRUDENTIAL INSURANCE COMPANY OF AMERICA, NEWARK, N. J.

Mr. Chairman and Members of the National Safety Council: The subject of my address is one to which I have given careful thought for more than twenty years. All of you are mining men but I question if any one of you has visited more mines, and different types of mines regarding the material extracted, in this and other countries than I have. It has been my privilege to visit even such remote mining fields as Newfoundland and Alaska. After I leave here I expect to visit, for several days, the great Homestake mines of South Dakota and other mines in the Black Hills. My interest in mining matters is primarily for reasons of our business of life insurance. The proper rating of mine employes has always been a difficult practical question on account of the wide variation in mining hazards according to the mineral extracted, or the methods of mining followed in the different sections of the country. Our earlier information was chiefly derived from English and continental sources, but it soon became evident that, for reasons of accuracy and equity, our practice should be based, as far as possible, upon the ascertained facts concerning mine experience in this country. The evidence is absolutely conclusive that, as a class, mine employees suffer more seriously from accidents and general diseases than men employed in manufacturing and general mechanical pursuits. For certain groups of mine employees, such, for illustration, as those engaged in underground mining in Southwest Missouri, or in the copper regions of Montana, the mortality from tuberculosis, and even non-tuberculous respiratory diseases, is unquestionably excessive. The immediately contributory factor responsible for this condition is the dust, which is now a much more serious problem than formerly on account of the practically universal use of pneumatic tools. I need not enlarge upon this problem, which is one that I may assume to be thoroughly familiar to all mining men.

INVESTIGATIONS IN JOPLIN DISTRICT

I may also assume that most of you are familiar with the investigations which have been made by the U. S. Bureau of Mines into the subject of siliceous dust in relation to pulmonary diseases among miners in the Joplin district. These investigations by Higgins, Lanza, Laney, and Rice are contributions of the first order to the subject of industrial hygiene in its special application to the mining industry. We have not, however, made the required progress in this country which would make our own investigations comparable to those, for illustration, of the South African Commission on Miner's Phthisis. The urgently required active cooperation of practical men familiar with underground conditions in the mining industry, of men engaged in the practice of medicine among mining men, and of scientific minds of a high order, thoroughly familiar

with highly specialized methods of technical research, has not as yet be forthcoming in this country, though the outlook in this respect was nev as encouraging as it is to-day.

The use of pneumatic tools in the mining industry is in itself a pro lem demanding special consideration. The danger to the health of tl employees is in almost exact proportion to the continuance of the dus or as the initial effects of dust inhalation are apparently harmless the generally prove more deadly in the end. Or more specifically, it : chiefly a question of the minuteness of the dust. the most dangerou particles of which are generally ultramicroscopical. It is these dust part cles that cause a continuous irritation of the lung tissue and brin about serious lacerations, followed by fibroid processes and ulcerations a a predisposing condition to a subsequent tuberculous infection. Tube culous germs. of course, are practically everywhere and perhaps not muc more common underground than above ground. but they are so muc more dangerous in places where the sunlight does not penetrate. an where the viability of the germ is probably more prolonged than in th outside atmosphere. Conformity to sanitary requirements underground is. therefore, of the most importance in mine management if the healtl of the employees is to be adequately conserved. and particularly so agains the risk of tuberculous infection.

PUBLICATIONS OF UNITED STATES GOVERNMENT

Qualified opinion is more or less at variance as to whether or not all mineral dust is injurious to the lungs. In a technical sense this is probably true, but there are important exceptions to the view that all dust inhalation is seriously harmful and a predisposing cause of tuberculosis. Much depends upon the mechanical and chemical properties of the dust inhaled and the conditions under which inhalation takes place. Men otherwise robust and in good health, with their vitality unimpaired, may suffer a much lesser degree of injury than those who have their vital resistance reduced by industrial fatigue, malnutrition, or habits of gross intoxication. As a practical question, our interest at this time should be concentrated upon the dusts that are most harmful, upon the specific occupations that are most affected, and upon the underground conditions that demand the most rigid supervision and control. Siliceous dust is unquestionably the most serious, while the dust of limestone or of cement is probably the least harmful. Much, however, depends upon the nature of the material and the minuteness of the dust inhaled. The quantity and continuity of the inhalation is also a matter of considerable importance. In a recent contribution of mine on the "Mortality from Respiratory Diseases in Dusty Trades," limited to inorganic dusts, and published as Bulletin No. 231 of the U. S. Bureau of Labor Statistics, I have enlarged upon certain aspects of the mining industry, which makes extended consideration unnecessary at the present time. The bulletin can be had on application to the U. S. Commissioner of Labor Statistics, Washington. D. C. The discussion includes all available mortality statistics, derived from insurance or official sources, and amplified by refer-

ences to technical discussions in mining periodicals, etc. As yet there has not been forthcoming a standard treatise on mine hygiene and sanitation by an American authority based upon carefully ascertained conditions in American mines, mills and smelters, such as is most urgently required in the furtherance of the broader plans and purposes of public health administration, with special reference to labor and industry. Text-books on mining, as a rule, make only fragmentary reference to health and sanitation, and usually only with reference to either very general or very exceptional conditions, such, for illustration, as the liability to poisoning in quicksilver mines, or to cyanide poisoning in the management of cyanide plants. It is therefore gratifying to meet with an increasing interest on the part of the U. S. Bureau of Mines in the hygienic aspects of the American mining industry, amplified by special investigations on the part of the U. S. Bureau of Labor Statistics, the U. S. Public Health Service, and the Working Conditions Service section of the Department of Labor. A forthcoming publication on "The Health Hazards from the Use of the Air Hammer in Cutting Indiana Limestone," by Dr. J. P. Leake, of the U. S. Public Health Service, and two supplementary reports on the "Supposed Physical Effects of the Pneumatic Hammer on Workers in Indiana Limestone," by Dr. David L. Edsall, and "The Effect of the Air Hammer on the Hands of Stonecutters" by Dr. Alice Hamilton, to be issued by the U. S. Public Health Service in bulletin form for general information, may here be referred to as practical indications of an aroused interest in a highly specialized branch of inquiry, which is also receiving the attention of a committee appointed by the National Tuberculosis Association. This committee will concern itself chiefly, at the outset, at least, with the health-injurious effects of employment in the stone industry, limited, however, to the granite and marble quarries of Vermont and the limestone quarries of southern Indiana. The committee, in course of time, however, intends to take up the question of underground mining conditions, and the cement industry, in which the health-injurious effects of dust inhalation are apparently of much less consequence than in underground mining with exposure to the inhalation of siliceous dust.

VIEWPOINT OF EXPERIENCED MINE SUPERINTENDENT

The paper to be read by Mr. Borcherdt, Superintendent of the Bertha Mineral Company, of Virginia, of which copies have been made available preliminary to this meeting, is one of the most useful contributions to the subject under discussion. This paper is the second one by Mr. Borcherdt, who last year made an important contribution to the subject of the abatement of dust in drilling operations by the more effective use of water drills. The paper is so much more important in that it presents the viewpoint of an experienced mine superintendent, and that the supplementary analysis gives the results of a questionnaire sent to some twenty or thirty mining companies throughout the country. If such a service had been performed by a mine superintendent abroad he would have been most highly honored, not only by his profession but by the

Government and the public at large; for there is the utmost urgency for voluntary service of this kind on the part of the layman thoroughly familiar with certain phases of an important question, which can not possibly be within the understanding of government mine officials or members of the medical profession. It is to be hoped that Mr. Borcherdt will continue his investigations in this fruitful field of scientific inquiry and that he will present the results of further investigations at subsequent meetings of this Congress.

The problem of mine dust and miners' mortality is clearly one of increasing economic importance to the mining industry. Every life of an experienced mine employe prematurely shortened represents a serious economic loss. All practical methods of health improvement, or life prolongation, rest, therefore, upon a sound economic as well as social and humanitarian basis. There has recently been issued a final report on Industrial Health and Efficiency, by the Health of Munition Workers Committee of the British Ministry of Munitions, in which there occurs this suggestive observation:

"Sickness due directly or indirectly to the industrial occupation takes various forms and degrees from the passing headache to serious organic disease of fatal issue. The lungs, the heart, the digestive organs, the nervous system, the muscular system—each or all may be affected with results harmful both to industrial efficiency and output, and also to personal health and expectation of life. Moreover it must be remembered that an undue proportion of sickness in any group of workers usually represents among those not actually sick lessened vigour and activity which can not fail to reduce output. Disabling conditions or influences which injure some have a tendency to mark all. Employers and their work-people should therefore have a general appreciation of these injurious conditions if they are to be on the outlook to guard against or mitigate their evil effect."

After enumerating the causes or conditions responsible for sickness occurrence in industry, including among others, excessively long hours of work; cramped and constrained attitudes; prolonged and excessive muscular strain; working in unventilated or insufficiently ventilated shops; imperfect lighting, conducive to eye strain, headache, etc.; and exposure to gases, vapors, poisons, or other irritating substances; reference is made to the dust produced in certain industries and productive of lung disease unless effectively safeguarded against by adequate protective measures. The report concludes with the statement that—

"Though these are a sufficiently formidable list of disabling conditions, or conditions which without proper care and precaution may readily cause disablement, they do not complete the inventory. At least as important as any of these occupational influences, but inseparable from them, is the predisposition to disease arising from the absence of personal hygiene. The necessities of individual health are few and simple, but they are essential. Suitable and sufficient food, fresh air, warmth, moderation, cleanliness in ways and habits of life, the proper inter-relation of work, repose and recreation of mind and body are laws of hygiene, the elements of vital importance for which facilities must be provided if the

maximum industrial output of the individual is to be secured and maintained. These matters need consideration by the management just as much as the healthy supervision of the external circumstances of the factory and its technical processes."

UNDERGROUND CONDITIONS IN CALIFORNIA

These observations are strictly applicable to the mining industry. They are best illustrated by the results of a recent inquiry into the occurrence of hookworm in underground mining in California, due largely to sanitary indifference and neglect. If it is true that over 50 per cent. of all the men are infected in certain mines, the economic efficiency of these men must be reduced very considerably, with a consequential financial loss to the mining industry. In some mines which I have visited the underground sanitary conditions are appalling. No cattle above ground would be housed or herded in such a thoroughly indifferent manner. The men are required to eat their meals underground, frequently amidst filthy and contaminated surroundings. The meal itself is only too often wanting in nutriment or otherwise health-promoting qualities. This is an aspect of miners' hygiene which has only of late received consideration. The investigations of the Health of Munition Workers Committee draw attention to the problem of food and canteens just preceding the consideration of the question of sickness and ill health.* The conclusion is advanced by this Committee, which consisted of the foremost British experts on the subject, that—

"There is now an overwhelming body of experience which proves that productive output in regard to quality, amount and speed is largely dependent upon the physical efficiency and health of the worker. In its turn such physical fitness is dependent upon nutrition. The purpose of nutrition is to secure the health, the proper development and growth, the repair and vital energy, of the human body. Food energy is spent in maintaining the tissues of the body and the body heat and in doing work. Nutrition is stimulated by the cooling effect of fresh air, and by bodily exercise, and its needs must be met by a food supply suitable in character and sufficient in amount to meet the expenditure on body heat and work."

In the light of my own investigations, I am absolutely satisfied that the food of miners is frequently unsuitable as regards quality though generally sufficient as to quantity. The conditions under which the food is eaten underground are often, if not generally, entirely unsatisfactory. The food is often in a deteriorated condition, with the result that intestinal or digestive diseases are relatively common. It would therefore seem well worth while for the mining industry to give more thoughtful consideration to this question and provide better facilities for the eating of meals underground, where the leaving of the mine for the meal hour would prove impracticable. Sufficient time for meals should also be allowed, and a full hour would seem a proper period.

*See in this connection "Standards of the Department of Health and Sanitation" of the United States Shipping Board Emergency Fleet Corporation, 1918, and "Restaurant Facilities for Shipyard Workers," by Frederick S. Crum, also published by the United States Shipping Board Emergency Fleet Corporation, Philadelphia, 1918.

These observations, of course, bear only directly upon the dust problem. Whatever diminishes disease resistance is, however, a contributory factor in the mortality from tuberculosis, and an anaemic miner is unquestionably more susceptible to the disease than one whose blood supply is of the required quality. The same observation applies to the physical examination of mine employees. A fair proportion of the men employed are physically unfit for the exacting, and occasionally exhausting, duties to be performed. Regarding all such conditions as anaemia, possibly associated with diseases of the heart and circulatory system, nervous exhaustion, derangement of special physiological functions, etc., the Health of Munition Workers Committee points out that though not in all cases immediately incapacitating, "they frequently tend to become chronic in nature and far-reaching in effect, and they lead directly to malnutrition and reduction of bodily energy. If allowed to persist they invariably lay the foundations of ill-health and disease in later years." A thorough physical examination, and periodical re-examinations, would eliminate from the mining industry men physically unfit, though by no means unsuitable for other employments. By thus raising the physical standard of mine workers the liability to tuberculous and non-tuberculous lung diseases would of itself be materially reduced regardless of the dust hazards underground.

NEED OF BETTER TEACHING METHODS

There is need of better teaching methods in matters of personal hygiene. The experienced mine worker is generally a man of more than average intelligence, and the success of the first-aid movement has conclusively shown his willingness, if properly approached, to co-operate with the mine owner and the Government. There are no reasons for assuming that he would not be willing to co-operate even more actively in matters concerning his immediate personal physical welfare and his future health and longevity. Cause and effect in chronic lung diseases are unfortunately often remote from each other. Minute particles of dust may be inhaled for years without apparently serious consequences to the health of the individual concerned. All those who are thoroughly familiar with lung fibrosis know of cases where the onset of active symptoms was extremely sudden and where death followed within a comparatively short period of time. At autopsy the condition of the lungs will, however, disclose serious deterioration extending over many years. It is too much to expect in a mine laborer a degree of intelligence in matters of personal habits conducive to good health not met with even among men in professional life. The effective teaching of the principles of the hygiene of the respiratory apparatus, including, for illustration, the dangers of mouth-breathing and the importance of removing obstructions in the nasal passages; the prevention of nasal catarrh; the danger of adenoid growths as well as the more simple rules concerning the prevention and treatment of tuberculosis, is a matter which is yet but very inadequately dealt with in attempts which have been made to improve the health of mine employes by suitable methods of health propaganda.

MECHANICAL CONTROL OF DUST EVIL

After all, however, the main problem is the mechanical control of the dust evil. There can be no serious objection to the compulsory use of the Water Lyner drill subject to certain qualifications in important matters of technical detail. The health of the workmen is of vastly more importance than reckless mine exploitation to the point of positive indifference and apathy in matters of mine sanitation. In a large measure the dust menace can be controlled by a rational adaptation to underground conditions by the use of Water Lyner drills, by better care in the use of pneumatic tools, etc. How this can be done at minimum expense and without serious interference with productive processes has been made clear to us by the impartial investigations from the employers' point of view by Mr. Borcherdt, of the Bertha Mineral Company, of Virginia. Mr. Borcherdt's observations on the proper construction of respirators are of special interest. It is to be hoped that he will continue his inquiries, for more information is urgently required. It is regrettable that thus far the subject should not have attracted the proper attention of the American Museum of Safety, which has adequate facilities for the display of the most useful devices. It might also be suggested that possibly the Bureau of Standards might take up this question and institute an inquiry to determine the type of respirator best adapted to the protection of the employes against different forms of dust. In my own investigations I have frequently met with men who had been using respirators in dusty stopes for a number of years and without serious inconvenience. In many cases, however, the men naturally object to the use of respirators of improper construction and therefore inconvenient, if not entirely unsatisfactory, for practical service. Under certain conditions particularly in small and narrow stopes, the use of respirators remains the only safeguard unless work of this character is to be prohibited by law. There are natural limitations to the use of spraying devices, or humidification, suggestive of further perfections in respirators, thus making them more suitable for the purpose than is generally the case at the present time.

PROBLEM OF FIRST ECONOMIC IMPORTANCE

I trust that I have made myself clear as regards the very practical importance of dust elimination in underground mines as a problem of the first economic importance to the mining industry. Further apathy and indifference are certain to be followed by serious consequences to those responsible for the continuance of conditions largely unnecessary in the light of our present-day understanding of the facts and the methods by which conditions obviously detrimental to life and health can be brought more or less effectively under control. It is not a question of aiming at the ideal, but merely of a deliberate effort to bring about a decidedly more satisfactory state of affairs than exists at the present time. It is therefore to be hoped that, on their own part, mine managers will give this problem more serious concern in the future, and that they will take into account the splendid work which has been done by the

mine owners of South Africa in their active cooperation with the Committee on Miners' Phthisis Prevention, and on the part of the Transvaal Chamber of Mines, which includes in its annual reports extended and well considered observations on the health conditions in mines, the miner's phthisis amendment act. the pay of employees attending medical examinations, the work of the prevention committee, the miners' sanatorium, the silicotic employment office, and the silicotic sanatorium, as well as the general work of the Medical Bureau. The Chamber has a standing committee on dust sampling, which, for the year 1917, reports a steady reduction in the number of cases of dry drilling. The Medical Bureau, for the same year reported that the periodical examination of European miners had proceeded systematically, and that the mining companies had agreed that the employee should be paid for the time required on account of the examinations, including the payment of railway fares. Of special interest in this connection is the statement in the report for 1917 as regards the success "in the prevention of pneumonia following the use of Dr. Lister's anti-pneumonia vaccine." It is pointed out that pneumonia was the principal cause of death among natives from tropical sections, but chiefly such as had previously been employed in the mine at the Rand. The Medical Bureau also reported that it had carried out many experiments with devices for the prevention and allaying of dust in mine air, and that, "it also, at the request of the Miners' Phthisis Prevention Committee, made a large number of tests with the Kotze 'Konimeter'—an apparatus designed to collect on a slide the dust particles in a given quantity of air, in such a manner as to enable those particles to be counted under the microscope. In the opinion of the Dust Sampling Committee there is indication that the apparatus, when further developed, will provide a convenient method of rapidly determining the approximate dust condition of the air sampled."

SPLENDID WORK ACCOMPLISHED

It cannot be too strongly urged upon mine managers and all others concerned with the more scientific control of health conditions, especially in underground mining, but also the proper sanitation of mine villages, etc., that they take into consideration the splendid work in this respect which has been done by the mine owners of South Africa, through the Transvaal Chamber of Mines and the Rhodesia Chamber of Mines, which, in 1917, issued its twenty-third annual report, including sickness and mortality returns of considerable value, and some exceedingly interesting observations on the prevention of pneumonia among the native population.

The most important source of information, however, is the general report of the Miners' Phthisis Prevention Committee, issued in 1916, of which it is hoped that some time a reprint may become available through the U. S. Bureau of Mines, as unquestionably one of the most useful contributions to the subject. The more technical aspects of the problem have received fairly extended treatment in the recently issued Mining Engineers' Handbook, by Robert Peele, professor of mining engineering in the

School of Mines of Columbia University. The section on Mine Air, Hygiene, Explosions, and Accidents, is by Mr. George S. Rice, chief mining engineer of the U. S. Bureau of Mines, who has admirably summarized the more essential facts concerning the effects on health of impurities and conditions of mine air; the dangerous qualities of siliceous dust, with observations on remedies, etc., as well as the permissible percentages of impurities, but of only very limited application to the problem under consideration. It may properly be suggested that the Bureau of Mines should concern itself more actively with this important problem as one of the first importance to all mine employes, mine managers, mine owners, and the Government. I thank you.

DISCUSSION

MR. R. DAWSON HALL: Fortunately for the coal industry the dust in the coal mines does not appear to have a very detrimental effect, as far as tuberculosis is concerned. The mortality tables of the United States show that the group "bankers, brokers and officials of companies" has the lowest tuberculosis death rate. Then come the "lumbermen and raftsmen," then "farmers, planters and farm laborers," then "miners and quarrymen." Everyone is ready to concede that the position of the "miners and quarrymen" near the bottom of the list, with fifty-three classifications above them, is due rather to the freedom of coal miners from tuberculosis than to any freedom from that diseases enjoyed by the metal miners or quarrymen who, many of them, work in siliceous dusts and on dry material (*Coal Age*. Aug. 24, 1912). For some reason, the dusts in most coal mines have been found not to be harmful to either horse or man.

Some time ago one of the big coal companies in Colorado endeavored to make an investigation of this matter and find out some of the reasons for it. The chemists of the company inquired into the solubility of the various dusts found in a coal mine, to see what proportion of those dusts were solvent. I am sorry to say that the liquids which they used in dissolving those dusts were such as are not in general to be found in the lungs.

It seems to me that if we are going to try an experiment on solubility we should endeavor to dissolve the dusts in those particular fluids with which they would come in contact in the lungs, and then possibly we may be able to find out when and why the disease they call silicosis is likely to occur. Apparently the miner is more subject to asthma than to tubercular affection. Some people have gone so far as to say that the coal-mine dust gives specific resistance to tuberculosis and that the air of the coal mine is free from tubercular germs. Whether that is true or not, I cannot say. If it is, then probably what tuberculosis exists among coal miners has a domestic and not an industrial origin.

FEW CASES OF HOOK WORMS IN NORTHERN COAL MINES

As regards the hook worm, it is a worm which only develops at temperatures which are higher than those found in most of our coal mines.

There are some of our coal mines, however, that are so warm that hookworms may breed in them. Where that is the case we may eventually find severe epidemics. But in coal mines where the temperature is around 55 degrees Fahrenheit the probabilities are that the hookworm will never develop. Miners have them, it is true, but only in the South where the temperatures on the surface are rarely under 55 degrees Fahrenheit—they get the hookworm on the surface and not in the mines. The attempt to make out that the hookworm disease is a disease of the coal industry, as it is in Germany, is a failure and always will be so long as our coal mines are shallow.

CHAIRMAN TILLSON: Is there any one else on the floor willing to contribute to the subject?

DR. BACON: (Inspiration Consolidated Copper Company, Miami, Ariz.): I do not wish to take issue, but to contribute my experience, or rather, my change of heart. When I first went to work in Chase county, I had charge of the hospital, and to that institution gravitated all the old-time miners who have worked in the district. We were always able, if we searched long enough and faithfully enough, to isolate a tuberculosis case. Therefore it became a conviction with me that miners' consumption, as we used to speak of it, is a disease separate from tuberculosis, and I do not believe it exists today. Eight years ago I moved to Miama and organized a hospital there. We have only had eight cases of miners' consumption, so-called—that is, where it could be demonstrated, as Dr. Hoffman has pointed out—in eight years; eight cases in eight years. In every one of these cases we have been able to demonstrate tuberculosis. The trouble is that these men do not live in hygienic conditions above ground. We are coming back to the point the government has been up against, the housing problem, especially throughout the West. Men go into these places and have no place to live, no place to sleep. In our own community men have to sleep in shacks, some have dugouts and many live in tents. The sanitary condition above ground is the determining factor in the development of tuberculosis. That is an evil the mining industry should take up at once and have investigated—the housing and feeding problem above ground; in other words, the living conditions.

RESTRICTIVE LEGISLATIVE ACTS

The physical examination Dr. Hoffman has insisted upon we will all agree to, especially in our country where we cannot get it. The request for a physical examination is a moot point with us. We have a compensation law that is binding upon the company but not the men. In addition to the compensation law we have an employers' liability act so constituted that men can take half-time compensation as long as it suits them and then drop it and bring action under the liability act and recover again. This has been done not once, but many times in the last few years. The miners are strongly organized throughout our State and community and the I. W. W. is particularly active. We had a very serious strike about a year ago, precipitated by the I. W. W., and one of the points the men bring out is they will never submit to the physical exam-

ination attempted by the employer. It is true that every week we have in our hospital from four to six cases of inguinal hernia, said to be the result of accident. As a matter of fact, we have had four or five traumatic (?) hernias, so-called—there is no such thing as traumatic hernia —and our company has paid out an average, I suppose, of $500 or $600 for every case of hernia they have handled in the last six or eight years.

The physical examination with us is a moot point and we would be much pleased to receive suggestions how we might secure it. A little over two months ago we started an effort in that direction—a sort of persuasive effort. We secured a set of vision cards and sent them to the employment office, which has only been established in our place since the strike a year ago. We have evidence that thirteen men are blind in one eye and eighteen or twenty men absolutely color blind. This test was carried out by a layman.

About underground sanitation I would like to say to Dr. Hoffman that I know of conditions that are deplorable. When they remove toilets they are brought to the surface and replaced with fresh ones, but they do not use phenol disinfectants regularly. I believe our underground conditions are first class.

We had some trouble in getting our miners to use the drill. You cannot force them to do so unless you put an inspector over each individual. It is a burning question, but we are trying as well as we can.

It happens I live in a country where, within sixty miles, there is typhoid all the time. These people come to a mine and develop the disease. They use the outside toilets a week or so after they have the disease; then it is picked up and carried to the boarding-houses. We discovered in our mine three cases of hookworms. These hookworm cases did not arise in our mine, but came from one of the mines in California.

PREVALENCE OF TUBERCULOSIS

DR. DARLINGTON: (American Iron and Steel Institute): I am very much interested in the addresses and in hearing about conditions in Arizona. The only thing I ever remember about the compensation law, however, is the medical provision; the only provision made for a doctor being paid is when the patient dies. I think that is the only law of that kind. Coming back to dust and tuberculosis. Tuberculosis is not directly due to dust, it is a bacterial disease. And what makes it? Anything that lowers resistance. There must be some point of entrance for bacteria. A child with a perfect mucus membrane never takes diphtheria even if exposed to it.

In regard to English miners: They do not have tuberculosis. Ultimately they give up mining and drift to London and die. So long as the miners live in the country and do not get pneumonia and bacteria in their lungs they get along all right. If they get pneumonia, they die. Why? Because they have these concretions in the lungs. In 1915 I was surgeon in Gneiss, N. Y. In my section of the work, which included that part of New York State, we had 7,000 workmen and in nearly every case of men who died from tuberculosis the cause was due to dust. I

made a post mortem on one young man who died eighteen months after he went to work and I found several small concretions of stone in his lungs. There wasn't any hope—no possibility—when the germs of tuberculosis got in there of his getting well, because of those foreign bodies. Dust is primarily one of the great factors in the production of tuberculosis; so is alcohol to diabetis. If people eat too much sugar and cannot assimilate it they go quickly with consumption. Dust is primarily the great factor, it is the beginning, the start; I do not care what kind of dust, whether organic or inorganic dust. Hundreds of people get well who have contracted tuberculosis. In a post mortem made by Dr. Lewis some years ago of those who died of different diseases only one-half of the cases that had tuberculosis were cured; if they have concretions in the lungs they cannot get well—there isn't a possibility. That is the great danger of dust; it must continue, it must go on.

In an institution in New York for the cure of consumption, 98 per cent of cases go back to their homes cured, and if they live under proper conditions and live as they are told to live they will not go back: but if they return to dusty trades they die. That is the rule. There are certain things we must recognize. The cost of human life by accident, where there is great risk in an industry, must go into the cost of the product. Later on we will recognize this with tuberculosis and other diseases as we do now with accidents. In the case of limestone, if it is going to take human lives let us give it up. If it is too costly in human life we will have to give it up—you cannot put money against human life. We must stop disease. We know absolutely that tuberculosis is one of the great factors which costs one-seventh of all the deaths in the United States. Out of 70,000 deaths in the State of New York, 10,000 were from tuberculosis. New York is no different from other States, and a large percentage of the deaths there are caused by dust. If you do not have bacteria, keep away from it and you will not contract disease.

OPPORTUNITY FOR COMPREHENSIVE ANALYSIS

Mr. H. D. Mason (Mine Safety Appliance Company): Just a few words about the comparison between coal mine and metal mine tuberculosis: We have in or near this State two communities, Joplin, or Jasper County, Mo., and Pittsburg, Kas., coal mining communities, both under the same conditions of climate and housing. Conditions do not differ to any great extent—probably they are a little better in the metal mining than in the coal mining district, but I would not attempt to say that the percentage of deaths from tuberculosis in these two communities, after over eighteen months' observation, is many times higher in the Joplin district than in the Pittsburgh, Kas., district. It would be interesting if a comparison could be made from the county records, because both communities have, roughly, 7,000 miners, one metal and the other coal. In the Joplin district we have hard flint rock. The same condition prevails in the metal mines in Arizona and other districts. One of our speakers has a paper on this subject. An investigation was made in the Joplin district but there has never been a comparison made between the two districts.

CHAIRMAN TILLSON: Gentlemen we will now have our next paper. Mr. Barnes is not present so I will ask Secretary Shearman to read it.

THE EFFECTS OF THE USE OF PNEUMATIC TOOLS ON THE NERVOUS SYSTEM

FRANCIS M. BARNES, JR., M. D., ST. LOUIS, MO.

Mr. Chairman and Members of the National Safety Council: The introduction of mechanical tools into the trades has been accompanied by numerous actual and claimed damages to their operators and also a more or less direct cause of the occurrence of new and particular diseases or the factor predisposing to the incitement of ordinary diseases in greater prevalence. Among such mechanical tools the pneumatic hammer, in comparatively recent years, has come to occupy a most important position in several lines, notably in ship building and in the steel and stone industries.

It is particularly in reference to the stone industry that these remarks will apply, and, more especially in so far as the pneumatic hammer is employed in the fabrication of limestone. Indiana limestone at the present time is one of the most important and largest factors used in certain types of building construction. It is not surprising, therefore, to find that the pneumatic hammer, although first introduced into the Bedford District some twenty years ago, within the past several years has become almost universally employed in the industry in this locality; and, likewise, it was to be expected that this most general usage would emphasize any untoward effects upon the worker which it might produce.

Within the past two years complaints of ill effects from the use of the hammer have become prevalent in the Indiana belt, although these do not seem to have originated so much with the individual user of the hammer as with labor organizations of which he is a member. It has been claimed that the use of the hammer produced in the men a diseased condition affecting the nervous system and leading even to paralysis, insanity or other form of complete incapacitation.

In view of the fact that in current medical literature no mention of such diseased condition from this causation could be found it became necessary to carry out an investigation to determine, if possible, whether such disease actually did exist, its extent and seriousness, and, if necessary, to study measures whereby its occurrence could be minimized or entirely done away with. Such a study is obviously of importance, not only to the workman, but to the operator whose interests are more broadly involved.

To this end a number of limestone operators in the Bedford District formed the Bedford Stone Club Auxiliary, and it was upon the invitation of this organization that the writer had an opportunity, in December, 1917, of studying conditions which, it was claimed, affected workmen using pneumatic hammers. This investigation was directed primarily

toward a study of the nervous system, although at the same time a complete general examination was made of a number of selected workmen. Recently investigations have been carried out in other parts of the country where the pneumatic hammer is used in ship building, in the steel industry and in granite cutting. From reports of such investigations as are available it would seem that a somewhat similar condition was found as that which was noted among limestone workers, although to a lesser degree. It was not found, in any instance, that the use of the pneumatic hammer produced any deleterious effect upon the general health of the workers, excepting that among hard stone workers, possibly, consumption was somewhat more prevalent. The mortality from consumption among limestone workers is no higher than normal for similar groups of people; indeed, the question has been raised if it is as high. On the other hand, it has been the general finding that limestone cutters, as a class, are a robust, healthy group of men, somewhat about the usual average in other industries.

So far as this study is concerned the men using pneumatic hammers on limestone were found to be in very good general health and none of the group examined showing any constitutional disease; their troubles (supposedly arising from use of the hammer) being limited to a disturbance of the function of the left hand—commonly known as "white fingers" or "dead fingers." As a general thing this condition occurs shortly after the men first go to work in the morning, or until they have "warmed up," although it also occurs during cold weather when the hands are exposed otherwise than in working.

First the little finger and ulnar side of the left hand (in right-handed men) become pale and blanched; the same area soon giving rise to tingling or numbing sensations, sometimes even to slight pain. The ring finger and part of the middle finger may also be involved in this process. By swinging the arms or rubbing the hands the condition may be made to disappear and when the hands are warmed the pallor rapidly gives place to diffuse flushing and reddening. The index finger and thumb of the right hand are occasionally affected, particularly in those workers who improperly control the exhaust by their finger or thumb.

So far as could be determined this condition of the hands constitutes the sole trouble from which the stone workers complain in so far as the pneumatic hammer is concerned. In all of the stone workers examined the hands were somewhat reddened and flushed, but not more than reasonably might be expected in the hands of outdoor workers. The hands were calloused to a varying degree in different subjects, but in all quite extensively. The palm and certain of the fingers of the left hand were more calloused than on the right. There was no actual cyanosis, excepting in one subject, where this was slight. No swelling, no tenderness, no pain, no edema and no involvement of the muscles or joints. Paresthesia was absent excepting in one subject, who reported some numbness in his "white fingers." This was the only subject to show the condition well developed. Sensation for all tests was acute and practically normal. In most subjects there was a lowering of acute-

ness of feeling—some blunting or dulling—but this certainly was no greater than could be expected in hands where so much callous was present. In all but one subject the callous was sufficient explanation for any variation from the normal which could be observed in sensation. In this one subject the sensory disorder passed off in a few minutes or as soon as the hands became warm. Mental disease was not present in any subject examined, nor was there any physical disease which could in any way be attributed to the occupation.

Such disorders of the extremities indicate very clearly that a disturbance of the peripheral circulation of the blood is responsible for their occurrence. The calibre of the peripheral blood vessels, and therefore the amount of blood supplied to the part, is dependent in large measure upon the action of the nerves which supply these blood vessels, known as vaso-motor nerves. Low temperatures stimulate the sensory nerve fibers in the skin and the nerve impulses thus aroused reflexly stimulate the vaso-constrictor center, or a part of it, and cause blanching of the skin. That cold may produce evident changes in the appearance of certain parts of the body, notably of the extremities—the feet, hands, ears and nose—is a matter of common observation.

It has been pointed out that exposure of the hands to cold usually produces at first a pallor of the skin which is evidently due to a constriction of the cutaneous arterioles. When the exposure is prolonged, however, the color is heightened and the skin usually becomes more or less cyanotic. Almost universally, therefore, cold produces a constriction of the cutaneous arterioles and a slow flow of blood through the skin. The variations in color are thus caused by the varying amounts of blood that collect in the skin capillaries. The flow through the blood vessels is also in part influenced by the muscles which surround them. Anything, therefore, which interferes with or impedes the normal action of the muscles will have its effect in turn upon the circulation, as it is the changing state of contraction and relaxation of the muscles which aids in the flow of blood under normal conditions. Where a group of muscles is held in a contracted state for a considerable length of time the circulation is thereby impeded.

With the stone cutter, whether using a chisel and mallet or a pneumatic hammer, the factors of cold, continued muscle contraction and cutaneous irritation are all present to a considerable degree and demand due evaluation in the consideration of such disorders in the hands as are sometimes observed. The fact, borne out with uniformity in this investigation, that the trouble occurs only in cold weather indicates most conclusively that the low temperature itself is one of the most important factors in the causation. The continued muscular contraction and the mechanical irritation (vibration) may play a role in its causation, but evidently these are of secondary importance.

There are certain well-recognized diseases which may bear a superficial resemblance to the disorders which sometmes occur in the hands of stone cutters. However, upon close study, it is found that this resemblance is but superficial and that the condition observed in the hands of some stone cutters is not one corresponding to any disease

known to medicine. The fact that such a condition, as is here under reference, has not been described in medical literature is, in itself, most highly significant. Whereas, the stone cutter has been working at his trade for centuries and the pneumatic hammer has been used in this trade for more than two decades, this condition of the stone cutters' hands has only been brought to attention within the past two years. If a specific disease of the stone cutters' hands existed it is inconceivable that it should have so long escaped attention, not only of the medical profession but of those interested in labor questions generally. That it is not due to the pneumatic hammer directly and primarily is proven by the fact that the condition was known to exist prior to the introduction of this tool. That the air hammer may have added somewhat to the frequency of its occurrence, as compared with the period when the chisel and mallet were used exclusively, is highly probable, but not proven; an extensive comparative study, which circumstances naturally make impossible, could alone settle this question.

The fact that the trouble, when present, pre-eminently affects the left hand (which holds the chisel and not the hammer) indicates clearly that other factors than the hammer itself are of more signal importance in its causation. The cramped position of the chisel hand with the more or less continuously maintained contraction of the muscles is one of these important factors. However, the hammer or the grip of the chisel, either alone or combined, are not sufficient to produce the condition, as is proven by the fact that it does not occur in the warmer seasons of the year when the stone cutting industry is at its height. The role of the vibration is uncertain, but as the trouble occurs in the hand not holding the hammer, it is doubtful if its importance is very great. We have left, therefore, the factor of low temperature which seems to be the final and most important element in the production of those vascular changes seen in the hands of some stone cutters which, although physiological in nature, form the pathological basis for the occurrence of stone cutters' "white fingers" and "dead fingers." So far as can be ascertained the condition leads to no permanent disability and results in no organic disease. Why it is that only a portion of stone cutters are affected cannot be answered. Whether certain undetermined conditions of poor general health or specific diseased condition existing, but not recognized, predisposes certain stone cutters to this disturbance is not evident from this investigation, although apparently such is not the case. With one or two exceptions they were all well developed, robust men without demonstrable general physical or mental disease.

