



PROCEEDINGS
of the
National Safety Council

*SIXTH ANNUAL
SAFETY CONGRESS*

Held at the
HOTEL ASTOR
New York City
September 10, 11, 12, 13 and 14, 1917

The National Safety Council

This is the day and age of progressive co-operation—a time when men are realizing, more than ever before, their individual obligation to society. This is demonstrated by a great revival of interest in civics, sociology, and philanthropy, and nowhere is it taking more definite form than in the crusade for accident prevention. The slogan Safety First is becoming as familiar as a folk story; it is spreading like wildfire, and the industries, railroads, public service corporations and national and state organizations are intently studying the problem.

A wonderful co-operation is apparent from this Book of Proceedings of the Sixth Annual Congress of the National Safety Council; it establishes a landmark in the progress of safety. To gather together one hundred and fifty-seven speakers and over fifteen hundred executives and safety engineers to discuss the various practical problems and to discover ways and means of lessening accidents is an accomplishment in itself justifying the organization and operative idea in the Council.

In spite of the war, safety enthusiasts and hardworking business men in the varied activities represented by the Sections have enabled the officers of the Council to produce this book. It will take place in all parts of the world as the last word in expression of methods for saving life and limb.

The Executive Committee of the Council, after mature deliberation, decided to issue the proceedings of the various Sections in pamphlet form. The volume of general proceedings will be sent to each member, together with a copy of the Sectional pamphlet directed to him.

member; however, copies of other Sectional pamphlets may be secured upon request. They are as follows:

Automotive,	Marine and Navigation,
Car Builders,	Mining,
Chemical,	Paper and Pulp,
Electric Street Railway,	Public Utilities,
Foundry,	Railroad,
Governmental,	Textile,
Iron and Steel,	Woodworking.

The general index has been prepared with great care. It is included at the end of the book of general proceedings and of each Sectional pamphlet.

To economize space the generous applause rewarding the thought and effort of the speakers has been omitted, except during the patriotic banquet session.

The Council thanks each contributor for his splendid co-operation in making the Sixth Annual Safety Congress a success and for drawing upon his store of knowledge and experience to the benefit of the entire membership.

THE EXECUTIVE COMMITTEE.

Chicago, Ill., Nov. 27, 1917.

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1. The first part of the document is a list of names and addresses of the members of the committee.

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National Safety Council

Business Meeting

New York City

Sept. 11, 1917

LEW R. PALMER, President, Presiding Officer

TUESDAY MORNING SESSION

THE meeting was called to order by Mr. Lew R. Palmer, the President, shortly after 10 a. m.

PRESIDENT PALMER: *Ladies and Gentlemen:* Dr. Hillis, being called away from the city unexpectedly, we will ask our past-President, Mr. Arthur T. Morey, to open our 1917 Congress with prayer.

INVOCATION.

MR. ARTHUR T. MOREY, COMMONWEALTH STEEL COMPANY,
GRANITE CITY, ILL.

Our Great Father, we thank Thee for all Thou art, and what Thou has meant to this great Safety movement. We ask Thy blessing on this assembly, and that Thy wisdom only may guide its deliberations and purposes; and, oh God, may all men everywhere so know and understand Thy love, that they see clearly that they are their brothers' keepers; so knowing and understanding the fact of God that they manifest the brotherhood of man; may all men and all nations come to see that carelessness and negligence and accidents, that injustice and selfishness and strife and war are not of Thy

will, but that under Thy government is only justice and safety and good for all men, and that only Thy law, national and international, can bring "that peace that passeth understanding"; and may Thou give strength and wisdom to these men who are leading the safety movement, to these men leading other men; to these men leading nations; that their leadership may be sought; that all men will be safe; and that all men will be free. Amen.

PRESIDENT PALMER: The first order of business is the address of welcome. Mr. Marcus A. Dow, of our Local Council.

ADDRESS OF WELCOME.

MARCUS A. DOW, GENERAL SAFETY AGENT, NEW YORK CENTRAL LINES.

Ladies and Gentlemen of the 1917 Annual Congress of the National Safety Council—In welcoming you here, I feel as though I ought to begin by apologizing on behalf of the New York Local for not having done more for your entertainment while you are here. However, it was decided by your Executive Committee, and I think wisely, in view of the serious condition of our national affairs at this time, that any effort toward special entertainment should be abandoned. Therefore, we have done nothing in the way of preparing an elaborate program of entertainment. However, we are none the less delighted to have you with us.

New York is a wonderful city and I doubt very much if even our very energetic Entertainment Committee could have prepared a program of entertainment that would in any way compete with the many attractions you will find surrounding you. For instance, within ten minutes' walk of this hotel are located forty-five first-class theaters, not including those exclusively devoted to moving pictures. New York has more high buildings and more torn up streets than any city in the world.

A friend of mine recently remarked that torn up streets was a sign of progress, but to my own certain knowledge New York City has for the past ten years been in a continuous state of progressive upheaval.

I am particularly glad to welcome the ladies. They will find a paradise of department stores, such as they have never pictured even in their most wonderful dreams. The weather man has prom-

ised to give us good weather, so I think that even with our hands tied we can promise you a fairly pleasant week.

It seems quite fitting that you should gather here in the shadow of the Statue of Liberty, that symbol of justice and freedom, because your work is essentially in the interest of justice and freedom from accidents. I think, perhaps, that in some respects this Congress will be one of the most important you have ever held, because of the inestimable value your work can be at this time to the Nation in its hour of need.

A few days ago, over on our principal thoroughfare, we listened for hours to the incessant tramp of feet of thousands of soldiers, New York's vanguard of that valiant army, marching on its way to defend the principles of justice to humanity for all the world. Today you are gathered here and will soon go forth as the representatives of another great army, pledged also to uphold the principles of justice to humanity in the field of industry. It seems to me that your great duty at this time should be to inspire and to encourage the great industrial army of America to put forth its best efforts to win the war that is being waged for the freedom of humanity from the yoke of oppression and suffering.

Let me urge upon you that you do not let your enthusiasm, your determination, your sincerity of purpose, terminate with the sessions of this Congress. May you return to your various fields of endeavor and put into practical operation the many methods for human betterment and increased efficiency in our industries which will be developed in your meetings.

In conclusion, about the only thing I can say is that I congratulate you upon the splendid achievements you have made and I urge you to a renewed effort in your noble and lofty work. We welcome you to New York with a sincerity that springs from 'way down deep in the heart, and I am sure that the sentiment which every member of the New York Local would have me express to you is contained in a few lines which tell of the "Glad-to-see-you" feeling:

The glad-to-see-you treatment is great for human ills,
'Tis better than prescriptions and a multitude of pills
Today a man may grumble, and feel downcast and blue,
The glad-to-see-you treatment will make him smile anew.
A man may feel depressed, resolved to quit the fight,
Your smile and "glad-to-see-you" may cheer and set him right.

So if through life you carry this cheerful phrase with you it is a certainty that the angels will be glad to see you, too.

COMMITTEE OF INSPECTORS OF ELECTION.

PRESIDENT PALMER: I know that I voice the sentiment of our members in thanking Mr. Dow for this hearty welcome.

There is a quorum present and unless there is objection we will dispense with the roll call. The first order of business is the appointment of a Committee of Inspectors of Election.

SECRETARY CAMERON: H. B. Adams, V. R. Currie, and H. L. Gannett.

PRESIDENT PALMER: Will you kindly confer with the Secretary in preparing the list of proxies?

ANNUAL ADDRESS OF PRESIDENT.

LEW R. PALMER, PENNSYLVANIA DEPARTMENT OF LABOR AND
INDUSTRY, PRESIDENT.

He is a slave who fears to speak
For the fallen and weak;
He is a slave who fears to be,
Though in the right,
Counted with two or three.

—Lowell.

Ladies and Gentlemen, Fellow Members: Again we are met to rededicate ourselves to the fulfillment of the high purpose for which our Council was organized.

A year ago, at Detroit, we added to our list of executive officials the office of General Manager. The wisdom of that act, and of the selection made, is, to my mind, borne out by the results attained which have been recorded in the splendid report of W. H. Cameron.

Last year we referred with pride to the rapid growth of our Council in the few years of its existence.

Today we learn that, even under extraordinary conditions, with our Nation shaken from coast to coast by events of world-wide importance, we have made a new record, 68 per cent increase in membership.

This is indeed an achievement of which we may well be proud, and your President and your Executive Committee join with you in congratulating Mr. Cameron and our loyal office force, who, during the past year, have so successfully promoted the cause of universal safety.

TRULY, THIS IS WORK WELL DONE.

It will be entirely fitting on this, the fifth, anniversary of the birth of a great national movement, to pause for a moment and look back upon our starting point, and to pay tribute to some few of the strong men who have assisted in making possible the success we thus far enjoy.

DR. EDWIN A. STEINER,

Whose eloquent prayer brought our Council into existence, spoke not only as a minister, but as a man raised from the ranks of labor, thus symbolizing both the spirit and the body. Well may we repeat from that prayer today:

"May our consideration of the safety of labor and the toiler be rewarded by a higher respect for humanity as a whole, a greater regard for law, a purer and deeper and higher patriotism, and may this great country continue to be the beacon to the world, lighting toward liberty and toward progress. May the work of this Congress be a contribution toward that end."

Thus was laid the cornerstone of a national institution, its emblem the white cross of universal safety.

Those who met together for the first time at Milwaukee, in 1912, will long remember that tower of strength among the pioneers who have blazed the trail for safety—our first honorary member—Dr. Joseph A. Holmes.

A kindly, noble spirit; a heart as big as the broad country he traveled for the cause he loved.

Since then he "has solved that great mystery—the exchange of worlds."

May we never forget to cherish his memory as one who—like the Master he served so well—gave himself for the good of man.

Among the many inspiring messages that launched our Council on its voyage of progress is recorded one whose theme stands as the theme of the Council:

WE ARE OUR BROTHER'S KEEPER.

All who have been associated with the early development of our organization, from the laying of the cornerstone to the formation

of its well-developed foundation as we see it today, will recognize the author as the man who stood at the helm in 1914-15, and with that rare tact, perfect poise and constructive genius of a born leader, guided the affairs of our Council with such thoughtful—yes prayerful—consideration that the success of today was in a large measure made possible.

TO R. W. CAMPBELL

We, as an organization, owe much, and we, as individuals, who have been privileged to work with him, have found a friendship that will live long in the hearts of his co-workers, inspired by his devotion to our common cause and to the higher ideals of which our work is but an expression.

ARTHUR T. MOREY

Bore the presidential mantle as could few others; his splendid work is of today, and none question the high place his masterly, brotherly effort deserves.

Great as has been the work done by these men, it would have gone for naught had they not enjoyed the support of the entire membership.

Professing the brotherhood of man—our emblem symbolizing unselfish service—quite naturally the administration of the affairs of the Council has been developed along democratic lines.

Last year the Chairmen of the various Sections into which our Council is divided—who are elected *directly* by the members—were made a part of your Executive Committee, it being our purpose in this way to bring the governing body into close contact with the individual member, thus insuring democratic administration.

SO MUCH FOR THE PAST. WHAT OF THE FUTURE?

Great as has been our development in the past, far greater is the promise of the future.

Only a *brief* outline is permitted me, but these few facts should be presented.

Industrial Safety.

Sixteen thousand individual representatives on the firing line.
Five million safety bulletins for 5,000,000 workers.

Willing hands; generous hearts; giving time, thought and money toward the protection of our ever increasing industrial army now in the trenches of labor.

These stand today the safeguard of our Nation, and on their loyal service depends the success of our Allied armies at the front, fighting our fight for humanity—for world democracy.

Public Safety.

Sixty thousand preventable deaths.

Against this appalling slaughter and the millions of serious accidents resulting from like causes—that only adds to our shame.

Let us interpose an organization equipped to educate against this *crime of carelessness*.

Train the child in the way he should go, and he will not depart from it.—Proverbs 22-6.

The lips of the righteous feed many, but fools die for want of wisdom.—Proverbs 10-21.

Marine Safety.

Uncharted, unfathomed, unlimited in possibilities.

Organized Labor.

As a whole still unorganized for safety.

One would be short-sighted indeed if in this field alone he did not recognize a work well worth a lifetime of devotion.

As we see it also, safety is but the entering wedge whereby a better understanding can be developed between the employer and the employe. With it must come a frank discussion of one vital problem, the solution of which works for their mutual benefit.

Having found that the co-operative plan really works for the good of all in this one instance, does it not stand to reason that the circle of application will grow, become larger and larger until, through faith in each other, the contending forces will be led out of the wilderness of strife and misunderstanding into the promised land of industrial peace—made a fact through a square deal for all?

International Safety.

Universal safety walks hand in hand with universal peace, attained only through co-operative effort; by meeting our problems, national and international. "WITH MALICE TOWARD NONE, WITH CHARITY FOR ALL."

REPORTS OF OFFICERS AND COMMITTEES.

PRESIDENT PALMER: Mr. Secretary, may we call upon you for the report and disposal of unapproved minutes.

SECRETARY CAMERON: The minutes of the last annual meeting are contained in a volume of 1,543 pages. (Laughter.)

CAPTAIN WILLIAM P. WHITE: I move that the reading be dispensed with.

PRESIDENT PALMER: I think the motion is quite in order. Do I hear a seconder? (Seconded.) The motion is carried. The first report we have is from the Secretary-Treasurer.

THE SECRETARY-TREASURER: Mr. Chairman and gentlemen, you have already received the annual report of the Secretary and Treasurer. There is very little to add to it. I am required by the by-laws of the Council to make a supplementary report.

REPORT OF THE SECRETARY.

WILLIAM H. CAMERON, SECRETARY.

CHICAGO, ILL., Aug. 1, 1917.—*To the Members of the National Safety Council—Gentlemen:* The Council has grown prodigiously during the past year—the membership has increased *sixty-eight per cent!* You may admit that we have been successful in building up a great membership, but have we lived up to every opportunity of rendering maximum service to the manifold interests represented in the Council? Have we contributed our utmost toward a better civilization; have we done our work in furthering the Democratic idea in industry? Are we accomplishing our mission—the promotion of the welfare and happiness of the human race?

The lessening of the number of accidents cannot be brought about without such a result following inevitably. When the attitude of employers and employes towards Safety is right, both will co-operate for the elimination of accidents. Recognizing this truth, you have worked hard throughout the year to establish safe conditions of employment and safe practices. Because of the slight increase in the number of accidents reported in 1916, as compared with the 1915 record, some of you may have become discouraged; but when last year's results are compared with 1906, and the abnormal labor situation and the extraordinary pressure and turmoil of business are taken into consideration, there is ample reason for encouragement.

The industries will never permit a return of the old careless attitude toward accidents. With three thousand three hundred members of the Council working day in and day out on the Safety problem, higher standards are being established for the protection of the life and health of the workers, and fewer lives will be lost and few cripples burden humanity. Today the United States, through its organized activities for Safety, is leading the world. The lesson has been learned that it is possible to stop many accidents and thus contribute toward the welfare of the individual and of the Nation.

THE RECORD FOR 1916-17.

The Council is four years old, and in these few years has built up a membership equal to many of our best known National Associations. My third annual report showed the membership to be 2,120; 1,447 members have been added during the year—an increase of 68 per cent; 274 members, for various reasons, have not renewed their memberships, or have been dropped from the records, leaving the total membership, as of July 31, 1917, 3,293, with over 15,400 representatives and 4,500,000 workmen.

The financial statement will show the income from dues to have been some \$77,000 for the year. Every bill and obligation is fully paid, and we have a surplus of cash and unpaid dues of over \$7,000. You are to be congratulated that we thus close a fiscal year of large accomplishments without a penny of indebtedness and with a moderate balance to our credit—all done on dues of members for services rendered and without contributions of any nature. The income for the first seven months of the calendar year, 1917, would indicate that the income for the year will amount to one hundred thousand dollars.

The Council's receipts have been large, but it must be remembered that it started without capital, and that it has to build its organization and facilities for doing work solely out of its income. Starting with a single salaried official, your Council's staff has been steadily increased until now it numbers twenty. The National headquarters have been moved three times to get the increased facilities needed.