Conclusions drawn from a comparatively small series of observations must be subject to some limitations. However, the uniformity of the results of the examinations made in this investigation, taken together with the testimony of the workmen and of others, reasonably justifies the following deductions:

1. Stone cutters working in limestone, as a class, enjoy good general health and are not, because of their trade, especially susceptible to any particular disease.

2. Stone cutters are liable to a disorder affecting the hands, especially the left hand.

3. This disorder of the hands is of a vascular character, not due to organic changes in the circulatory system, but dependent upon vasomotor reactions.

4. These reactions are physiological in character and are occasioned by three factors incident to the work of stone cutting: (a) Mechanical irritation of the skin, (b) continued muscular contraction of a cramping nature and (c) low temperature, cold.

5. Of these three factors, cold is considered the most important because: (a) the condition only occurs during the very cold weather and never in the summer, (b) warmth and measures to restore the circulation (rubbing, swinging the arms and the like) cause its disappearance.

6. It cannot be caused by the effect of the air hammer alone because (a) it occurs in those who have not used the air hammer, (b) it does not occur in warm weather when the stone cutting industry is at its height and, therefore, when the air hammer is most in use; (c) it occurs mostly in the left hand and not in the right hand in which the hammer is held.

7. The vasomotor disorder is of temporary duration and is not known to have resulted in permanent disability of the hand, nor itself to have been the cause of development of any other local or constitutional disease.

8. It is possible that once having occurred the person is rendered more susceptible to its reappearance, just as is the one who had had his ears or fingers frostbitten or "nipped" by the cold is more susceptible in these parts to the subsequent exposure to cold. This explains the occurrence of "white fingers" in stone cutters when not actually engaged at cutting but otherwise exposed to low temperatures.

9. There is no sufficient reason in the signs and symptoms presented in this disorder to conclude that one has to do with Raynaud's disease, acroparesthesia, neuritis or an occupational neurosis.

10. The institution of measures to warm the chisel before and while using, enlarging the shank of the chisel and covering it to make it possible to hold without so cramping a grip, the wearing of gloves, and the discontinuance of the prevalent custom of blocking the exhause outlet, and thus forcing a draft of chilled air out along the chisel and onto the fingers of the left hand would do much toward the prevention of this trouble.

DISCUSSION

DR. HOFFMAN: Having had experience with stonecutters, I must enter an earnest protest against the first conclusion that has just been read. May I say that the Bureau of Labor, in about a month, will issue a bulletin which contains Dr. Barnes' full report and a half a dozen other reports made from other points of view? This is one of the most controversial questions advanced by American industries. Dr. Barnes reviews merely one angle of the question, but a very important one, and it is

entitled to serious consideration. Those of you who would like to do so cannot do better than to ask for the bulletin. It can be had free of charge in a few weeks.

CHAIRMAN TILLSON: This subject is very interesting to us because of the hand hammer, better known as the big hammer. I take it from Dr. Barnes' paper that it is a good type of tool, in view of the fact he says only the right hand holds the tool. Other tools are heavier—they weigh possibly thirty or forty pounds—and require men to hold them with two hands. This subject has arisen as a possibility several times. In my experience, in the use of pneumatic tools, I can remember only one case in a period of eleven years in which we felt convinced that a man had been affected temporarily by working with pneumatic tools of the jack hammer type. It was a case very similar, I should say, to the symptoms mentioned by Dr. Barnes, and as objectionable, in the Indiana investigation.

The subject is open for discussion. We will be glad to hear from everyone present. Dr. Hoffman, you are familiar with the advanced proofs of the general reports on this subject matter. May I ask whether it has been indicated that the actual vibratory shock of some 1,500 to 2,000 blows per minute which are dealt by these hammers is held to have a prejudicial effect or is it chiefly the cramping position of a man's hand.

WORKERS OFTEN HELPLESS TO PROTECT THEIR HEALTH

DR. HOFFMAN: I am sorry to say that while I am familiar with a part of the report I have not read that portion of it—I had to stop on account of other work. My idea is this: The labor people do not even make a strenuous fight to have a tool prohibited by law. They are aware of the fact that it does a lot of work previously performed by hand and represents twenty men that would have to be employed without the use of the hammer. Their condition is practically hopeless; they haven't a leg to stand upon. You will find it worth while to read the bulletin because it showed a method of impartial investigation. It is one of the most scientific investigations ever made in this country.

CHAIRMAN TILLSON: If there is no further discussion of this paper we will proceed with the third paper which is "Abatement of Dust from Drilling Operations by the Use of Water Drills. Mr. Borcherdt is unable to be present and Secretary Shearman will read it in his stead.

ABATEMENT OF DUST FROM DRILLING OPERATIONS BY THE USE OF WATER DRILLS

W. O. BORCHERDT, SUPERINTENDENT, THE BERTHA MINERAL COMPANY, AUSTINVILLE, VA.

Mr. Chairman and Members of the National Safety Council: In the paper on "Underground Sanitation," which I had the honor to present to this Section at the Fifth Safety Congress, I discussed in a general way the

problem presented by dust-laden mine air, with particular reference to that which results from the use of various drilling machines.

While we are all aware that dust in mine air is dangerous and objectionable more or less in proportion to its silica contents, other things being equal, and the well-known disease known as phthisis or silicosis commonly results from the continued inhalation of dust high in silica, it is not so generally recognized as it should be that all dust is injurious, and that it should be the business of mine operators to suppress dust of any character and to employ in the solution of this problem the same perseverance and intelligence which is, or should be, applied to the more obvious dangers due to faulty sanitation or unsafe practices. In almost all the literature relating to this problem there crops out this attitude: That because high silica dusts are the most injurious, that other dusts, unless present in quantities offensive to the senses, may be ignored. Figures have been advanced showing that the incidence of tuberculosis among coal miners is no greater than among surface workers in the same locality, and it has even been stated that the inhalation of coal dust is supposed to confer a partial immunity to tuberculosis.

With the statement that dusts vary in the degree of danger which they present, I have no quarrel, but I consider it ridiculous and disingenuous to say that dust of any kind is not injurious simply because the lessened degree of danger renders less obvious the connection between cause and effect. Those of us who are operating mines in which the rock dust is not silicious, or silicious only to a slight degree, have, of course, a less serious problem to face than those whose work is carried on in the highly silicious rocks, but our problem exists none the less, and it behooves us to recognize and solve it promptly and voluntarily, in order to make unnecessary the eventual interference by the State by which society recognizes and attempts to correct the faults or shortcomings of an industry.

NATURE AND EXTENT OF DUST EVIL

So far as I am aware, we have not in this country any legislation directed at the dust evil which is as drastic as that of South Africa, but that we have had conditions, in certain districts at least, which paralleled those which existed in South Africa, is shown by the admirable work of Messrs. Lanza and Higgins in the Joplin district. This is touched upon in the excellent paper presented to this Section at the Sixth Congress by Mr. Young and Dr. Lanza, in which they describe not only the nature and extent of the evil, but also the effective and prompt action taken by the Operators' Association for the purpose of meeting the situation.

In my own paper, referred to above, I stated as a result of my own experience, and that of a few mines with which I was acquainted, that respirators did not, in general, present any hope of a solution since they are objectionable to the miners, are partially effective only when properly cared for, do in general hamper respiration, and will, therefore, only be worn by exceptional men or under conditions where unusually strict discipline can be maintained. To make respirators generally effective it would be necessary for substantially all underground men to wear them,

ANALYSIS OF QUESTIONNAIRE

Kind of Mine	Gangue Rock	Location	Rock Dust Problem	Experience with Various Dust Allaying Appliances in—					Block-holing R-Ub	Sugges-tions for Improve-ment
				Drifting	Overhand Stoping	Underhand Stoping	Raising	Sinking		
Zinc and lead	Dolomite	Va.	Moderate	R-Ub SM-Ub WFMD-S WFSD-Sf	R-Ub SM-Uab WFSD-Ua	R-Ub	R-Ub SM-Uab WFSD-Ua	R-Ub		WFSD-g h
Copper	Limestone	Ariz.	Moderate, worse in siliceous rock	SM-Uab WFMD-S	SM-Uab WFMD-S WFSD-Sld	WFMD-S	SM-Uab WFMD-Sk WFSD-Sad			m
Zinc		Mont.	None o	SS-Uab V WFMD-S	SS-Uab		SS-Uab WFMD-Sea WFSD-Sac	WFMD-Sp WFHD-Sp		g q
Iron		N. J.	None r							
Zinc and manganese	Limestone	N. J.	Moderate, drifting and raising only	SM-Uab WFMD-S WFSD-Ud DCB-Ub	WFMD-Ud		SM-Uab WFSD-Uaf DCB-Ub			
Iron	Jasper and slate	Mich.	None o s	DDAS-S WFMD-S WFHD-S	WFMD-S	WFMD-S WFHD-S	R-S WFMD-Ua	WFMD-S WFHD-S		DDAS in soft ground
Copper	Trap	Mich.	None	WFMD-S WFSD-S	WFMD-S WFSD-S	WFMD-S	WFMD-S WFSD-S	WFMD-S		
Nickel and copper	Diabase, Granite, Norite	Ont. Can.	Slight	SM-Uab WFMD-S	SM-Uab WFMD-S		SM-Uab WFMD-S	WFMD-S		
Gold	Quartz, Granite	Cal.	None	SM-Uab WFMD-S	SM-Uab WFMD-S	WFMD-S	SM-Uab WFMD-S WFSD-Uat	WFMD-S WFHD-Utu		
Zinc, lead iron, manganese	Limestone, Siderite	Colo.	In stoping	WFMD-S	WFMD-Ua WFSD-Ua	WFMD-S WFHD-S	WFSD-Ua	WFMD-S WFHD-S		DDAS in soft ground
Iron	Conglomerate, Sandy	Minn.	None r							
Gold Silver	Quartz, Andesite	Colo.	In some parts of mine	SM-Uab WFMD-S			WFSD-Ua			Rv
Copper	Granite, Schist	Ariz.	Yes	R-Ub SM-Uab SS-Ub WFMD-S WFHD-Uad	SM-Uab SS-Ub WFMD-S		SM-Uab SS-Ub WFSD-Ua			
Copper, Zinc, Silver,		Mont.	In stoping	SM-Ua WFMD-S WFSD-Sa	WFMD-w	WFMD-w	WFMD-w	WFMD-S WFHD-S		x

Kind of Mine	Gangue Rock	Location	Rock Dust Problem	Experience with Various Dust Allaying Appliances n—					Block-holing	Sugges-tions for Improve-ment
				Drifting	Underhand Stoping	Overhand Stoping	Raising	Sinking		
Silver	Conglomer-ates	Ont. Can.	None	SM-Uabd DCB-U						
Zinc	Limestone	Wis.	None r							
Iron	Jasper and Slate	Mich.	Only in rock raises	WFMD-Sn r			R-S	WFMD-Sn r		
Zinc	Hornblende, Garnet	N. M.	Drifting and blockholing	WFMD-S	R-S V-S					
Copper	Lime and Monzonite Porphyry	Nev.	None r	WFMD-S	Undercut'R DDAS-S			WFMD-S WFHD-S		DDAS in soft ground
Au-Ag-Pb-Zn-Cu	Limestone and Quartz	Utah	Yes, in stoping	SM-Uabd WFMD-S	WFMD-Sb	WFHD-Sb	WFSD-Ua	WFHD-Sb		
Lead Silver	Quartzite & Limestone	Utah	Moderate	WFMD-S			Re-S	WFMD-S WFHD-S		Ra Vj
Zinc	Limestone	Tenn.	None	SM-Uab WFMD-S WFSD-S	WFMD-S WFSD-Ua	WFMD-S	WFMD-Ua WFSD-Ua	WFHD-S		
Copper	Siliceous Schist	Tenn.	Only in raising	SM-Uab WFMD-S			Re-S			
Zinc and lead	Flint	Okla.	In drift-ing	SM-S WFMD-S						
Copper	Greenstone	Mich.	None	WFMD-S	WFMD-S	WFMD-S	WFMD-S	WFMD-S		y
Zinc and lead	Chert	Mo.	None	SM-bd WFMD-S	WFMD-S	WFMD-S	WFMD-S	WFMD-S		z

KEY

R	Respirators.
DCB	Dust collecting bags.
SM	Spray, mounted on drill.
SS	Spray, separate mounted.
V	Ventilation.
WFHD	Water-feed hand drill.
WFMD	Water-feed mounted drill.
WFSD	Water-feed stoping drill.
DDAS	Dry drill with auger steel.
S	Successful.
U	Unsuccessful.
a	Men prefer dust to getting wet.
b	Too much trouble to use.
c	Men will use if wages high enough.
d	Not perfected mechanically.
e	If in dry ground.
f	Maintenance high.
g	Perfection of self-rotating stoper.
h	Ventilation by suction from working face.
j	Better ventilation.
k	Partially—hard to use in style of raise driven.
l	Difficult to place holes accurately.

KEY

m	Perfection of water-feed stoper.
n	Not used in order to allay dust.
o	Except in raises in gangue rock.
p	Occasionally—not usually necessary.
q	Reduce indiscriminate outflow of water on men in overhand stoping and raising.
r	Have not attempted to allay dust in mine as ground is damp enough so that dust problem is not serious.
s	Use spray to wet down dirt piles on account of gas.
t	Steel sticks, cannot rotate by hand.
u	No dust in sinking dry.
v	Respirator construction might be improved by study of military gas masks.
w	Intend to use.
x	To use water-feed drills for all work.
y	No phthisis problem. Men are as healthy as any other class of labor.
z	Most dust at present comes from squibbing holes and popping boulders.
	Discontinue shooting of any kind on shift and use water-type drills.

and as pointed out in the paper by Young and Lanza, ordinary respirators do not remove from the air dust particles less than five microns in diameter, and much of the dust which has been shown to be harmful is less than three microns in diameter.

Water sprays directed into the dust, as delivered from the drill hole, and dust collecting bags intended to catch the dust and prevent its distribution through the mine atmosphere, have been proposed and constructed in many forms. It is my conclusion in the paper referred to that none of these methods are practically effective, and this view is borne out by the statements in the Young and Lanza paper, and in both papers the opinion was expressed that the best hope for a practical solution of the problem lay in the use of drills employing hollow steel, through which water is injected into the hole. This would appear to be the ideal method of solution, since, as has frequently been pointed out, this type of drill not only allays dust, but in general gives a higher drilling speed. In some mines the conditions are such that certain drills employing this principal have been entirely satisfactory from both a hygienic and mining point of view. In other mines, however, especially in those in which conditions demand overhand stoping and a large amount of raising in dry ground, the water feed-drills have not been so pronounced a success, partly because of mechanical imperfections and largely because of the attitude of the miners, who generally take the stand that they would rather take the dust than get wet.

Since the general considerations defining this problem, and the most practical methods for its solution, have been covered in the papers above mentioned, and in others such as the official reports of the South African and Australian Dust Commissions, it occurred to me that the best hope of contributing something of real value in this paper lay in the direction of determining the actual practical operating results with the various types of water feed drills in different mines under diverse conditions. For the purpose of securing this information I sent a questionnaire to forty-seven representative mines in the United States and Canada; twenty-six have made reply.

In the attached table the information thus secured has been arranged in as convenient a form as I could devise, and while it was necessary to use symbols and a key it will be found quite easy to read the experience of any mine.

A summary of this table shows eleven instances of the use of respirators, only five of which were considered successful; four cases related to raising and one to overhand stoping. One operator suggests that improvements in respirators could be made by following the practice in the design of military gas masks, and while it seems quite probable that, along these lines, a respirator could be developed which would be highly effective in stopping even dust of a few microns diameter, it is probable that the difficulty of getting men to use such respirators would be even greater than that of getting them to use the existing types, which while less effective are also lighter and otherwise less objectionable A man cannot chew or smoke while wearing a respirator and I think no one familiar with the actual problem of protecting men from themselves and

others will fail to agree with the statement that even men of more than average intelligence will not voluntarily and consistently use safety guards or precautions if these are such as to interfere with their comfort, convenience or fixed habits. This is unfortunate, but it is a fact nevertheless. In practice it is not sufficient to point out to men the existence of a danger and the means by which it may be guarded against, but they must be continuously and intensively educated to secure their co-operation in self-protection, and no amount of education will compensate for a safety device which results in discomfort or inconvenience. A side light on this problem is obtainable from the sand-blast art, where originally various types of masks and respirators were used, but where the present approved practice seems to be for the operator to work on the outside of the chamber in which the sand blast is operating.

CONSTRUCTION OF RESPIRATORS

I have experimented in the construction of respirators, based on the principle of using a replaceable filtering element or cartridge which would be inexpensive, readily placed and removed, and would have so large a filtering surface as to render violent exertion possible without distress. I believe that considerable progress is possible along these lines and that by the addition of an arrangement for humidification that it might be possible to stop even dust of a few microns diameter, but at the very best I feel that the field of respirators is very limited.

The use of dust collecting bags is reported in three instances, all of which were unsuccessful, since all the appliances so far produced have been a nuisance and have not been used. The utter failure of water sprays is well shown by the fact that, while reported in twenty-nine instances, only one successful instance is claimed—and that in drifting, where the dripping of the water on the operator is naturally not as extensive as in overhand stoping and raising. Water-feed hand drills, that is, unmounted machines of the jackhammer type, are extensively used. In drifting, four instances are given, three of which are successful; the other was unsuccessful because the men prefer dust to getting wet, and because of mechanical imperfections in the machine. In underhand stoping, three instances are given, all successful, although one is qualified as being too much trouble to use. For sinking, nine instances are given, eight of which are successful, although one is qualified as too much trouble to use. In the one unsuccessful instance the objection was that the steel sticks and the machine cannot be rotated by hand and that no dust is produced by dry sinking anyhow. Evidently because my questionnaire was not well worded, I have failed to elicit any information either for this type of drill, or the others, as used in blockholing. This I particularly regret, since in many mines blockholing undoubtedly contributes very materially to the dust in circulation, both directly, because it is carried on all over the stopes, and often in the chutes, during shift, indirectly, because boulders are frequently blasted during the shift, with the consequent spreading of dust, in spite of all the recommendations to the contrary which have been offered.

EXPERIENCE WITH DRILLS

The water-feed stoping drill is a machine of comparatively recent development; mechanically it leaves more to be desired than any of the other modern hammer drills. It has great inherent possibilities and to many operators it has seemed that the designers and manufacturers of drills have not fully recognized the extent of these possibilities and accordingly have not given the development of the machine the attention which it deserves.

In drifting, five instances are shown, of which four are successful, one being qualified because of high maintenance and the other because the machine was not perfected mechanically. The objection in the one unsuccessful instance is on the same grounds. In overhand stoping, which would appear to be an ideal field for this machine, five instances are shown, only two of which are successful, and in which the success is qualified because of mechanical imperfection and the difficulty in placing the holes accurately; by which probably it is meant that it was difficult to start the holes where desired, which is of course the case with any stoper, wet or dry. The three unsuccessful instances were all marked, "Men prefer dust to getting wet," and the symbol for this statement occurs so frequently in the tabulation as to bear out very strongly the statement made above, that no matter what the danger, men will not employ a safety device which causes discomfort or inconvenience, and we cannot expect them to do so.

In raising, out of eleven instances of the use of this type of machine, three were successful and eight unsuccessful. One of the successful cases is qualified by saying that men prefer dust to getting wet and that the machine is not perfected mechanically; another by saying that the men prefer the dust to getting wet, but will use the wet stoper if the wages paid are high enough. Of the eight unsuccessful instances, six were based on the grounds that the men prefer the dust to getting wet; another on this cause plus high maintenance, and another on this cause plus steel sticking, making rotation by hand impossible.

Two operators report the use of dry drills with augur steel for drifting and undercutting in soft ground, respectively. This type of equipment is recommended for these conditions by three operators as being substantially dustless, and it is possible that this combination has not received the attention it deserves, although it can be employed in only a limited number of cases.

That the water feed mounted drill is now the standard machine in most mines is clearly shown in the table. In drifting, twenty-two instances, all successful, are shown, although in the case of one of these the machine is used in wet ground and dust allaying is not considered one of its functions. In overhand stoping, eleven instances are shown, nine of which are successful and two unsuccessful, these being characterized as not perfected mechanically and men prefer dust to getting wet. In underhand stoping, eight applications, all successful, are shown. In raising, nine instances are given, of which seven are successful, although one is qualified as partially successful, hard to use in style of raise

driven, and one is stated as used if the ground is dry, but that the men prefer the dust to getting wet. In the two instances of failure this same familiar reason is given. In sinking, twelve instances, all successful, are given, one operator saying that they are used occasionally but are not usually necessary, and another that the water feature is not used to allay dust.

USE OF THE WATER-FEED MOUNTED DRILL

To the man interested in safety alone, examination of the accompanying tabulation would lead to but one conclusion; that is, that the water-feed mounted drill should be employed universally for drifting, overhand and underhand stoping, raising and sinking. Fortunately for them, in some mines—instances of which are shown in the table—the dictates of mining economics appear to agree with those of safety. The water-feed mounted drill has been adopted for all purposes and is reported as successful throughout. To what extent this conclusion represents the results of actual comparison I am, of course, not informed, but my own experience leads me to believe that in overhand stoping and raising, particularly the latter, a properly designed water-feed self-rotating stoper would give faster and cheaper progress than any mounted drill. In many overhand stopes the same thing would be true and even in drifting the water-feed hand-rotated stoper is a much more formidable competitor with the mounted water-feed drill than is generally supposed. There is reasonable hope that with the development of a water-feed self-rotating stoper, much more effective work could be done in drifting than is now the case. It is these considerations which cause many of us to hope that the manufacturers of rock drills will devote to the development of the self-rotating water-feed stoper a greater amount of effort than has been apparent in the past. Some of the machines now in existence are convenient, light and extremely powerful, but their maintenance is high and they contain details of design which have been carried over bodily from machines intended for other purposes and which, under the new conditions, are a source of constant difficulty and delay. In overhand stoping and raising about the only advantage, from the point of view of the operator, in the use of the mounted water-feed drill as against the stoper, are that the mounted machine is self-rotating and it is not necessary for the operator to stand so close up to the drill barrel; therefore, he does not get as wet. As will be readily perceived, the greater wetting received by the operator of the hand-rotated water-feed stoper is due to the fact of the hand rotation, which necessitates the drill runner standing close to the machine, where he receives all the drip and spatter. With an automatically rotated stoper this close proximity to the machine would not be necessary, and so far as the mechanical difficulties are concerned, which result from water and drill sludge running down the steel and into the working parts of the machine, there is no apparent reason why the same improvements in construction would not eliminate these difficulties in either case.

That this is the thought of other operators is shown by the response to the request for suggestions for improvement, where three refer to the

development of a perfected self-rotating water-feed stoper and one to means for the reduction in the indiscriminate use of water in the machines engaged in overhand stoping and raising. A certain amount of water is required to effectively allay the dust. In many cases the design of the machine is such that much more water is discharged through the steel than is necessary, or water is released at other points, with the result that the operator is constantly sprayed and the machine condemned.

Ventilation by suction from the working faces would prevent the distribution of much dust through the general mine atmosphere, but would be more expensive and difficult to apply. The ventilation of metal mines, comparatively speaking, is in its infancy and many projects for ventilation of such mines would at the present time be condemned as impractical or too expensive which in the course of time will become customary as advanced practice or legislation make them acceptable.

MACHINE MUST BE, AS NEARLY AS POSSIBLE, FOOL PROOF

The object of this paper will be seen to be very simple and humble and if it results in eliciting discussion of conditions as they are, by men who are familiar with underground conditions and drilling machines, I will be much gratified. To those operators who, in this day of the ever-present questionnaire, have taken the trouble to reply to mine, I wish to express my sincere thanks and to hope that in return they will obtain from this comparison of practice something of value. At the present time we have, as never before, conditions rather than theories to face. We must make our mines safe, regardless of whether the motive for doing so is high or simply that of making a virtue of necessity. Very few metal mines would show an atmosphere conforming, for example, to the South African regulations, and as it is idle to talk longer of disciplining labor or of making the men do this or do that—the only solution possible is the use of drilling apparatus which will be inherently non-dust producing and at the same time not be objected to by the men. In order to combine with these qualifications a drilling rate which will make it possible for the mine to operate, the machine must be light, simple, durable, powerful and at the same time, as nearly as may be, fool proof.

DISCUSSION

CHAIRMAN TILLSON: On a careful reading of Mr. Borcherdt's paper I think you will note the impression that the mechanical devices which have been tried to catch the dust after it leaves the drill hole have not proved successful; that the only way in which the dust can be caught effectively and subsequently carried away is by wetting down the rock at the point in which the drill steel cuts, causing the dust to sluice out in the form of mud. The problem has been very satisfactorily met in drilling down-holes and horizontal holes, or holes with a very slight angle above the horizontal. The problem—it seems most difficult to me and I think this paper points it out clearly—is with the drilling of holes steeply upward. Under these conditions the miner is subjected to

the muddy water running down upon him and the machine itself is subjected to the hard boring and of maintaining the condition of having this mud run down on the drill steel into the mechanism of the drill. The work of drilling upper holes will be the most important problem in the selection of rock drills in the near future. In Dr. Hoffman's remarks I do not believe that he intended to place the entire burden of the prevention of dust and its ill effects upon the operator or industry, because it is evident in South Africa and possibly in Australia—with which I am not so familiar—that the work had to be accomplished by very strenuous enactments, which not only required the operator to provide suitable means for caring for the worker, but also were more strenuously forced to see that the worker employed the means which were furnished. He was open to criminal procedure should he remove his respirator, when it was furnished, or should he fail to turn the water on for the wet drill in operating in the rock. It is vitally important to make clear in our transactions that the worker should have a responsibility and that such responsibility will have to be legally made and legally enforced. In Africa the inspectors are very strenuous in criminal proceedings, not only for the operators but also for the workmen.

SPRAYS ON STOPING MACHINES

MR. ALBERT TALLON (Old Dominion Copper Company): I am in accord with our Chairman's remarks in regard to the employer and employe. Probably some of you gentlemen are not as familiar with the compensation act as Dr. Bacon and myself. We have had quite a time in the last few years and it is a fact the same thing will exist and does exist regarding the provisions to keep down the dust as in the compensation act. Case after case has come to my notice where the compensation act has been brought into effect: the men will do anything, almost, to get compensation. One company provided fifty sprays on stoper machines, the machines that drill up; they had the stoper machines sent to the surface, provided with sprays and then sent down: in six months not a spray was to be found in the mine. Later on, they got carbide cans—I am not positive, but I think Mr. Emsley from the Miama was the inventor of a spray fastened to a carbide can and connected by a hose to the machine—and this spray was also provided. You can send these things down every day but unless you are right there with them you cannot get the men to work them—that is, most of them. Some men will use them and you cannot get them to run a machine without it. Probably another man, working on another shift, will come across it and will throw it down. The next day you haven't a spray, unless you continually watch these things. In regard to compelling men to use them, the only way that looks feasible to me is to provide that the miners will be punished as well as the employer. The employer and employe should both be censured for breaking the rules. If the government would make laws to that effect and place the censure on both parties I believe we could accomplish something, but unless it does it is going to be difficult.

CHAIRMAN TILLSON: Professor Raymond, may I ask whether the district you refer to is in Mexico or this country?

PROFESSOR RAYMOND: In Mexico and this country; they use horizontal holes because they get better results. There are a few places where they have vertical holes by stoping drills. They are taking that method of stoping—stoping somewhat on an incline.

DR. BACON: I am a little bit at sea. I would like the Chairman to see what the opinion is, now that we have discussed this matter at some length, as to the best possible advice. Is it a hollow drill or something else?

CHAIRMAN TILLSON: What is your opinion, gentlemen?

A DELEGATE: No question about it, it is a hollow drill.

CHAIRMAN TILLSON: I think I am justified in saying, as I suggested before, that distributing water through a hollow drill, supplied to the cutting edges of the drill, is the only satisfactory means of allaying dust. I know of no disputants to the argument that that will satisfactorily allay the dust and remove the hazard of cutting rock. Will you vouch for that statement, Dr. Hoffman?

DR. HOFFMAN: Yes, I guess that is about as well expressed as my limited knowledge goes. Of course, you understand, when it comes to a technical subject of that sort—

CHAIRMAN TILLSON: With your knowledge of the investigations, where the rock has been drilled by water taken through hollow steel, you know of no hazards resulting from dust where that has been used?

DR. HOFFMAN: Nothing serious.

MR. GARNETT: There is one other method which can be used if the ground is soft enough. That is the augur drill; it makes no dust at all, it takes the place of a jack hammer; we are using it wherever possible.

CHAIRMAN TILLSON: We will now hear the report on "Standardization of First Aid Methods," by Lt.-Col. C. H. Connor. He is unable to be present and has asked Dr. W. M. Lipscomb to present the paper.

DR. LIPSCOMB (American Red Cross): I have the honor to represent Lt.-Col. Connor, who regrets very much that he cannot be here. For the last five years I have demonstrated first-aid methods for the Red Cross in the coal mines in Pennsylvania, the copper mines and other industries in the Northwest and on eighteen or nineteen railroad systems. I have always counted my membership in the National Safety Council as one of the best investments I ever made and I appreciate very much the knowledge I have obtained through my membership. I will read the paper delegated to me and if I have anything worth saying I will open the discussion.

STANDARDIZATION OF FIRST AID METHODS

LIEUT. COLONEL C. H. CONNOR, MEDICAL CORPS, U. S. ARMY, IN CHARGE OF FIRST AID DIVISION, AMERICAN RED CROSS, WASHINGTON, D. C.

(Chairman Standardization of First Aid Methods and Rules for Conducting and Judging First Aid Contests Committee Mining Section, National Safety Council.)

Mr. Chairman and Members of the National Safety Council: As Chairman of the Committee on Standardization of First Aid Methods and Rules for Conducting and Judging First Aid Contests there is submitted herewith a report summarizing the work accomplished in connection with our effort toward the standarization of first aid methods. In presenting this report certain facts should be cited, among which are the following: Preliminary letters were sent to the members of the committee, with a copy of the Red Cross circular describing first aid contests. The rules and suggestions contained in that circular have proven satisfactory to the First Aid Division of the American Red Cross in competitive events and it was suggested that they be adopted as standard by the Mining Section. Replies were received from all but two members of your committee and a digest of the comments is contained in the followed remarks:

Since the last annual meeting of the National Safety Council a census has been taken of the opinions of industrial surgeons in reference to organizing first aid teams in industrial concerns, the giving of prizes and medals for excellence in first aid among employes, and the holding of first aid contests, nearly all favor and endorse such methods.

In reference to organizing first aid teams, some members are of the opinion that it should be compulsory, especially in hazardous occupations; others say that it is not required in small industrial establishments. The point is brought out that organized team work greatly stimulates the study of first aid, adds to the interest manifested and ultimately leads to prevention of accident. Unfavorable criticisms not altogether explicit. One industrial surgeon replied: "It is better to employ nurses"; another gave the opinion that it might lead to something being done which would later be regretted.

THE GIVING OF PRIZES

The majority of your committees—industrial surgeons and first aid men—approve of giving prizes. A large number express a preference for medals rather than a cash prize. "It is a splendid idea and men are proud of these trophies"; "It is an incentive to greater energy and effort, and results in more efficient workers;" "has worked satisfactorily in the mining region," and similar expressions are read. "Give cash prizes and certificates of merit; medals should be reserved for big deeds," is another individual expression. Unfavorable comment was as follows: "Trade to commercialize man's duty to his fellow man" and "highest efficiency should be reached purely from the standpoint of relieving the suffering of a fellow employe."

The favorable comments far exceeded the unfavorable ones as to holding first aid meets in companies, at which different first aid teams may compete for the prizes. By stimulating a healthy rivalry first aid meets make for greater efficiency and improve both individual and team work. They develop technique and lead to an exchange of ideas; the results obtained are well worth the effort in every way. The meets are particularly advantageous in mine rescue work and in industries where team organization is essential. One member cites the fact that exhibi-

tions are to be favored, but not contests, as the latter provoke trouble. Another favors contests of this character, but opposes the giving of prizes. Unfavorable criticisms are that rivalry is gallery play, that it belittles the purpose and nothing is gained and that it does not give a chance to the beat, who are always modest and timid. Several surgeons state that the performance of a plain duty to one's comrades should not require reward.

INTER-COMPANY AND INTER-STATE MEETS

As to whether or not inter-company and even inter-state meets are productive of good results in maintaining interest in first aid instruction: About one-fourth of the replies to the letters received indicate that the writers do not approve the idea of holding either inter-company or inter-state meets, while a few express their preference for inter-company contests. A majority, however, endorse the meets as outlined in the letter. In the opinion of one member, such meets result in an exchange of ideas and cause greater interest in the subject, thus tending to broaden and perfect the system and ultimately leading to standardization of first aid methods. Another states that the spur of competition is helpful, while a third believes that a national association for first aid instruction might be the outcome. Those who are opposed to first aid contests say such meets are neither necessary nor practicable, that it is too difficult to put this kind of efficiency on a competitve basis, or that such contests should be limited to boy scouts and camp fire girls, that they are not suitable for workmen.

Mr. E. E. Bach, Director of the Sociological Department of the Ellsworth Collieries Company, has called attention to a "bone of contention" among safety men in the appointment of judges for first aid contests. In the past it has been recommended that all such judges be physicians. Mr. Bach makes a very good suggestion, that men who have completed a first aid course and show a very good general knowledge of first aid as well as physicians, be permitted to act as judges.

Mr. C. E. Pettibone, Chief Safety Inspector of Pickards Mather & Company, suggests that members of first aid teams be limited to laboring men only, and that men should be taught to rely entirely on measures they can improvise from the materials at hand. The opinion of industrial surgeons to this question is unanimous, all believing that students should be taught to be able to improvise suitable materials when regular supplies are not available.

Dr. W. A. Lynott, in his Bureau of Mines manuscript, recommends that first aid teams be selected with great care and with the thought that the men will remain in the employ of the company for years.

FIRST AID INSTRUCTORS

As to the advisability of permitting first aid instruction to be given by other than physicians, the majority of opinions received regarding this matter are in the negative, the principal reason cited being that the laymen cannot answer intelligently and correctly, questions which may be asked

during the course of instruction. A large number, however, agree that the first aid instruction may be given with very satisfactory results by a thoroughly trained and experienced first-aider or graduate nurse. Some of the statements are amplified in the following manner: "Instruction should be given by a physician, but it is highly desirable to standardize the courses so that definite and prescribed teaching shall be followed; the entire course to be kept simplified and not left to the individual judgment of the instructor as to what shall be included or omitted." "First aid instruction to be of value must be given by one who thoroughly understands the subject." "Intelligent first aid instruction requires a considerable knowledge of anatomy and some physiology and symptomatology; a layman is not often in possession of this knowledge." "Physicians, unless they have spent considerable time in informing themselves on first aid work, are not qualified to teach it as it should be taught today; furthermore, they do not always have sufficient time to devote to the subject. A salaried, well informed, first aider with teaching ability, spending his entire time at the work, talks to employes in a language which they can understand, not 'over their heads.' He drills them personally and obtains results." It is recommended, however, that previously prepared lectures on first aid should be given by a physician, mentioning briefly details of anatomy and physiology, and presenting reasons why certain first-aid procedures should or should not be followed. The advisability of giving elementary instruction in anatomy and physiology in a first aid course is not questioned.

First aid treatment is meeting the basic and immediate requirements of the sick and injured from an anatomical and physiological standpoint. As the life of an injured person often depends upon the care he receives from the first individual to aid him, it is important that people be taught the rudiments of physiology, anatomy and the principal factors to be met in an injury. For instance, in resuscitation, something of the mechanism of the respiratory apparatus should be taught; in the control of hemorrhage, knowledge of the location of the most important and vulnerable blood vessels is necessary.

In furtherance of first aid and accident prevention work, and the dissemination of knowledge in the homes of the workmen, it is recommended that all employes should be instructed by lectures and demonstrations and also by placing a text book in the hands of each employe.

DISCUSSION

CHAIRMANS TILLSON: I think it proper to give the report consideration at this time, so that the fruits of this year's work will be developed in the discussion and the decisions of the body meeting today. I think we should consider the topics mentioned and go upon record with our views in this matter for the guidance of your committee during the coming years. Is there any general discussion or do you think it well to consider the sections of which Lt.-Col. Connor has treated?