One of the important accomplishments during the year has been the establishment by this organization of facilities to properly and promptly meet your requirements for service, and today the Council is in a position to respond to almost any demand made upon it. The National Safety Council is ————

body of business men, and neither the war nor any other contingency can interrupt its splendid work for humanity.

Unceasing efforts have been devoted to the planning of economy of administration, and it is important that you should remember that in spite of the large increase in the cost of every item comprising the service, as well as the concomitant increase in salaries, the Council's service has been augmented and improved without an additional cent of dues. Had the cost of materials this year been the same as in 1915 (when the present dues were fixed), service could have been considerably augmented and would also have assured that reserve your Executive Committee believes it necessary to provide for emergencies and contingencies.

THE COUNCIL'S ACTIVITIES.

The bulletin service has been maintained every week. The bulletins have been greatly improved and are all now printed in two colors. The large-sized bulletins have been popular and the number of extra copies have averaged fifty thousand per month. The Sectional series have been increased and improved. Over five million of these bulletins have been mailed during the year, and they are not only teaching our American members, but our service reaches one hundred and fifty members residing in nine foreign countries.

The Council's information bureau and library has been doubled in size. It is believed by some of your far-seeing Executive Committeemen that the ultimate destiny of the Council is to train its members to come to our headquarters for the collective experience of the world on accident prevention and welfare subjects. We are working with this end in view.

The Fifth Annual Safety Congress was attended by over twenty-one hundred representatives of the Council. For the first time a splendid commercial exhibit was provided in a separate building and the result demonstrated the value of giving the world an exhibition of the latest developments in Safety devices. The proceedings of the Congress were published in a volume of 1,543 pages, at a cost of over \$5,000.

Eleven Local Councils were organized or reorganized during the year, as well as two State Councils. Thirty-three of these State and Local Organizations have now been established. Mr. C. W. Price entered the Council's service as its Field Secretary, September 1 last, and has demonstrated the needfulness of organized local efforts

to discuss ways and means of preventing accidents. Plans are being made to add another Field Secretary to the staff of the Council and to give increased Safety service in field work next year.

The various Sectional and Local Council officers and committeemen are entitled to unqualified praise for the enthusiastic and practical manner in which they have organized their work, including the preparation of bulletins, Safe Practices pamphlets, meetings, etc., and for planning their part of the annual Congress to be held in New York next September.

When the United States entered the war, your officers and Executive Committee immediately offered the services of the Council to the Council of National Defense. Your President, Mr. L. R. Palmer, has made dozens of trips to Washington, and has taken the leadership in preparing plans for assisting the Government in supervising the Safety of workmen in its plants during the war. Out of these activities there came a request from the United States Employees Compensation Commission for skilled aid in directing and supervising Safety surveys in all of the Government Navy Yards and Arsenals. Mr. Price entered the Commission's service May 15 for this purpose and expects to complete his work within a few weeks. Too much praise cannot be given to members who met every request for supplying, free of expense to the Government, the services of their engineers and assistants to make these surveys, and demonstrate to the Army and Navy Departments that organized Safety work must be established in all of their plants.

The new Danger Emblem approved by you at the Fifth Annual Congress has grown in popularity, and your officers have fostered a growing interest in a thorough trial of its merits.

SAFE PRACTICES.

The Safe Practices Committee has done valiant work; you have already received six of the Safe Practices pamphlets on the subjects of "Ladders," "Stairs and Stairways," "Boiler-Rooms," "Crane Construction and Safe Practices," "Belt Shifters and Belt Chippers," and "Knots, Bends, Hitches and Slings." Six additional pamphlets are now in process, and from this time forth it is hoped there will be no interruption in the regular distribution month by month of one of these pamphlets. They form the most comprehensive and practical presentation of information upon the subjects treated yet extant in the United States. Special and traveling exhibits; safety

meetings in the plants of members; Fire and Accident Prevention Day; the constant promotion of the sale of the "Sure Pop" book; the work of the new Committee to promote Safety education in the schools; and the dozens of other specific activities pushed forward by the Council, day in and day out, justify the need for a National Clearing House of Information. These activities also warrant the steady co-operative effort by the members of the Council to learn how to prevent accidents, to educate Safety Committees and the public as to the real facts connected with needless accidents, and to propagate continuously the Safety idea and make it an integral part of American life and a growing influence in foreign countries.

Your Executive Committee and Officers believe that the Council is organized upon a sound economic principle—that it is "good business" to provide to a large body of employers the bulletins and other publications they must have to educate managers, superintendents, foremen and workmen, as to accident causes and remedies. So long as the work of the Council proceeds along practical lines there seems to be no limit to the service it can render to members on all aspects of the human relation to industry. Plans for future work will keep pace with the opportunities presented.

Too much praise could not be given to the hundreds of splendid men who are doing so much constructive work quietly, yet effectively, upon Committees of the Council, and only through this and other co-operative work is it possible to provide the service you have received. Many of our members have also loyally helped us in the getting of new memberships, and in the supplying of photographs, ideas, etc., for our Bulletin Service.

Occasionally someone says, "So many men are being killed in the war that I haven't courage to continue my Safety work." Surely this is an illogical, poor-spirited attitude towards our great public and industrial accident problem. The lamentable truth that millions of men are being killed and maimed in the war is an added reason why we should try to reduce the tens of thousands of accident casualties in America.

Every existing social agency in our country must work more productively and more comprehensively than ever before to stop the needless waste of life and limb. Let us co-operate to double our membership next year and to establish beyond the shadow of a doubt the principle of maintaining safety in the industries, safety in the homes and safety in public places.

FINANCIAL STATEMENT.

STATEMENT OF RECEIPTS AND DISBURSEMENTS FOR THE YEAR ENDED
JULY 31, 1917.*Receipts:*

Membership dues:

Active\$69,321.16

Associate 1,285.42

\$70,606.58

Less refund of dues..... 307.12 \$70,299.46

Sales of pamphlets, bulletins,
books and miscellaneous re-
ceipts

6,291.05

Loans: Amounts borrowed
from banks and officers for
current expenses.....\$ 5,750.00

Less repaid..... 5,750.00

Cash balance Aug. 1, 1916:

On hand.....\$ 102.36

In bank..... 2,006.70 2,109.06 \$78,699.57

Disbursements:

Salaries of General Manager, Assistant

Secretary and office staff.....\$21,976.47

Office printing, stationery and supplies.... 2,351.89

Office furniture and equipment..... 1,740.67

Postage 2,630.48

Rent of general office.....,..... 2,695.00

Traveling expense..... 2,063.61

Telephone and telegraph..... 872.69

General office expense..... 1,658.61

Membership solicitation expense..... 3,914.76

National committee work..... 307.35

Traveling safety exhibits..... 36.17

Advance on account of survey in connection
with United States Employees' Compen-
sation Commission.....

500.00

Expenses of various Local Councils,..... 6,276.72

Sixth Safety Congress

Expenses connected with distribution of	
"Sure Pop" book.....	193.05
"Safe Practices" pamphlets.....	1,002.22
Annual Congress expense.....	8,054.45
Weekly bulletin service.....	17,195.80
Sectional activity expense (including print- ing bulletins, pamphlets, etc.)	3,747.80

Cash Balance July 31, 1917:

Cash on hand.....	\$	202.36		
Cash in bank.....		1,279.47	1,481.83	\$78,699.57

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.

DELOITTE, PLENDER, GRIFFITHS & Co.,
Chicago, Aug. 14, 1917. Accountants and Auditors.

PRESIDENT PALMER: We will call upon the Chairman of the Finance Committee for his report.

REPORT OF THE FINANCE COMMITTEE.

Mr. Chairman and Members of the National Safety Council:
On behalf of your Finance Committee I again congratulate you on the continued growth of your Council and upon its financial record for the fiscal year ending July 31, 1917. To have convinced and enthused over thirty-four hundred industries, railroads, insurance companies, associations and individuals of the merits and needs for organized accident prevention work within the short period of less than four years, is a masterly accomplishment; and to have financed the Council's activities upon the principle of giving full measure of service for the annual dues paid has set a new and commendable standard for co-operative associations. Not the least interesting result is the proof that the collective method for exchanging ideas, experiences and information in a great business and educational project, such as the Council's, is both wise and productive.

Your Council is demonstrating to the industries and to the people of America and the world that business men will generously support

an association when it is conducted upon the principle of giving full value in service and relies upon the merit and value of this service for its support.

Above everything else, you are to be commended for the indubitable proof that you are increasingly interested in your responsibilities for the conservation and preservation of every human life entrusted to your care. You are not permitting the rigors of war to lessen your efforts to preserve every man and woman in your employ from accidental injury, and it seems to me that your realization of the efficiencies and economies resulting from your Safety efforts is one of the important developments of business methods during the past decade.

ANALYSIS OF FINANCIAL CONDITION.

We have taken a glimpse of the general results of the work of the Council; now let us analyze the present financial condition of your organization. The Secretary and Treasurer's report shows an increase of 68 per cent in membership and 60 per cent in income, and that the income of the Council was \$7,000.00 more than the amount anticipated by our last annual report. The headquarters of the Council have been moved to larger offices and the facilities have been built up out of our income, and today the offices and staff are so well organized that we may safely assume that the Council is equipped to perform its tasks at the average rate of increase per year. It is also true that our direct service, in the form of publications, has been standardized, increased and improved, and I believe that it will be further improved.

These are very pleasant and encouraging statements, yet while we are congratulating ourselves on our remarkable success we think your attention should be sharply directed to the following facts:

(1) Although the total income for the fiscal year approximated \$77,000.00 the cash balance was less than \$1,500.00. As of July 31 there was some \$4,000.00 outstanding in unpaid dues (this is about the present average indebtedness to the Council from month to month). A large percentage of this amount will eventually reach our treasury. A further item shows \$3,000.00 worth of bulletins on hand for future distribution. After writing off a liberal amount for depreciation of office furniture and equipment we believe \$2,500.00 is a fair amount to charge to assets for this equipment. The several accounts enumerated total \$7,000.00 and may be accounted as follows:

(2) Happily the Council has not been hampered in the orderly conduct of its affairs by fire or other disasters (of course, we carry fire insurance) and neither illness nor important changes in the working staff has interfered with maximum production in service day by day, so I can repeat what I have said to you in previous reports, viz.: That every good business principle of economy has been exercised in the expenditure of our income, and each department of the service has been developed and managed upon a budget approved by the Executive Committee from the amount set apart and in most instances carefully adhered to.

(3) We must, therefore, look upon our financial condition as of July 31, 1917, to mean that we have assets in memberships of over \$70,000.00 and \$1,500.00 of cash assets in the bank, with a probable expenditure of \$87,000.00 to carry on only the activities and service now maintained. The only warrant the officers have for continuing a program of enterprise, initiative and progress is the renewals of membership dues and income from new memberships. In other words, no funds except such small excess of new membership dues as may be received would seem to be available for financing the increasing need for expansion in industrial and public Safety work in the field and augmenting the production of publications through the engineering and editorial staffs at headquarters.

(4) It will be apparent to every business man and every executive that the Council should have a larger working capital with which to finance the new educational projects agreed upon from time to time, and to establish upon a stronger commercial basis the large expenditures it must make from time to time to maintain and improve the weekly bulletin and other publication services. Last year the Council undertook an obligation of possibly \$8,000.00, to be paid throughout the year, to increase the service in one specific line without having a cent of money on hand at the time to make certain its fulfillment. While increases in memberships and renewals of existing memberships enabled the Officers to pay every obligation, we feel the time has come when you should meet the increasing expenses and needs of the Council and enable your Officers to increase and improve the service by building up a surplus which will warrant it in continuing a progressive, though conservative, progress, and not relying in the future solely upon prospective income.

(5) When you remember the value of the Council's definite weekly, monthly and other services for each \$5.00 of membership dues and that the authorized \$5.00 horizontal increase in dues was

put into effect in the spring of 1915, and take into consideration that the cost of materials and other items has increased 100 to 300 per cent, it seems to me that as progressive business men you should be willing to pay a slight increase in the dues to assure your Officers that financial support of which they stand in such great need in conducting and managing your service.

INCREASE OF DUES.

An increase of 50 per cent in each of the various classifications of membership would mean very little to each member, but upon the present basis of membership alone the Council's income would be increased approximately \$29,000.00. The fixed expenses and organized activity of the Council warrant your Finance Committee in stating that \$20,000.00 to \$25,000.00 in cash should be on hand to finance new projects; to meet current bills in those months of the year when the income is lightest, and to capitalize the new and expanding projects which are coming to the Council every month. Your Executive Committee is submitting to your Board of Directors a recommendation that such an increase in the amount of dues in all classes of membership with a corresponding increase in the unit basis of service be effected by appropriate amendment to the By-Laws to be effective upon all new memberships and the renewals of all memberships expiring after such amendment, and it recommends that you consider the service rendered in the past, the assurance of an expanded and improved service, and the obligations of the Council which lie ahead of it, and approve such increase in dues if in the judgment of the Board of Directors it should be deemed advisable.

We have every reason to be optimistic. The Accident Prevention Movement fostered by the Council has stood the test of a pressure put upon shop managers and superintendents such as never before experienced in the history of industry, and, in spite of a slight slackening of effort here and there, your Committee believes that organized educational and technical Safety work has now become an integral part of the operation of factories!

The time will soon come when every community will have its organized Safety department to care for the lives and health of every citizen, and five years from now we should have 15,000 industries on our membership roll and 100 Local Councils where we have but one local today.

Let us all pledge ourselves to express our patriotism in the preservation of the lives of the men who are fighting the battle for

as well as those who are fighting for world-wide Democracy in the trenches!

R. W. CAMPBELL, Chairman,
A. T. MOREY,
H. W. FORSTER,
Members Finance Committee.

PRESIDENT PALMER: You have heard the report from the Finance Committee. What is your pleasure?

MR. J. M. EATON (Cadillac Motor Car Company): I move the adoption of the report.

The motion was seconded by Mr. Rosseland.

PRESIDENT PALMER: All in favor of the motion as stated will signify by the usual sign. Contrary, "No." It is so ordered. We will now hear the report of the Program Committee.

REPORT OF CHAIRMAN PROGRAM COMMITTEE.

The Chairman of the Annual Congress Program Committee, Mr. W. H. Cameron, called the attention of the attendants at the meeting to the fact that the second edition of the program should be used by everyone present; that they are especially urged to attend the Safety Exposition in the Grand Central Palace and to visit the American Museum of Safety's headquarters; that all those expecting to attend the dinner should buy tickets at once at the reservation desk; furthermore, to make the Congress a success, every member should plan to attend the meetings, take part therein and get the advantages which accrue by participating in the discussions.

PRESIDENT PALMER: May we now hear from the Chairman of the Resolutions Committee, Mr. Morey.

REPORT OF THE RESOLUTIONS COMMITTEE.

ARTHUR T. MOREY, COMMONWEALTH STEEL COMPANY, CHAIRMAN.

Mr. Chairman: If in order, at this time, I will offer a resolution that the By-Laws be so amended that the Chairmen of the Divisions enumerated under the proper headings become ex-officio members of the Executive Committee. The verbiage of the changes in the By-Laws to meet that end to be under the supervision of the Executive Committee.

PRESIDENT PALMER: I accept that as a motion.

CAPTAIN WHITE: I second the motion.

PRESIDENT PALMER: Are you ready for the question?

MR. R. C. RICHARDS: I would like to ask a question, if I may. If this resolution is carried, what becomes of the auxiliary Sections? For instance, the Transportation Section, in which I am chiefly interested: Shall we remain a part of the Section which takes in railroads, public utilities, and industries of that kind? Is it intended, under the resolution, to have an auxiliary Section for each of those classes, with a chairman and secretary, the same as we have now?

MR. MOREY: Yes, sir. The autonomous nature of the Sections will be maintained and any Sections that are now organized will retain their functions.

MR. R. C. RICHARDS: The only difference in the Sections is the reduction of the number on the Executive Committee?

MR. A. T. MOREY: No, Mr. Richards; each Sectional Chairman will be an ex-officio member of the Executive Committee, just as he is now. The reason for this suggestion is that heretofore we left the way open for the formation of any number of Sections, and there was a tendency to form a lot of very small ones that should have been grouped.

MR. R. C. RICHARDS: Instead of having eight or ten members of the Executive Committee from the different Sections you will have four or five?