DR. L. A. SHOUDY (Bethlehem Steel Company): The question of first

aid is one in which I am vitally interested, because from the standpoint of steel, I think we try to do as much as anyone in first aid work. It is not necessary for me to tell you, you know the company is behind it, and I think you have seen some of the results of our methods. The Bethlehem Steel Company has spent a good deal on money in this matter, but the money comes back. After years of work in the Health Service Section the effort has not amounted to much. I say this with due respect to the men, because I have not done any more than they have, but I try to lay plans for the men in the Health Service Section to have something to do. Another thing we must do—have standardization. We can do some of this work, but one thing will be this: We will not work by ourselves; we will take what all the other organizations have to say, the Mining Section and the American Bureau of Mines, and put it all together and get what we can and what we consider the best principle to teach first aid. We have spent time on artificial respiration. You may tell me I am wrong, but I am not—I have worked that out. The boys who did it for you last night were wrong; it is wrong to allow men to learn in that way. They were simply told to keep the arms out straight, keep the weight here; where it belongs (indicating) is on the tenth and eleventh ribs, the floating ribs. Teach the men to keep their hands like that (indicating), putting their fingers upon the hip bone and teach them to go down straight. Have a little fellow try to resuscitate a big fellow. Teach them about shock, the proper things to do, and when to put their fingers on the backbone. It is wrong that men should be taught that way and keep on and on. It is wrong: these pamphlets are going all over and they think they are doing right. Where did they learn it? Are you willing to accept it from a man who has worked on it? Dr. Lanza has been working on it and proven it. The thing he is trying to do is to bring out what is best in first aid; what to teach. He has told you that you must teach a little anatomy; but the main thing is: What must we teach?

TEACHING OF FIRST AID METHODS

You must not teach folderols; you must teach the man that he must know certain things, must know shock and what to do for it; he must know about covering up a man, about lowering his head, about rubbing a man in the right direction and about applying heat; that he can do certain things. He must know that in hemorrhage the main thing to do is to stop it, and he must stop it. He must know the general lines of arteries and veins; he does not have to know the names of them. Teach them every day and put it in language they can understand. He must know a little bit about fractures. You can tell him what a fracture is and what a broken bone means. Take a broken bone; he must not handle it like this (indicating). Do not try to tell him the anatomical points; teach common sense; that it hurts a man to move him around, it causes pain. You can tell him that by monkeying with a broken bone he may stick it through the skin and make a simple fracture a compound one, liable to infection. We want to get these

things down in teaching first aid. Teach him shock, the care of a hemorrhage, artificial respiration and careful handling of men and you teach him the principle of first aid.

MR. SEIP: I feel that we have made considerable progress in our standardization of first aid work, especially among the miners, in the past two years. Every one is not familiar with the fact that the Bureau of Mines, for a considerable time, has been working on a new book—a report by a committee on standardization of first aid work which can now be obtained. It is a valuable text book, one of the best on first aid work that I know of, and it has been so recommended by one of the best surgeons in the anthracite coal fields of Pennsylvania. That is an indication of progress in our standardization work. However, I feel we still have too much laboratory work in our first aid teachings. As I see it, first aid resolves itself into only four things: *First*, it is to relieve any immediate danger which may exist, then to remove the man from a dangerous condition and start artificial respiration; *second*, to relieve pain; *third*, by proper dressings to put the patient in such condition until you can remove him from the mine to his home or hospital, as the case may be, with his injury in exactly the same shape as when he received it; that is all you can hope to do. The *fourth* is the transportation of the injured man in a proper method, so as not to undo your previous good work. These things are first aid work pure and simple. There is no reason for laboratory dressings or fancy dressings; simply put a clean, sterile compress over the wound, bind it up to keep the dirt out and get him out as quickly as possible.

FIRST-AID CONTESTS SOMETIMES MISJUDGED

Another thing I feel has been a mistake was to start first-aid contests. I taught first aid in the mines for years and when I went into the field I began to lay plans for a contest. For two or three weeks before a contest we had men working on it days, nights and Sundays. Because they did not win their interest died in first aid right then and there. I believe first-aid contests should only be used to revive interest after long periods of work. I think we should correct those evils, the laboratory work and also first-aid contest work. Then, I believe, we will have gone a long way to maintain interest in first-aid work.

MR. COOK: We speak of teaching miners sportsmanship. I would like to ask why dissatisfaction always comes about in first-aid contests? In my experience I never saw a first-aid contest correctly judged. I have seen teams work for months preparing for a first-aid contest and then be called up before eight or ten physicians and no two of the physicians in the entire judging staff agreeing upon anything. That is where I think a great deal of work should be done in coal mining communities.

MR. SEIP: In regard to judging, we had a plan that worked out nicely at Terre Haute, Ind. We used this system: A number of physicians in the city of Terre Haute formed a judging committee. They were sent to a great many points in the country to judge contests because they were disinterested. The plan worked very well. They received a list of prob-

lems a week or more in advance of the meeting, so that every problem in the contest was gone over by them.

CHAIRMAN TILLSON: Of course, these first-aid contests are something different from first-aid contests outside of the mines. It is pretty much like a baseball game, and there are certain rules and regulations. They should be judged by rules, as in a baseball game. Teach the men to do the very things you want them to do and when they come to a contest they will have a game, the same as in the national game.

The Section then adjourned.

WEDNESDAY AFTERNOON SESSION

THE MEETING was called to order by Chairman B. F. Tillson at 2 o'clock.

CHAIRMAN TILLSON: The first paper to be considered will be "Suggested Methods of Keeping Mine Accident Records; Results Which Have Been Obtained," written by Mr. A. H. Fay. Mr. Fay is unable to be present and I will ask Secretary Shearman to read it.

RESULTS OBTAINED BY KEEPING MINE ACCIDENT RECORDS

ALBERT H. FAY, MINE STATISTICIAN, UNITED STATES BUREAU OF MINES, WASHINGTON, D. C.

Mr. Chairman and Members of the National Safety Council: When the bureau began the collection of mine accident statistics, in 1911, there were but little data available concerning nonfatal injuries in the mining industry. The reports of fatal injuries were not as complete as they should be yet sufficient data had been accumulated to point out the principal hazards. The returns first received and published by the Bureau of Mines showed what was then considered a high nonfatal-injury rate, by reason of the fact that there was nothing with which to compare. In 1911 about the first efforts were being made whereby the Industrial Accident Commissions were to be legislated into existence. The mining companies had not been accustomed to keeping complete records for either the State or Federal Government, and in many cases not even for their own use.

The recording of all accidents is absolutely necessary if there is to be a reduction in accidents at mines. Detailed records will give the exact cause of the accident, and knowing this, remedies will readily suggest themselves in most cases. They furnish the safety engineer a reliable mass of data about which to formulate ideas relating to safety, and the application of safety devices and safer methods of mining. To this end the bureau prepared a form for keeping a record of accidents at mines. On this form is to be recorded the name of the injured person, the date of the accident, the cause, also whether or not it was fatal or

the degree of disability measured in days lost due to the accident. A number of the mining companies are keeping this record and the returns which have been received from those companies indicate a great improvement in the matter of accident records. At the same time, they show an increase in the number of nonfatal accidents, which is more apparent than real, as the industry is no more dangerous than when records were not kept. It simply brings to light the hidden dangers of a great industry.

In order to bring out more clearly the results of keeping records Table 1 has been compiled from the bureau's metal-mine accident publications, 1911-1916, inclusive, and is for the entire United States. This table shows that the fatality rate is decreasing, while the nonfatal injuries are increasing. In 1911 there were reported to the bureau 170 nonfatal injuries per 1,000 300-day workers, and in 1916 the number reported was 250 per 1,000 300-day workers, thus indicating that better records are being kept, and the fact that there are less fatal accidents indicates an increase in safety and first-aid work.

TABLE NO. 1.

Number of men employed, days work performed, and number of men killed and injured at all metal mines in the United States.

Year	Average days active	Men Employed		Total shifts	Number Killed		Number Injured	
		Actual number	Equivalent in 300-day workers (calculated)		Total	Per 1,000 300-day workers (calculated)	Total	Per 1,000 300-day workers (calculated)
1911	282	165,979	156,089	46,826,573	695	4.45	26,577	170.27
1912	287	169,199	161,662	48,498,510	661	4.09	30,734	190.11
1913	288	191,276	183,593	55,077,855	683	3.72	32,971	179.59
1914	271	158,115	142,619	42,785,840	559	3.92	30,216	211.87
1915	280	152,118	141,997	42,599,015	553	3.89	35,295	248.56
1916	282	204,685	192,455	57,736,425	697	3.62	48,237	250.64

Table 2 represents the quarry industry for the period 1911 to 1916, inclusive, and shows an increased nonfatal injury rate ranging from 63.8 in 1911 to 175.6 per 1,000 300-day workers in 1916. The fatality rate at the quarries shows practically no change.

By reason of the lack of complete records among the smaller operators of mines and quarries these figures are entirely too low, as is indicated in Table 3. The data assembled in Table 3 shows the returns of 258 companies in 1914, 280 in 1915 and 246 in 1916, all of which are keeping records practically in accordance with the form prescribed by the bureau. It will be noted that this selected group of mines also shows an increasing nonfatal injury rate, the figures being 331 per 1,000 300-day workers in 1914 and 398 per 1,000 300-day workers in 1916. The fatality rates, however, show a reduction from 4.92 per 1,000 300-day workers in 1914 to 4.06 per 1,000 300-day workers in 1916.

LABOR TURNOVER CAUSE OF VARIATION IN REPORTS

The accident rates at mines as heretofore published also appear lower than they actually are by reason of the fact that in so many instances the operator reports the total number of men on the pay roll during the

TABLE No. 2.

Number of men employed, days' work performed, and number of men killed and injured at all quarries in the United States, 1911 to 1916.

Year	Average days active	Men Employed		Total shifts	Number Killed		Number Injured	
		Actual number	Equivalent in 300-day workers (calculated)		Total	Per 1,000 300-day workers (calculated)	Total	Per 1,000 300-day workers (calculated)
1911	228	110,954	84,417	25,325,094	188	2.23	5,390	63.85
1912	249	113,105	93,837	28,151,043	213	2.27	6,552	69.82
1913	246	106,278	87,141	26,142,237	183	2.10	7,739	88.81
1914	233	87,936	68,187	20,456,157	180	2.64	7,836	114.92
1915	246	100,740	82,447	24,734,224	148	1.80	9,671	117.30
Average for five years	240	103,802	83,205	24,961,751	182	2.19	7,438	89.39
1916	253	90,797	76,457	22,937,178	173	2.26	13,427	175.62

TABLE NO. 3.

Summary of metal mine accident data grouped by methods of mining during the year ended Dec. 31, 1916.

Method of Mining	Number companies represented	Number States represented	Days active	Total days labor	Number men employed in mines	Number 300-day workers	Number Killed			Number Injured		
							Total	Per 1,000 employed	Per 1,000 300-day workers	Total	Per 1,000 employed	Per 1,000 300-day workers
1. Room and pillar	62	14	280	2,522,986	9,023	8,410	47	5.21	5.59	4,013	444.90	477.17
2. Overhand stoping:												
(a) With stulls	22	7	324	1,385,778	4,281	4,619	21	4.91	4.55	1,824	426.17	394.81
(b) With square sets, cribs, etc.	32	10	326	4,695,937	14,385	15,653	55	3.82	3.51	7,661	532.38	489.52
(c) With filling	21	10	329	2,031,454	6,170	6,771	35	5.67	5.17	2,584	418.80	381.68
(d) Shrinkage	13	7	351	958,754	2,729	3,196	14	5.13	4.38	1,129	413.56	352.81
3. Underhand stoping	5	5	306	1,113,333	3,635	3,711	12	3.30	3.23	1,707	496.43	460.11
4. Caving methods	61	7	301	6,121,033	20,326	20,403	80	3.93	3.92	7,134	350.91	349.71
5. Open pit, with steam shovel	23	7	283	2,574,733	9,100	8,582	27	2.97	3.15	2,416	265.49	281.58
6. Open pit, without steam shovel	7	5	265	92,319	348	308	....	.....	.....	108	308.57	348.39
Total, 1916	246	....	307	21,496,327	69,997	71,653	291	4.16	4.06	28,576	408.23	398.82
1915	280	....	303	22,842,999	75,365	76,140	324	4.29	4.25	27,314	362.42	358.73
1914	258	....	292	22,004,824	75,453	73,349	361	4.78	4.92	24,306	322.13	331.38

year. By reason of the labor turnover during the year, the number of men on the pay roll is much larger than the actual number of full time workers, hence in order to get true accident rates, it is necessary that the time the men were employed be known. Such a record of the hours worked has been kept by the New Jersey Zinc Company, thus placing the accident rates on a basis upon which there can be no doubt as to the exactness or completeness. This is one of the reasons why the bureau's rates in the earlier years appear low, as it has been difficult for the bureau to obtain such detailed information, as it is kept by only a few of the larger companies; the next best step to adopt was to reduce all accidents to a 300-day basis. This, however, does not take into account the 8-hour or 10-hour day, but in most of the metal mines, in recent years, the 8-hour day has prevailed. Many of the inequalities have been eliminated by reducing to a common denominator of 300 days. This, however, does not eliminate the pay roll discrepancies, when the number of men employed is given as per total on pay roll.

The increasing completeness in the matter of records is due in part to the bureau's campaign among the mining companies for safer conditions as well as the annual requests for reports of accidents during the current year, and the enactment of accident compensation laws. The mining companies expect to make the returns and the majority of them, therefore, are now keeping records so that they may be able to render their reports at the close of the year. There is, however, some lack of uniformity as to what injuries they shall record, although it is believed that the larger companies are recording practically all of their injuries. The accidents which are reported to the bureau are only those which cause disability of one day or more. Those causing a disability of less than one day are not expected to be reported, although in some cases it is believed they are included. Even these figures are not as complete as they may be, as is shown by the New Jersey Zinc Company's report for the period of four years in which it is believed every nonfatal injury that caused any loss of time has been recorded.

EXPERIENCE OF NEW JERSEY ZINC COMPANY

Concerning the figures of the New Jersey Zinc Company, reference is herewith made to a paper prepared by Mr. B. F. Tillson, assistant superintendent, entitled, "Recording Accidents and Safety Measures Employed by the New Jersey Zinc Company." This paper was published in the *Engineering and Mining Journal*, April 17, 1917, and gives a detailed description of the methods used by that company in keeping records of accidents, together with its method of determining rates for comparative purposes, and also many suggestions as to what has been done in the matter of safety improvements and the methods employed among the foremen and shift bosses to reduce accidents.

This paper shows that for the first four months of the year 1913, without any special safety organization but with complete records, the nonfatal injuries at the mines which caused any loss of time amounted to 2.24 per 10,000 hours of labor performed. The last eight months of 1913, during

TABLE NO. 4.

Injuries by causes obtained from the records of the New Jersey Zinc Company.

Causes	Injuries, 1916 and 1917				Injuries, 1914 to 1917			
	Number*	Per 1,000 300-day workers	Number†	Per 1,000 300-day workers	Number*	Per 1,000 300-day workers	Number†	Per 1,000 300-day workers
Fall of rock or ore from roof or wall	44	25.17	184	105.26	78	26.05	338	112.86
Rock or ore while loading at working face	69	39.47	365	208.81	101	33.72	499	166.61
Timber or hand tools	31	17.74	226	129.29	93	31.05	617	206.01
Explosives	16	9.15	24	13.73	25	8.35	37	12.35
Haulage	39	22.31	81	46.34	82	27.38	255	85.14
Falling down chute, winze, raise, or stope	25	14.30	69	39.47	49	16.36	139	46.41
Run of ore from chute or pocket	9	5.15	31	17.74	36	12.02	216	72.12
Drilling, machine or hand	20	11.44	131	74.94	54	18.03	299	99.84
Electricity	2	1.15	4	2.29	3	1.00	9	3.01
Machinery			2	1.14			3	1.00
Nails			2	1.14	1	.33	14	4.67
Sledging chunks and mucking	5	2.86	12	6.87	23	7.68	137	45.74
Other causes	19	10.87	133	76.09	26	8.68	184	61.44
Total underground	279	159.61	1,264	723.11	571	190.65	2,747	917.20
Falling down shafts	2	1.14	3	1.72	2	.67	3	1.00
Objects falling down shafts							1	.33
Overwinding	1	.57	1	.57	1	.33	1	.33
Skip, cage, or bucket	1	.57	5	2.86	1	.33	6	2.00
Other causes	3	1.72	14	8.01	3	1.00	15	[illegible]
Total shaft	7	4.00	23	13.16	7	2.34	26	[illegible]
Total underground and shaft	286	163.62	1,287	736.27	578	192.99	2,773	925.88
Surface haulage			1	.57			1	.33
Railway cars and locomotives								
Run of ore from bin	1	.57	1	.57	1	.33	1	.33
Falls of persons	1	.57	4	2.29	2	.67	6	2.00
Hand tools, axes, bars, etc	4	2.29	12	6.87	6	2.00	15	5.01
Machinery	1	.57	2	1.14	2	.67	3	1.00
Other causes	5	2.86	29	16.59	7	2.33	42	14.02
Total surface	12	6.86	49	28.03	18	6.01	68	22.70
Falls or slides of rock or ore	8	4.58	24	13.73	14	4.67	48	16.03
Haulage (cars, locomotives, etc.)	1	.57	4	2.29	3	1.00	16	5.34
Falls of persons	3	1.72	13	7.44	9	3.01	41	13.69
Machinery	1	.57	6	3.43	3	1.00	13	4.34
Hand tools			8	4.58	2	.67	35	11.69
Sledging chunks and mucking			2	1.14	11	3.67	32	10.68
Other causes	9	5.15	33	18.88	9	3.01	34	11.35
Total open cut	22	12.59	90	51.49	51	17.03	219	73.12
Total open cut and surface	34	19.45	139	79.52	69	23.04	287	95.82
GRAND TOTAL	320	183.07	1,426	815.79	647	216.03	3,060	1,021.70
Hours labor worked	4,195,412				7,187,604			
8-hour shifts	524,427				898,438			
300-day workers	1,748				2,995			
300-day workers, per year	874				[illegible]			

*Includes all injuries [illegible]

TABLE NO. 5.

New Jersey Zinc Company: Accident data, 1916 and 1917, by occupations..

Occupations	Hours labor worked	300-day workers	Injuries*			Injuries†			Number of accidents†	Total hours lost by accidents†	Hours lost per accident†
			Number	Per cent of total	Per 1,000 300-day workers	Number	Per cent of total	Per 1,000 300-day workers			
Muckers	996,535	415	81	25.31	197.59	350	24.61	843.37	350	7,104	20.3
Timbermen	781,769	326	51	15.94	156.44	233	16.39	714.72	233	6,930	29.7
Trammers	751,550	313	63	19.69	201.28	273	19.20	872.20	273	5,368	19.7
Runners, drill	564,832	235	72	22.50	306.38	323	22.72	1,374.47	323	7,934	24.6
Helpers	194,394	81	7	2.19	86.42	45	3.17	555.56	45	392	8.7
Ground trimmers	106,385	44	10	3.13	227.27	33	2.32	750.00	33	1,896	57.5
Pipemen	88,058	37	4	1.25	108.11	31	2.18	837.84	31	168	5.4
Nippers	79,123	33	3	.94	90.91	15	1.05	454.54	15	400	26.7
Bosses	76,999	32	5	1.56	156.25	18	1.27	562.50	18	536	29.8
Motormen	45,621	19	2	.62	105.26	8	.56	421.05	8	24	3.0
Trackmen	45,920	19	0	.....	.....	9	.63	473.68	9	0	.....
Chutemen	44,925	19	2	.62	105.26	10	.70	526.32	10	16	1.6
Blockholers	37,746	16	2	.62	125.00	11	.77	687.50	11	72	6.5
Car repairmen	15,023	6	3	.94	500.00	6	.42	1,000.00	6	80	13.3
Miscellaneous	184,024	77	15	4.69	194.81	57	4.01	740.26	57	987	17.3
Total	4,012,904	1,672	320	100.00	191.99	1,422	100.00	850.48	1,422‡	31,907	22.44

*Includes all injuries except fatal and trivial.

†Includes all injuries except fatal.

‡Does not include 3 trivial accidents to ore loaders and 1 trivial accident to linemen in 1917, as these occupations were free from accidents in 1916 and the time of exposure to risk in the latter year could not be segregated.

which Safety First was inaugurated, the accident rate was reduced to 2.17. The organization was still more perfected in 1914 and 1915, with the result that in 1916 the nonfatal injury rate was 0.77 per 10,000 hours and in 1917, 0.78. By keeping detailed records, the company has been able to diagnose the principal causes of accidents and apply remedies therefor. By an educational campaign among the employes and giving bonuses to the shift bosses, the reduction in accidents has been very marked. The records of this company not only show accidents by causes, but also by occupations, and on the basis of the actual number of hours employed in the mines.

Through the courtesy of the New Jersey Zinc Company, I am able to present a summary of the nonfatal injury figures for the two-year period 1916 and 1917, also a summary for a four-year period, 1914 to 1917, according to causes as shown in Table 4. The accident data classified by occupations is given in Table 5, in which is shown not only the occupations, but the hours work performed in each occupation, the number of injuries and the number of injuries per 1,000 300-day workers. It also shows the number of hours lost per accident in each occupation and the total number of hours lost in each occupation by accidents. The trivial injuries referred to in this table include all such accidents as do not prevent the men from returning to work the next day, or in other words, they do not include those which record only the loss of the remainder of the shift.

While these records are as complete as it is possible to make them, yet they represent the returns from only one company and it is doubtful whether or not the figures are sufficiently large to be thoroughly fair to each occupation or even to each cause of injury. Data compiled by a large number of companies on this basis would undoubtedly furnish a reliable basis on which to study accidents and their causes and at the same time give sufficient information to establish equitable insurance rates.

Summary: Exact records should contain sufficient data to show the causes of all accidents; hazards by occupations, as in Table 5; hazards by mining methods as shown in Table 3; the days and hours worked and the time lost per accident as in Table 5, hence a basis of insurance rates that will be fair to all; and, lastly, such records will show the real progress that is being made in accident prevention.

DISCUSSION

CHAIRMAN TILLSON: The subject is open for discussion. As the author, Mr. Fay, is absent, possibly I may be able to answer some of your questions. I am familiar with some of the features mentioned in the paper.

MR. R. DAWSON HALL (Associate Editor, *Coal Age*): I think Mr. Fay has somewhat misinterpreted the manner in which the records of the number of men employed are figured by the ordinary company. It is not customary to take the names of all the men who have been employed in the course of the year and record the number thus obtained

as being the force at that mine; I believe it is customary to take the numbers on the payroll in any given month and from that to figure the number of men employed. It is a good thing that the error has been pointed out by Mr. Fay; at the same time it is not such an alarming error as it would be if we paid no attention to the turnover at all but took the whole number of men we have employed in the course of the year. As a matter of fact, all we do is to take the average monthly payroll and assume it to be the average number of men employed. That, of course, is inaccurate, but it is not nearly so inaccurate as the method of computing which Mr. Fay says is customary. I can hardly believe that, because it involves a great deal of trouble to ascertain the number of men you have employed in the course of a year, because you do not have them all on the payroll at one time and consequently it would require quite a calculation, but you take the number of men you have in the various months of the year, divide by twenty-four semi-months and overlook the turnover which occurs every half month, although it sometimes amounts to a considerable number.

CHAIRMAN TILLSON: I think the turnover may make an error of 50 per cent.

MR. HALL: Our turnover would not amount to more than 5 or 10 per cent.

SUPERINTENDENT CHECKS NUMBER OF MEN IN MINE

MR. JOS. W. REED (Consolidated Coal Company): I do not know just how other companies keep their number of men for the year, but our method may be interesting. At the end of each month the superintendent at each mine turns in a list of the number of men who have been employed and the number of men who have left. As every man that is employed or leaves the company has to go through the office payroll we are able to check up the superintendent. Occasionally we find a superintendent is a little careless, but after he finds that he is checked up we get very good results. The twelve months, averaged up, gives our number for the year. But as to the number of days worked in a coal mine per man I do not see how you are going to get it, because you cannot tell how many days each man puts in. We have no record other than our check sheets showing weights of coal and we all know that a man works one day and that the coal comes out the next. If you take your figures from the weight sheet your are liable to charge that man up with a day when he wasn't at the mine. The best I can do is to take the number of days the mine worked and the total number of men, which is incorrect.

CHAIRMAN TILLSON: May I ask if you have any system of time checks in your coal fields; of men checking into the plant and checking out?

MR. REID: We do and we do not. I do not know at how many mines we use the checking system—probably at 30 per cent of the mines. We use the system at all our gaseous mines and mines of larger size where there is only one opening, such as shaft mines. Some of our mines have four or five openings, two or three miles apart, and the men go

in at different places—they go in at one opening and come out at another. That is particularly true in the Gorge Creek field in Maryland. We have not been able to compel the men to pay any attention to the check board. You can put a fine on them, but I do not know whether it is legal to collect such a fine.

CHAIRMAN TILLSON: You can handle that problem by having the men pass through a turnstile; they have to give up their check to get through and to get out at night.

A DELEGATE: The chief difficulty seems to be in mines where conditions are not the same as we have, that is, there are contract miners in the coal mines that do not work on a day basis and those are the men hard to keep track of as to their time. It seems to me in every mine there should be some kind of a checking system in order to know how many men are in your mine on any one day, whether they are contract miners or not. I realize the difficulty Mr. Reid speaks of. You may have an opening on one side of a mountain, near a settlement. On the other side of the mountain you may have another settlement which is far from the mouth of the mine, yet there is an opening there where men can enter. The problem resolves itself into this: Whether the company will maintain a man there to take care of the check board. I do not think it is a hardship for a man to take a brass check and hang it up when he comes to work in the morning. In that way you have a record of how many men you have in the mine and therefore can figure your accident rate every day.

NUMBER OF MEN ESTIMATED BY TONNAGE MINED

MR. REED: We get a report from the mines probably two or three hours after the men are at work, covering the number of men inside, from our various shift bosses, or section foremen, as we call them. They report to the foreman and he reports outside, which gives us an estimate on the probable tonnage we will get that day, but I do not know the accuracy of that report. It is reported out, sent to the foreman and he reports to the clerk. The clerk knowing the number of men inside the mine—I refer to coal miners, not to the day men—knows the average tonnage to expect from each man and we get a report at our main office which gives approximately the daily tonnage to expect that day. I would not consider that as being sufficiently accurate for the purpose suggested and I would like to get something accurate if I could.

CHAIRMAN TILLSON: If you will pardon the Chairman for talking so much on this subject, the basis of good accident prevention work depends on knowing whether you are getting results from the schemes you are trying out. If you do not know, you are likely to waste lots of money or feel discouraged over things you have no reason to be discouraged about.

To emphasize that point, I may say that the accident record of the New Jersey Zinc Company up to the first of this month has been reduced to one-seventh of what it was in 1912. It has been a steady, gradual reduction, which can be plotted in the form of a curve and analyzed by a

mathematical equation. There is only one point that digresses from the mathematical equation and that is a very slight distance off the curve. That indicates the type of work done has been progressively effective, so we know what we have gained for the labor and time and money that has been spent. I may say that in 1912 the accident rating was less than the average for either coal or metal mining, as reported by the Bureau of Mines, and yet that has been cut to one-seventh of the former figure. If we had not taken a great deal of trouble and spent considerable money to keep statistics we would not have known how we were progressing. It requires some trouble and costs money to find out how many hours have been worked in your mine for each month, but it is worth while, I assure you. We have tried it and have no regrets.

Some of us, particularly in metal mining—I do not know how much of it is so in coal mining—have men working overtime. I have figure things out on a straight day basis and the discrepancy that comes into overtime work is really worth recording. The turnover is another considerable discrepancy, and those things are worth while when you start to organize your accident records.

The figures are only tentative in regard to the hazards of various occupations, because they are only based on two years' records. They are only an index to encourage others to keep figures on the same lines. Some day we will know whether a drill runner's occupation is more hazardous than a mucker's, and in knowing that we can find out what are the points of hazard in our mine operations and start eliminating those hazards.

STATISTICS OF INQUIRIES KEPT BY CAUSES

MR. REED: My statements would make it appear that we were not keeping a very accurate record. I suppose we all have our pet ways of keeping statistics and each man feels that his is the best. I do not think mine is the best; it is subject to considerable improvement, but I have been using the amount of compensation on accidents as the best indication of the extent of the injury and the accidents in the mines that I could get hold of, figuring that the compensation boards allow different amounts for different accidents, according to the seriousness of the injuries. I estimate the amount of compensation which should be payable on the accident before I get a return from the board. On getting the return I substitute the amount the board allows and revise my statistics. In that way I compile a statement each month, showing the cost of each individual kind of accident, classified somewhat similar to the list you saw here, but continuing each one of the main classifications and four or five sub-classifications. This brings the subject down as close as I can get it to one particular item which we may be able to eliminate. Thus I know exactly what it cost us for not having guards on our gears, for instance, and all other items along similar lines—I know to the cent. In figuring it out against the tonnage

of coal produced, I get a cost per ton which is my indication of an increase or decrease of the safety in the mines.

CHAIRMAN TILLSON: Mr. Reid has raised a very interesting point when he deals with cost. The mine operator is interested in the dollar, but I submit to you gentlemen for consideration the question as to whether the cost of an accident indicates the hazard. It may be that the hazard depends upon two things, the condition under which a man is working and the length of time which he spends under the influences of that condition. The same fall of ground which in one case may break a man's toes may in another case strike him on the head and cause a fatality. I would, therefore, submit to your consideration the question as to the value of fatality records. Fatality records are an index, and a good index, if they are based upon millions of cases, but based upon the few cases which occur in any one plant they do not form a proper index of the work which has been accomplished at that plant nor the work which has been accomplished in the State. The next thing is to find —in all the hazardous occupations—are the chances of accidents. You know that we cannot do that, because ground may fall from a dangerous place when a man is not there, but we can follow up our cases of injury and if we consider every case an injury which requires a man to lose time we are following up two things, the hazard and its proper treatment and the attendance of the worker in coming back to his job when he is again fit.

RECORD KEPT OF EVERY ACCIDENT

MR. SIDNEY ROLLE (U. S. Metals Refining Co.): I haven't anything to do with mine accident records, my duties pertain to metallurgical records. We find exactly the same thing: That you cannot base your facts on the big things. We go further and consider all accidents, no matter how small, and we find in the aggregate they mean a great deal. If you base your estimates only on time lost or on compensation you are going too broadly. At one of our plants we work under the New Jersey act and no compensation is provided except for serious accidents. We find that we have many small accidents where a man gets no compensation: sometimes he does not lose much time, but it requires a lot of time to keep a record of all these little things. In the aggregate we find, going down to the most minute accidents, that we have been able to do good work in general prevention which I do not think we would have secured if we had only considered accidents in which men had lost time or fatalities.

MR. A. THACHER: Don't you want all three? As you very properly say, one classification does not give you the whole story—you need all three to form a proper conception of the work. Compensation plays a part, because it is presumably based on the extent of the injury, and while, as Mr. Tillson has properly said, it does not cover the case, still it is a vital factor to us.

MR. ROLLE: Perhaps I did not make myself clear. Of course, it is

understood that the big things are not pushed aside to catch the little ones.

MR. REED: I would like to correct what seems to be a wrong impression. I thought I made myself clear when I stated that I used a number of different methods for comparison. I do not deal entirely with compensation. Every month each manager receives a statement from me showing the extent of injuries to his men. He gets a statement showing the exact causes of each injury that has occurred and opposite that is shown the amount of compensation payable, the number of injuries and the mines at which they have occurred. Our company requires every injury to be reported, whether it causes a loss of time or not. If a man knocks the skin off his finger a report comes to my office and the cause of that accident is considered just as carefully as a fatal accident. I find there are certain classes of accident causes which may result in serious injuries, and which should be given first and special attention, before the ones which will simply cause small cuts and bruises, mostly due to carelessness, which you must handle by getting the men in the mine to take care of themselves. The big accidents, which cause compensation, are often preventable on the part of the company, and if you can show the company where it is costing them money—thousands of dollars—by not doing so, you are in better position to show the company that you are on the right track toward preventing accidents.

"GO BACK TO CAUSE AND GET DOWN TO BRASS TACKS"

MR. MATTHIESON (American Smelting and Refining Company): We do not have mines, but we have a little experience in the mining line. As safety engineers, we are all interested in preventing accidents and our records help very materially in maintaining our systems. We keep a record of every accident, no matter how small or large, and a very careful investigation is made. I wish to bring out this fact, that our records show causes. Look over your records for last year. You have had so many accidents from falling ground: Get after it. We find a great many men are injured by stepping on nails: Get after your nail hazard. I have always noticed, when you go after some cause, there is sure to be a reduction in the number of accidents. I have talked to a good many men and they may say: "We do not have many accidents at our plant; they are all caused by carelessness." Go back to the cause and get down to brass tacks. I generally tell these men that to say an accident is caused by "carelessness" is a lazy man's way of explaining how an accident happened. There is a cause for every accident and your records will show those causes and give you a basis to prevent accidents, and, after all, it is our business to prevent accidents.

MR. E. C. FRIEDEWALD: I have adopted a system in my company wherein I classify an accident not according to the time the man worked but in the manner in which the accident occurred. I do not even classify roof falls, or anything like that. I have three subjects:

I classify accidents under "carelessness" or "negligence." Under "carelessness," it is an act, or omission, and under "negligence" it is the method. Then I subdivide under "cost and material," "quality," etc. When an accident occurs, and a man is hurt, for instance, if in putting up a prop, it is the act of omission that caused the accident—in the way he put it up. Then if, after it was put up, it falls down for some reason or other, it was the method of putting it up and the lack of supervision on the part of some man in not seeing that it was put up right.

In three months' time I have found that accidents were largely due to one particular thing: Failure to exercise proper caution. In the last month I have dwelt on the need of caution and I have stimulated our foreman to the extent that accidents due to this cause have been eliminated. The first month I operated I had six accidents chargeable against that one cause: so far in September I have not had one. I think that my system, although I do not know whether or not it will apply generally, has greatly helped me.

WHAT COULD HAVE BEEN DONE TO PREVENT ACCIDENTS

CHAIRMAN TILLSON: It might be well to bear one thing in mind: That in accordance with the remarks of Mr. Matthieson we cannot fail to realize that hardly a single accident occurs on a plant that any of us in a responsible position cannot say, in the last analysis: "What could I have done to prevent it? If I had foreseen it, could I not have arranged things a little differently and not waited until the accident occurred to tell us what we should have done? If we had thought along proper lines could we not have anticipated the hazard?" In my personal experience I find there has hardly been an accident that I could not consider myself as contributing to by the failure to have thought of the possibilities of its occurring.

MR. FRIEDEWALD: In the system that I have established that very thing can be met. I had some trouble with pick handles breaking and in classifying them I placed them under "quality" and therefore found what was the trouble. If I find a number of accidents arising from an ordinary wheel on a coal car—from the wheels breaking or from the failure of proper oiling—I find it is "quality" and therefore supply a better quality of goods in order to prevent accidents. In extending my system—like the pick handles—I have not gone far enough to really anticipate accidents, but I believe it can be done.

CHAIRMAN TILLSON: The next paper was to be delivered by Mr. Robert Johnson, but I have received this telegram:

"NATIONAL SAFETY COUNCIL, St. Louis, Mo.—*Gentlemen*, owing to circumstances over which I have no control I am unable to be present at your meeting. If possible have someone to read my paper. I wish the Council every success.

"ROBERT JOHNSON, *Mine Inspector*, Pittston, Pennsylvania."."

I will ask Mr. Shearman to read Mr. Johnson's paper.

WHAT RELATION HAS LABOR TURNOVER TO MINING ACCIDENTS?

ROBERT JOHNSON, INSPECTOR, PITTSTON, PA.

Mr. Chairman and Members of the National Safety Council: I feel grateful to your committee for the honor conferred upon me and I bring you greetings from the 150,000 men who are engaged in the production of anthracite coal in Pennsylvania—men who are loyal and true and who are bending every effort to assist this government, that democracy shall triumph over autocracy.

The subject assigned me is a very broad one and rather complex at the present time, owing to the fact that at least 35 per cent of the regular employes engaged in the mining and hauling of coal from the face to the foot of the shaft have enlisted or have been drafted into the regular army, and it has been necessary to replace them with men unacquainted with the work, who, either through thoughtlessness or carelessness, fall victims to the various accidents which occur in and around the mines. This is especially true of the accidents that result from falls of coal, slate and roof, and also from mine cars. At least 50 per cent of these accidents could have been avoided if the victims themselves and the person directly in charge of the mines had been more careful.

WORK SUGGESTS GLOOM AND DANGER

The mining of coal is not a subject to excite the fancy or arouse enthusiasm. Rather, it suggests to the mind a picture of gloom, the characteristically distinctive feature of which is a background of dangers, set in morbid, unhealthy and desolate surroundings. This unattractive picture was true as illustrative of the conditions of the past and is still unfortunately true in many cases today. In taking a general view of what has been accomplished for the safety, health and happiness of the mining population, the work may be classified: First, as physical, having reference to the safety and protection of labor from accidents and discomfort while in the performance of its duties; second, as sociological, having reference to the domestic affairs, the social, intellectual and moral conditions of the community. In addition to the general description given under these headings brief mention may be made of first-aid and rescue work, relief-fund systems, hospital facilities and educational advantages.

Pennsylvania may well be proud of her supremacy as a manufacturing center, due to the intelligent and successful utilization of her vast coal resources. Coal has made possible the creation and maintenance of her greatly varied industries. It has enriched the operators, given subsistence to hundreds of thousands of workmen and their families and has been a blessing generally to mankind. It is only proper, therefore, that every consideration should be given to the welfare of those engaged in the arduous and dangerous work of extracting the coal from the depths of the earth.

EMPLOYER AND EMPLOYE MUST OBEY SAFETY LAWS

The mining of coal is a most dangerous vocation; the lives of the men engaged in it are always in jeopardy, and yet the exercise of care and judgment on the part of both employer and employe would eliminate much of the danger. It is true that the managers of the mines of Pennsylvania have adopted rather stringent rules in their efforts to safeguard the miners and have spent large sums of money to make the mines safe. But the fact still remains that the chief object of the management is to produce the greatest amount of coal at the smallest cost. The employes of the anthracite mines are producing more coal per person than the employes of the mines in any European country, and are earning more money than the foreign employes. The question is: Does this combined effort on the part of the employer and employe to increase the production add to the perils that already surround the occupation? If so, it is time to call a halt on both employer and employe, and insist that they give greater attention to the safeguarding of the lives of the people in the mines. The dangers cannot be entirely eliminated, but they can be greatly lessened if common and well-known precautions are taken. Roofs should be made secure, care should be taken in handling explosives, in dealing with gaseous mines, in running mine cars, in operating the machinery of the hoisting shafts and in and about the breakers. Undoubtedly many accidents could be prevented if greater precautions were taken. From my experience of many years I am of the opinion that nothing but stringent laws that will reach both employer and employe, with penalty clauses attached that can be enforced, will prevent the sacrifice of lives in the mines of Pennsylvania. There can be no good reason advanced why the American operator and the American miner cannot be made to observe laws made for their mutual benefit and protection.

MANY MEN UNABLE TO UNDERSTAND ENGLISH

Persons who are acquainted with the conditions existing in the anthracite mines of Pennsylvania are aware of the fact that the dangers connected with the occupation of the mining of coal have greatly increased within recent years on account of the mines becoming deeper and more difficult to operate. In addition to this, workmen, as a class, are deteriorating year by year, notwithstanding the fact that miners' examining boards were established for the purpose of preventing incompetent persons from obtaining employment in the mines. It was supposed that these boards would issue certificates only to such persons as were qualified to perform the work of miners. It is a fact, however, that from 60 to 70 per cent of the employes inside of the mines cannot understand or speak the English language. This, I believe, is the primary cause of so many accidents in and around the mines of Pennsylvania.

DISCUSSION

CHAIRMAN TILLSON: Mr. Johnson has not dealt completely with the title of his paper in relation to labor turnover and accidents. It is a

subject which has never been presented in print, to my knowledge, and if any of the delegates have records which indicate definitely the relation of a certain labor turnover rate to the accident rate, they would be very valuable in the transactions of this meeting and I trust you will not hesitate to offer them.

MR. HALL: The best I have seen is that of Mr. Bach. This is taken from the sociological report that he makes every year to the directors of the Ellsworth Collieries Company. The percentages of accident disability, as to years of experience, shows 70 per cent, as against the first year when they started the mines. The second year it dropped to 20 per cent. The third year it mounted to nearly 80 per cent. After that it began to go down rapidly; it became smaller and smaller every year until at present it has reached a very low figure. I think you will find this table quite interesting. It shows that the men, when they first come to the mines, have accidents because of their greenness; later they are very much disposed to take risks and the accident rate mounts very fast, but after they have been at the work a little longer and have seen the results of carelessness, the rate goes down very rapidly and continues low as long as the men remain at the mine.

I must admit that the figures are not based on very many accidents: someone has pointed out that we should not regard them as very conclusive evidence. In 1917 the total number of accidents was 369; in 1916, 521. Of course, that is not a basis on which very elaborate estimates can be made, but this is the best they are able to give so far. If we had the figures for a whole State we would be able to dogmatize a little on them. They are interesting, at the same time, as tending to show that the first risk is the greenhorn risk, and that appears to be overcome: then comes the "Smart Alec" period, and when that is over you get pretty well seasoned miners, men who take care of themselves. The "Smart Alec" period is when a man feels confident he can work by himself and does work by himself—and has an accident. It may be not so much the lack of care as it is that more responsibilities are placed on him and he is not equal to the task.

EXPERIENCED MEN SUFFER MANY ACCIDENTS

MR. REED: I will have to take exception to some of the statements because I am afraid they are based on too few accidents to be in anywise accurate. Our experience is not like that and I do not think the experience of our company, although it is based on about 10,000 employes, is sufficiently accurate to be used as the basis for a fair conclusion. Our experience is that during the first few years a man is in the mine he receives a good many injuries because of his lack of knowledge. He then passes through a period in which he seems to be very careful but after having anywhere from five to ten years' experience he again becomes careless. Our experienced men have been the hardest ones to handle, as far as our records show, in their accidents. The old miner almost corresponds to the greenhorn when it comes to taking chances. I do not have accurate figures to give you, but it is all

plotted, and relying on my memory for data for the last two years that is about the experience of our company. Others of our delegates probably have had a somewhat similar experience and by averaging the experience of those present we should be able to get closer to the truth than would be possible in any other way.

CHAIRMAN TILLSON: We are here to get experience and I will ask Mr. Reid, if he has charted figures, to be kind enough to forward them to Council headquarters. Mr. Cameron will see that they are properly distributed. Can you do that for us, Mr. Reid?

MR. REED: Yes.

CHAIRMAN TILLSON: Thank you.

MR. REED: We are coming again to what constitutes an injury. Do you want a basis on serious injuries—on accidents ranging from thirty days up?

CHAIRMAN TILLSON: We would like them on every basis you have. If we can analyze the figures, it is easy to add them together.

MR. REED: But I do not like to add them together—I like to make comparison on every one separately.

CHAIRMAN TILLSON: If you could plot a curve to cover both serious and slight injuries, and even add to that trivial injuries in which the man does not lose any time, your report would be wonderfully complete.

OLDER MEN DO MOST DANGEROUS WORK

MR. THACHER (New Jersey Zinc Company): We have no figures, but in an experience of perhaps forty years it has been the fatal accidents we have paid most attention to, but even with those we have not the figures. My recollection is that the larger part of our fatal accidents have been with the older employes, those who have been mining a long time. They are willing to take the risk because they had been in the mines twenty or thirty years and never had an accident. They were the very ones caught.

MR. BYRON CUMMINGS (Ocean Insurance Company): I would like to know if we could not get some light on the subject as to whether more accidents are occurring now in proportion to the number of employes than you had before the war period?

MR. R. H. SEIP (New Jersey Zinc Company): Our records show that accidents have decreased about 20 per cent, even during the war period.

MR. B. A. SINE (The Associated Companies): Mr. Reid mentioned a point which I think casts a little reflection on the experienced miner. He said that more accidents occurred among experienced miners than among other men working around the mine. My experience is this: That if he will look over his records closely he will discover that the inexperienced men will probably number less than 10 per cent and they pass into what is known as the experienced class that represents probably 90 per cent—in some States it amounts to more than 90 per cent of the men employed—consequently you have nine men to draw from while in the other case you have one. If you take them according to

the number of years employed I think the experienced man will show quite a bit of efficiency over the inexperienced man.

MR. REED: Mr. Sine brings up a good point; it shows how inaccurate statistics are when we try to get down to basic facts on anything. We do not know how many young men or old men we have in our employ, so we could not make a very good comparison on that point if we tried. Of course, statistics should show the percentage of men injured against the percentage of experienced men in the mines, but that again is impossible. I do not wish to cast any reflection on the man who has been in the mines for a certain length of time and I hope we can get enough figures to show that my statistics are incorrect, but my analysis shows a decrease in accidents as the man's experience increases up to a certain point, and from that point on there is an increase—my statistics show there is a decrease for a certain number of years after the man is employed and from that time on there is an increase. The increase is on the old men—not old men, but the men who have been employed in the mines for a number of years—and never reaches the point of new men in the mines. The man of mature experience never becomes as careless as the man going in green.

ACCIDENTS TO RAILROAD EMPLOYES

MR. WM. F. BOERICKE (Mineral Point Zinc Company): It seems to me there is another item which must be taken into consideration. Take a particular line of work, such as that of a roof trimmer or timberman. A particular job may be much more hazardous in timber work or trimming roof and a superintendent will put his more experienced men on the more hazardous work. The probability is that the accident would come on the more hazardous work and the experienced man might be blamed for having had an accident—but that would not be a fair deal to the older man. I think the same thing would apply in trimming roof. In mucking or drill running the hazards are about the same in different parts of the mine, but you can see, with the ones I have mentioned, that the more experienced man would get a harder deal and stand a greater chance for an accident than the man who was just put on.

MR. C. H. WILSON (Utah Copper Company). I have been waiting to hear someone from the metal mines tell us of their experiences, but not hearing from them I do not know whether there are many here or not.

The Utah Copper Company gets out approximately 40,000 tons of ore a day. We have seventy-nine steam locomotives, standard gauge, and twenty-seven steam shovels. Our work is all surface work, a steam shovel on every level, and our labor turnover, taken, for instance, for July, 1917, was 18 per cent, whereas in July, 1918, it was 53 per cent. The largest part of our labor turnover was on railroad work and we experienced most of our injuries in that part. We operate on a grade that varies from 4 to 6 per cent. Most of the accidents were caused, perhaps, by inexperienced brakemen or firemen that we were unfortunate enough to get hold of. In spite of increased production we have decreased accidents in so far as the drilling and shooting end of it is

concerned, but the railroad work is the particular department that is affecting us and shows a very serious condition in the bringing of the ore down off the levels.

We pay, perhaps, as good wages as they do at any place in our efforts to attract the most desirable labor. I believe we are paying maximum wages for that kind of work and it is all based upon eight hour work, too. I do not know if there is anyone here who is having the steam shovel experience we are suffering from but if it is of any value to you—the labor turnover we are having—that has been our experience for July, 1917, and July, 1918: Thirty per cent of labor turnover was confined to railroad work.

CHAIRMAN TILLSON: May I ask whether that is 18 per cent turnover of the force each month, making twelve times that on an annual turnover rate, and the 53 per cent was on a one-month period?

MR. THACHER: Our experience in Colorado was a little higher than that for the turnover. I think it was nearer 100 per cent.

NUMBER OF ACCIDENTS GOVERNED BY SUPERVISION

MR. WILSON: I might explain that by the fact that Utah possesses a very large Mormon element and perhaps 60 to 70 per cent of the people in that State is a permanent population, and that we do not have very much of the transient element. I might say, in connection with that also, that Joseph Smith of the Mormon church does not permit anyone to belong to a labor organization nor to affiliate with any secret order.

MR. ROLLE: Our experience shows that labor turnover really has no direct relation to accidents. Like everyone else, our labor turnover has increased. We are right in the midst of the big industries that take the men away from us—powder plants, shipyards, etc.—and our labor turnover runs between 350 and 400 per cent per annum. With the same accident prevention we had before the largely increased labor turnover, our accidents are gradually decreasing, and we feel if we keep on with our accident work and actually instruct the new men, which is part of accident prevention work, and keep on guarding our machinery the best we can, accidents will not increase with the increased labor turnover. We feel that it has no direct relation.

MR. HALL: There are two kinds of turnover—what you might call industry turnover and mine turnover. Since the war we have not had so much of the industry turnover; that is to say, we have not gotten so many new men into the industry. It is true that quite a number of Americans have come into the industry in the bituminous region, but very few Americans or others have come into the industry in the anthracite region. It is the industry turnover which is the great source of danger; at the same time we have had an increase in the number of accidents in the mine, despite the fact that the industry turnover has not been as great as it was before the war, because we do not have the foreigners coming into our industries as we had formerly. They came in by droves and we had to instruct them not only in mining, but also in

the speaking of the English language—the meaning of the pidgeon English in which we endeavor to address them.

MR. WILSON: I desire to make a suggestion. If anyone here is experiencing such grave conditions in the operation of trains as we are, I have found that the principal cause of accidents was runaway trains. This was due to the fact that men operating them were not given what we call an air-test examination. We now require all the men in that service to take an eighty-five-pound air pressure test examination before being assigned to that kind of work and we are in hopes of eliminating the larger number of accidents arising from that cause.

CHAIRMAN TILLSON: We have allowed our discussion to run a little over time. I shall have to ask for the paper by Professor Raymond.

STANDARDIZATION OF MINE CARS IN METAL MINES

PROF. R. M. RAYMOND, SCHOOL OF MINES, COLUMBIA UNIVERSITY, NEW YORK CITY.

Mr. Chairman and Members of the National Safety Council: A car which we find most often nowadays, fortunately, is the car which has done away with the yoke type and has either a very small turntable or dumping iron at the fore part for dumping forward, or has a very flat turntable made of sheet iron for swing around—a flat turntable made of sheet iron and links which gives a very small space between the truck and the ore body. Fortunately this is coming into more common use and is doing away with the old Homestake type of car, which has a very insecure base.

I think we have perhaps advanced a little more on this point than the coal mines, which have up to recently used loose wheels, or loose bearings with frequent oilings, whereas the metal mines have done away with the solid axle and loose wheels and are going more thoroughly after solid and closed bearings and saddle covers, to add to the lubrication and strength and rigidity of the axle.

One of the troubles the Anaconda has had is that their cars were rather small and there was hardly enough weight to hold itself in place. The whole thing tips over, but in the larger car there is more wheelbase and better opportunity for the truck to preserve its place on the track.

One thing we have stuck to is a bearing of eighteen inches, but we are getting to as high as twenty-two inches for mule driven or larger sized cars. I believe the standard of eighteen inches could be raised to twenty inches quite as easily, and would give a much better bearing for the cars than the usual old fashioned eighteen inch, particularly now that we are using better axles and bearings and can use a much larger car, which should have a much better base.

A car twelve feet in area would be roughly three by four, or something less than two and a half feet, by four or four and a half feet.

This car is illustrated on the blue print, of twenty-six cubic feet, has a

height of twenty-six inches and has a width of thirty-four, and the roller bearing is very easily operated by one man, and having a car of greater width and greater area does help in preventing accidents, particularly in material falling over the sides. I have used cars of that size, the twenty-six foot capacity, and found very few accidents in loading it.

The point at which a latch engages is worn so easily that necessarily the car body on the truck becomes loosened in this manner and something further than that should be used in order to keep the body perfectly in its place. Always in an old car there is a little bit of rickety running, due to the lack of the car body being kept firm. An improvement on the usual latch, no matter how well it may be placed or in its shape or construction to engage the pin, is to have a small pin on the truck and this in addition to the usual latch keeps the body firmly in place. You will see on these blue prints a small pin at the back end of the car which the body engages, and of about half an inch in height. As the car is brought around into place it is very easy to catch and holds that car firmly without much wear.

LEVER ONE OF DANGER POINTS

The lever is one of the danger points about a car. The handle of the lever should not reach the top of the car by three or four inches at least, and if possible, if the car be high, it can and should be much lower. It should be at least two or three inches from the end of the car, so that as it sticks out there is plenty of room for a man's hand to work the lever without encountering the rivets on the side or any of the side bars. It should also have the four, five or six inch clearance between the ring which holds the level in place.

These guardboards—two inch planks with strap irons at each end, slip over the end and give a greater height on the side on which the man is standing—have been found very efficacious in mines operating on heavy ore like the Copper Queen, and are so simple and so useful—I think we should adopt them more than we do.

This is pretty well shown in the illustration; better than I can describe it. Hooks are always a disadvantage because they are sure to catch a man's fingers or clothes, but if a closed ring can be used it makes a good hold and there is no possible danger of a man's clothing or finger being caught.

On the point of centre of gravity of a car, one type of car which has gone to almost an excess has been developed in the New York subway. It has been found very efficient in preventing accidents and very useful for the double purpose of loading large pieces and on account of the short lengths of track which are put in for temporary use. These cars have been found particularly useful. They are very low, with the car wheel set up above the bottom of the body, making a total height of about thirty inches. In that way the cars, although very large, are handled by two men. They are hoisted to the surface like a bucket and dumped by a hook at the back end. They are heavy and not fitted for use as a mine car, but are a good illustration of a low-gravity car.

OBVIATES DANGER OF END DUMP

The form of car illustrated on the blue print just passed to you obviates the danger of the end dump, or swinging the car around. Turntables are eliminated and the height of the car is reduced. The dumping is done at the side and are operated by a lever opposite the door. It puts the lever at a little disadvantage, but it gives a good dumping arrangement with no possibilty of the car tipping over. This makes an excellent car for moderate sized haulage and has been found very efficient in some of the copper mines in the west.

"The rocker or rolling type of car is rather in disfavor among miners underground, but is now being made rather lower in structure, instead of the former very high type. It has one great advantage underground because there are so few points where a man's fingers or clothes can catch. This structure, which is somewhat of wider top and has a good bearing. car is becoming popular in the west. The Copper Queen and United Verde use this type of car.

I think a cradle is one of the most satisfactory methods of dumping and can be used in a great many cases where operations are confined to a few levels. If power is used it can be applied very easily and makes the dumping very rapid.

(Blueprints are on file at council headquarters.)

DISCUSSION

MR. SEIP: I thoroughly agree with Professor Raymond that a handle should be placed near the bottom of the car to raise when dumping. However, I believe there should be a handle near the top of car—at least one or two inches below the top—because invariably men will push a car with their hands on top of it. It isn't three weeks since one of our men lost a finger due to that very cause. In spite of the fact that a handle was provided for that purpose the man was pushing the car with his hands on either side. The car jumped the track and caught his fingers between the edge of the car and the chute. If a handle is provided that is not so likely to happen. Very probably we have suffered a number of accidents due to this cause.

Another feature referred to by Professor Raymond was that of having guard boards on the side of the car when loading from a chute—that is, opposite the chute—to prevent material from falling onto the man's feet or otherwise injuring him. It has been our practice not to permit men to load cars from the side opposite the chute; that is, the men are not permitted to stand in front of the chute; they stand either at the end of the car or on boards provided for that purpose. The boards are placed on the ends of the car and the man also has safety boards, so that he is doubly guarded. I do not know whether or not that is possible in all places.

Regarding cars used on mule or motor haulage: I would like to know the length of the buffers on the ends of the cars. In my opinion the buffers should be sufficiently long so that the space between the cars

is ample for the men to be safe while coupling; there should be twelve or fourteen inches, so there will be no danger of men getting hurt even when the cars are bumped.

COUPLING SPACE SHOULD BE SUFFICIENT FOR SAFETY

PROFESSOR RAYMOND: There should be a distance of twelve inches, or more between cars—probably a buffer of six or seven inches. In coal mines where there is much of the old fashioned chain coupling, they have a buffer of seven inches, but I think with a buffer of five or six inches, of the type which brings the coupling above the buffer, and providing a space of at least twelve inches for a man to step in between the cars, should be allowed.

MR. TALLON: I agree with Mr. Seip, because I lost two fingers by having my hand on top of the car—it was impossible to run the car without having my hand there. The accident was due to a low drift and the car striking a rock or something on the track. The car tipped over and caught my hand against the cap; at least it came just close enough to pass through under the cap. Immediately after that the management put handles on the cars. That was thirty-one years ago. The handles were similar to the ones described by Mr. Seip and were placed a little way down from the top, both in front and behind; a handle on each side.

In regard to loading from the end of cars at loading chutes, it would be almost impossible for us to do that owing to the position of the chute and the way the doors are put in, but we have a standard width of three feet so as to make plenty of room on the side of the car. Our standard gives the men plenty of room and a platform is provided for the men.

CHAIRMAN TILLSON: As I understood Mr. Seip, he intended to bring out the fact that cars were loaded from the side. The men stand on the ends of the cars, instead of on the opposite side in front of the chute.

MR. TALLON: I understood that you load from the side of the car, but the man stands at the end. This would be almost impossible in our case.

CLOSER AFFILIATION OF COAL AND METAL MINERS

MR. G. C. NELMS (Mine Safety Appliance Company): This is an ore mine car discussion, but I raise a question in connection with the side chains you speak of. I know one coal mine proposition where, because the cars are dropped down an incline, we use both the bumper coupler and the side chain as a safety chain. It seems particularly appropriate to draw that question to your attention because we use both and we found not only that we reduced our accidents from the breaking and running away of trips, but the jump-off and all the fast-moving trips were controlled by the side chains being in position. I want to raise that point, because we occasionally use them in the coal business.

MR. HALL: It has always seemed a surprising thing to me there

was such a very great difference in the cars used in the metal mining industry and those used in coal mining. I feel considerable trepidation about saying anything relative to the matter, because I do not understand conditions in metal mining. It has always surprised me that it was thought well to put the dumping arrangement on the car instead of depending on a dump for that purpose. I can realize, of course, that in metal mines, with the narrow drifts, a narrow gauge is necessary. It is also necessary to have a narrow wheel base, though both are extremely undesirable, but it does seem strange that an arrangement for dumping each car is provided, to be hauled through the mine and to make the car dangerous by reason of the high center of gravity which is thereby entailed.

It seems to me that if operators would look over the coal mining industry and try to get a few ideas from it, it would help the metal mining industry, just as it would help the coal mining industry to visit the metal mines and learn from the experience of those miners. We have much in common and if we would try to convince ourselves that each industry has lessons for the other we would be great gainers thereby.

MR. THACHER: I agree with Mr. Hall; we can learn a lesson from the coal mine and we are following that practice in many instances. In some of our mines we have more nearly a coal car. The reason, however, for the smaller cars is that they have grown up from the practice of small mines, where you have a great variety of ores going to different places and you are curtailed in the dumproom. The varieties of ores that you get necessitates sorting them into different lots, but Mr. Hall is quite right when he says that we have carried it to extremes and could learn many lessons from the coal mines.

MR. T. H. GARNETT (Empire Zinc Company): I would like to ask Mr. Seip if they load a train of cars from the end?

MR. SEIP: We load from the end; load the trains coupled. The men stand on top of the cars or sometimes between the cars in such cases.

CHAIRMAN TILLSON: Professor Raymond has spoken of the gauge of the cars as being sixteen inches, preferably eighteen or twenty inches. What is the matter with a 24-inch gauge?

GAUGES OF TRACKS IN MINES

MR. THACHER: I would call Mr. Tillson's attention to the fact that, from my experience in some of the larger mines, you can use twenty-four or even thirty-inch gauge, but when you come to a little mine and have to wiggle around the twenty-four-inch gauge causes considerable trouble. In the West are hundreds of mines in which you would not think of putting in a twenty-four-inch gauge. I have seen extreme cases where they have to use a hoist to get around the curves.

MR. HALL: The difficulty, it seems to me, if you are going to use a locomotive, is that any gauge of that kind is very hard to handle—any small gauge. The gauge in coal mines runs up to forty-eight inches;

in fact, it runs up to four feet eight and one-half inches—they are trying to standardize on forty-two inches. Where it can be used the larger gauge is extremely desirable, but there seems to be a natural disposition to fit methods to the most undesirable conditions, rather than to suit the particular conditions which may exist in any one mine, but perhaps that is an unfair or unjust characterization of the way in which things are done. We usually take the ordinary conditions and standardize accordingly, without any regard to the peculiar advantages which a mine might possess.

A DELEGATE: Mr. Hall raised the point of a narrow gauge being unsuitable for mechanical haul. It may be of some interest to know that in the West they use eighteen-inch gauge for gasoline hauling; large tonnage, too.

PROFESSOR RAYMOND: The point of gauge—eighteen-inch gauge vs. twenty-inch gauge—applies simply to the small car, the man car. I think that a standard of thirty inches should be set and used in preference to the more frequently used eighteen-inch. Of course, when you come to the larger size, like a mule car or storage battery car, you run at once to thirty or thirty-six inches or to forty-two inches.

There is one point I would like to dwell on, that of loading. I think we should pay more attention, not to the size or shape of the car, but have a little more room for the carman when he loads his cars: that instead of standing between the cars he should have a decent chute, to begin with, and a decent door to the chute should be provided. Space should be provided so that a man can stand out at the side of the car, or over the car, and have a chute and a chute door and a handle for that chute door, so that the car may be easily loaded and the door closed quickly. The lack of those things adds to the number of accidents in loading, perhaps more than the structure of the cars. I think that is a point we would be wise in paying attention to—the form of chute and space and room provided for the carman on the side or end of the car or above the car.

CHAIRMAN TILLSON: We have two papers, "Hazards and Safeguards in Coal Breakers and Washeries," by Mr. D. K. Glover, and "Hazards in Ore Dressing Plants," by Mr. J. S. McKaig of the New Jersey Zinc Company. Both of these papers deal with the concentration and separation of minerals and the separation of minerals and rock. I will ask Mr. Shearman to favor us with these papers in the absence of the authors.

HAZARDS AND SAFEGUARDS IN ANTHRACITE BREAKERS AND WASHERIES

D. K. GLOVER, SAFETY ENGINEER, LEHIGH COAL AND NAVIGATION COMPANY

Mr. Chairman and Members of the National Safety Council: In presenting this paper on "Hazards and Safeguards in Anthracite Breakers and Washeries," it is not my intention to convey the idea that the haz-

ards set forth are all the possibilities or that the safeguards suggested are the best that can be installed. It is, rather, an outline of conditions and their applied remedies that have come under my observation; therefore, it is open to criticism and suggestion of others which will be of benefit to all of us. I trust these points will be brought out and open a discussion.

Perhaps the most logical method of covering hazards and safeguards is to follow the flow of the coal through the breaker. At the dump, as the coal leaves the mine car, the hazards are from flying pieces of coal or rock and cars jumping the dump, resulting in injury to men engaged in removing the latches of car door. Injuries from flying material can be prevented by enclosing the dump at sides and top. The jumping of cars is possible on certain styles of dumps, particularly on the old balance or gravity dump. Where this style is used, timber framework should be placed to check the car but at the same time not to interfere with the dumping. On the Greene dump, the rotary dump, the self-dumping cage and steam dump there is only a remote possibility, if any, of accidents from this cause. On old-style dumps, where wooden cars with end latches were used, it was customary to have man knock latches with sledge hammers while car was being dumped; with the rotary dump this is entirely eliminated; on the Greene dump the latch can be loosened while car is moving slowly; at the steam dump the car latch is partly opened while car is at rest and final opening is made by blocks set at sides of the dump. Where the self-dumping cage is used, with a steel car equipped with a sliding ring on a horn, it is necessary to pull ring by hand. In order to remove the man performing this duty from danger, he is placed on a platform high enough so that no material from the car can possibly strike him, he is also provided with an iron rod, eight feet long, with a U-shaped prong large enough to pass over the horn but not over the ring, and as he stands at an angle of about 45 degrees with the direction of the flowing material he is out of all danger.

PLATFORM MEN

As the coal flows down the dump chute, if it were not checked, there is a possibility of it having sufficient velocity to pass over the shakers and strike the platform men. There are two forms of checks which work very satisfactorily; one is a suspended gate nearly the width of dump chute, about four feet high, made of three-inch oak covered with one quarter inch sheet iron. This gate is worked by the weight of the material resting against the upper side forcing it open, thus allowing the material to flow under. The other is the slowly revolving feed, which is the width of the dump chute, and consists of four paddles about eighteen inches high set at right angles to one another. While this feed is not primarily a safeguard, it acts as one on many occasions. To eliminate possibilities of large lumps bounding over the feed and striking the workmen on the picking platform, second-hand forty-pound T-rails are strung across the top of the platform, being raised above the floor about two feet to allow ordinary lumps to pass under.

On the first platform, where the class of material handled is large and rough, the possibilities of a man injuring himself by straining is eliminated by arranging his stand so that his waist line is at the level of the platform. To avoid cutting his fingers while sliding rock off into the rock chute, he is provided with either leather mitts or hand leathers; to avoid pinching his fingers when starting a jam, a two-pronged hook is used.

On the second platform the material handled is finer than at the first platform, it having passed through the shakers; the only possibility of accident is the cutting of fingers on sharp edges and this is eliminated through the use of leather gloves.

As the coal passes on the rolls, the chutes are protected near the rolls, so that in the event of a man carelessly stepping into a chute he cannot slide down to the rolls. The rolls are entirely covered, with the exception of the covered chutes leading into the rolls and the chute under the rolls, thus preventing anyone from accidentally stepping into or falling into rolls and eliminating accidents from flying pieces.

As the rock passes to the rock pocket, the chutes are built with sides high enough to prevent flying pieces striking employes. When the rock is loaded out of the chute, accidents to loaders, who in times past stood in front of the chutes to pull the lever operating the gate, are prevented by the installation of steam rock gates, operated from a platform above; the operator is in an absolutely safe place and performs his work without straining efforts.

The coal, on leaving the main rolls, is again passed over sets of shakers and sized before passing to the jigs. Accidents around shakers usually occur at the shaker shafts while men are oiling. If a railing forty-two inches high, with four removable pipe sections, is constructed in the rear of the shaker shaft and the cam straps are provided with grease cups, there is not much chance for an oiler to be caught. Several fatal accidents, in which the victims were wrapped around the shaker shafts, have come under my observation—all due to removal of railings by thoughtless oilers.

At jigs, the hazards consist of being caught around jig shafts, or, in some types, coming in contact with sprockets and chains on elevators. The first hazard is readily removed by covering the jig shaft, leaving the cams and straps exposed, with the grease cup placed on top of the cam strap; the second, by a guard over the sprocket wheel and chain.

During repairs of the jigs, when it is necessary for men to work inside, there is small possibility of accident, as this is usually done at night when no material is passing through the breaker, or, if extensive repairs are necessary, the flow of water and material can be diverted without great difficulty.

LOADING POCKETS

In the loading pockets, to which the coal passes from the jigs, the only hazard present is when, under extraordinary conditions, the pockets become blocked and it is necessary for a person to start the coal, the workman may be drawn down with the flowing coal and buried. This

hazard is safeguarded by the use of a safety belt or by the construction of a walk on one side of the pocket. Another possibility that occurs to me is that of a workman accidentally falling into the pockets. However, where a substantial railing of standard height is maintained there is not much danger of such an accident.

Running cars under the breaker for loading presents several hazards; one is the danger of a car runner being knocked off the car by the lip of the chute. As it is contrary to good principles of operation to have chutes very high above the cars, on account of breakage, and the fact that there is so much variation in the height of standard-gauge coal cars, necessitating a chute high enough to suit the highest, it requires caution on the part of the car runner while handling cars under the breaker. Inasmuch as the cars are under control at all times, ordinary precaution and attention to business is all that is necessary.

Another hazzard is that of persons being squeezed between cars and side of breaker or breaker supports. In breakers that were built before the safety campaign assumed such proportions as at present, and the clearance is not very great—it would require great expense to remodel so large a structure and possibly interfere with production—a danger sign should be posted, warning all concerned of the accident possibilities while breaker is running. During cleaning-up time, after hours, a man should guard the incoming end of the breaker to prevent cars from being run under the pockets. In new breakers, or at old breakers where interference exists that can be changed, a clearance of seven feet from the center of the track on each side should be made.

HORSEPLAY

This probably covers every stage of the preparation of coal, but there are other hazards that occur throughout breakers and washeries in general. One of the most serious is that of horseplay. Very often boys have been injured sliding down stair railings; teasing one another, resulting in coal, bolt nuts or other pieces being thrown and either striking the person intended or some by-stander; wrestling, pushing through or over protective railing and chasing one another up or down steps. There is no question but that boys will be boys and enjoy fun, but there is room for an educational campaign on the proper way for boys to play, as exemplified in the publications of the National Safety Council. A splendid field for an educational safety campaign is afforded in every school located in a mining community and great benefits would be derived therefrom. Very often it is hard to determine whether or not the injury was caused by horseplay but when fully proven it is sometimes effective to take advantage of the clause in the Workmen's Compensation Act of Pennsylvania which denies compensation for injuries received while engaged in acts which are not furthering the interests of the employer. This affects the boy's pay envelope; brings his parents' attention to the cause of the accident, and sometimes results in the boy being forcibly reminded of his carelessness. One case that comes to my mind is that of two boys fooling, then quarreling and finally throwing pieces of coal at one another; neither one succeeded in stopping the other until

one boy threw a three-quarter-inch nut at the other but struck an old man, who was passing at the time, above the eye. Both boys were brought before the foreman, lectured and made to stand equal shares of the man's earnings while he was disabled. Horseplay in this breaker received a great setback.

MUSHROOMED TOOLS

Another hazard is the use of mushroomed tools by repairmen. The simplest and surest way of correcting this evil is to instruct the blacksmith who sharpens the tools to dress both ends before returning them; also through periodical inspections.

In timber repairs, erecting additions, or construction work, safety belts have proven very satisfactory. In handling material, the heavy parts are usually hoisted in a corner of the building so situated that it is somewhat removed from the operating and frequently traveled part of the building, thus eliminating the hazard of falling material. Where canvas gloves are used by the men handling sheet iron for chute bottoms very few cut fingers result.

Allow me to make one point in conclusion: I do not want anyone present to feel that we have entirely eliminated accident hazards in our breakers. I feel that we have made great strides in our safety campaign in our breakers and washeries and invite you to visit our plants and make use of any of our ideas or suggestions.

HAZARDS AND SAFEGUARDS IN ORE DRESSING PLANTS

JOHN STUART MCKAIG, B. S., E. M., NEW JERSEY ZINC COMPANY, FRANKLIN, N. J.

Mr. Chairman and Members of the National Safety Council: In taking up this subject it would be impractical to attempt to set standards for safeguarding all kinds of hazards or to cover all the hazards that may exist. The particular method or type of safeguard may vary with conditions in different plants, just as the number of accidents due to different causes vary; this may be determined by the safety engineer or safety committee, as the case may be. Certain standards could well be followed in many cases, and, when possible, this should be done.

Difficulties that have been met in carrying out safety work may be of value to those who are less experienced. It is necessary to get employes interested and to teach them to realize the value of safeguards. Forming a safety committee (to be composed of the bosses and men who serve for a certain period of tim and are then replaced by others) to make regular inspections of safety work and recommend new work to be done, has its merits at the beginning, but usually fails after the first year or two, due to pressure of other work or lack of interest.

Wherever a guard of any kind is placed in such a position that it may hamper the work of operating or maintenance it should be made removable, otherwise it will be torn out and not replaced. Propaganda is very successful in calling attention to the sources of danger and bulletin boards for posting should be erected in conspicuous places.

Many accidents, particularly around machinery and drives, are due to clothing being caught by the moving parts. If possible the men should be persuaded to wear their jumpers inside their overalls and when the suits become torn to discard them for new.

Crippled or infirm men should not be allowed to work in dangerous places. A physical examination of all employes should be made every three months in large plants and the results reported to the operating department.

New construction or alterations should always be followed closely by safety work, as it is during this period that accidents are most likely to occur.

CLASSIFICATION

Under the classification adopted by the Department of the Interior, Bureau of Mines, accidents are divided into three classes:

1. Fatal.
2. Serious injury, time lost, more than fourteen days.
3. Slight injury, time lost, one to fourteen days, inclusive.

Accidents by causes and the percentages due to each for the year 1916 are given in the following table:

		—*Percentage of Total*—	
		Killed	*Injured*
1.	Haulage system	9.09	4.59
2.	Railway cars or locomotives	12.12	1.32
3.	Crushers, rolls, or stamps	.....	5.28
4.	Tables, jigs, etc	.....	2.57
5.	Other machinery	33.34	10.55
6.	Falls of persons	6.06	11.71
7.	Suffocation in ore bins	9.09	.13
8.	Falling objects (rocks, timbers, etc.)	3.03	11.40
9.	Cyanide and other poisoning	.....	.41
10.	Scalding (steam and water)	6.06	1.10
11.	Electricity	6.06	1.66
12.	Hand tools, axes, bars, etc	3.03	11.31
13.	Nails, splinters, etc	.....	5.37
14.	Flying pieces of rock from sledging or crushing	.....	3.42
15.	Other causes	12.12	29.18
		100.00	100.00

An examination of the table shows that machinery caused 33 per cent of the fatalities and 18 per cent of the injuries; haulage system and railway cars or locomotives, together, caused 21 per cent of the fatalities and 6 per cent of the injuries; falls of persons and falling objects, together, caused 9 per cent of the fatalities and 23 per cent of the injuries. The ratio of fatal accidents to the total injured is about 1 to 100.

In a plant where safety work has been established for some time it will be found that by far the largest amount of injuries are classified as "slightly injured" and when this stage is reached an examination of

the accident records will readily show the importance of training employes against carelessness and foolhardiness.

ACCIDENTS BY CLASSES

The classification of accidents in their numerical order will be followed in the balance of this paper and the more important hazards and safeguards dealt with.

1. HAULAGE SYSTEM: (KILLED, 9.89 PER CENT; INJURED, 4.59 PER CENT)

Among the variety of haulage systems used at ore dressing plants, the most important are steam, electric, wire rope tramways, and hand tramming.