SECRETARY CAMERON: No; that is not the purpose of the change.

MR. A. T. MOREY: There will be, I think, nineteen Chairmen of Sections and Divisions, and all will be members of the Executive Committee. This will give representation on our Executive Committee to each classification of members.

PRESIDENT PALMER: It will increase the total number of our Executive Committee from twenty-nine to thirty-four. We have effected a re-grouping and the consolidation of one or two of the separate Sections into one stronger and larger Section. Each Division, or as it is called today, each Section, will have its own officer, and the Chairman will be a member, as stated, of the Executive Committee. It is simply a broadening of the bureaucratic idea that we are trying to maintain.

MR. R. C. RICHARDS: I did not understand the resolution in that way when it was read. I thought you meant the other system.

PRESIDENT PALMER: No, sir.

formation of a Section of Manufacturers of Safety Appliances, or would that come under the heading of Miscellaneous Manufacturers?

PRESIDENT PALMER: My judgment would say it does not include any Division that shows a size or a spirit sufficient to maintain a living working organization.

SCOPE OF NEW PLAN OF ORGANIZATION.

MR. SHEPPARD: What becomes of the present officers—are they absorbed?

PRESIDENT PALMER: I do not know that I would so express it—absorbed. I am most friendly to the Foundry Section and to the Iron and Steel Section. That was one of the places where we thought a combination would be stronger than the two separate parts.

MR. W. H. CAMERON: I have this one thought to add to your consideration of the question: It is very largely a paper proposition, fundamentally outlining various Sectional activities that we now approve, but if the commercial men shall so desire, they can appear before the Board of Directors, who also have the power of providing for the creation of a Commercial Section. The plan is to group our activities under the five general heads our actual work has developed—Industrial, Transportation and Public Service, Public Safety, Governmental, and Health and Industrial Relations. The plan does not deprive any existing Section of representation on the Executive Committee; in fact, it provides for four or five additional Sections, not as yet organized, but which, when organized, will have representation on the committee.

Chairmen of the several Divisions not divided into Sections in the proposed amendment to the By-Laws will become members of the Executive Committee, the same as our present Sectional Chairmen. The thought has been included, however, of providing for Sectional or Divisional organizations, under which the Chairmen of the several Sections in the Industrial Division, let us say, will meet and organize a divisional committee, which will attempt to co-ordinate industrial activities, and, if possible, aid the General Manager and Secretary in carrying out industrial work. The same plan will be attempted in the Division of Transportation, four Sections will elect one of their number, probably one of their Chairmen, to be Chairman of the Division; he to attempt co-ordination in their work and produce mutual harmony. Our object is greater co-operation in fields of activity which are allied and which have common purpose. I hope the motion will prevail.

PRESIDENT PALMER: Are you ready for the question? All in favor of the motion will indicate by the usual sign. Carried unanimously. It is so ordered.

MR. ARTHUR T. MOREY: Mr. Chairman, may I offer, on behalf of the Resolutions Committee and of our convention and members, a resolution conveying to our Entertainment Committee and to our Committee on Arrangements our appreciation and thanks for their thoughtfulness as to our comfort and convenience while in New York City? I offer it as a resolution.

PRESIDENT PALMER: I think we will not be fulfilling our duty if we do not include it among our resolutions. You have heard the resolution. Do you accept it as a motion? If so, do I hear a seconder? (Seconded.) All in favor of the motion as stated will indicate by the usual sign. Carried unanimously. Next is the report of the Safe Practices Committee. May we hear from the Chairman?

REPORT OF SAFE PRACTICES COMMITTEE.

R. J. YOUNG, ILLINOIS STEEL COMPANY, CHAIRMAN.

Mr. Chairman and Members of the National Safety Council: In presenting the annual report of the Safe Practices Committee we believe we can justly chronicle the success of one phase of activity of the National Safety Council. During the twelve months an organization devoted to compiling and reviewing Safety literature in the form of Safe Practice pamphlets has reached at least a fair stage of efficiency.

Seven numbers of the leaflet have been issued since the Detroit Convention. Topics covered embrace "Ladders," "Stairs and Stairways," "Boiler-Rooms," "Crane Construction and Safe Practices," "Belt Shifters and Belt Shippers," "Knots, Bends, Hitches and Slings," and "Belts and Belt Guards." Other numbers are in course of preparation and will reach members at stated intervals.

PREPARATION OF SAFE PRACTICES PAMPHLETS.

In the preparation of the series the Committee wishes to give credit to the large number of Safety Engineers composing the Conference Committee on Safe Practices, as well as the Committee of Review. Before any leaflet is issued a mimeograph copy is submitted to a widely-scattered group of experts for criticism.

the idea being to secure the viewpoint of many men in various industries located in every section of the country.

The original drafts are prepared in the office of the General Manager and the library of the Council and experience files of our members are freely drawn upon to provide foundations for the leaflets. From this point the manuscript is given careful consideration and a first revision by a voluntary group of Safety Engineers located in or near the headquarters city. After this preliminary work the corrected and revised draft is forwarded to a Committee of Fifty and suggestions and criticisms requested.

Returns from the general committee are tabulated, checked and incorporated in a second revision in the National headquarters and the new draft forwarded the Committee of Review for final revision and approval.

This method, while somewhat slow in operation, insures accuracy of detail and clarity of expression, and has been found to be a splendid method of securing the educative experience and information of many Safety Engineers. To the more than half-hundred Safety men who have so generously contributed of their time and effort to insure the success of the pamphlets the Safe Practices Committee wishes to extend the thanks and appreciation of the Council.

NO ATTEMPT TO FIX DEFINITE STANDARDS.

No attempt has been made to fix definite standards. Standard text books on the subject of accident prevention have been quoted quite freely, and State laws have been drawn upon liberally, to obtain minimum requirements in the several sections of our country. Experience tables of members of the Council have proven an invaluable fund of information on many subjects and from this source it is proposed to base many pamphlets in the future.

QUESTIONNAIRES.

A new departure in the work is suggested in a more frequent use of questionnaires containing one topic only and this sub-divided into two or three simple sub-topics. It is proposed to issue experience mimeograph leaflets based on these questionnaires, and, as the subject takes form, to unify the combined topical and sub-topical experience questionnaires into Safe Practices pamphlets. In this manner an increasing amount of original research and amalgamation of localized activities will be welded into well-conceived and, we hope, pamphlets of increasing interest and value.

One of the problems which confronted the committee during the year has been the most acceptable presentation of the data contained in the Safe Practices pamphlets. Engineers and highly specialized technicians prefer very limited descriptions of guards and an abbreviated form of general instructive methods, together with blue prints or tracings, while Safety Committeemen and, in some instances, plant executives, indicate a preference for colloquial expressions and a minimum of technical phrasing.

The committee would appreciate an expression of opinion from the delegates in attendance on the Congress as to their views on this important subject. Who reads the Safe Practice pamphlets? Are they, or should they be, placed in the hands of others than Safety Engineers and plant executives? Is the time opportune in industry to offer to the man on the job the educational subjects treated in this branch of the Council's activities?

FORM OF PUBLICATION.

If the pamphlets are limited to technical phrasing and descriptions your committee is of the opinion that the Council will fall short of its mission, and, while ready and anxious to accede to the wishes of the majority, the committee would prefer to continue the popular form of presentation found in many of the pamphlets so far issued. In fact, if a change is desired, the committee would suggest an ever closer adherence to the vernacular of the shops and work places and a simplicity of phrasing and presentation which would attract workmen possessed of even a grammar school education.

The committee is quite clear in its opinion that the wealth of technical papers and handbooks within reach of our graduates of engineering courses, but which are closed by their intensive presentation to the men in the shops, might well be supplemented by the National Safety Council in the Safe Practice pamphlets for work-a-day accident prevention activity.

The committee would appreciate a thorough discussion of this important matter.

As the work progresses several of the subjects covered in the present series will be reviewed and additional data recorded and forwarded for incorporation in the Safe Practice files. As time develops the idea and intensive study clarifies the study of accident prevention, the committee feels that the encyclopedic work of the

service of the Safety Engineers and plant executives of industrial America.

PRESIDENT PALMER: You have read the report. What is your pleasure?

MR. J. C. SMITH: I think it is only proper and fitting that the Congress should go on record as expressing a vote of thanks to the Safe Practices Committee for the fine and very valuable contributions they have made to safety literature during the past year. I do not know of anything that has ever been done by the Council that has had a greater effect or has been more valuable to the cause of accident prevention than the Safe Practices Committee pamphlets. I wish to offer a motion that we give a vote of thanks to the committee. (Seconded.)

PRESIDENT PALMER: All in favor of the motion will indicate by the usual sign. Carried unanimously. They certainly deserve it.

MR. W. H. CAMERON: The committee asks a definite expression from the Council as to the form of presentation of the pamphlets. For the purpose of answering the question I move that the report of the committee be received and approved and their recommendation that the present form of the Safe Practices leaflet be adhered to be indorsed.

CAPTAIN WHITE: I second the motion.

PRESIDENT PALMER: All those in favor of the motion indicate by the usual sign. Carried unanimously.

SECRETARY CAMERON: Will each gentleman please announce his name and company?

PRESIDENT PALMER: As Chairman of the Industrial Preparedness Committee I will submit a brief verbal report.

INDUSTRIAL PREPAREDNESS COMMITTEE.

At a special meeting of the Directors on March 19 resolutions were unanimously adopted offering the services of our organization to the Federal Government and several members of the committee were appointed to meet with the Council of National Defense. Later we were referred to the Labor Committee of the Advisory Commission to the Council of National Defense and your President was appointed Chairman of the National Committee of Industrial Safety. We have co-operated in every possible way with the representatives of the Federal Government in helping promote their national war program. Coincident with this came an offer or a request from a

new branch of the Federal Government, the United States Employees' Compensation Commission, and in response to the request we have assisted in organizing a safety campaign throughout the Federal establishments of the United States. The details of this work will be given a place in the latter part of our program.

The survey was promoted in closest co-operation with the National Museum of Safety, and I think, when you hear the details of the work, you will agree that it was one of the best pieces of safety work accomplished in this country. Recently we have been asked to develop certain safety standards, to be utilized in connection with the work of the Council of National Defense. We have been called upon to appoint a number of the Council in each of the states. I will close by saying that we hope to continue to progress with our work of co-operation.

I understand from the Secretary there is no report from the Committee on Statistics of Industrial Accidents and Hygiene. I know we are co-operating with the national organization that has this matter in hand.

The Danger Emblem Committee, Mr. Chandler.

DANGER SIGNS AND EMBLEMS.

W. L. CHANDLER, DODGE MANUFACTURING COMPANY, CHAIRMAN.

Mr. Chairman and Members of the National Safety Council: Occasionally some one overlooks the difference between a *danger sign* and a *danger emblem*, and for that reason it seems desirable to consider their separate functions.

A *danger sign*, to be most effective, should indicate clearly the nature or the source of the danger, and, if possible, should suggest means of avoiding injury. If a sign can be so worded as to insure the desired action on the part of the person reading it, so much the better. A *danger emblem*, on the other hand, is used merely to call attention to the sign and indicates that it is a *danger sign*.

In planning a *danger sign* four points should be striven for, as follows:

1. To attract attention.
2. To arouse interest in the subject.
3. To create a desire to avoid mishap, and
4. To secure action toward that end.

Attracting Attention.

There are many ways of attracting attention. We may station a man at the sign to ask passers-by to stop and read it, we may install a bell or some mechanical device to catch the ear or eye, or we may add to the sign some symbol, emblem, or other design which will be sufficiently striking to catch the eye of those who would otherwise fail to see the sign.

If a man was stationed at the sign, he would, perhaps, say to passers-by: "Danger! Read this sign and do as it tells you!" A phonograph would be made to say something similar, a bell would arouse curiosity or serve as a reminder, as the case might be. When a design or emblem is resorted to, it should be selected with a view of approaching as nearly as possible the effect of stationing a man on the job.

The design should be such that, when seen by any one, after it has become generally known, it will bring into his subconscious mind the impulse to hesitate long enough to read the sign and then to act accordingly. If some emblem should be adopted to always indicate a raise in wages, any sign bearing that emblem would be read by all. The danger emblem must similarly attract attention to danger signs.

In order that the design may accomplish this to the best advantage, it should be so distinctive as to be at once recognized by every one, no matter of what nationality, as emblematic of danger and as indicating a need for caution.

No such design is now recognized the world over and in order that our emblem may become so known and accepted, it must be advertised as such. It will take time and effort, but the emblem will eventually become known universally if proper measures are adopted as soon as conditions are ripe.

An example of similar kind is found in the red cross. It is now quite generally recognized in civilized countries as the emblem of the Red Cross organization.

When our danger emblem is universally adopted, our labor forces will eventually come to us with a knowledge of the danger emblem, so that danger signs will be at once recognized as such. Can you imagine any greater relief for the safety men, and for the foreigner? I have here two Japanese books which show clearly that the universal Danger Emblem of the National Safety Council has invaded Japan. The emblem appears in small size on nearly every page.

Our emblem should, in time, mean only one thing and exactly the same thing to the people of all lands, and, owing to the confusion of tongues, it, like the red cross, should not attempt to carry any words in its make-up; otherwise it cannot become universal.

During the education period, it will be necessary to instruct the public in the meaning of the emblem—methods for accomplishing this will be shown later.

TESTING COLORS.

In connection with the emblem, it has been suggested that I very briefly repeat for the benefit of those who did not see them at that time the more important experiments shown last year at Detroit, when the emblem was adopted. The experiments at that time consumed one and three-quarter hours; I now have but a few minutes in which to tell the story, so I will be very brief.

The first experiment is that of testing colors. We will now extinguish all the lights in the room and while it is dark Mr. Van Derhoef, a member of the Danger Emblem Committee, will uncover eight twelve-inch squares of colored paper.

We will now gradually illuminate these colored squares and ask you to make note of the relative amounts of illumination required to see the various colors. Can you see any of them while the room is dark?

Now the lights are on full again. It is seen that the colors range as follows: White, yellow, orange, pink, green, light blue, red and dark blue. You probably noticed that white stands out very much more prominently than any other color. The squares are all absolutely of the same size. Note the value of hanging them by the corners.

Red required more illumination than any color shown except dark blue. In fact, some careful tests have indicated that yellow requires about three times as much light as white, and red requires five times as much as white to give equal visibility to the average eye. Out of doors, red is visible, on the average, nine hours a day, while white may be distinguished throughout the twenty-four hours through most of the year. Did you ever notice that you can always see a pair of white shoes no matter how dark it is?

Colored squares were placed in the sandblast room of the Dodge Manufacturing Company and allowed to remain there for several months. The handles of a truck were painted in red, yellow and

all colors, but that white was the only one which seemed to possess the power to show itself with any degree of success through these coatings.

Some one might question the importance of selecting colors which show best in the dark and through dust or grease. If a danger emblem is to be so favorably situated that it will always be well illuminated, and never become dust covered or greasy, any colors will answer. However, we should plan a sign which will give us the greatest effectiveness, not only under ideal conditions, but under all conditions which may be met.

When the emblem becomes universally used, it will be found in poorly lighted shops, outdoors where the moon is the only source of light, in mines, and in many other unfavorable situations.

If white has so much more value, it seems quite wise to adopt it as our major color. As a background black has no value of itself, but serves very well to show off the white. The space occupied by the black is wasted except as it serves to create a design in the white.

SHAPE OF THE EMBLEM.

In the corridor are shown nine different shapes, all made as large as could be cut from sheets twelve inches square.

It is not possible here to show clearly the values of these shapes with varying lights, but the apparatus used at the plant for testing them enabled us to measure the amount of light needed to make them visible and to determine the shape which best caught the eye of the average individual.

The shapes consist of a ball or disc, an oval, a buzz saw, with teeth of different sizes; a star, two crosses, one hung in a natural position, the other hung in an unnatural position; two diamonds with long axes horizontal and vertical, respectively; a triangle standing on its apex; two squares, one with its edges horizontal and vertical, the other hung by the corner. These are all cut from white bristol board.