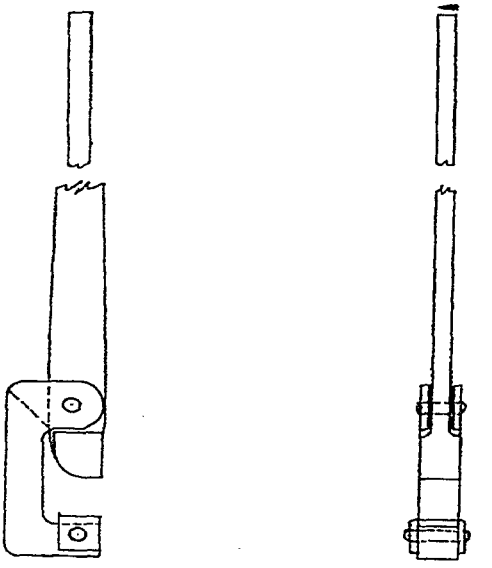
For steam and electric haulage the essential safeguard is in maintenance of equipment and track. Regular inspections should be made by the yard master. Electric power lines should be marked with danger signs.

2. RAILWAY CARS OR LOCOMOTIVES: (KILLED, 12.12 PER CENT; INJURED, 1.32 PER CENT)

(*a*) Locomotives should comply with Interstate Commerce Commission standards.

(*b*) Tracks and crossings should, where possible, be constructed overhead or underground. When crossing is on the track level a railing should be placed parallel to the track, at proper clearance distance, so that a person will be compelled to walk around it and not be able to step directly in front of a moving car or locomotive. Danger signs should be placed on both sides.

APPROACH TO TRACK FROM STAIRWAY GUARDED BY PIPE RAILING.



SKETCH OF SAFETY WRENCH FOR (RAILROAD) CAR DOORS.

(*c*) Clearance—The proper railroad clearance for main lines and sidings should be maintained wherever possible. In other cases standard warnings should be established.

(*d*) Loading chutes should be automatically counterbalanced to return to their clearance position when released.

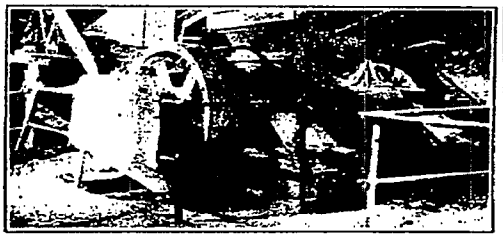
(*e*) Safety wrenches should be used for pulling up or releasing car doors.

3. CRUSHERS, ROLLS OR STAMPS: (INJURED, 5.28 PER CENT)

(*a*) Gyratory crushers, under ordinary conditions, offer slight danger of injury. When running on wet, sticky material or on an oversize chunk it may require a man to bar or sledge the ore, in which case a proper platform and guard should be provided. Transmission belts and pulleys should be guarded.

(*b*) Jaw crushers, the same as gyratory, with a warning not to expose the head or body above the crusher from which a piece of iron or hard rock may fly with disastrous force.

(*c*) Rolls should be enclosed to prevent flying pieces. Guard the pulleys and transmission belts and provide means of reaching the grease cups without danger of being caught.



SHAKING LAUNDER PIT AT TAIL END OF JIGS GUARDED BY REMOVABLE PIPE RAILINGS.

CRUSHING ROLLS—ENCLOSED TO PREVENT FLYING PIECES OF ROCK, AND GUARDED WITH PLATE AND PIPE RAILINGS.

(*d*) Stamps—Guard with removable railings and maintain fingers for suspending the stamps. Stems should be firmly held and blocked when changing shoes or dies or when cleaning up.

4. TABLES, JIGS, ETC.: (INJURED, 2.57 PER CENT)

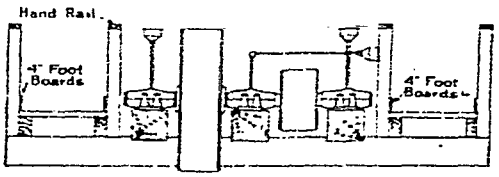
Transmission belts and pulleys should be guarded and belt-shifting device provided for tight and loose pulleys. Sumps or under floor conveyor ways should be protected by removable railings or platforms and a severe penalty imposed for not keeping them in place.

5. OTHER MACHINERY: (KILLED, 33.34 PER CENT; INJURED, 10.55 PER CENT)

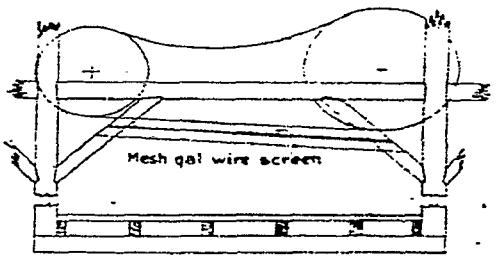
This is the most important source of fatalities and serious injuries and

covers the ground on which the largest percentage of safeguarding can be done.

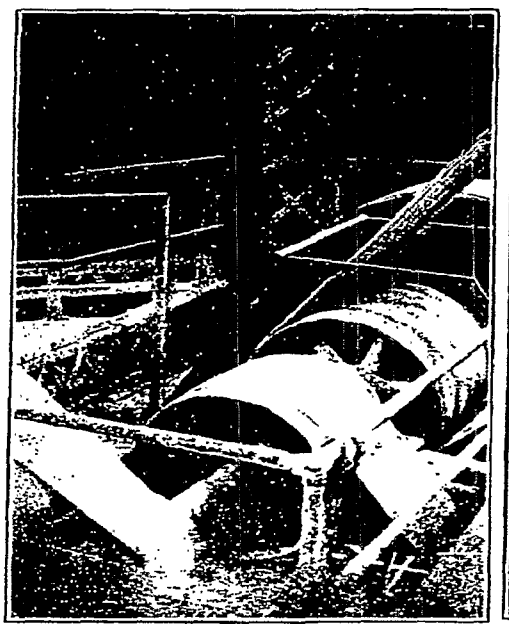
(*a*) Drives—Transmission belts at floors or runways should be guarded by railings on the accessible side or sides. When overhead, if the belt passes within eight feet of the floor, it should be protected with a plate or screen guard.



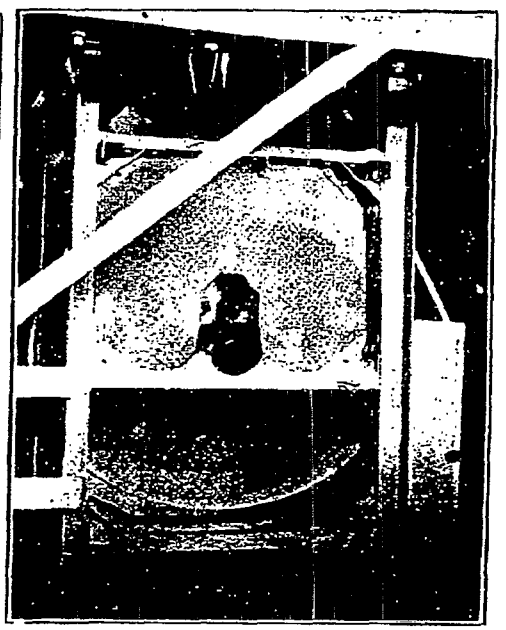
SKETCH SHOWING SCREEN GUARD FOR OVERHEAD BELT.



(*b*) Pulleys and flywheels should be enclosed by protecting screen or plate guard or railings. When in a dusty place, should be kept clean and in balance as it is possible for a cast iron pulley to fly to pieces from this source. Loose pulleys should be equipped with a standard type of belt-shifting device—many accidents have been caused by men attempting to shift a belt with their arms.



PULLEY WITH SCREEN GUARD AT EXPOSED SIDE.



PULLEYS AND BELTS GUARDED PLATES AND RAILINGS.

(*c*) Sprockets and chains should be guarded in a similar manner to belt drives, the danger of accident being greater.

(*d*) Gear should be enclosed with a removable guard or railing.

(*e*) Clutches should be guarded and if located in a dangerous place should have an extension for throwing the clutch arm.

(*f*) Belts should be carefully hooked or laced to avoid the possibility of catching in clothing. In nearly all cases a belt fails at the connection; the joint should be systematically inspected. When any weakness is apparent at this point the ends should be cut off and recemented or relaced. Removing or replacing belts while running is a dangerous but often unavoidable procedure and should be attempted only by experienced men. This rule can readily be enforced by the shift boss or foreman in charge.

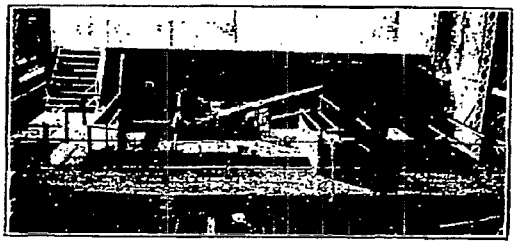
(*g*) Motor drives should be guarded and the motors thoroughly insulated at the terminals.

(*h*) Line shafting should be guarded by railings and all grease cups made easily accessible, if necessary, by piping out from the bearing. No projecting or rough places should be allowed in the shafting and safety set screws and collars should be used.

(*i*) Elevators, both chain and bucket, should be housed in, with sections removable for repairs or replacement. When repairing, the arrangement for holding in place should be carefully inspected by the head machinist before the men are allowed to start work.

(*j*) Mechanical Conveyors—Belt conveyors should have the head, tail and snub pulleys guarded by housing or railing. When the conveyor is above the floor level, steps and a platform should be installed at passage ways for crossing over. Belt hooks should be kept in good condition, with no sharp projections that would catch in clothing. Flight and chain conveyors should have the sprockets and chains protected in a like manner.

(*k*) Bearing Lubrication—Oil or grease cups near pulleys or moving parts, that are not easily reached, should be piped out of reach of danger. When overhead or inaccessible should have ladders or runways to prevent the oiler from crawling about the moving parts.



PIPE AND ANGLE IRON RAILINGS AT RUNWAYS AND STEPS.

6. FALLS OF PERSONS: (KILLED, 6.06 PER CENT; INJURED, 11.71 PER CENT)

All permanent runways and platforms, elevated over four feet, should be

equipped with standard angle iron or pipe railings and toeboards. When temporary, wooden railings, strongly constructed, will serve. Railings should be 3 feet 6 inches high, with intermediate member midway between top rail and toeboard. Toeboards, 4 inches high and flush with the floor. Pipe railings should be made of standard 1¼-inch pipe, with malleable floor fittings. Angle iron railings should be of 1½x1½x¼-inch angle top rail and uprights, and 1½x¼-inch bar intermediate rail.

Stairways should have all treads equal and all risers equal, and the tread never less than six inches nor more than ten inches. When possible the angle should be 45 degrees, but not more than 60 degrees nor less than 20 degrees. There should be not less than 30 inches between railings, except where construction makes this width impractical. Outside steps, or where they are likely to become slippery, should be equipped with approved safety treads.

Ladders should be securely fastened in place and care taken to have no missing rounds.

7. SUFFOCATION IN ORE BINS: (KILLED, 9.09 PER CENT; INJURED, 0.13 PER CENT)

Men should not be permitted to go alone in ore bins nor at any time without the knowledge of the boss. They should be equipped with safety belts and ropes.

8. FALLING OBJECTS (ROCKS, TIMBERS, ETC.): (KILLED, 3.03 PER CENT; INJURED, 11.40 PER CENT).

Warning signs should be placed where easily seen when men are working above or there is danger of falling material. Toeboards on all runways and platforms should be carefully maintained.

9. POISONING: (INJURED, 0.41 PER CENT)

Drinking water supply should be regularly analyzed.

Where work is done in poisonous dust or fumes a proper form of respirator should be used. A change-house should be provided, with means of keeping clean and working clothes separate, with shower baths and wash basins, also a lunch room, with means for washing before eating.

10. SCALDING (STEAM OR WATER): (KILLED, 6.06 PER CENT; INJURED, 1.10 PER CENT)

Local conditions would suggest the best safeguard. In places where there is danger of burns from flames shooting out a wire mesh screen should be placed in front of the opening.

11. ELECTRICITY: (KILLED, 6.06 PER CENT; INJURED, 1.66 PER CENT)

All wires should be enclosed in conduits. All fuse cut-outs and knife switches should be mounted in iron boxes. All high-tension pole lines or exposed electrical apparatus should be marked with a danger sign. All

feeders should be coded, to prevent cutting in on a high voltage when a low voltage is wanted. Where main power feeders are run open in wet or damp places, the insulation should be of approved rubber cover.

In an alternating-current ungrounded system there exists a so-called "phantom ground," from which sufficient voltage can be obtained to cause death. By installing a "grounding transformer" the voltage will be cut down to a minimum. On magnetic separators, the rheostats should be cut in before the switches are pulled, otherwise a sufficient arc is drawn on the switch to cause a serious burn.

12. HAND TOOLS, AXES, BARS, ETC.: (KILLED, 3.03 PER CENT; INJURED, 11.31 PER CENT)

Accidents under this heading are generally due to carelessness, ignorance or foolhardiness and the greatest prevention can be gained by the boss in charge instructing the men in the proper handling of the tools.

13. NAILS, SPLINTERS, ETC.: (INJURED, 5.37 PER CENT)

Torn-off boards should have the nails immediately removed or bent over. Nails or splinters sticking out in timbers or walls should be removed.

14. FLYING PIECES OF ROCK FROM SLEDGING OR CRUSHING: (INJURED, 3.42 PER CENT)

All types of crushing machinery from which pieces of rock may fly should be housed in with a removable housing. Heavy goggles should be worn to protect the eyes when sledging.

15. OTHER CAUSES: (KILLED, 12.12 PER CENT; INJURED, 29.18 PER CENT)

This class contains the highest percentage of injuries recorded. In going over accident records the majority of cases are sprains, bruises and cuts. Useful safeguards: Use of danger signs, lighting all dark places, avoid piling material carelessly.

DISCUSSION

MR. G. C. NELMS (Mine Safety Appliances Company): The question of moving cars under the tipple and moving them out: I used to do that job—you know how the ordinary brake is worked by the car droppers, with a pick handle or some other wooden instrument against which he throws all of his weight on the brake platform. Mr. Glover speaks of a safety belt proposition. Would it not be a good trick for a car dropper to throw his belt around his brake stand before he throws his weight against the brake rod? We have a good many accidents from that cause, because naturally a stick will break and the man is off balance and will be precipitated to the ground. I believe that an ordinary telephone repair man's belt, passed

around his brake stand, would be a pretty good proposition for a car dropper.

CHAIRMAN TILLSON: That is a good suggestion. Are there any more?

USE OF STICK BY RAILROAD BRAKEMEN

MR. JOS. W. REED (Consolidation Coal Company): I believe the subject should receive very careful consideration. We have had two fatal accidents from that source: one man was thrown off the brake platform but fortunately scrambled out of the way before the cars ran over him. These accidents all occurred within the last five years and came from different causes. Several resulted from the brake stick breaking, one was due to defective railroad equipment which allowed the wheel to turn suddenly; in another case an unloosened brake spun around rapidly and threw the man off the platform; we have no knowledge as to what happened in another case, we believe the man fell off the platform. The brake was set up tightly, but he was found underneath the car, which had shoved him along five feet, breaking his back.

These accidents occurred over a considerable period of time, but they show that accidents of that kind, while not as frequent as other mine accidents, still are worthy of careful consideration. I believe all the accidents would have been prevented if the men had worn safety belts.

MR. SEIP: I believe Mr. Nelms' suggestion is A-1; although the ordinary lineman's belt, it seems to me, would be a little bit cumbersome, I think the idea is right. Yesterday, at noon, I watched the fire department in their exhibition and in the use of their scaling ladders. When they put one ladder up and went up to put another to the next floor, they wore a belt with a strap and a hook on the end, which they rapidly fastened to their first scaling ladder. It was just as rapidly unfastened and I do not see why that would not be more satisfactory than an ordinary lineman's belt, on account of the quickness with which it can be changed. While I did not think of it yesterday it comes back to me now that for our purpose it would be suitable.

A DELEGATE: Mr. Reed spoke of a man falling from a car. I have no information on the subject, but I have noticed when men use a stick to tighten brakes that when they change to another hold to set the brake a little tighter they probably give it a little push before they take up the slack: if they did not receive the resistance they expected they are in danger of a fall from the front of the car. It seems to me if the stick had a hook and knob on the end it would help to avoid this class of accidents. On a rainy day, or on a day when it is sleeting, the rods are slippery and when the men apply pressure the stick is liable to slip out suddenly and they will go headlong in front of the car.

CHAIRMAN TILLSON: Our last paper for this session is by Mr. C. A. Mitke, a man of considerable experience, and one whose knowledge and ability is well thought of in the Southwest, where he is called upon for much consulting advice in the ventilation of various mines. Unfortunately he is not able to be with us. His paper will be read by your Chairman.

PRACTICE OF MINE VENTILATION

CHARLES A. MITKE, ASSISTANT CONSULTING MINING ENGINEER, PHELPS DODGE CORPORATION, BISBEE, ARIZ.

Mr. Chairman and Members of the National Safety Council: Adequate ventilation is essential to good mining and the more advanced men engaged in this industry are already realizing its importance and the necessity of having ventilating systems thoroughly worked out, just as they do the methods for stopping their ore bodies. Experience has already shown that the results to be gained from the installation of a well-thought-out and complete ventilating system will surpass even those obtained from the introduction of some of the newer methods of mining.

In order to maintain maximum production with a corresponding high standard in the quality of the work, such as careful sorting to keep up the grade of the ore, it is absolutely necessary that every working place should have a "good working atmosphere", and the ventilating system should be kept up with the progress of the work so that the men will continue to perform their duties in health and comfort.

It is a well-known fact that any mechanical device which accelerates the air over and above that of the ordinary natural currents results in a noticeable improvement. This is not due so much to a decrease in temperature as to an increase in the velocity and volume, which generally has the effect of lowering the humidity and thereby making it appear that the temperature has been lowered.

A GOOD WORKING ATMOSPHERE

The general impression is that the first duty of the ventilating engineer is to lower the temperature. This, however, is a mistaken idea, because there is very little change in temperature, even after a complete system of mine ventilation is in operation. There is, however, a notable decrease in the relative humidity and a marked increase in velocity and volume. It is this combination which creates a "good working atmosphere." It is quite possible, by mechanical means, to raise the total volume of air passing through a mine to about ten times that furnished by natural air currents. The same difference may be observed in drifts which are main air courses and in which the velocity may be increased from, say, approximately 100 feet per minute to 1,000, and in exceptional cases 1,500 feet per minute. The volume of air per man per minute has been increased in some mines from fifty cubic feet of air per minute to 300 and in a few cases to 500 cubic feet per minute.

Standard requirements for ventilation in mines are prescribed by law in certain states. However, as a general rule, the question of ventilation is left to the discretion of the operators. The Arizona mining law requires that "the total quantity of carbon dioxide present in the air shall not exceed 0.25 per cent by volume, except that at any place where firing by explosives has been done a higher percentage of carbon dioxide shall be permissible for a reasonable length of time after the last explosion." This is a quality standard and it is necessary to have accurate samples taken

of the mine air in different places and determinations made in order to accurately detect the amount of carbon dioxide present. The anthracite mine law of Pennsylvania specifies a minimum of 200 cubic feet of air per minute, and the law further states that the amount of air in circulation shall be sufficient to "dilute, render harmless and sweep away smoke and noxious or dangerous gases." This is a quantity standard and is the product of the velocity and area. It is the standard most generally taken and if the minimum is set high enough, the quality standard will take care of itself, as the amount of carbon dioxide present will, of necessity, be well within the limit. In considering these two requirements for mine ventilation it will be seen that no specifications have as yet been arrived at which will constitute a good working atmosphere.

The same successful results which have attended the application of standardization to other lines of business may be obtained by its introduction into mine ventilation in standardizing the equipment to be used and the average mine conditions, which, in the Southwest, have been termed a "good working atmosphere." Such conditions would be suitable not only for a particular mine or district, but might be adopted by a number of districts. During the past five years, after numerous experiments, the average readings in workings in some of the mines in the Southwest were used as a basis to determine what conditions should constitute such an atmosphere. The following averages were finally decided upon:

Temperature	78 degrees
Humidity	80 per cent
Velocity	125 feet per minute
Volume	350 cubic feet per minute

INSTALLATION OF MECHANICAL VENTILATION

An atmosphere of this character was found to be one in which men could be expected to perform a fair day's work and in which the smoke and gases resulting from the mine workings were diluted and finally carried off. It was also proved to be good economy to intensify the ventilation until these conditions were established. This atmosphere has been found to be particularly applicable to mines in the Southwest.

Prior to the installation of mechanical ventilation, in order to determine the volume of air necessary, some of the important items to be considered are: The number of men and animals in each district; the production of CO_2 or other gases, as shown by chemical analyses; relative humidity, temperature, amount of explosives used, distance from currents of good air, number of lights, number of splits of the air current, and method of distribution.

The next consideration is the method of mining employed, number of shafts, etc., which determines the system to be used, such as pressure or exhaust.

Having decided on the method to be employed, the volume of air, and the size and number of blowers necessary, the mining end should next receive consideration. This is very important as the success of the ventilating system is largely dependent upon the manner in which the air is coursed

through the workings. Unless due consideration is given to this particular the effect of the blowers will be greatly reduced. An impression exists among some people that in order to improve the ventilation it is merely necessary to increase the number of fans, whereas good ventilation can often be obtained with a very limited number of fans, provided they are properly located and the air effectively coursed through the workings. Multiplicity of fans merely increases the expense of the system without raising its effectiveness.

There are a number of standard large size mine fans which have given excellent satisfaction. The capacities generally used in metal mines range from 10,000 to 125,000 cubic feet of air per minute (according to the extent of the mine workings) and having either a pressure or suction of from one inch to five inches. In coal mines it is possible to use much larger sized fans than in metal mines, owing to the large areas in intakes, mine workings and outlets, which offer but a slight resistance to the main air currents and therefor require only a low suction or pressure; while in metal mines the areas are much smaller and the size, shape and direction of the air courses very irregular.

It is desirable, wherever possible, to have the fan installation on the surface, but in many cases this is out of the question, as those companies which have only a limited number of shafts must necessarily use them as working shafts and it is impracticable to have a surface equipment over a working shaft. However, wherever installations have been put underground they have given excellent satisfaction and short circuiting of the air has been practically eliminated by the use of air tight stoppings, double doors, etc.

BLASTING BETWEEN SHIFTS

One problem, not found in coal mines, which confronts the metal miner is the necessity for frequent blasting between shifts. This is especially true in some of the caving systems, where it is often necessary to blast boulders about every ten minutes in the same stope. This continual blasting creates a large amount of powder smoke and frequently results in men being gassed, especially when the blasting is done in headings and necessitates the use of a larger amount of fresh air to dilute and render harmless these various gases. While the greater portion of this smoke is unavoidable some of it might be eliminated by paying careful attention to the quantity of explosives and the strength of detonator used. This problem is now being attacked by the operators who are having more thorough investigations made and are installing equipment to increase the volume of air generally throughout the mine workings.

In some cases reversible fans are installed, the idea being to reverse the air in case of fire in a downcast shaft. In no case, during the many fires which have occurred in the Southwest in the past few years, was it found necessary to reverse the fan. In fact, the danger would have been increased in nearly every instance because the men expected the air to keep moving in a certain direction and if this should be changed without their knowledge there would be danger of their being caught in gas.

A general ventilating system usually takes care of the major portion

of the mine workings, but the drifts, raises and winzes, constituting development work must be taken care of by an auxiliary ventilating system.

PRESSURE BLOWERS

In prospect and development work the headings are usually ventilated by the exhaust air from drilling machines when in operation and the turning on of the full head of compressed air after blasting in order to clear out the heading. When the work progresses beyond a point where the compressed air becomes insufficient, artificial means are employed to supplement the ventilation. Air jets are used, then, as the work continues, small blowers attached to small motors and ten inch ventilating pipes are installed. If it is desired to clear out the heading within a limited time a reversible attachment can be connected to the blower which changes its action from that of a pressure to a suction fan. As soon as the smoke is cleared from the heading the fan again becomes a pressure blower. There are few cases, where speed becomes an important item, in which two blowers can be used to good advantage, one as a pressure to force good air into the workings and the other as cushion to draw the smoke, gas and vitiated atmosphere from the heading. These, however, are only necessary in exceptional cases in tunnel work.

In installing a ventilating system, the purchase and installation of the mine fans is the smallest part of the expense. The larger portion of the cost is absorbed by the mining end-driving drifts and raises to allow sufficient air to pass through to thoroughly ventilate the stopes; erecting doors in suitable drifts and crosscuts and putting in air-tight stoppings to cut off old workings and leaks which might impair the efficiency of the system, and in cutting blower stations for mine fans in case they are to be located underground.

Ventilating equipment should be standardized as much as possible. Not much can be done regarding the large fans, as they are designed for each particular case in question, according to the capacity (pressure or suction) required, and the elevation where they are to operate. Small blowers, however, can be standardized, also the design of electric motor and size of ventilating pipe which should accompany them. One of the great advantages in using a standard size of pipe is that it eliminates the confusion and delay occasioned by men endeavoring to attach the wrong size pipe to blowers, etc. A five H. P. motor with ten inch blower and ten inch pipe has given good satisfaction in a number of mines.

METAL OR CANVAS PIPE

There is a diversity of opinion as to the relative merits of metal and canvas ventilating pipe. Metal pipe has been found very satisfactory in the Southwest: it stands up well under average conditions, requires very little attention and owing to its joints being carefully sealed with burlap and tar there is little or no leakage. The canvas tubing is more easily handled, can be readily hung and does not require as many elbows as the metal tubing. However, there is a possibility of water lodging in it and the material, being collapsible, requires more power to keep the sides of

the tube open and force the same volume of air through than it does with the metal pipe. When the cost of the extra power necessary to deliver the same volume of air at the working face through the canvas tubing as can be delivered through the metal pipe, is taken into consideration, there is a question as to whether it has any advantages over the metal pipe.

Standard design and sizes of bulkheads or stoppings, and hand and motor tram doors should be used throughout the mine workings. Motor doors should be automatically controlled so that the motors may pass through without stopping.

Aside from its primary use in improving underground conditions mechanical ventilation has proved quite an asset as part of the equipment in fighting mine fires. This has been demonstrated on several occasions during the past two years when the ventilating system was used to stabilize the air currents in order that men might work in safety and not be subject to the perils of changeable natural ventilation. There are a few examples of mines where mechanical ventilating systems have been installed expressly for this purpose.

In order that the men may work in health and comfort and their efficiency unimpaired, it is absolutely necessary that mechanical ventilating systems keep pace with the daily progress in stoping and other mine workings. Only in this way will it continue to fulfill the purpose for which it was primarily installed.

DISCUSSION

Mr. A. S. Richardson (Anaconda Copper Mining Company): We have conditions somewhat similar to those Mr. Mitke refers to in his paper. I think you have to consider ventilation problems strictly from the point of view of what you are accomplishing. We have a local temperature of 104 degrees, it is even greater in some cases, and we have a big ventilation system under way to try and improve conditions. At the present time we are circulating one and a half million cubic feet per minute and are going to increase it to three million. In regard to small blowers, we have about 130 in use now and have just bought 300 more; we are trying to tackle the problem in a big way.

I cannot agree with Mr. Mitke when he says you cannot reduce the temperature; I think you can—under different conditions you can reduce it twenty degrees. We have places where the temperature normally would be pretty close to 100 down below 80. In regard to the reversibility of mine surface fans, that is a matter of record in one of the great mine disasters in which 163 lives were lost and some men were cut off. A party of twelve were caught in the mine—there were reversible fans at the mine and they were reversed. The fire occurred in the downcast and by reversing the fans they helped clear the mine of gas and helped drive it back into the shaft in which the fire was raging. If they had not been able to reverse the fans those men would not have been able to escape. Many of our mine fans are reversible, some are not. When we get through with our ventilation program we will not have a surface fan that is not reversible. The Section then adjourned.

THURSDAY MORNING SESSION

CHAIRMAN TILLSON: Mr. Chance is unable to be present, so Mr. Shearman will be kind enough to read Mr. Chances' paper.

ACETYLENE AND ELECTRIC CAP LAMPS FROM A SAFETY STANDPOINT

H. M. CHANCE, PHILADELPHIA, PA.

Mr. Chairman and Members of the National Safety Council: The subject to be discussed under the above title is restricted to the relative elements of safety or danger in the underground use of acetylene open lights and electric cap lamps.

The acetylene safety lamp has been used underground in relatively small numbers and no argument used in this discussion is intended to refer to acetylene safety lamps. This discussion is further limited to the use of acetylene open lights and electric cap lamps in mines that ordinarily are termed "non-gaseous," i. e., mines that produce no inflammable gas, mines that produce inflammable gas in such small quantities as to be practically negligible as an element of danger, and mines that, while producing larger quantities of inflammable gas, can in certain portions be made relatively safe for the use of open lights.

It is, of course, evident that in mines where open lights are used, the danger of ignition of inflammable or explosive mixtures of combustible gas and air from the flame of such lamp is practically the same, whether the lamp be an oil torch or an acetylene lamp. There may be minor differences in the danger of ignition by the flame of an open light, but these differences are small and unimportant.

"MIXED LIGHTING"

It is not proposed to discuss any question of policy as to what is termed "mixed lighting" underground, i. e., the use of safety lamps in some portion or portions, of a mine and the use of open lights in other portions of the same mine. Much has been said, and written as to the expediency from a safety standpoint, and also from a managerial standpoint, of this use of safety lamps and open lights in the same mine. Where a mine is being worked with open lights used in all working places and the use of a safety lamp is restricted to inspection of working places by the fire boss, mine boss or other officials, such limited use of the safety lamp for purely testing purposes is not considered to constitute a "mixed" system of lighting—this term being used only where safety lamps are used in parts of the mine by the miner for the mining of coal or the driving of entries, etc., while in the same mine other miners are using open lights, or open lights are used by mule drivers, motormen, etc., on the main haulage roads.

It may, perhaps, be sufficient in this connection for the information of those not familiar with the literature on the subject to say that mining engineers, mine executives and miners engaged in coal mining are

divided upon this matter and do not seem to be able to reach any conclusion to which unanimous consent can be secured. On the one side we have those who hold that if it be necessary to work any portion of a mine with safety lamps, then the whole mine should be worked with safety lamps and no open lights whatever should be permitted to be used in any part of such mine, and on the other we have those who claim that the use of safety lamps, where necessary in parts of the mine in conjunction with open lights elsewhere, conduces to greater safety than if the opposite policy be pursued. We have also a third class, claiming that under certain conditions the use of safety lamps in the mining of coal should be enforced, while open lights may be safely used upon the main haulage roads over which the coal is transported to the outlet of the mine, and over which the empty cars are returned to the points from which they are distributed to the working places. This subject is one of very great interest and doubtless will continue to be discussed for many years unless discussion be cut short by the enactment of laws requiring the adoption of the use of the safety lamps exclusively in all mines classed as "gaseous" mines.

Returning to the subject which it is the object of this paper to discuss, it may be well, in advance of a review of the physical differences in the two types of lights under discussion, to outline the elements of danger or of safety in which lighting may be an important factor. Having excluded from the discussion any question of the ignition of inflammable gases or mixtures of inflammable gases and air, by limiting ourselves to a consideration of the use of these types of lamps in "non-gaseous" mines, we have remaining one element of danger which in many cases is of great importance and which must always be increased by the use of any open flame light, whether the light be produced by acetylene, by candles or by any type of oil torch. This is the danger of mine fires.

MINE FIRES

In mines of all classes in which combustible material exists there is the ever-present danger of mine fires. In many cases this is greater in coal, sulphur and other mines in which the material mined is of a combustible nature than in metalliferous mines or mines working a mineral which is not combustible. Aside from spontaneous combustion, which is foreign to the subject under discussion, the danger of the direct ignition of coal from an open light is comparatively small. Fires in coal mines caused by open lights usually are due to the accidental setting on fire of mine timber, cotton waste, wooden boxes or other material, and not to the direct ignition of the coal from the flame of the light. The origin of such fires in coal mines, therefore is often similar to that of fires in metalliferous mines, in which the fire is confined to the timber ring or other combustible material which has been brought into the mine.

It may at this time be well to refer to the common presence in mines of many different types of combustible material which are brought into the mine for various purposes. Where mules are kept underground we have, of course, hay and grain and the straw used for bedding, which frequently have been the cause of serious mine fires. In many mines

we also have oil houses and lamp houses underground, in which oil for the lamps and lubricating oil for machinery is stored, and engine houses where machinery (such as pumps, compressors, fans, etc.) is used underground. In addition to the oil there is usually cotton waste, which is, of course, universally recognized as an element of danger. While the present practice in many districts is to discontinue the use of wood, so far as possible in the construction of permanent enclosures underground, such as engine-rooms, oil houses, stables, etc., the presence of lumber in such construction is an element of increased danger when open lights of any type are used. In addition to these materials we have the timber used for roof support along the gangways, entries, drifts levels, chutes and haulage and travelling ways, and in the working places. In mines where a timber mattress or cushion is used between the ore being mined and the overburden, we have large quantities of inflammable material which may frequently be in danger of ignition from the use of any type of open light. Again, in the working places the miner frequently brings in materials that are inflammable, such as powder boxes and other waste material, and boards or planking for use as shovelling platforms, brattices, stoppings, etc.

"CAUSES OFTEN DIFFICULT TO ANALYZE"

Mine fires in metalliferous mines are of course often due to other causes than the use of open lights. The decay of timber, heat produced by the great friction of moving masses during settlement or squeezing, and other causes of spontaneous combustion, have doubtless been responsible for many fires in mines of all classes. In addition to these we have of course the ever-present risk of fire from the accidental ignition of explosives and from the firing of shots in the brooding of the ore or other material mined.

All of the above considerations apply with nearly equal force to the use of any type of open lights. Where candles, oil torches or acetylene lamps are used there will be some danger of mine fires being started by the flame of such lights. It is useless to argue that the majority of fires so caused are due to carelessness in the use of such lights. The danger in all cases, while similar, is not however exactly equal. In the use of candles we have in addition to the flame the danger caused by the dripping of paraffine, stearine or tallow, and in the case of oil torches a similar increase in danger from the dripping of oil from a leaky lamp or from a lamp or from the wick spout. In the case of the open oil torch we also have the additional danger due to the carriage of oil and the presence of oil in quantity kept underground for the use of the miner, and also that carried by him for supplying his lamp. In the absence of complete statistics showing the cause of mine fires it is impossible to determine the relative difference in the character of the lights that may tend to increase or diminish this danger.

It will readily be understood that the danger of mine fires from the use of open lights will depend largely on whether the mine is relatively wet or relatively dry or damp. In regions where the air is extremely dry and the mines contain but little water, the timbering is

much drier and the risk of mine fires correspondingly greater and the difficulty of extinguishing fires is increased, of course, by the dryness of the timber. This statement applies with equal and perhaps greater force to coal mines, because in coal mines that are relatively wet or in regions where the air is relatively highly charged with moisture, the coal is not so easily ignited by burning props or mine timber of any kind as when the mine is dry or is located in a more or less arid region.

It is evident therefore, that as the danger of mine fires is increased by the use of open lights underground, the electric cap has a decided advantage over any open flame light.

"ACCIDENTS TO MINERS AND OTHER EMPLOYES"

In addition to the elements of danger peculiar to mine employes the miner is subject to many of the accidental risks commonly met by men on the surface. It would be beyond the province of this discussion to enumerate the hundreds of kinds of accidents which occur underground. In going to and from his work and in working in the room, chamber or stope in which his principal work is done, the miner is often the victim of an accident that may be designated as belonging to the "self-inflicted" class. In this class may be grouped all those accidents resulting from the use of tools employed in mining. The miner may accidentally strike himself or be hit by some flying fragment of coal or ore, be injured with a pick, may become entangled by machinery, or receive injuries from electric shock—there are many ways in which he may acidentally cause injury to himself or a fellow employe. He may injure himself by tripping over an obstacle, by falling down some hole, winze, shaft or other excavation, may be run over by a mine car, kicked by a mule, fall from a scaffolding or ladder, to illustrate that general class of accidents which are due to the voluntary or involuntary act of the employe which are avoidable. In many cases they are due to carelessness on the part of the miner or a fellow employe and do not belong to that class of accidents which are due to the risks peculiar to underground work. We may include in this class many accidents due to shots that have missed fire, to the presence of explosives in ore or coal which is being loaded by the miner, and many others which will be found in the reports of the mine inspectors in the several states in which mining is conducted on a large scale.

"MOST ACCIDENTS NOT PECULIAR TO UNDERGROUND WORK"

The writer has not had the time to compile lists of accidents which belong to the class which has been described above as due to the voluntary or involuntary act of the miner or fellow employe and which are not due to dangers which are peculiar to underground work, but he is of the opinion that such compilation, if made, would show that most accidents underground belong to this class and that much smaller proportion will be found chargeable to conditions which are peculiar to underground work.

The writer also believes this class of accidents is more important

than that of all other classes combined and should be given prominence in any discussion, from a safety standpoint, of the use of the acetylene light as compared with that of the electric cap lamp.