It was found that the diamond, with axis vertical, the triangle on its apex, or in fact in any other unnatural position, and the square hung by the corner made very much the best showings. The diamond has been shown by many other investigators to attract much more attention when its long axis is vertical than when it is horizontal. Those who were at Detroit saw this clearly and the others have seen it in the corridor. We abandoned the diamond because its area or surface is too limited for the amount of space occupied.

Each reduction of a diagonal of a square to form a diamond reduces the area proportionately and area is a mighty valuable asset. The square hung by the corner consists of two or more triangles and proved by far to be the most effective of the shapes in which to show off the white color.

In the corridor also are shown, along with the adopted emblem, eighteen designs which were tried and later abandoned. One hundred and twenty-six designs have been tried in all. We cannot dwell on these, but suffice it to say that the skull and cross-bones was abandoned in favor of the red ball, because the grewsomeness of the former could not be eliminated.

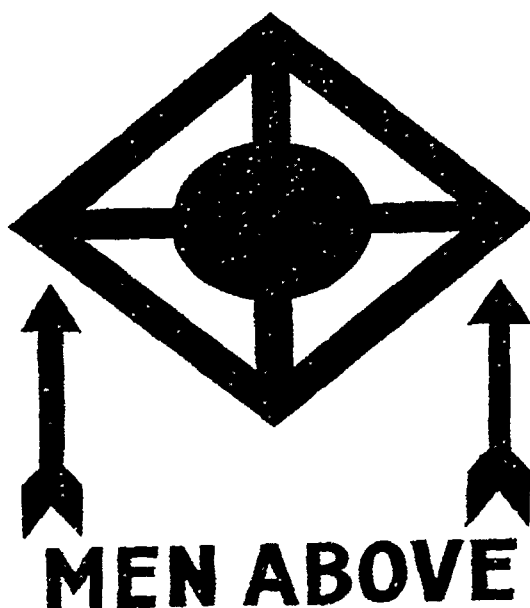
EMBODYING THE ESSENTIAL REQUIREMENTS.

Now we shall darken the room and then show the red ball on different backgrounds. As the light increases, you notice that you see some backgrounds, apparently with holes in them, before you see others. Notice particularly, on one of the middle samples, that black forms a very poor background. Red or black would neither of them be seen at dusk, so that in a danger emblem red and black should be widely separated and a considerable area of a highly contrasting color, such as white, interposed.

Eliminating many of our conclusions on account of lack of time, we come to the final design adopted at the Detroit Congress. Being an arbitrary design, it is possible to ask why it should not have been drawn in some other way. It could have been made in several thousands of other forms, but your committee, after two years' deliberations and several weeks of steady work, including a report of progress made to your Philadelphia Congress and careful consideration given to every suggestion received, finally selected this one as, in its judgment, embodying the essential requirements of a danger or cau-



Ball in Center of Danger Emblems



Ball in Center of Danger Emblems
Is Always in Red



favorable lighting conditions, but under all conditions.

It embodies white in the form of a square hung by one corner, as the principal color, also the red ball and enough black to break the square up into four triangles, all of which are in unusual positions. The white portions form what might be considered as a combination of the Pattee and St. Andrew crosses. A white cross seems particularly appropriate in the work of the National Safety Council. The result is a design which is not apt to be found in use for decorative or other purposes, thus minimizing the chances of confusion.

During the educational or advertising period, the word "Danger" will help in popularizing the emblem. However, no one language is sufficient. Ultimately, it will be unnecessary to use the word danger with it. Rather than to put any word or words on the emblem itself, and, in our eyes, detract from it, we recommend that the word "Danger!" in any four languages be placed outside the emblem near its four sides, as will be shown later.

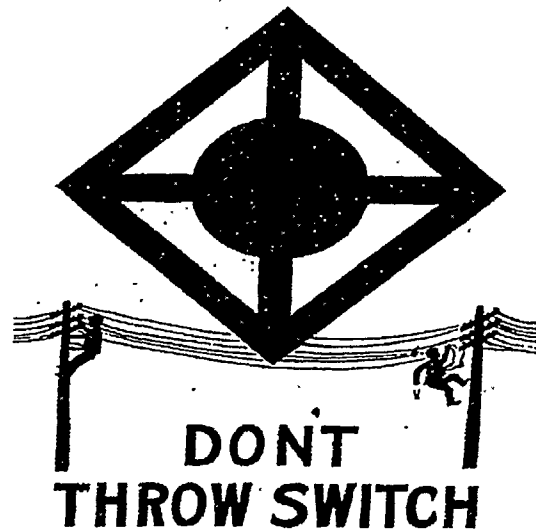
SIZE OF THE EMBLEM.

The size of the emblem required to attract attention to a specific sign depends upon the nature of the sign and the conditions under which it is to be used.

To attract the attention of automobilists on highways, we need emblems of large size, compared to the size of emblems needed to catch the eyes of pedestrians. Where an emblem six inches square may be suitable for pedestrians, it might need to be twenty-four inches on a road sign.

On the other hand, the sign on which that twenty-four-inch emblem is used may need to be five or ten feet wide, to afford sufficient space for lettering of sufficient size to be read on the fly. Instead of making the emblem the full width of such a sign, as advocated by some, it will save space and be much more artistic to place the emblem in one corner and put the lettering on the balance of the sign.

The brain may be unfavorably influenced by the sight of an emblem out of proportion to the needs of the circumstances. Personally, I feel that it is desirable to use smaller sizes of emblems on signs such as "No Smoking!" "No Admittance!" "No Trespassing!" "Stop Machinery Before Oiling!" etc., than on those indicating "Explosives!" "High Voltage!" "Men Above!" etc. I am opposed to filling a shop with danger emblems, especially if they are of large size, to the point where men ignore them all because they see them all about them



Ball in Center of Danger Emblems
Is Always in Red ..

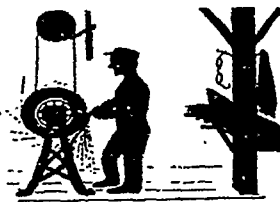


Ball in Center of Danger Emblems
Is Always in Red

AROUSING INTEREST AND CREAT-
ING DESIRE.



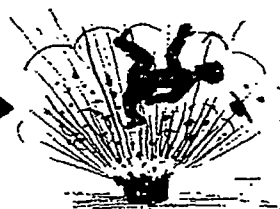
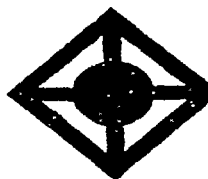
NO ADMITTANCE



WEAR GOGGLES



NO CLEARANCE



EXPLOSIVES

Here is a job for an advertising man; in fact, in the matter of danger signs generally, it is more important to save a finger or a life now and then than to save a dollar in the first cost of the sign. Men experienced in advertising, particularly billboard advertising, should be able to offer valuable suggestions.

Time will not permit a lengthy discussion of the subject which would be necessary in order to be of any real value, but for those not already viewing the matter from a standpoint of salesmanship, I recommend that they consider the question from that angle. Perhaps some of the exhibitors may have some interest along these lines.

SECURING ACTION.

The elimination of the negative in favor of the positive has done much in the direction of securing action of the desired kind. I have seen some signs which tended to bewilder rather than to calm a man in the presence of danger.

I have in mind one sign embracing a danger emblem, and underneath it an arrow. There is nothing to explain what the danger is or whether the arrow points to danger or to safety. A man seeing the sign must stop and look around in order to find

out what the danger is. Some other signs tell what not to do rather than to indicate the action desired.

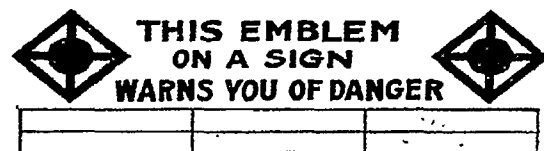
Making signs readily intelligible to foreigners is one powerful means of securing action, and if the sign suggests or indicates the desired action, so much the better. In order that we may appreciate the situation of the foreigner in America, suppose we went to Poland to work. The safety instructor might show us a number of signs and explain what they meant. About all we would remember of the Polish word for danger is that it contains seventeen letters all jumbled together (NIEBEZPIECZENSTWO). Another word with three less letters means safety, and so on through various and numerous signs, until our minds would become one maze of bewilderment.