It will probably be admitted without discussion that the risk of accidents resulting in injury or death to the miner, will decrease as the efficiency and volume of light is increased. There can be no question as to whether accidents of this class occur more frequently underground than on the surface. The principal (but not the only) reason why accidents in this classification are more frequent underground than at the surface is undoubtedly due to the difference in the amount of light and in the illumination of the tools, etc., being used. It is also true that accidents of this class, underground, are increased over those that occur in similar work at the surface, because of less efficient supervision by foremen and supervision by foremen and superintendents as to the condition under which the individual employe is working. Neither the mine foremen, mine boss, or superintendent can continuously be present to supervise the work of the individual employe, to notify him to avoid risks of injury, or to reprimand him for obvious carelessness. Therefore it is evident that the increase in accidents of this class underground is not entirely chargeable to deficiency in illumination, but is partly due to the impossibility of exercising as efficient supervision underground as at the surface.

As increased efficiency in illumination—that is, increase in the ligh furnished the individual employe—will materially reduce the risk of accidents of this particular class, it is evident that the acetylene light is superior to the electric cap lamp of the type and candle power ordinarily used; also that the acetylene light is better than oil torches or candles, because of the greater illumination which it affords.

"VALUE OF ACETYLENE CAP LAMP"

The miner using an acetylene light is less likely to stumble, fall, or come into contact with electric wires, be run down by mine cars, injure himself or a fellow employe with hand tools, implements or machines used in mining; is less likely to miss his footing in climbing ladders or traveling winzes or stopes not provided with ladders, than if he were doing these things with the light afforded by the ordinary electric cap lamp.

"ACCIDENTS PECULIAR TO MINES"

Under this heading it is not intended to include accidents due to the explosion of combustible gases, the burying of miners by accidental caving or squeezing whereby the traveling-ways leading to the surface are closed, accidents due to the flooding of mines, or to any cause not effected by the method of illumination.

The principal cause of those accidents underground which are due to the falling or caving of the roof in working places or on the traveling or haulage ways along which the miner travels and through which the material mined is transported. These accidents, generally, are not due

to any direct act of the miner or his fellow employe but arise from some weakness in the material forming the roof or to a failure to recognize such weaknesses and the taking measures to avoid the danger. This danger is present to a greater or lesser extent in all mines, but under some systems of mining it is reduced to a negligible factor by the method by which the material is mined; for instance, in the system where a mattress or cushion is used between the material being mined and the overburden, there is, of course, no direct danger from falling roof, the danger in such cases is from a general caving in or squeezing.

In addition to the hazard caused by a weak roof, or an insufficiently timbered roof, there is the danger of falls from material being mined. Where deposits inclined at a high angle or pitch are being mined the danger is principally from this cause and not from the roof or hanging wall of the deposit. When the deposit is relatively flat and of considerable thickness there is danger of fragments falling from the walls or face of the material.

While this phase of the risks peculiar to work underground is of importance in connection with any consideration of the system of illumination used, it can be dismissed with very few words, because it is evident that the risk of injury will be reduced by an increase in the illumination of the working places, or of places where such roof falls or falls of material are likely to occur. The subject, however, is one which could be discussed at great length in its various bearings.

ADVANTAGE OF HIGH ILLUMINATION

The advantage of high illumination in working where the roof or the material mined constitutes an element of danger from falls has been recognized in many districts by the installation underground of electric arc systems of lighting, by which it becomes possible to more thoroughly inspect the roof from time to time and to more quickly detect dangerous conditions which may develop. Further, the use of such intensive lighting is of great advantage in prosecuting the work of removing the danger, either by the removal of loose material or the placing of supports to greatest advantage in places showing, or likely to develop, weakness.

The same principle applies to taking care of the roof in the rooms or chambers of coal mines, and in small stopes of mines working ore deposits, and is evident that the high candle power furnished by the acetylene lamp will contribute to the safety of the miner and his fellow employes, not only by enabling him to more readily and surely detect any dangerous condition at or near the place where he is working, but will assist him in setting his props or other supports in the best position to reduce this danger to a minimum. Failure to set such props or supports in the best position, or in a position where the prop gives such support as will remove the danger, is a frequent cause of accident, due to the fact that the miner having set the prop, or props, and believing that he has placed them properly, will then perhaps unnecessarily expose himself to greater risk than if he had taken no measures to prevent the roof from falling.

Unfortunately, there are no records available showing whatever differ-

ence there may be in the number of accidents from roof falls in mines worked with safety lamps (which, of course, give very small and inefficient illumination) and mines working under similar conditions as to roof in which open lights are used. The writer has suggested to the Bureau of Mines that statistics of this kind should be obtained, because this has an important bearing upon the expediency of using safety lamps, and he understands that measures will be taken to secure such data. It must, however, be some years before sufficient information can be compiled to be useful in drawing conclusions as to the increase, if any, in roof-fall accidents which may be traced to the use of safety lamp illumination.

In the absence of this data it is, of course, impossible to say how much higher illumination of the acetylene light over that of the ordinary electric cap lamp will increase the safety of the miner in relation to accident from roof falls and falls of ore, coal or other material.

WHAT THE LAMP FLAME SHOWS

The acetylene lamp is objected to by some because it does not give as early warning of a deficiency in oxygen in the mine atmosphere as that given by an oil flame lamp, but by others this peculiarity of the acetylene flame is regarded as furnishing an added element of safety. The difference in the action of oil and acetylene flames in an atmosphere deficient in oxygen may be compared to the customary use by our railroads of green and red as danger signals. The green signal means, "Danger ahead, proceed with caution." The red signal means, "Danger, *STOP!*" One is a caution, the other an imperative order to stop. So it is with the lights. When the oil lamp begins to fail the air is still respirable; the flame may go out and the air may still be respirable—the warning to the miner being cautionary but not positive. Hence, he may walk directly into a deadly atmosphere. When, however, the acetylene flame begins to fail, or is extinguished, the miner knows that the danger is *actual* and is *present* and that he must at once retreat or be overcome.

In mines where atmospheres deficient in oxygen are likely to occur both oil and acetylene flame lamps are safer than the electric cap lamp, for the latter gives no warning whatever of any deficiency of oxygen or of the presence of any poisonous constituent in the mine atmosphere.

RELATIVE MERITS OF ACETYLENE AND ELECTRIC CAP LAMPS

	Acetylene Lamp.	*Electric Cap Lamps.*
Weight	Light	Heavy
Length of Shift	Can be prolonged	Fixed
Quantity of Light	Can be increased above normal	Fixed
	Can be reduced below normal	Fixed

Warning as to irrespirable atmospheres	Gives warning	Gives none
Repairs	Burner can be renewed or cleaned if clogged	*New bulb can be inserted
Mine fires	May be cause of mine fires.	Not likely to cause mine fires
	Danger may be reduced by wire mesh guard or mica chimney to protect flame.	
Extinguished by shot firing	Yes (Can be equipped with auermetal or other re-igniter)	No
Debatable uses	In mines where timber is very dry. In mines where coal is very dry and there is much coal dust.	Can be safely used under these conditions.

DIFFERENCE IN ILLUMINATION

I have not attempted to show the difference in the illumination afforded by these two types of lamps, but may say for the information of those who are not familiar with the subject that the figures of candle power as given in many publications must be analyzed before making a comparison. If the light, as in the electric and acetylene cap lamps, be concentrated by a reflector to illuminate a certain spherical sector, the light in this section is, of course, of much greater candle power than if the light be permitted to radiate in all directions. Owing to differences in the reflecting mirrors used for this purpose, both as to design, polish, size and condition, and owing to the difference in the shape of the flame of an acetylene lamp and the incandescent filament of an electric cap lamp, many of the candle power tests reported by different observers cannot be compared directly. It seems to me that the only fair basis for comparison would be to determine the *total light* by candle power determinations made under precisely similar conditions, and the *available concentrated illumination* by determinations using the most effective reflectors for each of the two types. I do not know whether this has been done or not. From observations that have come to my knowledge from various sources with-

*Note: In the electric cap lamp, as constructed for use in gaseous mines, no provision is made for replacing a broken bulb (or defective bulb)—but the lamp can be so constructed, if desired, for use in non-gaseous mines.

in the last three or four years I believe that the available illumination given by an acetylene cap lamp, burning normally at average rate, is from three to six times that produced by an electric cap lamp operating under average and normal conditions. The difference in the concentrated illumination may be somewhat less than this, but when the acetylene lamp is operated at its full rate (and many miners so operate them continuously) the difference is often twice that indicated by these figures.

DISCUSSION

MR. BOERICKE: In different types of rock formation—that is to say, in different kinds of mines—does the smell of carbide acetylene affect the health of the men? That may sound rather fantastic, but when I was in California some years ago I visited the Empire mine, which, as we all know, is one of the most efficiently conducted mines in the country. I had a carbide lamp with me and a supply of carbide. I noticed they were not using this type of lamp at the mine and I asked Mr. Street, the general manager, why. He said the fumes made the miners sick; he thought it was nonsense until he investigated and was actually nauseated. I have since heard like complaint from several others. I have never seen the slightest case of nausea or other illness resulting from the use of carbide. Have any of the delegates experience on this point?

MR. REESE: It does not occur in coal mines; I never heard of any bad effects.

MR. SINE: I have been in a large number of coal mines in several states and I believe 99 per cent of the illumination in open-light coal mines is furnished by carbide lamps. Occasionally some old miner thinks these lamps are an encroachment on his rights and he objects to their use. When we first started to use them they seemed to cause a smell and I thought they were a bad thing, but I got used to them. We have had very good success with carbide lamps and some mines came to my attention, not very far from St. Louis, where the ventilation is poor and the miners consider the introduction of the carbide light as materially increasing the efficiency of the ventilation.

A DELEGATE: How has the introduction of carbide lamps materially increased the ventilation?

MR. SINE: They have not increased ventilation, but they have increased the efficiency of the air; they do not take up so much oxygen—do not put so much carbon dioxide into it and make it unfit to breathe.

A DELEGATE: Is it true that an oil lamp will not burn in an atmosphere with less than 17 per cent oxygen and that a carbide lamp will burn until the oxygen runs down to 12 per cent?

MR. SINE: That is so, but the fact of the lamp burning does not make the condition better for the miner.

SPECIAL USES FOR CARBIDE LAMPS

A DELEGATE: I think the nausea was caused by the smell, not from the vitiated air; where the air is dead the smell might be more offensive than where a lamp was taking out more oxygen.

MR. RICHARDSON: We use carbide lamps in Butte, I believe exclusively, and I have never heard any objection to them. Of course, in cases of "dead-ends," where the ventilation is not kept up, men might become sick from the fumes, but that could not be ascribed, necessarily, to the use of carbide lights. In regard to the consumption of oxygen, I think if you will follow the re-action of the carbide lamp you will find that it consumes as much oxygen, possibly, as a candle and that it does take oxygen from the air. The lamp will burn in an atmosphere that is low in oxygen—12 per cent—when a candle, I think, will go out at 17. One general thought among the miners is that the oxygen for combustion is supplied by the decomposition of water.

MR. BOERICKE: There is no question but that a carbide lamp will burn in an atmosphere that will put out a candle at once; I tried it not once but half a dozen times. In the summer time, in the shallow shafts in Wisconsin, we have a great deal of bad air and invariably, before going down a shaft even as shallow as fifty feet, one must try out the air. I have lowered a candle and had it go out while a carbide lamp would go right to the bottom without appreciable diminishment in the intensity of flame. Whether a carbide lamp will burn in atmosphere that will not support human life is another matter and I should be much interested in hearing from delegates on that point. Is it safe for a miner to go into a heading with a carbide lamp and rely on it to give him some indication whether he will be able to exist there? I have no information on that point.

MR. RICHARDSON: While I have had no personal experience we have had Dr. Lanza with us in Butte the past two years. I have heard Mr. Herrington state that a man could live in an atmosphere which would put out a carbide light, but only for a short time—he could not stay there and work.

MR. SEIF: The Bureau of Mines recently issued a chart on mine gases, giving in condensed form the properties of gases, their effect on flames or lamps. Other effects are noted on small animals and also on men. It is the most valuable chart I have seen in a long time. Copies may be had from Mr. Van H. Manning, Director of Bureau of Mines, Washington.

FAILURE OF LIGHTS

MR. R. D. HALL: Gentlemen, I am sorry that we don't read at this meeting the papers in full as presented, but, instead, discuss them on the incorrect assumption that the papers being duly printed have been given the careful consideration of the members. The author says:

"The acetylene lamp is objected to by some because it does not give as early warning of a deficiency in oxygen in the mine atmosphere as that given by an oil-flame lamp, but by others this peculiarity of the acetylene flame is regarded as furnishing an added element of safety. The difference in the action of oil and acetylene flames in an atmosphere deficient in oxygen may be compared to the customary use by our railroads of green and red as danger signals. The green signal means, 'Danger

ahead. proceed with caution.' The red signal means, 'Danger, STOP!' One is a caution, the other an imperative order to stop. So it is with the lights. When the oil lamp begins to fail the air is still respirable: the flame may go out and the air may still be respirable—the warning to the miner being cautionary but not positive. Hence, he may walk directly into a deadly atmosphere. When, however, the acetylene flame begins to fail, or is extinguished, the miner knows that the danger is actual and is present and that he must at once retreat or be overcome. In mines where atmospheres deficient in oxygen are likely to occur both oil and acetylene flame lamps are safer than the electric cap lamp."

It is pretty generally understood that the acetylene lamp does show a difference when the air is deficient; that it does not burn with the same—just exactly the same—color as it does at other times and that an experienced eye can detect a difference, and in that way can tell to a certain extent the percentage of oxygen present. It is not, of course, safe to proceed where the acetylene lamp shows real and distinct signs that the air is of low oxygen content, but at the same time one can live—at least, for a short time—even after the acetylene lamp has been extinguished. It is unsafe, of course, to rely on the greater resistance of life than the lamp to extinction. The point is that the acetylene lamp gives a warning and, in air which is still respirable but is low in oxygen, still burns and so gives the man who is in need of its light a chance to get out.

CHAIRMAN TILLSON: In one of the Lake Superior mines in Michigan, in which they are using the caving system, and considerable timber had rotted above the workings, the ventilation was so deficient and the percentage of oxygen so low that a man could not carry a lighted candle along the level. The candle would burn when stuck into a timber, when the miner was standing still; it would not stand the slightest draft, but the acetylene mine lamp would continue to burn.

Those conditions were due, in large measure, as I subsequently found, to an overtaxed compressor in their power-house on the surface and because of humidity due to the rotting timber and caving workings, also to lack of a suitable ventilating system. The custom was to blow the compressed air through little nozzles in the air line at different parts in the heading, thereby overtaxing the capacity of their header. It was so overspeeded and overloaded that they burned up large quantities of lubricating oil in the compressor and vitiated the compressed air—they were really throwing poisonous gases into the mine and thought they were ventilating it.

I think Mr. Chance has well summarized his points in regard to acetylene and electric cap lamps. Does anyone take exceptions to his terms? Mr. Chance calls attention to some figures in his last paragraph, but does not give the actual data and diagrams to show the relative illumination produced by acetylene lamps with customary reflectors and electric cap lamps with their reflectors—the intensified illumination or the value of the illumination properties of these lamps. Last year we had a very interesting paper by Mr. Mason, in which he alluded to the merits of the electric cap lamp and indicated to us that possibly it was of such

value that it might well replace the acetylene lamps. If Mr. Mason comes in later I know you will be glad to hear his views on this subject

USE OF ELECTRIC LAMP

MR. RICHARDSON: I first saw electric lamps used to any great extent during a recent trip through the coal mines. It struck me that the illumination was not great—had not the power—but they seemed to be quite adequate for underground work. I do not know that we could use them to advantage in metal mines—some of the Bureau of Mines men say their power of illumination seems to be very low. In metal mines the surface is different from that in a coal mine and the white rock might require a different illumination.

CHAIRMAN TILLSON:: You would expect a less powerful light would be necessary where you had white rock to reflect the light than where you had a black surface.

MR. RICHARDSON: That would seem logical. If there is a bad back or a small crack you need a strong beam of light to bring it out.

CHAIRMAN TILLSON: The coal miners have to watch backs as carefully as do other miners.

MR. RICHARDSON: The power of illumination was low, yet it seemed to be adequate in coal mines.

CHAIRMAN TILLSON: The paper presented last year indicated that the Bureau of Mines was in favor of the electric cap lamp.

MR. THACHER: The electric light was tried in the asphalt mines in Utah and Colorado. It was found that the heat from the lamp coated the bulb very readily. This was overcome later by putting a double glass over the bulb.

CHAIRMAN TILLSON: Mr. Mason. we are discussing Mr. Chance's paper on the relative merits of the electric and acetylene lamps. Have you had an opportunity to read the paper? We would like to hear from you on this subject.

MR. HALL: I think we would like to hear about the Gasconade mine and the proposition of dust being precipitated on the glass and melting and obscuring the light.

MR. MASON: What type of lamp was used?

MR. THACHER: It must have been fifteen years ago. They introduced electric lights but the dust soon varnished the bulbs; this was overcome by installing an extra glass, thereby reducing the temperature.

MR. MASON: That would not be true of the present lamp; the bulb is protected by an outside lens which is not heated in any way.

The point I wanted to bring up was contained in Mr. Chance's paper on the hazards of the various types of electric lamps. The paper was presented by Mr. La Motte and reprinted in *Coal Age*. It deals with the dangers of smoking and the use of open lights.

COST OF OPERATION AND MAINTENANCE

MR. SEIP: Mr. Mason, can you tell us anything relative to the cost of operation and maintenance of operating the two lights, carbide and the electric cap lamps?

MR. MASON: I cannot give you exact figures on the up-keep of carbide lamps, but I can give you cost and upkeep, during the last two or three years, for the Edison cap lamps. The cost per lamp is from 2½ to 3½ cents. The figures are from six different companies, ranging from three and a half down to two years and include the cost of the lamp, as well as that of operation and maintenance.

MR. SUR: Figures for acetylene lamps were published some time ago. The Union Pacific Coal Company made careful inquiry and gave data for each of their mines. There seemed to be a great variation and it was hardly a fair comparison, because they did not charge up the lamp at all. They said an acetylene lamp would last only one month. I do not know whether that is so or not as I never worked steadily in the mines for a month at one time. I do not know just how long it takes a miner to put a lamp on the "blink"—if I may so express myself—but it does not take very long. Any comparison of the two kinds of lamps should not overlook the fact that a miner has to replace his lamp quite frequently. The destruction of acetylene lamps is much more rapid than it was with the old type of oil lamps—these you could keep going for two or three months if you did not hammer them too hard.

CHAIRMAN TILLSON: Mr. Case is not present but he may be able to give us some figures later on. We will take up a paper on hoisting ropes by Mr. M. W. Reed.

HOISTING ROPES

MR. M. W. REED, TECHNICAL ENGINEER, AMERICAN STEEL AND WIRE COMPANY, WORCESTER, MASS.

Mr. Chairman and Members of the National Safety Council: The subject of "Hoisting Ropes" cannot be dealt with mathematically, owing to the fact that a rope is a compound structure. It is not and cannot be dealt with in the same manner that a straight steel rod can be considered. I think we will all agree that an intelligent usage of wire rope is at least of as much importance as is its intelligent manufacture. In so far as the protection of human life is concerned, I believe intelligent usage is much more important than are the conditions of manufacture, for the intelligent user, at least, knows when the rope is no longer safe: further, he undoubtedly makes a good rope last longer. Therefore, the question before us is: What should one know in order that he may be an intelligent user and play the game of safety without first being taught by disaster.

STRENGTH

Strength is affected by broken wires, wear, bending, or any deformation of the rope structure. In regard to broken wires in a rope, it is next to impossible to show the effect on strength mathematically as the innumerable combinations of broken wires that may appear prevent any definite statement. The recommended rule of the Bureau of Mines is that not more than six broken wires shall be permitted in one rope lay

and that if the broken wires are reduced 30 per cent in area not more than three are permissible. This applies to 6 x 19 ropes used for hoisting men and is a good rule.

Suppose all six breaks were at about the same spot in the same strand. In that case the effect of the broken wires is more than just the loss of metallic area, because when tension is put on the rope this weak strand will part first, thus throwing the whole load on the other five, which, being unsymmetrically placed, will in all probability break one by one as the excess load comes on them.

In another case, however, we might have all of the broken wires at about the same plane of the rope but distributed in different strands. Here we would have a result showing that the loss of strength is just about proportional to the loss of metallic area, because all strands would be able to take approximately the same portion of the load and one would break about as soon as another. There would be no unstable condition, as in the first case. This condition will seldom, if ever, be found; I mentioned it merely to bring out the point. If it ever is found it will be the result of some accident or probable misuse.

Still another instance (that which we almost always find) would show us broken wires well scattered all along the rope in all strands. Provided the total number in any one rope lay is not excessive this is not necessarily a serious condition, because of the binding action on the wires of the rope caused by twisting. I believe that, due to binding action, a broken wire will develop its full strength at a point about six rope lays from the break, provided the rope is under tension.

Since the last-mentioned case is the one which we almost always find let us consider a rope which has the maximum number of broken wires in it in one lay, as allowed by the Department's rule, namely, six. In considering this case we will assume that the friction on a broken wire allows its full strength to be developed at a point six rope lays from the break. In a 6 x 19 rope there are 114 wires. Considering one particular rope lay, supposing there are in this lay six broken wires, this would leave us 108 wires which would have effective strength. Now, suppose that in the adjacent rope lay there are six more broken wires, these being different wires than any of those broken in the first lay. wires passing through which have no breaks in them are now equal to 102. Due to friction, however, on the six wires broken in the first mentioned lay, we may add the strength of one wire to these 102 and consider that our effective strength is that of 103 wires. Going on in this manner and assuming the worst possible condition, that the six wires broken in each successive rope lay are different wires than those broken in any other lay, we have at a distance of three lays from where we started an effective strength of 99 wires. Four lays away the effective strength is 96 wires. Five lays away the effective strength is 94 wires. Six lays away the effective strength is 93 wires. Seven lays away also gives an effective strength of 93 wires, as do all the lays beyond that. We have then, reached a stable condition wherein our effective strength, under the worst possible condition of six broken wires in each lay is 93 wires. We have lost almost 20 per cent of the original strength of the rope. Sup-

pose the rope is worn down 10 per cent of its area, then our effective strength is only 90 per cent of these 93 wires, which equals 83.7 wires, and this is only about 73 per cent of the original strength of the rope. I do not believe that anyone would care to ride in a cage being hoisted by a rope which had lost any more strength than this. Of course, it is unlikely that in successive rope lays those wires which were broken would be different wires than those broken in any other lay in each and every case. Some of the wires would undoubtedly be the same, and in this case we would have a somewhat modified effect. It will not do, however, to trust that this will happen.. Rather it seems that the thing to do is to consider the worst possible case under general circumstances and draw up your line of action on that basis.

DEVELOPMENT OF STRENGTH UNDER TENSION

I believe the statement that a broken wire will develop its full strength in a distance of six rope lays from the point of breaking, provided the rope is under tension, is very nearly correct for a 6 x 19 rope. Therefore, it seems there should be no question but what a rope, although showing very little wear, should be removed when six or more broken wires appear in a length of one rope lay. If the outside wires are worn down 10 per cent, then it seems that five broken wires should cause its removal: four broken wires, when worn 20 per cent: three broken wires, when worn down 30 per cent. For this general case, that is, when the broken wires are well distributed along the rope and in the different strands it would seem that the rule of the Bureau of Mines fills the bill for a safety law in a 6 x 19 rope. It is not by any means too strict where human lives are at stake.

In regard to the strictness of the rule, it may be interesting to know that many inspectors of elevators will not permit a rope to stay on if there are as many as a half-dozen broken wires along the whole length of the rope. It would seem, however, that a rope which was condemned on this basis had not been used to the full limit of its safe service.

As for cases where broken wires appear only at one spot in a rope, as I said before, this would be quite apt to have been caused by some misuse or accident and it is rather difficult to lay down any general rule. Suffice it to say that if a rope shows a tendency toward marked deterioration in one locality there is either a condition which must be overcome immediately or else the rope taken off. If the condition is bad enough, it might even be possible to have someone, who is quite familiar with the construction of a rope, look at it.

As to what is the best type of rope to be used in a certain place, it is of course that one which will take care of the greatest number of foot tons, providing the cost is not unreasonable. Foot tons hoisted, however, cannot be taken as a base for determining when a rope has become unsafe. Some ropes of the same type and construction last longer than others under apparently the same conditions. We, therefore, must determine the safety factor of our rope by some other method. Consideration of the number of broken wires and condition of wear is the best way.

BENDING STRESS

Bending stress is one of the worst enemies of wire rope. Many people do not realize its importance nor do they realize that there is a decided difference between bending stress and loss of strength due to bending. For a 6 x 19 rope the formula

$$S = \frac{12{,}000{,}000\ dA}{D}$$

is applicable where

d = diameter of individual wires.

A = metallic area of the rope.

D = diameter of sheave to the center of the rope.

S = quantity known as bending stress, which we add to the load of the rope.

In using this formula we are really determining the maximum fibre stress that occurs in the wires of the rope when bent and then assuming that this maximum exists throughout the cross section of the rope. The proposition is to obtain a result such that when added to the load of rope itself, plus whatever is on the end of it, will give an apparent total load great enough so that, when calculating the safety factor, we will safeguard exceeding the maximum fibre stress as well as the strength of the rope itself.

If we were going to determine the loss of strength due to bending we would, theoretically, use the average and not the maximum fibre stress. What we must guard against, therefore, in considering bending stress is the stretching of any fibre of any wire beyond its elastic limit.

The figure 12,000,000 has been determined by actual experimenting and has further been checked mathematically as being a safe modulus of elasticity for a 6 x 19 rope. A 6 x 7 rope has a modulus somewhat larger than this whereas a 6 x 37 rope would have a modulus smaller than this. A new 6 x 19 rope will have a smaller modulus than the above, and an old rope will not have one that is any larger, although with age the modulus increases due to the strands setting firmly into their places. A rusty rope might have a larger modulus, due to the fact that rust binds the wires together and prevents free action. The reason that a rope has a smaller modulus than a steel rod is because it is a compound structure. The wires are acting somewhat as springs.

In regard to stresses due to bending over sheaves it might be well to call attention to the fact that when a rope is deflected by a series of small sheaves, close together, the bending stress is less than would be caused by passing over only one of the small sheaves, due to the inherent stiffness of the rope preventing it from conforming fully to the curvature of the small sheave. The rope is also more or less supported by the sheaves on either side of the one in question.

In thinking on this, however, you must be careful not to confuse the above explanation. You are liable to get the impression that a rope must be bent 90 degrees over a sheave to develop the stress indicated by the above formula. This is not so. Whether a rope is bent 10 degrees or

90 degrees the bending stress which must be considered is that caused by the actual radius of curvature. This may not be the same as the radius of the sheave and is not the same in a series of small sheaves.

STRETCH

Sometimes ropes are discarded because the "stretch" is apparently all taken out of them. Those who labor under the impression that a wire rope is no good after the stretch is out are mistaken. The stretch is nothing more than the settling into place of the strands of the rope. After this is accomplished you still have a perfectly good rope, provided the wires are not broken excessively. Just what this stretch is is most apparent when making tests for modulus of elasticity where the increase in length for certain additional loads is compared. In these tests you always find that a rope stretches very fast at first, but after the strands are firmly set the stretch for an equal additional load is uniform up to the elastic limit. In determining the modulus that part of the result obtained when the rope stretches rapidly is never considered. Therefore, lack of stretch is not considered an indication of an unsafe rope. Condition of wear and the number of broken wires are the real factors to base a decision on.

CORROSION

You cannot see what rust is doing inside a rope. There is only one remedy and that is to keep the rope lubricated. Besides eating away the metal rust prevents the rope from functioning properly.

STARTING AND STOPPING

Starting and stopping are also important features. The strain on a rope when lowering a cage and it is stopped quickly at the upper part of the shaft is very great. The more sudden the stop the greater the strain. due to the fact that there is not so much yield in a short length. On a longer length, of course, the effect is not so bad.

An effect that is serious on a long length, however, is the "whip action," caused by taking up slack quickly. The questions of starting and stopping are directly up to the engineer.

It is true, I think, that the majority of breaks in hoisting ropes occur in a section comparatively near the lower end. In thinking this matter over you will realize that this is not strange, since a sudden stop or start with a short length of rope quickly taking up slack in a long length affects the same section of the rope. Further, this lower section is exposed more than the upper part. Therefore, it would seem that the lower section of the rope would be considered the most dangerous.

LANG LAY ROPE

The question is frequently raised regarding Lang lay rope. Generally speaking a 6 x 19 rope which is made Lang lay is of Seale patent type. The Warrington lay rope does not act well when made Lang lay, and a Seale patent Lang lay works better than a one-size wire, Lang lay rope

of 6 x 19 construction. Personally, I do not know of any 6 x 19 Lang lay ropes other than that of the Seale patent type being used and this is generally used on slopes, where it gives better service because of its greater wearing surface. Lang lay is not universally adaptable and in any case, before using it, it would seem advisable to take the matter up with the manufacturer. For fastening a Lang-lay rope you must be sure that each end is secured so it will not untwist. This means that swivel attachments must be avoided. I do not think a swivel attachment is advisable on any rope used in mines.

CLIPS AND SOCKETS

Whether clips or sockets are desirable is another point. Socketing is to be recommended as preferable to clips, the cone being poured with zinc. Of course, a rope should be resocketed frequently—approximately six changes during the life of the rope are desirable. In any event three and a half or four months should be considered a maximum time to permit a rope to go without resocketing.

In putting on new sockets care must be taken that there is no bend in the rope near the socket when the zinc is poured into the cone, since a bend such as this would cause deformation of the rope and deterioration at that point. Wires must be well brushed out inside the socket and should be well cleaned to give the zinc a fair chance to take hold.

Clips are generally considered uncertain. The number required to hold a rope for the maximum strength varies with the type of clip, the manner in which it is applied to the rope, and with the man who puts it on. In this respect I would recommend that the manufacturers' advice be asked. To give an idea of the number required, they are tabulated on the attached list. This tabulation, however, is an estimate, believed to be fairly correct. The most familiar type of clip is the one where a clamp is held by two nuts on the ends of a U-bolt. The point to remember in attachtaching these is to have the U-bolt next to the short end of the rope so as not to damage the part taking the strain. Inspection, frequent and careful, is the best preventor of accidents. Condition of wear and broken wires are the best indicators of the time to discard.

CLIPS

Size Rope	*No. Clips*	*Spacing Inches*	*Size Rope*	*No. Clips*	*Spacing Inches*	*Size Rope*	*No. Clips*	*Spacing Inches*
¾	3	8	1¼	4	12	1¾	6	16
⅞	3	9	1⅜	4	13	1⅞	6	17
1	3	10	1½	5	14	2	6	18
1⅛	4	11	1⅝	5	15			

NOT RESULT OF TESTS. ESTIMATED AND BELIEVED CORRECT

I have tried to make it as clear as I could. I am young and I do not know as much as I will some time later. I have tried to present the subject without repeating and restating. I think the Bureau of Mines rule is a good one: The number of broken wires and the condition of the wire

of the rope are the only indicators they consider when determining whether or not a rope is unfit for further use. I thank you.

DISCUSSION

CHAIRMAN TILLSON: May I ask whether you have made tests as to the strength of a rope socket attachment to a rope with a certain number of clips?

MR. REED: We have made tests but we have no actual record that we would care to advocate as a basis; therefore, I say my figures are estimates, although I believe them to be nearly correct. I believe that we will be able to make tests and secure definite results. We have made tests and have broken ropes in the middle by having them fastened with clips. Often the argument is advanced that you can see when a clip is holding, but you cannot see how a socket is holding. I do not agree; I can see how a socket is holding, because zinc is a fairly adhesive substance and if it is going to fail, you can tell it. On a large rope the wires are big enough so there is practically no danger. I should say there isn't any danger of the heating of the metal when socketing the rope effecting the strength. On a very small rope there might be some question, but on ropes used for hoisting purposes you will never find that. Therefore, I believe we can tell when a rope is gone by the board with the socket attached as well as we can tell when it is gone by the board with a clip.

CHAIRMAN TILLSON: Our papers last year left some figures open for discussion in regard to reductions of strength. Can you give us some data on this subject?

MR. REED: A great deal depends on the position of the rope and on the broken wires. That is why I have tried to bring out the point of all the broken wires in one strand. There you have something that can be corrected in your installation or the rope should be taken off. If all the broken wires are at one spot, and in different strands you find the same condition, probably you will find some trouble in your installation. If the wires are all along the rope take the broken wires according to the worst possible place and worst possible combination for the wire condition wherein to draw your safety rule.

WHEN SHOULD A ROPE BE DISCARDED?

A DELEGATE: Mr. Reed mentioned the practice that obtains in some places of discarding a rope when the stretch of that rope has ceased and stated that it was due to the fact merely of the setting of the wires; that the rope was just as strong as it was originally and, therefore, the practice of discarding such a rope was unnecessary. A little later he mentioned the strains due to stopping and starting and brought out that the wires are not settled in place—allowing the actual spring action which tends to take up the excessive momentary strain during stopping and starting. If a rope has had the stretch taken out, so the spring is not there, isn't it a bad practice to retain such a rope?

MR. REED: Your rope, having its full strength, would not break during

starting and stopping. Your broken wires would appear, but no serious effect would be obtained from starting and stopping. After the stretch is all out of the rope the "whip action" or strain of stopping and starting is too severe and the wires will break individually. A wire rope always gives warning before it goes and that warning is in the shape of broken wires.

CHAIRMAN TILLSON: Mr. Reed, possibly you have seen wires and ropes that have surface splits, longitudinally, without fracturing through. Is that an indication of failure along the lines we are discussing?

MR. REED: That is a rather hard question. If a wire splits, longitudinally, it may extend all through its length; that is, you have in effect two wires. I would not consider the material of which the rope was made to be good wire if it split in that manner, but I do not recollect having seen a rope in just that condition.

MR. REED: Do you consider it safe or unsafe?

CHAIRMAN TILLSON: I would not like its looks; that is why I asked the question.

MR. HART: Mr. Reed quoted the figures used by the Bureau of Mines —six broken wires in any one rope lay. I have in mind a rope used on an incline where they hoist and lower people. The practice for some few years has been to retain a rope until fifty wires are broken in one foot of the rope. It is about a 6x19 rope.

MR. REED: What is the factor of safety?

MR. HART: I do not know, but it is not large.

MR. REED: Sometimes the factor of safety is rated between twenty and thirty. In this case you have fifty broken wires. What is the size of the rope?

MR. HART: An inch and seven-eighths, I think.

CHAIRMAN TILLSON: I have seen some ropes in use that resembled porcupines, but they developed, as I recall, about 60 per cent of their original strength.

MR. BAWDEN: I understood Mr. Reed to say that he recommended a practice exactly opposite to the one we use in our district. Is the U-bolt of the clip fastened to the short end of the rope?

USE OF U-BOLTS AND CLIPS

MR. REED: Yes, Here is the base, the U-bolt is like this (indicating) and the rope fastens through here; the long part, that takes the strain, ought to be down next to the base. The U-bolt should be over the short end of the rope, come up and pass through the thimble and you have an end here. The U-bolt ought to be over the short end; down here is where you tighten your nuts. You have the long base firmly set against that part of the rope which takes the strain and your clamp effect really comes mostly on the short ends. You will notice, when you put them on the rope, it will squeeze down and comes up like that (indicating), that is a deformation of the rope.

MR. BAWDEN: The clasping effect of the U-bolt is apt to pull out on the part that takes the strain.

MR. REED: It isn't so apt to pull out as it is to deform the rope. That section of the rope which actually takes the strain is a deformation of the rope and is dangerous.

MR. REESE: Mr. Reed, I would like you to give us a better reason for preferring the socket to the clip. As I understand, you prefer the socket, but you say it should be socketed with zinc not ordinary babbit metal. You also say that it should be resocketed about three times during the life of the rope.

MR. REED: Six times during the life of the rope.

MR. REESE: We are getting from two to eight months out of a hoisting rope. If we used a socket would you advocate resocketing six times in two months to eight months? Why isn't a clip better than a socket? You can see the condition of the rope and the clips every day or every minute. With the socket, even with the best job of socketing, your recommendation is that we must resocket too much and we can't see what is going on inside of the socket. Why isn't it better for a layman and the people around coal mines to use a method that will enable them to see when anything is going wrong, rather than depend on a socket where we cannot see and which we have to take out every two or three weeks to ascertain whether it is all right or not?

MR. REED: The socketing creates absolutely no deformity in the rope. You get a straight pull and the pull is equalized on every wire of the rope. When you socket a rope the end is brushed out on the inside of the socket and the zinc is poured around it, adhering firmly. When you use clips you squeeze one side of the rope in, partly. That is why we do not consider the clip as safe as the socket.

MR. REESE: That is on the matter of the life of the rope, rather than of safe practice, isn't it? To get the best results out of a rope, therefore, use a socket, but as a matter of safety will you not admit that the other is the best?

EQUAL STRAIN ON EACH STRAND

MR. REED: No, Mr. Reese. I would say that the socket is the safest, for the reason that it allows an equal strain to be put on each and every wire and on each and every strand, and that is the basis that has to be followed faithfully in making up a rope. The wires, in making a strand, have to be stretched equally; the strands, in laying up a rope, have to be stretched uniformly.

CHAIRMAN TILLSON: In your experience, in visiting plants, which is the best practice you see actually performed at the plants, ropes that are socketed the way they socket them in most places or ropes that are fastened with clips the way they use clips as fasteners? What you do in your own shops will be well done, as you know how to socket a rope and you take all the pains necessary to clean off the grease with acid and for the proper alloying of steel and zinc. It may be a workman is not looking for the alloying effect to bind it together; he thinks if he gets it together with a wooden or steel wedge it may answer the purpose.

MR. REED: I will have to consider some of your questions, Mr. Tillson. I will try to answer them later.

MR. SINE: I think we should also consider just how the rope is fastened to the load; the rope may end in a socket fastened directly to the load. Probably, in that case, crystallization will be most likely to centralize at the socket, but with a "bridle joint," to take care of a part of the swinging in the rings or links, crystallization is not so apt to take place. I believe most of the mines that are hoisting from around 200 to 300 feet use a socket and they seem to be getting along very nicely; the majority are using a chain between the socket and the cage—what they call a "bridle" chain. Mines 400 to 600 feet deep seem to prefer clamps. The claim is made that the rope crystallizes at the socket. Mr. Reed may be able to give us additional information on attaching a rope to the load itself: whether in deep shafts they have more trouble with ropes crystallizing at the socket than they do at the shallower shafts, and if there is a remedy for this condition.

MR. REED: I have often heard the question discussed, but I will have to give it further consideration before answering.

CHAIRMAN TILLSON: Mr. R. H. Summer will present Mr. Arthur LaMotte's paper.

SAFETY IN THE USE OF EXPLOSIVES

MR. ARTHUR LAMOTTE
MANAGER TECHNICAL DIVISION, E. I. DU PONT DE NEMOURS & COMPANY, WILMINGTON, DELAWARE

Mr. Chairman and Members of the National Safety Council: It is said that it takes three generations to make a gentleman; the same may be said of a man who can be depended upon to engage in hazardous work with a maximum of safety. You must begin with his grandfather.

The primary characteristics of the safe man are unselfishness and consideration for others. Personal bravery and nerve or cowardice have nothing to do with it; thorough knowledge of the subject has a great deal to do with it. The most unsafe man on dangerous work, or, rather, let me say, in handling dangerous goods, is the man who is *afraid to be afraid.* He may know that the thing he is doing is dangerous; he may know that it is dangerous to remain where he is under certain conditions, but he is often afraid to take cover himself or to warn others, or to take ordinary intelligent precautions for fear of being thought timid. Instances of this kind, I am sure, are familiar to all.

I remember being in a mine some years ago where five men were killed by being tipped out of a skip while coming out, because several of the men rode on the bale of the skip, causing it to tip in front and engage a cross tie. Positive orders were thereupon issued that no one should be allowed to ride on the bale; and yet, only three days later, when I was coming out of the mine, in company with the foreman and several others, the skip was stopped and several men got on and climbed out on the bale. When the foreman remonstrated with them, saying that this was against orders, one of the men sneeringly remarked: "What's the matter with you; are you afraid?" This instantly silenced

the foreman, who made no further objection, and we went out under exactly the same conditions as those which were known to have caused a fatal accident.

The prevention of this type of accident, it seems to me, can only be accomplished by discipline, laying down hard and fast rules and enforcing them ruthlessly. Education, which is very effective in preventing a large class of accidents, seems to be helpless here. If possible, rules should be made so inelastic as to prevent even the officers of the company from violating them. In the army, for general safety, even the commanding General may not do certain things, and I feel it would have a most beneficial effect on industrial workers if they knew that their chiefs were not allowed to do various dangerous things which are forbidden the workers.

Getting back to my subject, "Safety in the Handling of Explosives," in this instance we do, to an extent, begin with the grandfather of the dynamite, that is, the raw materials. These are purchased on specifications, submitted to a rigorous analysis, and are most carefully inspected, sorted and strained. The inert, or, at least, non-explosive ingredients which enter into the manufacture of explosives are just as carefully treated as are the more essential ingredients; and this inspection is brought right up to the last process in the course of manufacture. For instance, the wood meal and nitrates are given the final sieving in the mixing house just before they are put into the tub and incorporated with the nitroglycerin. This latter ingredient is put through a series of processes which would delight the heart of any safety man. From first to last it is "handled with gloves," generally rubber gloves. After separation from the acid it only comes in contact with wood or rubber. It is washed and stored in wooden tubs under water. It is drawn off through rubber pipes, the flow through which is stopped by elevating the end of the pipe. It is weighed in rubber buckets and is transported either through rubber-lined gutters by gravity or by a rubber-tired traveling tank with a rubber hose for a spout. Buildings are floored with rubber, and the workmen wear rubber-soled shoes. The scales are covered with rubber, both the platform for the box and the platform for the weights. The weights also are covered with rubber. The operation is carried out in a frame building having an earth embankment entirely surrounding it as high as the eaves of the building itself, and this building is kept as far away from every other explosive building as the experience of the plant engineers shows to be necessary. After the dynamite is made, it is transported, in the process of being punched and packed, in wooden boxes having no exposed metal parts, and is punched with soft-rubber-tipped wooden sticks. Special shoes are worn throughout the danger area and the floors of the buildings have coverings of soft rubber-like material which can be taken up from time to time and burned.

CLASSIFICATION OF ACCIDENTS

For a number of years we kept a list of accidents in the use and handling of explosives, compiled from the British and Canadian reports.

supplemented by an elaborate system of American newspaper clippings. The object of these was to classify the accidents which could happen in the use of explosives in such a way that a fairly brief list of precautions could be made up which would cover practically every condition likely to arise in the use of explosives in mines, quarries or on construction work. This list is added to from time to time, whenever a new cause of an accident is reported. It is not possible to be very specific in all of these, but that they cover the ground fairly well is shown by the fact that in the past few years no accident has been brought to our attention which is not covered by these precautions and which would not have been prevented had all of the rules been observed. This list of precautions is printed in our different catalogs, and I will take each one in turn and try to explain the reason and necessity of each one of these precautions.

They all start out with the injunction "*Don't.*" I remember reading this list at a convention of coal miners some years ago and one of the miners told me at the end that if he obeyed all the rules he would not be able to use explosives at all, but when I asked him in detail to describe each of the different operations through which he went in his blasting operations I showed him that at no time did he do anything in violation of these rules, which was probably the reason why he had never had an accident with explosives.

"Don't forget the nature of explosives, but remember that with proper care they can be handled with comparative safety." The function of explosives is to explode and a perfectly safe explosive would be useless. We have always tried to steer clear of describing any explosive as safe, but explosives can be used in such a way that accidents are avoided and for the man who handles explosives a good thought to carry is: "Don't take a chance and don't try conclusions with dynamite." It is dangerous, of course, but so is a mine mule, and both the mule and the dynamite will perform their allotted work and render good service if treated with the proper amount of respect.

NO SMOKING

"Don't smoke while you are handling explosives and don't handle explosives near an open light." Not all explosives ignite from a spark with the same facility. Blasting powder and nitro-starch powders are most easily ignited. The paper shells covering dynamite give them a certain amount of protection, but there is a considerable difference even among the different kinds of dynamites in the ease with which they are ignited. Straight dynamite ignites more easily than the ammonia dynamites and gelatins. The permissibles of the ammonia-base type are least easily ignited. A pipeful of ignited tobacco spilled in an open box of dynamite would probably ignite it; it would certainly ignite blasting powder. Open hat lamps on the men who carry the dynamite around in the mine are distinctly dangerous, as sparks are continually falling from wick lamps; although acetylene hat lamps are much safer, I have seen a lighted lamp drop into a box of dynamite. The best practice is for the powder men to be equipped with permissible electric hat lamps,

which are the safest lights known at the present time. It is thought that the Park avenue explosion in the New York subway construction was brought about by a man bringing an open light into the powder house, where a number of detonators had been inserted into the dynamite. I remember seeing a drill runner drop an open bug light right into a lot of paper shells which had been taken off several boxes of gelatin dynamite and which entirely covered a box of primers. This was in one of the New York subway tunnels and probably closely paralleled, except for its result, the Park avenue explosion.

"Don't carry loose matches in your pockets while loading explosives—use safety matches." A number of accidents have occurred from the dropping of matches from men's hat bands into bore holes which were being loaded with dynamite. Quarrymen frequently appoint a number of laborers to fire the block hole and mud cap shots, for the lighting of which they fill their pockets with matches and stick half a dozen into their hat bands, so that in case a match goes out at a critical time they can quickly lay their hands on another. These men are called upon in the loading of a large blast, such as well drill holes, to assist the blasting foreman, and it seldom occurs to him to take these matches away from the men, especially out of their hat bands. In leaning over the holes these matches are liable to fall out into the bore hole and fire the dynamite. While dynamite will usually burn up peacefully in the open, it cannot be depended upon to do so in a bore hole, and will certainly explode if the detonator has been inserted.

NO SHOOTING OR HUNTING NEAR MAGAZINES

I almost hesitate to read the next on the list, as it would seem that no one out of an insane asylum would require it, yet it has been the cause of a great many serious explosions. "Don't shoot into explosives with a rifle or pistol, either in or out of a magazine." To an intelligent man it would appear a plain case of suicide and yet not many years ago one of our customers tried to convince our salesman that dynamite would not explode if fired into with a small calibre rifle bullet. The customer tried the experiment in his cellar, shooting into several cases of dynamite which he had stored there. He failed to prove his point, however, as the dynamite did explode, killing the experimenter and his whole household.

"Don't allow shooting or hunting near magazines." While magazines should be bullet-proof, it is seldom that they are so constructed, and even if they were the doors are liable to be open when explosives are being carried in or out. The risk of a disaster is too great to take any chances.

"Don't leave explosives in a field or any place where cattle can get at them." Black powder, probably, would do them no harm, but nitroglycerin is a very powerful poison. Although cattle like the taste of the soda and nitrates in dynamite the other ingredients would probably poison them.

"Don't handle or store explosives in or near a residence." In some sections of the country it is the custom for miners to buy their own

explosives and take home what they do not use in the day's work. This introduces a very great hazard in the home, both on account of the possibility of children getting hold of the explosives and on account of the danger in case the building should take fire. The new Federal regulations governing the handling of explosives will probably result in fewer accidents from this cause.

KEEP EXPLOSIVES IN A DRY PLACE

"Don't leave explosives in a wet or damp place. They should be kept in a suitable, dry place, under lock and key, and where children or irresponsible persons cannot get at them."

There is an increased effort in the matter of conservation of explosives to use nitrate of ammonia explosives, which requires less nitroglycerin. Nitrate of ammonia explosives are more hygroscopic than other types, although any explosive will deteriorate when stored for any length of time in a humid atmosphere. Probably the chief cause of explosives taking on moisture is storage in magazines built into the side of a hill—so-called dug-outs.

The actual loss in dollars and cents from this kind of treatment of explosives is very considerable, but there are two reasons from a safety standpoint why explosives should be kept dry. *In the first place*, wet dynamite and wet blasting caps produce only a partial detonation, which is liable to cause a blown-out shot, which is highly dangerous in coal mines containing inflammable gases or dust. *In the second place*, the fumes from a partial detonation are much more poisonous than those from explosives which are in good condition and explode perfectly. Dampness getting into blasting caps is a prolific cause for dynamite igniting instead of detonating, and a charge of burning dynamite in a bore hole fills the working place with extremely poisonous fumes. Much more care is taken at the present time to keep explosives under lock and key than was the case a few years ago, but blasting caps are particularly attractive to children and their playing with them has been responsible for between thirty and fifty accidents every year, which result in the loss of fingers, hands or eyes, and occasionally the loss of life. Children pick up blasting caps when they are left around quarry operations and attempt to pick out the charge of fulminate of mercury, usually with a pin or nail, with the idea of using the shell as an ornament or cap for lead pencil or for a whistle. Now, fulminate of mercury is an extremely sensitive explosive and attempting to remove it in this way nearly always results in an explosion. When you consider that a modern blasting cap will blow a hole through a 1/16 inch steel plate and that the pieces of flying copper will imbed themselves in iron two or three feet away from it you realize what a power for mischief these necessary articles may become.

CHAMBERING BORE HOLES

"Don't explode a charge to chamber a bore hole and then immediately reload it, as the bore hole will be hot and the second charge may explode prematurely."

This operation is variously known as "springing," "chambering," "pot holing," "squibbling," and so on, and is done by exploding a succession of charges in increasing amounts in the bottom of the bore hole, with little or no tamping, in such a way as to expand the bottom of the hole, so that a larger charge can be accommodated. In some rocks the enlargement is produced by shearing and scaling off rock from the sides of the bore hole and in others by compressing the rock itself. This latter, of course, is only possible in soft rock. Considerable heat is generated, not only by the explosive itself but in the compression when that occurs, and unless ample time is allowed between "springing" shots accidents are liable to occur from the charges being placed in the hot pocket, or becoming ignited from fragments of fuse or wire insulation. Of course, when the pocket is full of water and fills up immediately after each "springing" operation, there is no danger from the hole being too hot, but there is another hazard in the loading of "sprung" holes and that is the danger of the dynamite, especially when a straight dynamite is used and the cartridges are slit, of its getting between the cracks and crevices of the rock in such a way that when the hole is being tamped it may be pinched under considerable pressure and cause an explosion. For this reason, dynamite of the gelatin type is much safer to use where this operation is regularly performed, but where gelatin cannot be used the next best thing is not to slit the cartridges.

"Don't do tamping with iron or steel bars or tools. Use only a wooden tamping stick with no metal parts." There is very great danger, of course, in punching dynamite with an iron tamping rod, especially in holes bored in hard rock, but I venture to say that nearly half the miners who use dynamite use their drill steels for loading the charges, and considering the frequency of this practice it is a wonder that more accidents do not occur. It would seem a simple thing to provide miners with wooden tamping sticks and compel their use, but a number of them look upon it as a needless refinement and, having always their drill steels with them, they prefer to use them. When powder men remonstrate with them, they say that if the drill does strike a spark it will not ignite the dynamite, that they use it carefully and ram the dynamite in gently. However, it is only the survivors who say this. The ones who are killed do not give their versions of these affairs. One of the curiosities of legislation was a bill introduced in one of the State Legislatures, requiring the use of several inches of copper on the end of the tamping sticks. When black blasting powder was used to a greater extent than it is now, copper was looked upon as a safe material to use with it, because it would not strike a spark, and that same feeling has descended to dynamite, but it is just as easy to detonate a drop of nitroglycerin or a pinch of dynamite with a copper hammer as it is with a steel one.

DON'T FORCE CARTRIDGES

"Don't *force* a cartridge of explosives into a bore hole." This is one of the most prolific sources of accidents in the use of explosives and one of the most difficult to control. If a miner or blaster has a cartridge of dynamite sticking half-way down in a bore hole, it is a great tempta-

tion to drive it down by main strength rather than let it go and waste the bore hole and all the labor that it represents. Fortunately, modern explosives, which are much less likely to explode from rough handling than the straight dynamites of ten or twenty years ago, have reduced the number of accidents from this cause to a considerable extent. The remedy, of course, is to have the drill bits always made to gauge, allowing for a sufficient clearness over the diameter of the dynamite in use.

"Don't have a wire carrying electric current near detonators or charged bore holes at any time except for the purpose of firing the blasts." One of the dangers of having electric mining or quarrying machinery around explosive operations is the chance of one of the terminals coming in contact with the electric blasting cap wires. Considering the care necessary to make connections properly for firing the blast purposely, it would seem that this danger is very remote, but a number of accidents have occurred. When the blasts are fired by the lighting or power current, it is doubly necessary to observe this caution, because even with special safety switches there is always a chance of the workmen becoming confused and connecting the wrong wire. While the use of the power and lighting current is generally advised for quarry and construction work in the open, the use of a regular blasting machine is much safer in underground work, as by its use the danger of connecting the blast to a live wire can be avoided, and while in open work the number of shots desired to be fired at any one time may be in excess of what the blasting machine can do, it is very rare indeed that such necessity arises in mining or tunnelling work. By keeping an entirely different circuit for the firing of the blast much greater safety in operation is secured, but under no conditions should electric drills, electric punchers or undercutters be operated or other wires allowed around a room where men are charging bore holes for electric firing.

"Don't explode a charge before everyone is well beyond the danger zone and protected from flying debris. Protect your supply of explosives also from danger from this source." "Don't cut the fuse short to save time. It is dangerous and wasteful of explosive, as it is impossible to tamp such charges properly." There are not many accidents from flying rock where electric firing is practiced, as compared with cap and fuse, because the blaster will not operate the blasting machine if he knows he is in range of the blast, and even if his leading wire is being continually shortened by the rock falling upon it he will take care to lengthen it by splicing on other wire until he can get into a safe place, but in quarry work this does not always hold. The blaster is liable to continue to use his leading wire without taking this precaution and get too close to the danger zone. I have seen blasters fire their shots from the cover of an upturned dump cart, while they left an unused half-box of dynamite with three or four electric blasting caps in it out in the open a few feet away from them. It would seem an unnecessary hardship to expect the blaster to take all unused explosives and accessories back to the magazine before the blast is fired, as he may have to use some of them in case it became necessary to reprime a bore hole, but it should be impressed upon him that these leftovers should be put in a safe place before the blast is put off.

HANG-FIRES AND SAFETY FUSES

"Don't hurry in seeking an explanation for the failure of a charge to explode." This is to warn blasters against returning to the face in the event of a hang-fire, until sufficient time has elapsed to render it safe.

High-grade safety fuse is a wonderfully reliable device. It is strong, resists abrasion well and stands immersion in water, often for several hours; it is uniform in its burning speed. Cheap fuse is not regular in its burning rate, is not very waterproof and will not stand abrasion against the rock in the bore hole nearly as well as the better grades. However, any kind of safety fuse is liable, occasionally, to hang fire. This happens, at times, from the blaster failing to ignite the powder core, and the jute or cotton wrappings of the fuse may smolder for several minutes and then ignite the core, or if the fuse is cut in the hole the powder core may go out but ignite the jute beyond the break, which may cause a hang-fire. It is difficult in experimenting with fuse to simulate the conditions which cause hang-fires, but hang-fires do occur in actual work and are a prolific source of accident. Accidents occur most often, perhaps, from a miscount in the number of explosions. Where eight or ten fuses are lighted at the same time, it frequently happens that two of these will go off at exactly the same time, making one report. Consequently, blasters are inclined to venture back to the face, even if the reports heard do not tally with the number of fuses lighted, assuming that two or more have gone off together. In the event of a misfire, at least half an hour is the least that should be allowed before investigating. Two or three hours is much better; waiting until the next day is practically safe. Hang-fires can be eliminated by the use of electric blasting caps and electric squibs, and the increased sales of these devices are gradually cutting down the number of accidents from hang-fires.

"Don't drill, bore or pick out a charge which has failed to explode." A careful miner can sometimes be depended upon to remove the tamping and insert another primer. At times, it is safer to drill another hole near the missed one, but this is not practicable in many instances, especially in hard rock and in "sprung" holes. As a precautionary measure against striking the charge in the case of a misfire, it is suggested that a piece of newspaper or a handful of some other easily recognized foreign substance be placed on top of the last cartridge before the tamping or stemming is done. This acts as an indicator so that the tamping may be removed with comparative safety without any chance of digging into the explosive.

"Don't use two kinds of explosives in the same bore hole except where one is used as a primer to detonate the other." It is a common practice in some sections to place a dynamite cartridge in the bottom of a bore hole and the main charge of black powder on top of that, firing the black powder with fuse or squib. The dynamite explodes from the shock of the black powder but it does not explode as completely as when detonated by blasting cap, so that it is doubtful if any real benefit is obtained by this method. Different explosives have such different rates of detonation that it is not only wasteful but frequently dangerous to use this method of blasting.

FROZEN OR CHILLED EXPLOSIVES

"Don't use frozen or chilled explosives." Although frozen dynamite is more difficult to detonate with a blasting cap than when it is properly thawed, it is more sensitive to other kinds of shock. Before low-freezing explosives became as generally used as they are today a number of accidents occured from men breaking frozen cartridges in two or rolling them to break up the frozen crystals. In loading well drill holes with large sized cartridges a number of thawed cartridges could be dropped into these holes sometimes 100 feet or more deep, with safety. Punching a hole into frozen cartridges is by no means a safe operation and the fumes from frozen dynamite are vastly more poisonous than from the same dynamite when properly thawed. In fact, frozen dynamite frequently takes fire from the blasting cap and burns up, giving off large quantities of exceedingly noxious gases.

"Don't use any arrangement for thawing dynamite other than those recommended by the manufacturer." Thawing dynamite is one of the most prolific sources of accidents, or, rather, has been, as the use of low-freezing explosives has enormously cut down the number of accidents from this cause. Explosive manufacturers have investigated every kind of thawing device and recommend only those which they know are safe. Thawing must be done at a relatively low temperature and no part of the explosive should be exposed to any temperature higher than what can be comfortably borne by the hand. It should not be heated on stoves or on hot rocks or metal, or placed on top of a steam boiler, or over any steam or hot water pipe, or heated metal surface. The warmer dynamite becomes the more likely it is to exude and a drop of nitroglycerin falling a few inches on a heated metal surface may explode. For this reason the radiators or coils in a thawing house should always be over or to one side of the dynamite and never directly under it. It is often a great temptation to thaw dynamite by putting it directly on top of the radiator, but this is an exceedingly dangerous operation and radiators should be fenced off so that it is impossible to do this in the thawing house. Explosives should never be taken into or near a blacksmith shop or forge, as the flying sparks are liable to ignite or to detonate them.

"Don't allow thawed dynamite to remain exposed to low temperature; use it as soon as possible." We have often seen blasters attempt to use explosives which have become chilled or partly frozen, and on remonstrating have been told that the powder has been thawed. For this reason, we urge them to use the dynamite as soon after it has been thawed as possible and to take precautions against its freezing after it leaves the thawing house.

"Don't paint magazine roofs black." On a bright summer day the temperature directly under the roof of the magazine, especially if the ventilation is poor, may rise to as high as 130 degrees. This is liable to cause dynamite to leak and the waterproofing on fuse and electric blasting caps to run, so that they will not only not be waterproof but they will not carry the spark or explode. For the same reason, high explosives, fuse or detonators should not be exposed to the direct rays of the sun longer

than is necessary. Sunlight tends to decompose nitroglycerin as well as to cause it to leak if it becomes too hot.

BLASTING CAPS

"Don't allow priming (the placing of a blasting cap or electric blasting cap in dynamite) to be done in a thawing house." A separate place should be provided for the operation of priming, so there will be no temptation to use the magazine or thawing house for this purpose. The Park avenue explosion in the first New York subway excavation was probably due to this cause.

"Don't prime or connect charges for electric firing during the progress of a thunder storm." A number of accidents have occurred from lightning exploding charges connected for electric firing, not only in the open but in tunnels where leading wires have crossed the rails and the rails struck by lightning.

"Don't carry blasting caps or electric blasting caps in your pockets." In the first place, the blasting caps are liable to accumulate moisture, in which case they are liable to set fire to the charge instead of detonating it, or they may become filled with some foreign matter, in which case they will not explode from the fuse; finally, they are too dangerous and sensitive to make this a safe operation; besides which, they are liable to fall out and become lost and turn up again at a most inopportune moment.

"Don't attempt to take blasting caps from the box by inserting a wire, nail or other sharp instrument into the caps." The explosive charge in blasting caps is extremely sensitive, as mentioned before, and a box of blasting caps has enough potential explosive force to blow a man in two. The proper way to take one cap out of a box is to tilt it over slightly until a few of them slide part way out, then take one of these out with the fingers.

"Don't try to withdraw the wires from an electric blasting cap." This for the same reason as the last.

"Don't fasten a blasting cap to the fuse with the teeth or by flattening with a knife—use a cap crimper." Crimping caps with the teeth is a very common operation, but aside from the danger of biting the shell down on the fuse it does not make an efficient crimp, and the fuse is liable to come out or moisture to get in. The cap crimper is a tool made specifically for this purpose and it should always be used.

"Don't keep electric blasting caps, blasting machines or blasting supplies in a damp place. All of these accessories are either spoiled or their life and usefulness materially abbreviated by damp storage. A blasting machine which is kept in a dry place will be twice as effective as one not kept dry; the same is true of blasting caps.

WIRES AND WIRING

"Don't leave the leading wire connected to the blasting machine." To make assurance doubly sure it is not a bad idea to carry the blasting machine with you if it is necessary to return to the charge, then you can be

sure that nobody is tampering with it or will attempt to fire the charge while you are in the danger zone.

"Don't loop or tie wire connections. Scrape the ends of the wires clean and bright and twist them tightly together." In mines where there is much acid water or corrosive gases it is worth while to have all the blasting wire connections soldered, as a number of misfires have been observed from connections which were originally well made becoming so corroded as to fail of their purpose.

"Don't insert blasting cap or electric blasting cap in explosive cartridges carelessly. Have closed end of detonator point toward the bulk of the charge and have it tied to the cartridge securely." A large proportion of blasters using electric blasting caps punch a hole diagonally through the inside of the cartridge, insert the detonator and take a half hitch around the cartridge with the wires. If the hole is punched through the cartridge at too great an angle it is liable to go through the cartridge and possibly jam in the bore hole. This would be very likely to lead to a fatal accident. The detonator should lie as nearly as possible in the central axis of the dynamite cartridge, although a slight angle does no harm provided that the end of the detonator is well inside the cartridge.

The object in having the detonator point toward the bulk of the charge is that the greatest effect of the detonator is from its loaded end. If the detonator points away from the bulk of the charge, unexploded powder may occur in the bottom of the hole and afterward cause trouble. The detonator should always be tied or fastened securely to the cartridge so that there is no danger of its pulling out when the charge is loaded and tamped. Otherwise unexploded powder or misfired holes may result.

"Don't store or transport blasting caps or electric blasting caps with high explosives." High explosives by themselves are fairly insensitive to shock and will withstand an extraordinary amount of rough treatment at times without exploding, whereas detonators are extremely sensitive both to shock and to sparks, and while they are very violent in their explosion, effects are local. When they are carried in the same receptacle or transported together you have the condition of the sensitiveness of the caps with the far-reaching force and violence of the high explosive. This is a particularly necessary injunction and, unfortunately, it is very largely disregarded in mines and quarries where the powder man carries a box containing twenty or thirty pounds of dynamite with a box of caps or a bunch of primers on top of the dynamite.

"Don't attempt to use electric blasting caps with the regular insulation in very wet work. For this purpose secure 'waterproof' or 'submarine' electric blasting caps." This does not necessarily apply where only one shot is fired at a time, but where several shots are fired there is a possibility of electric leakage and short circuits through the ground to the electric blasting cap wires. This results in the under holes and those adjoining going off and the holes in the middle of the line missing fire.

"Don't use old or broken leading wire or connecting wire." These are prolific sources of misfire and failure to get the shot off at the time desired. Breaks inside of the insulation are not easy to detect and cost much more than they are worth.

"Don't handle fuse carelessly in cold weather, for when cold it is stiff and breaks easily. It should be warmed slightly before using."

FUSE SUBJECTED TO HEAT AND COLD

"Don't store fuse in a hot place, as this may dry it out so that uncoiling will break it."

The waterproofing material on fuse is a compound of various asphalt tars with guttapercha and similar substances which become brittle in cold weather and which also are liable to run if subjected to too high a temperature. It is well worth while to store the fuse, at least shortly before its use, at a temperature of between 60 and 80 degrees F. If the fuse is too cold it is liable to crack when uncoiled and cause a misfire or a hangfire, with its resulting danger, or if stored in too hot a place it is liable to go out and cause a misfire.

"Don't lace fuse through dynamite cartridges, and don't place several slit or broken cartridges on top of primer with cap and fuse. This practice is frequently responsible for the burning of the charge." The paper shell of the dynamite cartridge is sufficient protection against the side spit of the fuse from igniting the dynamite inside the shell. Without this protection the side spit is almost sure to ignite the dynamite which will burn much more rapidly in a bore hole when strongly confined than it will in the open, sometimes causing the loss of a considerable proportion of the charge, besides giving off poisonous fumes and possibly blowing out the tamping, so that the explosion is ineffective.

"Don't expect explosives to do good work if you try to explode them with a detonator weaker than a No. 6." The use of modern low-freezing ammonia dynamites has resulted in an immense reduction in the number of accidents, as those explosives are much less sensitive to shock and friction than those in general use twenty years ago. At the same time, these explosives require a much stronger detonator to develop their full power than did the older type of explosives; although it is possible under favorable conditions to detonate even these modern explosives with weaker detonators than a No. 6, there is a considerable factor of safety in using the stronger caps. They not only insure complete detonation but they increase the effective power of the explosive and reduce the amount of noxious fumes to a minimum.

Explosives which have been stored for some time under adverse conditions become more insensitive and a larger detonator tends to offset to a considerable extent this condition. Strong detonators will fire larger charges than weak ones, and they not only reduce chances of misfires, but almost entirely eliminate the chance of a properly primed charge burning instead of exploding. No. 6 or stronger detonators are required for all "permissible" explosives which are not "permissible" unless the strong detonators are used with them.

DISCUSSION

CHAIRMAN TILLSON: I think we will start the discussion by a consideration of the list of "Don'ts" and permit discussion to develop the points.

MR. SUMMER: "Don't forget the nature of explosives, but remember that with proper care they can be handled with comparative safety. Don't smoke while you are handling explosives and don't handle explosives near an open light." I am almost ashamed to come before this Section and confess that I very seldom go into a mine but what I find miners smoking, just as though they were not handling powder at all. Upon remonstrating with them they will say "It won't explode," and in many cases, after watching them, I will say: "Sit down and have your smoke, but don't take a chance." In a million times the powder may not burn, but again it may explode and it is not worth taking a chance. Another point, different detonators ignite with different degrees of ease. The warning against the carrying of loose matches applies especially to quarry workers and is an important safety precaution. "Don't leave explosives in a field or any place where cattle can get at them." Black powder, probably, would do them no harm, but nitrogylcerin is a very powerful poison. Cattle like the taste of the soda and nitrates but the other ingredients would poison them. Black powder would not and might even act as a conditioning powder, to a certain extent.

Last Saturday, in Missouri, three men were killed by powder—detonation was not complete and the men were overcome by fumes. Yesterday the *Kansas City Star* printed the story of a boy who found a cap and took it in the sealing-room with him with the idea of using the shell as an ornament or cap for a lead pencil or for a whistle. He started to pick out the fulminate of mercury when it exploded. He lost four of his fingers and several other persons suffered minor injuries.

USE OF TAMPING TOOLS

"Don't do tamping with iron or steel bars or tools. Use only a wooden tamping stick with no metal parts." This is very simple and requires no explanation. One State has a freak bit of legislation, requiring four inches of copper on the ends of tamping bars. The idea probably originated during the use of black powder, as copper was considered comparatively safe from striking sparks, but with straight dynamite copper is liable, under pressure, to detonate and cause an explosion. Only wooden tamping sticks should be used, but it is difficult to induce the miners to use them. They often insist on using the steel, because it is always at hand and the tamping stick is not.

MR. REESE: That does not apply to black powder.

MR. SUMMER: I should say it would be better to use a stick even with black powder. The danger I referred to—the metal acting as a hammer on dynamite—would not apply to black powder, because it is almost impossible to ignite black powder by a blow, a spark is necessary.

DANGER OF EXPLOSION

"Don't explode a charge before everyone is well beyond the danger zone and protected from flying debris." Very often men will get themselves out of danger but within range of the place and they may have electric blasting caps and even dynamite in the same box. If an explosion oc-

curred in the box it might cost several lives. A case of that kind came to my notice very recently: I was with the men behind a dump and a box of powder and caps on short fuses was a short distance away, but within dropping range of the flying rock. We were in a place of safety, but if the box of dynamite had exploded I would not be here to tell about it. After this experience I saw that all material was safely out of the way before the shot was fired.

"Don't hurry in seeking an explanation for the failure of a charge to explode." You are all familiar with "hang fires"—places where men are anxious to get back and investigate. One of the chief dangers is to the man who Mr. LaMotte refers to as "being afraid to be afraid." Half an hour is the least time I ever go back to a place of hang-fire. Any kind of fuse is liable to hang-fire; even the best of fuses may abrade against the rock or the trouble may be due to improper storage conditions. Hang-fires happen, at times, because the blaster failed to ignite the powder core and the jute or cotton wrappings of the fuse may smolder for several minutes before it ignites or if the fuse is cut in the hole the powder core may go out but ignite the jute beyond the break and cause a hang-fire.

About three months ago I visited a zinc mine about 200 feet deep. I came out when they fired, at 4 o'clock, and I wanted to go back at 6 o'clock, when the night shift went on, so I stayed around the mine. About 5:15—an hour and a quarter after the shots were fired—I heard a shot go off. It was a hang-fire—it couldn't have been anything else. A hang-fire should not be investigated until the next shift or the next day if conditions permit such a course.

"Don't drill, bore or pick out a charge which has failed to explode." We recommend drilling another hole, about eighteen inches away, but in "sprung" holes it is dangerous practice, because in very brittle ground the chamber hole is liable to crack for a distance of two feet and nitroglycerine may find its way down. Where it is necessary to take out a misfire, a good practice is always to take a little piece of paper or some foreign substance, before tamping, and insert it over the charge. When the miner takes out his tamping this foreign substance will act as an indicator and he will know when he is getting to the business end of his charge.

"Don't use frozen or chilled explosives." This is a question of bad gas resulting from the explosion of two different kinds of powder, especially black powder and dynamite in the same hole, excepting where the dynamite acts only as a primer or is used to detonate. In the iron region, I believe, they nearly always ignite their black powder with a 40 per cent dynamite primer. That practice is all right, but where, in some cases, they are putting dynamite in the bottom of the hole and black powder on the top, and there is a great deal of velocity to the detonation, the execution will not be a good one. The fumes resulting from that kind of charge are liable to be very noxious and poisonous.

MR. MASON: Have you seen that practice in the coal fields?

MR. SUMMER: Very little of my work is in the coal fields—my work has

been in the metal mines. I have heard of the practice but have never seen it.

SAFEGUARDING EXPLOSIVES

CHAIRMAN THELSON: You can use two explosives of the same strength in the same bore hole if they each have as high a rate of detonation?

MR. SUMMER: Yes, that is it; you have the explosive first, usually that should be at the top of the hole, because if it is at the bottom you do not get the execution you desire—it is not good from a safety standpoint in that case, but it is from an efficiency standpoint.

"Don't use frozen or chilled explosives." This is a very short sentence, but it spells a great deal. I think it is safe to say that a greater number of accidents have occurred from freezing or chilling explosives and their use than from any other cause. Miners, especially in the West on small properties, where they do not have the liberal thawing houses and equipment of the larger mines—it is a very common practice—will take the powder into their own homes and put it close to the stove or behind the stove. They will even put dynamite cartridges near an open fire close to the works and when they go to work they will carry it in their boots or under their arms.

You are all familiar with proper thawing devices; they should always be used, the type depending, of course, on the use to which they are to be put, but on no condition should dynamite be thawed near hot water systems. In all regular thawing houses the heat should either be above or to one side of the explosives; the reason being that dynamite, if left in a thawing house for a considerable length of time, will exude nitroglycerin, and if this drops two or three inches onto a heated surface it is very liable to cause an explosion of sufficient strength to detonate the other dynamite. This is a good point to remember.

"Don't allow thawed dynamite to remain exposed to low temperature; use it as soon as possible." That is for the precaution of the miner who will thaw his dynamite but who fails to realize how quickly it will freeze again. He will thaw enough for his work but by the time he wants to use it it will be frozen again and the nitroglycerin crystallized while he is preparing his primer or rolling the cartridge, or an exposure may take place after he leaves the thawing house. While it is true that dynamite is more difficult to detonate in a frozen than in a thawed condition, it is more dangerous to handle on account of the liability of friction starting explosion of the frozen nitroglycerin crystals. Of course, when the little crystals explode, detonation follows throughout the whole mass.

"Don't paint magazine roofs black." This is a protection against too great heat in the magazine. On a hot summer day the temperature directly under the roof of a magazine may rise to as high as 130 degrees and at that temperature nitroglycerin would exude and cause a dangerous condition.

BLASTING CAPS

Now the next "Don't" relates to blasting caps. A separate place should

be provided for the operation of priming, so there will be no temptation to use the magazine or thawing house for this purpose. The Park Avenue explosion in the first New York subway excavation was probably due to this cause.

A number of accidents have occurred from lightning exploding charges connected for electric firing, not only in the open but in tunnels where leading wires have crossed the rails and the rails struck by lightning.

Blasting caps may accumulate moisture, in which case they are liable to set fire to the charge instead of detonating it; or they may become filled with some foreign matter, in which case they will not explode from the fuse; finally, they are too dangerous and sensitive to be carried about in pockets, they are liable to fall out and become lost and turn up again at a most inopportune moment.

Blasting caps are packed by the manufacturer to fit snugly into the box and a little piece of felt is put on all sides of the box to prevent their shaking around. A man will frequently try to pick out some of the caps; it is very easy to pick up the box and give it a little shake, the rest will come out very easy. Never try to insert a wire to get them out.

"Use a cap crimper"—I think you are all famliar with numerous accidents that have occurred to miners who have opened caps with their teeth and bitten down over the fulminate of mercury. The practice is not as common today as it was a few years ago.

"Don't keep electric blasting caps, blasting machines or blasting supplies in a damp place." All of these accessories are either spoiled or their life and usefulness materially abbreviated by damp storage. In damp blasting caps the fulminate of mercury becomes wet and will not explode or the caps may explode with partial detonation, not be sufficient to detonate the dynamite. The result will be that the dynamite will burn, with the resulting poisonous gases.

"Don't leave leading wire connected to the blasting machine." In connecting up an electric blast start at the face, the last thing before the battery should be the connection of the leading wires. That insures that no one will come along and use the battery while the men are working at the face.

PLACING OF DETONATOR

"Don't insert blasting cap * * * carelessly" A large proportion of blasters punch a hole diagonally through the inside of the cartridge, insert the detonator and take a half hitch around the cartridge with the wire. If the hole is punched through the cartridge at too great an angle it is liable to go through the cartridge and possibly jam in the bore hole. This very likely would lead to a central axis of the dynamite cartridge; a slight angle does no harm, provided the end of the detonator is well inside the cartridge.

The object in having the detonator point toward the bulk of the charge is that the greatest effect of the detonator is from its loaded end. If the detonator points away from the bulk of the charge unexploded powder may occur in the bottom of the hole and cause trouble. The detonator

should always be tied or fastened securely to the cartridge, so there will be no danger of its pulling out when the charge is loaded and tamped—otherwise unexploded powder or misfired holes may result.

High explosives by themselves are fairly insensitive to shock and will withstand an extraordinary amount of rough treatment at times without exploding, whereas detonators are extremely sensitive both to shock and to sparks and while they are very violent in their explosion the effects are local. When high explosives and detonators are carried in the same receptacle or transported together you have the condition of the sensitiveness of the caps with the far-reaching force and violence of the high explosive. Injunctions against this action are particularly necessary; unfortunately, they are very largely disregarded in mines and quarries where the powder man often carries a box containing twenty or thirty pounds of dynamite with a box of caps or a bunch of primers on top of the dynamite.

Old or broken leading wires or connecting wires are prolific sources of misfires and failures to get shots off at the time desired. Breaks inside of the insulation are not easy to detect and cost much more than they are worth.

The waterproofing material on fuses is a compound of various asphalt tars with guttapercha and similar substances. It becomes brittle in cold weather and is liable to run if subject to too high a temperature. It is well worth while to store fuses, at least shortly before their use, at a temperature of between 60 and 80 degrees F.

The paper shell of the dynamite cartridge is sufficient protection against the side spit of the fuse from igniting the dynamite inside the shell. Without this protection the side spit is almost sure to ignite the dynamite, which will burn much more rapidly in a bore hole when strongly confined than it will in the open, sometimes causing the loss of a considerable proportion of the charge, besides giving off poisonous fumes and possibly blowing out the tamping, so that the explosion is ineffective.

The use of modern low-freezing ammonia dynamites has resulted in an immense reduction in the number of accidents, as those explosives are much less sensitive to shock and friction than those in general use twenty years ago.

CHANGES IN EXPLOSIVE HAZARDS

We recommend the use of No. 8 caps in connection with low-grade explosives and at times we meet with a very great opposition to the use of No. 8 caps. The miners tell you that years ago they used Nos. 3 to 5 with good results. Twenty years ago, when dynamite was simply nitroglycerin absorbed in a sort of earth, it was very sensitive and a great many more accidents happened than occur today. The safer modern explosives necessitate a stronger detonator and I have had the question put to me frequently: Why it is that a few years ago we recommended No. 6, especially for grades under 40 per cent powder, and especially the ammonia type, while today we strongly recommend the No. 8 cap? The reason is on account of the relative unsensitiveness of the present day product.

CHAIRMAN TILLSON: We are greatly indebted to Mr. La Motte for this very thorough paper and to Mr. Summer for presenting it so completely. I would suggest that we proceed with the last paper on our program and combine the discussion on both papers. If there is no objection to that course I will ask Mr. P. S. Case of the Union Carbide Company of Niagara Falls to present Mr. Morrison's paper. Some discussion has taken place and one of the questions on which we desire information is the cost of installation and operating of acetylene mine lamps, including amortization of the original cost.

MR. CASE: I am very sorry I am not in a position, on the spur of the moment to give you the information your Chairman desires on the cost of operating mine lamps. I will be very happy, however, to refer this to Mr. Morrison or some one in our organization who can give you the information. I will arrange to get it to anyone interested through correspondence.*

HANDLING AND STORAGE OF CALCIUM CARBIDE

A. CRESSY MORRISON, SECRETARY, INTERNATIONAL ACETYLENE ASSOCIATION, NEW YORK CITY

Mr. Chairman and Members of the National Safety Council: Calcium carbide has, within a generation, attained such universal use that it is now recognized as one of the world's great commodities. Its manufacture, transportation, storage and widespread consumption soon made necessary consideration as to the best method of safeguarding the commodity from the electric furnace in which it is manufactured until it had served its purposes. These problems have been so well solved that calcium carbide is now known to be adequately safeguarded and handled practically without hazard.

In order that the nature of calcium carbide may be fully understood, and the reasons for certain precautions shall be made clear, a brief statement as to the methods of production and the character of the product may well be given consideration.

Calcium carbide is made in the electric furnace from a mixture of lime and coke; the temperature of the electric furnace is said to be approximately 7,000 degrees Fahrenheit. To this temperature the calcium of the lime and the carbon of the coke yield, both becoming fluid and forming a

*(After adournment of the convention the following letter was received: "Union Carbide Company, New York City; B. F. Tillson, Esq., Dear Sir: Our Mr. N. Duffett, who was at the recent National Safety Council Convention at St. Louis, has advised us that you requested some data showing the average daily cost of operating acetylene miners' lamps. We are informed by the Union Carbide Sales Company that the proper charge for the average miners' carbide cap lamp is from one and one-half to one and three-quarters ounces of carbide and sustains a light from two to two and one-quarter hours. The average miner recharges his lamp four times per eight-hour shift and with ordinary care, six to seven ounces of carbide per shift should be ample. The cost per shift of the average miners' carbide lamp, based upon the above figures and the present price of carbide (about 5½c per pound), are as follows: Six ounces per shift, $.0206; seven ounces per shift, $.02406. We trust that this is the information you desire. Very truly yours.
"F. B. MORGAN, Assistant to Works Manager,")

true chemical combination. This combination of calcium and carbon is calcium carbide. The product issues from the electric furnace in a molten state and cools into ingots which are broken in stone crushers into various sizes to meet commercial requirements. This product, which resembles the crushed stone used on roads, is immediately packed in steel drums. The drums have double covers and are air and water tight. The packages are usually 100 pounds each. In this form it becomes merchandise and is shipped everywhere.

NOT SUBJECT TO CHANGES OF TEMPERATURE

A moment's consideration of the method of production of calcium carbide shows that no temperature less than that of the electric furnace will affect it. This immediately answers all questions as to what calcium carbide will do if subjected to temperature. No ordinary fire would have any effect upon it and the drums, which are lock-jointed and made without solder, are designed to resist and do resist fire. The fact that calcium carbide is broken in stone crushers in the process of preparation for market makes it clear that carbide is not affected by concussion or any other violent treatment.

Calcium carbide is the exclusive source of acetylene. Acetylene is a hydro-carbon gas originally used almost exclusively for lighting country homes, but now used in connection with oxygen in the oxy-acetylene blow pipe for welding and cutting metals, in miners' lamps and in many other important industrial fields.

The production of acetylene from calcium carbide can be brought about by one method only—that by bringing water and carbide together. The moment that calcium carbide comes in contact with water the calcium is affected and combines with the oxygen of the water, leaving the hydrogen of the water to combine with the carbon of the carbide. The calcium becomes calcium hydroxide and the carbon and hydrogen become acetylene. The lime has no further activity, this residue being simply slacked lime, but the acetylene is a true hydro-carbon gas which, when ignited, serves its useful purposes with great and in some cases unparalleled efficiency.

Acetylene must be treated with the same care that any other hydrocarbon gas demands. It responds to all the laws of gases but differs in one particular. When acetylene is compressed above fifteen pounds to the square inch its endothermic character becomes manifest and this has been provided for by the well-established methods of compression and special cylinders. The endothermic character of acetylene accounts for the remarkable temperature of the acetylene flame when combined with oxygen, but this does not require discussion in connection with the subject, calcium carbide, now being considered.

As water is the only substance which will produce acetylene from calcium carbide, it therefore becomes apparent that to completely safeguard calcium carbide it is only necessary to keep water away. The first step in the protection of calcium carbide from contact with water is the carefully constructed steel drums. This constitutes a method of packing

which has stood the vicissitudes of transportation, storage and use. The character of these drums, which are of sheet steel, lock-jointed and double covered, does not concern the general public or the user, as no one attempts to manufacture and distribute calcium carbide in the United States without complying with the requirements which assures a rugged package which will withstand all the conditions of transportation on land or sea.

SAFETY IN SHIPMENT

Calcium carbide is shipped in carload lots to the warehouses of the manufacturers, one of which is to be found in practically each of the principal jobbing centers of the country. Over 200 such warehouses exist in the United States in conformity with local regulations as to the storage of calcium carbide in quantity. In addition to these warehouses there are numerous others belonging to jobbers and large users who may purchase in carload lots. The regulations for the storage of calcium carbide, in brief, are perhaps best expressed by the regulations of the Underwriters' Laboratories, which has for many years given the subject careful consideration. The insurance rule is that calcium carbide up to 600 pounds may be treated like other merchandise when kept in its original containers, the same precautions being used to keep calcium carbide dry that are used to keep any other character of merchandise from contact with water. It might be said here that calcium carbide, being packed by the manufacturer in waterproof metal drums, is of itself much better protected from accident than most of the merchandise in any store

Where calcium carbide is to be stored in quantities in excess of 600 pounds the insurance rules require that it should be in a separate building, above grade level, the building to be waterproof and well ventilated. Calcium carbide not being a hazard in itself, its storage with other merchandise is probably objected to only because should fire get in other merchandise or consume the building where a large quantity of calcium carbide was stored, falling merchandise or walls might break open the drums of carbide and water from the fire department might get in contact with it, thereby adding to the conflagration. At this point it might be well to say that should calcium carbide be brought into contact with water in a burning building the resulting acetylene would be instantly ignited by the flame, but there would be no explosion as there could be no accumulation of acetylene. So long as the fire existed acetylene could not exist with it.

The rules of the National Fire Protection Association are as follows:

STORAGE OF NECESSARY CALCIUM CARBIDE

(*a*) Calcium carbide in quantities not to exceed 600 pounds may be stored, when contained in approved metal packages not to exceed 100 pounds each, inside of buildings, provided that the place of storage be dry, waterproof and well ventilated, and also provided that all but one of the packages shall be sealed and the seals shall not be broken so long

as there is carbide in excess of one pound in any other unsealed package in the building.

(*b*) It is recommended that the quantities of carbide permitted under paragraph (*a*) be stored in the generator room and not elsewhere unless a more suitable place can be provided.

(*c*) Calcium carbide in excess of 600 pounds shall be stored in approved metal packages, above ground, in one-story buildings without cellar or basement and used exclusively for the storage of calcium carbide, unless in a specially constructed, outside generator house. Storage buildings shall be constructed to be dry, waterproof and well ventilated, and shall be located outside congested mercantile or manufacturing districts. If storage building is of incombustible construction, it may adjoin other one-story buildings, if separated therefrom by an unpierced fire wall; if detached less than ten feet from such one-story buildings, there shall be no openings in the adjacent sides of either building. If the storage building is of combustible construction, it must not be within twenty feet of other one-story or two-story buildings, nor within thirty feet of other buildings over two stories.

(*d*) Packages must be made of metal of sufficient strength to insure handling without rupture and must be provided with a screw top, or its equivalent. They must be so constructed as to be water and airtight without the use of solder, except at such points as it may be necessary to use this in order to close small crevices which cannot be otherwise sealed. Solder must not be used on joints in such a manner that fire would disrupt the package.

Packages containing calcium carbide must be conspicuously marked "Calcium Carbide—Dangerous If Not Kept Dry."

Where carbide is stored in large quantities in a separate building, in accordance with the regulations, fire cannot originate in the carbide warehouse. If the warehouse is of incombustible construction, that is, presuming it is made of corrugated iron with a cement floor, the building would not catch fire or be in any way affected by a nearby burning building. The storage of calcium carbide in large quantities affects very few people and can be dismissed from the discussion as having been properly safeguarded and experience has shown that where calcium carbide is stored in accordance with insurance regulations there is no danger whatever.

Where calcium carbide is used by the individual it has been found unnecessary to regulate it particularly except for the general direction of "Keep Dry!" Many city ordinances still exist, however, which were originated before the time that calcium carbide came into very general use and was little understood; these are very stringent. Such regulations simply call for excessive caution but should, of course, be complied with so long as they are on the books. The general rule regarding calcium carbide is to keep it in a dry place in the original drums and when a portion of the carbide is removed always to replace the cover. This ordinary use of carbide is so well understood that in the hands of users in the United States nearly 800,000 drums of carbide are to be found at

any moment and experience has demonstrated that there is no danger from this widespread storage. For many years there is no record of the carbide itself originating either a fire or an explosion.

APPLICATION OF ORDINARY COMMON SENSE

The use of calcium carbide as an illuminant in mines, especially in the miner's cap lamp, has reached such extraordinary proportions that it would certainly have demonstrated all dangers which might develop from its use if these dangers really existed. It is generally agreed that calcium carbide should not be carried in quantity into the mine or stored below the ground, and usually the regulations of the various state mine inspectors provide that the residue from the cap lamp must be carried out of the mine. With these precautions the really enormous use of carbide in the mines of the United States has been going on for many years and accidents caused by it have not been recorded. One particular circumstance which caused discussion was a case of several miners keeping their supply of carbide in a quart fruit jar which fell upon some hard substance, scattering the carbide into a puddle of water: the men stooped down with a light to get the carbide out of the water and the acetylene was ignited. The miners all sat down suddenly, much surprised at the result and equally surprised to find themselves unhurt.

The whole subject of the use of calcium carbide in mines reduces itself to the question of the application of ordinary common sense and this applies in other fields where calcium carbide has to be considered. One point in regard to calcium carbide which it may be well to specifically dispose of is the statement which is frequently made that, in view of the fact that calcium carbide will slowly disintegrate in the presence of moist air should it under any circumstances be scattered freely about in the room, warehouse, or in the mine, where it would get in contact with moist air, it would produce acetylene. This would, it is said, gradually accumulate and in the event of some one approaching the spot or entering the room with a light might ignite the acetylene with a resulting explosion. Without going into details as to the experiments which have been conducted it can be made clear to a technical body, like the one to which this paper is addressed, that such a happening is an impossibility. *First*, it requires a certain amount of acetylene mixed with air to form an ignitible mixture; *second*, air only contains a certain amount of water. There is not enough water in air at its highest point of saturation, even with air at a high temperature, to make enough acetylene to ignite. As for the question of accumulation, this is impossible because, should the carbide take from the air all of its water, it could not get any more water until more air was brought to it. In other words, if the carbide has taken up the moisture in the room you have got to get more air in before getting more moisture and if you do that something has to go out and the trace of acetylene would go with it.

When it is considered that in the United States alone there are in transit from one one point to another freight cars to the number of over

500,000 per year containing one or more drums of calcium carbide, and that this substance is to be found in nearly every warehouse and railroad station, has been so found for many years, and no accidents are recorded from this vast movement, the question as to any hazard from calcium carbide in its manufacture, transportation and storage is practically settled. As considered even in its relation to the user, the simple regulations of keeping the drums closed, keeping the carbide in a dry place and not taking a quantity underground or where it is subject to possible flood comes very near to answering all questions as to the danger of its use. The best answer, probably, to any question as to the hazard of any substance is the fact that it has become a commodity of very large use over a sufficient period of time and that the record is free from accidents except where gross carelessness or the combination of the human equation and an unusual concatenation of circumstances have brought about the trouble. The record of calcium carbide as a commodity is enviable, and, granting that the user has common sense, the substance is properly safeguarded.

DISCUSSION

MR. SEIP: Have you had any experience of men complaining of headache arising from the dust due to the handling of carbide?

MR. CASE: I believe it is evident that dust arising from crushing would be greatly in excess of that which might arise from the handling of carbide by the miners. I know from personal experience, extending over a period of years, that headaches do not arise from that cause. If a man inhaled it for a minute he would have to sneeze, but if he inhaled that much lime dust he would also sneeze. It is not the cause of headaches. The men who do the crushing are provided with masks and everything we know of to make them comfortable.

CHAIRMAN TILLSON: The dust of the carbide, if inhaled, would combine with the fluids of the system and produce acetylene gas, would it not?

MR. CASE: Wherever carbide is combined with moisture it produces acetylene. There are many fine points which we might consider at length and if the delegates desire I will be pleased to answer them by personal letter as the Chairman informs us the time is limited for discussion of this subject.

TAMPING TOOLS AND THEIR USES

MR. REESE: I want to take exception to the recommendation that we use nothing but a piece of wood to tamp holes with. That may be all right with dynamite, and it may be all right in rock mining, but in coal mining we konw some things by experience that we may not be able to prove scientifically. The worst explosion that ever occurred in the State of Iowa was caused by blown-out shots. We do not believe a hole can be properly tamped with a wooden tamp bar.

I have charge of the mines of Iowa and Illinois. In Iowa we want a

hole tamped tight; we require, by law, that it be tamped with sand, soil or coal and that it be tamped from the powder clear out to the end of the hole. The reason for that law was the so-called "dust explosion." As a result of this accident the Governor of Iowa appointed a commission to ascertain the cause of such explosions and I was delegated to make an investigation. We found the shot had been so heavy that the powder could not do its work properly. The place of least resistance was the tamping and as this had been done with fine coal dust, and was not very tight, powder exploded into the air and created what is commonly called a "dust explosion." Practically all explosions in non-gaseous mines are the so-called dust explosion—if the hole is not well tamped you are liable to have a blown-out shot. And you can't tamp a hole properly with a wooden stick.

CHAIRMAN TILLSON: It hasn't sufficient weight, I presume.

MR. REESE: Yes, it hasn't sufficient weight. A hole is bored six feet in the coal and a foot and a half or two feet of powder is put in—this is an ordinary condition. In Iowa we shoot with a fuse and the law requires that the hole be tamped solid. I do not believe that you could properly tamp that hole with a wooden tamping bar. We mine all the coal in our Illinois mines with machinery and do not use a very large charge of power. We do not allow our men to use fuses—we make them use "squibs." This prevents a lot of coal fires, as fuses will cause more coal fires than squibs, so in Illinois we use a tamping bar and blasting barrel, with the squib coming through. In Illinois, I think by law, we are required to use four inches of copper on the end of the tamping bar. I do not believe that in coal mining conditions, as we have them in Illinois and Iowa, we would want a regulation or recommendation that our tamping should all be done with a wooden bar. A miner would probably steal his wife's broomstick—that would be just about what they would get for a tamping bar—and you could not properly tamp a hole with a broomstick. The gentleman who prepared the paper was not thinking about our conditions. There have been fewer accidents in tamping shots where proper tamping bars with copper ends were used than when men used their steel drills.

SPECIAL WOODEN TAMPING STICKS

CHAIRMAN TILLSON: The objection is due to lack of weight—you cannot get sufficient force in tamping the material. Could not this be overcome by using a wooden tamping stick counter weighted at the outer end?

MR. REESE: Would it be possible to have a stick strong enough—with a weight on the outer end? Could you get a wooden bar strong enough to stand the "gaff."

CHAIRMAN TILLSON: If the steel bar enters the side of the hole more than four inches back there is a chance of striking the black powder getting a spark.

MR. REESE: Striking a spark is not likely to occur in our case. The powder is put in first, then some tamping is placed very carefully against

the powder and any future spark would not reach the powder. The danger from the spark is when you are putting in your powder, the first thing following the tamping. After that there is no danger from the spark, because if you make a spark it can't get to the powder.

CHAIRMAN TILLSON: Is there any likelihood of getting a little train of powder along the bore of the hole?

MR. REESE: That could happen.

MR. SUMMER: Mr. Reese's remarks are very well put. It is absolutely necessary, to avoid dust or gas explosions, to have the bore hole properly tamped, but I believe you can get adequate tamping with the proper kind of hardwood stick. Mr. Reese, do you have just the end of the bar equipped with a copper ferrule?

MR. REESE: In Iowa we do not require the copper by law; in Illinois we do. About a six-inch copper piece is fitted to the tamping end of the scraper. Sometimes a steel drill has a copper end, but as a rule the butt end of the scraper is equipped with copper.

MR. SUMMER: I believe a good hickory stick, with the end squared off, would provide sufficient means for tamping. I do not quite get the idea of the counterweight. That would be a good plan if it was necessary, but the average fellow that is loading powder has plenty of energy stored up in his arm to ram it home. Coal dust is not good tamping.

CHAIRMAN TILLSON: After the nominating of officers we will continue the discussion. The Nominating Committee will now report.

REPORT OF NOMINATING COMMITTEE

MR. HALL: Your Nominating Committee met yesterday and considered the matter of nominations most carefully. They really did desire to make a change in the personnel, for there are many objections to a continuance of the same persons in office, year after year. It is always well to make changes. The committee wanted to put a coal man in the chair because they thought it was well that a coal man should alternate with a metal man. They also desired to put in a Western man in place of an Eastern man, if that were possible, but as they looked around and tried to find somebody who could replace Mr. Tillson with any degree of satisfaction, to find a man who was so placed that he would be able to render an equal service, and who would be equally generous in rendering it, it became more and more apparent that Mr. Tillson, and only Mr. Tillson, was the right man for the position.

As for Mr. Shearman, he is our present efficient Secretary. He told us just now that he had served only three months. I was inclined to think his tenure of office was longer than that. However, he served through the close of the executive year and we are proud to say that owing to his energetic work ours is the only Section which has printed its proceedings in advance. He managed to induce the authors to get their papers in early, and they are printed in a very creditable shape. This happy consummation is due largely, I believe, to the energy of Mr. Shearman. And, as Mr. Shearman is closely affiliated with Mr. Tillson, it seems to

us best that the two should work together, as they have worked so well in the past.

We have put two metal men on the committee, and it seemed advisable, of course, to put some coal men on. The Nominating Committee favored for the First Vice Presidency, Mr. H. G. Davis. Mr. Davis is not here this morning, but I may say, and Mr. Tillson will back me in that statement, that Mr. Davis of the Lehigh & Wilkesbarre Coal Company has been extremely faithful in attending the meetings of the Executive Committee of this Section.

As Second Vice President we nominate Mr. Charles W. Goodale. Mr. Goodale has refused to serve as President. Our last suggestion is Mr. Moorshead of the Madison Coal Corporation. We have named a metal man for President, a metal man as Secretary, an anthracite coal man, Mr. Davis; a metal man, Mr. Charles Goodale, and a bituminous coal operator, Mr. A. J. Moorshead, as the officers of the Section.

MR. REESE: I move that the recommendations of the Nominating Committee be adopted. (Motion seconded and carried.)

PLANS FOR THE NEW YEAR

CHAIRMAN TILLSON: I appreciate the honor very greatly. I have tried to do all that I could to help the work of the Section and would have preferred to retire in favor of another man, as I do not consider it wise to maintain men in office for a long period of time. However, I will do my best for the Section. I thank you for your consideration.

We wish to make the program for next year a success and if the delegates present will suggest subjects of papers your officers will be deeply appreciative. The Secretary will receive suggestions at this time or later by letter. Please give this matter your earnest consideration.

DISCUSSION OF GENERAL SUBJECTS

In the discussion earlier in the day Mr. Summer mentioned No. 8 caps. I would like to inquire whether he ever personally conducted tests with lead blocks or aluminum plates relative to the force of the detonation of No. 6 and No. 8 caps? My experience, in a great many tests, is that the force develops from the end of the cap in the line of the axis and is not superior in a No. 8 cap over a No. 6. I spent, for the company, a great many hundreds of dollars buying No. 8 caps, over a long period of time, before I discovered that very little fact. I kept after the manufacturers and they finally granted my contention in one instance.

MR. SUMMER: I have not personally conducted such tests. My work has been confined to practical application in metal mines. I have tried to seek out some tangible data on tests of that kind, showing the relative strengths. Of course, the rated strength and the actual amount of fulminate of mercury in a No. 8 is just twice what is contained in a No. 6 cap and you would expect twice as much force. In practical use we recommend No. 8 caps with low-grade powders of certain quantities—for instance in powder holes where there are, perhaps, four or five pounds of

explosive—say, six, eight or ten cartridges. It is pretty hard to get practicable tests to determine whether a No. 8 cap will give you better execution than a No. 6. Personally, I have been unable to detect it. In places where they chamber their bore holes, in the Joplin mines, for instance, they use twenty-five pounds of powder in one bore hole and there is no question about their getting a very complete detonation and better results from a No. 8 cap than a No. 6, because in places where we found unexploded powder in the bottom of the bore holes—especially with a No. 6—we had to change the brand of powder. We used a No. 8 and failed to find that condition. I would say we have a more complete detonation in large quantities of explosives than with the No. 6.

CHAIRMAN TILLSON: Would the cap be in the chambered portion of the bore hole?

MR. SUMMER: It would be just about at the outer extremity of the pocket.

CHAIRMAN TILLSON: The tests indicated, in the little experience I have had, that the cap laid upon its side will produce a much greater effect in a No. 8 cap, but the force exerted longitudinally, from the end of the cap, we could not detect to be any greater than a No. 6, so that if the cap in a chambered hole was down within the chamber the force of the detonation was exerted sideways as well as through the bottom, and the effect would be far greater with a No. 8 than it would with a No. 6. The common test is to mount the cap on its end in a small steel frame—at one time a lead plate cut to a certain size was used. An aluminum plate of a certain thickness seems to be, if anything, a slight improvement. Detonating of the cap will form a crater in the plate and the size of the crater, or the depth it has punctured the plate, indicates the relative, not quantitatively, but qualitatively, the difference in the force diverted in that direction. Another test made in finding fine points was to find how much of a hole in a wooden block would be made by the detonation of caps laid on it sideways. A No. 8 cap would cause a larger crater than a No. 6. We have never had any trouble with the detonation of 40 to 55 per cent low-freezing ammonia dynamites with No. 6 caps.

LOADING BORE HOLES

MR. SUMMER: What is the average quantity for loading your bore holes?

CHAIRMAN TILLSON: Probably one to five eight-inch sticks of dynamite in the hole.

MR. SUMMER: Personally I have not determined where the outer line is; I have not been able to determine it—it is not tangible. I have conferred with Mr. La Motte on the subject and tried to get at the point where we recommend No. 6 and where No. 8.

CHAIRMAN TILLSON: There is one other condition: The larger caps are very often more difficult, I think, for the men to put in the sticks of dynamite and in priming the stick of powder.

MR. SUMMER: That holds true if they are priming from the side. If they are priming from the end there is very little difference.

CHAIRMAN TILLSON: We got into a controversy over one of the bulletins issued by the Chicago office on the proper priming of explosives. That bulletin was issued relative to the practice of one of the big Southwestern copper mines, in which they particularly urged the placing of the detonator with one stick of powder in the bottom of the hole and loading their sticks of dynamite upon it. That is claimed by them to have been the decision of their foremen. That bulletin was issued and exception was taken to it by some of the Bureau of Mines men and others throughout the country. It was referred to me after it got to the controversial state and I could only express my opinion by saying that I thought the bulletin was wrong—I had not seen it until it had been issued. The Bureau of Mines claimed that if the hole was too deep it would not detonate properly from the primer at the top of the hole. The mine industry that issued the original bulletin claimed that when they placed the primer in the bottom of the hole there was no danger of powder being left in the bottom of the holes. Some of the exponents opposed this method of putting the primer in the bottom of the hole, claiming it tended to distribute the powder in the muck pile by some of it being blown out of the collar of the hole unexploded, thus providing a source of danger. In South Africa, I have been advised, they had considerable trouble at one time because of powder being left in the bottom of the holes. It was the practice to investigate the holes after firing the rounds and to block with wooden blocks of a special color, so that the miner could not avoid seeing where the danger existed and to keep him from drilling into that "boot leg" in subsequent holes. I think that the copper men, who have made a practice of putting the primer in the bottom of the hole, believe that it is all right for their miners to deepen the bottom of an old hole, but I do not want to be positive on that.

PLACING OF PRIMER

MR. SEIP: It does not seem advisable to me that the primer should be placed at the bottom of the hole nor at the top of the charge. It would seem that you would get a more even detonation if the primer was placed as near the center of the charge as possible—you would get equal detonation in both directions, thus making it more likely that the entire charge would explode at one time.

CHAIRMAN TILLSON: Mr. La Motte has spoken of the likelihood of the fuse igniting the powder when it passes down by the sticks of explosive. In the cases of electric blasting, of course, the objection is not well taken, except by the possible abrasion of the insulation of the wires by having powder tamped upon them and thus permitting a short circuit; in which case the hole would probably not be fired at all.

MR. SUMMER: In electric blasting I would say that the danger of igniting the powder would be very remote. In blasting with cap and fuse, I think, the chief point of the detonator of the primer being on the last cartridge in the hole is that you avoid the danger of igniting your charge; also the chance of unexploded cartridges being scattered into the work and being a source of danger. These are two very strong points, I think,

for the detonator being inserted at the top. If you have an opportunity to make a test you will find a considerable side spit in the ordinary brands of fuses in use today.

In reference to the bulletin giving the practice of the copper company in placing the detonator at the bottom of the hole: It appears to me that might be one place where a stronger detonator might have solved the difficulty. By using No 8. caps, they have gotten rid of that condition —unexploded powder at the bottom of the hole. The grade or type of powder would make a difference in this practice.

CHAIRMAN TILLSON: I think it was 60 per cent dynamite.

USE OF TAMPING MATERIAL

MR. COOK: We have followed, to a great extent, the practice of putting, the detonator toward the bottom of the hole, but not because the powder did not explode. In our work the first hole going will perhaps break upon a slip and possibly cut out three or four other holes—taking the detonator out of them. The detonators then explode in union; this leaves two or three holes with powder at the bottom, with even chances of exploding the detonator.

I would like to ask the experience of metal men in getting miners to tamp holes. A Butte foreman answered by saying: "Oh, hell; our boys tamp with powder."

MR. BOERICKE: In Wisconsin, when they want to bore some ground, the usual practice is known as "squibbing" or "chambering" your hole with a couple of sticks of powder. They give it a chance to cool and then put in nine or ten sticks—that usually brings it up within a foot or two of the collar. I am talking about a two-inch hole. The primer is then put in; after that they usually wedge in a couple or more sticks of powder. A little clay or fine muck is then thrown on top of the powder and wedged home with a good tamping bar.

We use No. 8 squibs exclusively, but we found it was impossible to get the miners to follow the recommendations of the Bureau of Mines when priming. They poke a hole through the cartridge, lace it through once and then stick a cap into one of the cartridges. Would that make a No. 8 cap act better than a No. 6?

MR. SUMMER: The full effect of the increased strength of the detonator does not necessarily come from the force that is produced through the end of the cap. These caps are very nearly of the same caliber and in making these tests, as Mr. Tillson has stated, the test on the side showed a much greater effect for the No. 8 than the No. 6. In the initial detonation that takes place, the spit—the velocity of detonation—using No. 8 caps with the same dynamite. will be the greater and the explosive wave that is produced will be correspondingly greater through the whole mass and really comes from the increased velocity of the primer cartridge. While granting what Mr. Tillson says is true, it may be the effect of the No. 8 cap, regardless of the position, because of the increased detonation of the primer cartridge.

MR. RICHARDSON: In Butte we are doing something in tamping by the use of flotation slime.

PROFESSOR RAYMOND: In Arizona we are using clay tamping. We find clay better than anything in the nature of sand. It is put up in boxes and handed the miners by the powder man, so there can be no question about their having it. We find that clay is very much more effective than the best sand. The miners put the slime in paper bags and provide the proper preparation in the mine.

MR. SUMMER: To soften the clay water is used and to a certain extent makes an oil surface. Wouldn't it be more effective to have dry holes?

CHAIRMAN TILLSON: Mr. Williams, Manager of the Accident Prevention Division of the National Safety Council is deeply interested in the preparation of *Safe Practices* pamphlets. Mr. Williams, will you please explain the plan of the Council regarding this matter.

SAFE PRACTICES PAMPHLETS

MR. WILLIAMS: The National Safety Council proposes to issue a series of Sectional *Safe Practices* pamphlets—the detail work to be done by the headquarters office, under the supervision of the Sectional officers. One such pamphlet has already been printed for distribution to the members of the Paper and Pulp Section. We assumed at first that the Mining Section did not need much attention from us because the field had been covered by the Bureau of Mines—but some of your officers thought otherwise. So we should like to find out what your pleasure is. The head quarters' staff is limited; we cannot get out more than one book for a Section—and we cannot do anything without assistance from you. We shall have to get the original information from you, and then we shall have to send our draft to you for criticism. Please tell us what we should first cover; how many pamphlets we should attempt to issue eventually and on what subjects; whether we should ignore certain subjects as having been covered by the Bureau of Mines, or whether we should attempt eventually to cover the whole field of mining, and if so, in what way our pamphlets should differ from the publications of the Bureau of Mines.

MR. THATCHER: I think the discussion of the last two or three days shows a decided need for *Safe Practices* leaflets. If one pamphlet is prepared we could see how it worked out and arrange for elaboration later.

CHAIRMAN TILLSON: Professor Raymond, do you think the Bureau of Mines covers the field?

PROFESSOR RAYMOND: I do not think they do. The pamphlets would help train the foreigners we are forced to employ in the mines.

MR. WILLIAMS: Of course, you know I am not talking about bulletins or posters. There pamphlets are intended for the superintendent, the foreman and the safety engineer, to give them the methods others are using.

MR. HALL: Certain information has not been covered by the Bureau of Mines. Gasoline locomotives and the possibility of asphyxiation from gasoline fumes has been covered more completely than the National Safety Council would be able to do it; also explosions which might result

from sparking electric locomotives. The Bureau of Mines has covered many subjects very well and they are experimenting with others which they will cover later.

CHAIRMAN TILLSON: Hoisting ropes has not been covered at all.

A PAMPHLET ON TRANSPORTATION

MR. WILLIAMS: Am I to accept, as the sense of the meeting, that you agree with Mr. Hall and the others that we should do something along this line? All right. Then assuming we could give you one pamphlet during the next twelve months—I wouldn't like to promise more than that, because there are others more pressing—would you like to have one pamphlet on haulage ropes?

MR. COOK: The question of haulage is causing trouble in the metal mines—the handling of cars and their operation.

CHAIRMAN TILLSON: That question could be well considered under the head of transportation. From the face to the point of dumping would take in haulage on the level, the slope and the shaft: it would include cars and means of hauling, whether by rope, locomotive or otherwise to the shaft; hoisting, etc.

MR. WILLIAMS: Do you think we could develop one pamphlet on transportation, or some subdivision of transportation, that would apply to both coal and metal mining?

A MEMBER: The hazards are pretty much the same—the space between the cars, lack of clearance, men keeping off the tops of the cars, etc. The same class of injuries are produced in coal as in metal mining. Hoisting equipment, cages and other appliances are much the same.

MR. SEIP: The first pamphlet might well be confined to haulage on the level, rather than an attempt to take in the complete subject. We could then make a comparison between metal and coal mines on one subject without reading a library on matters of transportation.

HAULAGE ON THE LEVEL

MR. HALL: One difficulty would be that haulage on the level includes quite a little that is not germane to haulage alone. I think if we were to take up the question of mine car accidents we would come nearer to it. At the dumps we have a lot of accidents, due to cars bumping into one another: the means by which we prevent these accidents are the means which we would use when we are hauling on the level, and sometimes when we have the same accidents without any hauling.

MR. NELMS: I think Mr. Hall's point is very well taken. I would like to see the mine car accident record brought to the attention of the companies.

CHAIRMAN TILLSON: We will try to get out one pamphlet; it can be elaborated on later.

A PROGRESSIVE SECTION

MR. MASON: The Pittsburg delegation wishes me to express their thanks to the Chairman and Secretary for the splendid way this meeting

has been handled. The digest of proceedings has done much to expedite the meetings and the Mining Section stands for real efficiency, as well as safety. I think all the members present join in this sentiment.

CHAIRMAN TILLSON: I hope the delegates present will give the officers a full measure of co-operation during the year—that is what counts in safety work. The more you help the better the Section. I thank you.

The meeting then adjourned.

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