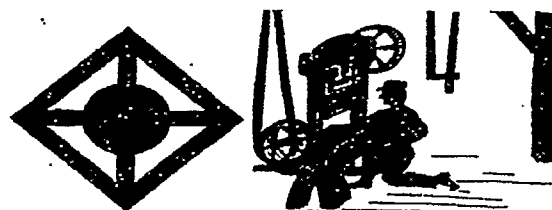
We can help the foreigner we strive to protect by adopting signs which tell him the story of the danger in pictures.

EDUCATIONAL SIGNS.

Let us first show him an educational sign which embraces one or two small emblems, with the wording in English, and also in his own language, using the phrase: "This emblem on a sign warns you of danger." I consider it a mistake to show him an

Ball in Center of Danger Emblems
Is Always in Red





DON'T START MACHINE

riety of danger emblems with the word "Danger" on the emblems in his own and other languages, because it means confusion. Show him only the emblem you are using and the one he will encounter, and then help him to understand that the one emblem means danger.

The best way to impress a man is through his eyes. He sees the emblem and has it associated on the first sign you show him with the idea of danger. Help him to get that embedded in his subconscious mind.

To illustrate my idea of using pictures more clearly, I submit thirteen suggestions for signs, prepared with the painstaking assistance of Captain L. E. Willes, a member of the Danger Emblem Committee. I shall ask you to imagine the word "Danger" in four languages surrounding the emblem on each sign, provided you feel that until the emblem becomes more universally known it is desirable to remind your men of the significance of the emblem. I feel that the educational sign just shown will do the work admirably and that it is sufficient. On the next sign I have shown the word "Danger" in four languages, but it happens that the four words are intelligible to eight or more nationalities. These words should be selected to suit local conditions if used at all.

In each sign is an attempt to give a man, whether American or foreigner, a mental picture of the condition referred to by the sign and something to suggest action along the desired lines. You may tell a foreigner what "Look Out for the Cars" means, but he may have forgotten by the time he encounters such words on a sign of the old style.

However, if he remembers what the danger emblem represents and you have shown him a sign bearing the emblem, together with the words "Look Out" and a man jumping out of the path of a locomotive, he will readily remember what the sign means when he sees it again because of the association of ideas, the danger emblem, the locomotive, and "Look Out." A principle of memory training.

I believe the other suggestions likewise, through the eye and mental pictures, will be remembered by foreigners much better than signs equipped with words and danger emblems alone.

Danger signs, like billboards, must be read by people as they run. The first time a man of any nationality sees a sign of this kind he will figure it out, or, if a foreigner, he should have it explained to him. The next time he sees it he will grasp its significance, where he might not stop to read the words of this or any other sign.

I consider the emblems shown to be amply large for the sizes of the signs. However, if some unusual condition requires the emblem to attract attention (its only function) under unfavorable conditions, we should use an emblem big enough and embodying all the elements needed to secure attention under both favorable and unfavorable conditions, with little regard for the small relative difference in the first cost of the sign when made under equitable conditions.

TENTATIVE REGULATIONS.

I suggest that we also discuss the tentative regulations intended to prevent confusion which would result from indiscriminate use of the emblem for advertising or decorative purposes. Those now in use are as follows:

1. The danger emblem is to be used only to warn the public at definite places of conditions requiring more than ordinary caution against possible injury or loss of life. It may be displayed, however, for purposes of instruction, as follows:

(a) When used for instruction, the danger emblem shall not, except as elsewhere herein provided, exceed three inches square, and shall be so displayed that the public will readily understand that it is being displayed for instruction and not to indicate the presence of danger.

(b) Danger emblems of any size may be displayed on lecture platforms or through stereopticons or moving picture machines, provided such use does not in any way confuse or mislead the public and that such use does not violate any of these regulations.

(c) In order not to confuse the public, the posting of the emblem for educational purposes should be confined to bulletin boards generally recognized by the public as such.

(d) The danger emblem may be used on inside pages of newspapers, magazines, books and other literature for educational but not for commercial purposes. The reason for such display should be clearly indicated.

2. Its various dimensions must always be in proportion to the master size, which is twelve inches square.

TABLE OF SOME ACCEPTABLE PROPORTIONS, IN INCHES.

Overall size of black square.	Longest diagonal of square (approximate).	Diameter of red ball.	Total width of white cross.	Width of black diagonal and border lines.
24	34	13	19	2 1-2
18	25 1-2	9 3-4	14 1-4	1 7-8
12	17	6 1-2	9 1-2	1 1-4
10	14 1-8	5 13-32	7 7-8	1 1-16
8	11 5-16	4 10-32	6 1-4	7-8
6	8 1-2	3 1-4	4 3-4	5-7
4	5 5-8	2 5-32	3 1-8	7-16
3	4 1-4	1 5-8	2 3-8	5-16
2	2 13-16	1 3-32	1 9-16	7-32
1	1 13-32	35-84	25-32	7-64

3. When displayed, the danger emblem must always have one of its diagonals in a horizontal position.

4. The danger emblem must always be kept free from defacement by word, sign or character of any nature.

5. The danger emblem should always be accompanied by words, signs or characters indicating wherein the danger lies, or giving the specific reasons for its use; it should never be used alone.

6. When the need for caution which prompted the use of the danger emblem has ceased to exist, the emblem must be removed.

7. The word "safety" or its translation or synonym shall not be used in conjunction with the danger emblem. Such words often carry a suggestion exactly opposite to that for which a danger emblem is intended.

8. The danger emblem may be used in advertisements of danger signs of which it forms a part, but must not be used for any purpose of trade or as a part of an advertisement, or in any decorative way, except in the solicitation of orders for danger signs, when emblems of any size may be used, if confined to catalogs or other literature and displayed only as a part of a complete sign in accordance with other regulations.

PRESIDENT PALMER: The General Manager suggests that we might be able to reproduce the illustrations and use them for educational purposes.

You have heard this splendid, enlightening report. I agree with Mr. Chandler that the cross embodied in the sign is rather significant. We have the Red Cross for first aid and our white cross for accident prevention. I think people will eventually come to know what the black cross means—we have enough of them to learn from painful experience. You have heard this most creditable report. Do I hear a motion?

MR. VAN SCHAACK: I move that the report be accepted and that the thanks of this Congress be extended to Mr. Chandler and his committee for their excellent work.

CAPTAIN WHITE: I second the motion.

PRESIDENT PALMER: Are you ready for the question? All those in favor of the motion as stated will indicate by the usual sign. Carried unanimously.

We will proceed to the report of the Fire Prevention Committee.

REPORT OF FIRE PREVENTION COMMITTEE.

H. W. FORSTER, INDEPENDENCE BUREAU, CHAIRMAN.

Mr. Chairman and Ladies and Gentlemen: I wish to preface my brief report for the Fire Prevention Committee by calling attention to the fact that we have at least some red in the sign, because red is a symbol of fire prevention, and it is desirable that we should give just recognition to this phase of our work. Over 90 per cent of all fires are accidents; less than 10 per cent are intentional, namely, arson cases. Therefore, the National Safety Council is keenly interested in fires, but in view of the fact that the excellently organized and splendidly directed National Fire Protection Association has for over twenty years been paying special attention to life and property and safety, in so far as fire prevention and fire protection are concerned, it has not been necessary for us to pay very considerable attention to that subject. We have, however, dealt with the following subjects: First of all, for two years we have co-operated with the National Fire Protection Association in the celebration, on October 9, of National Fire and Accident Prevention Day. Last year our members did mighty good work, and this year, in spite of war pressure, the indications are that we will also do good work; no doubt we will continue on an everincreasing useful scale. Secondly, a number of National Safety Council members have

members of the Committee on Safety to Life of the National Fire Protection Association—Mr. Palmer, Mr. Beyer, Mr. Hansen, for several years, and I.

On that committee we are putting forward special life and safety fire features. We have nearly completed a piece of work that I hope will be almost epoch-making; namely, the development of a standard of safety of the number of persons that may be safely permitted in a given building. Taking into account the number and kind of exits, the construction of the building, the presence or lack of automatic sprinklers, the erection of the stair, elevator and other vertical openings; the height of the building and, finally, the character of the business that is carried on therein—a foundry is obviously less hazardous than a sawmill. This work has been under way for three years. I think it will be completed by next May and when available, I hope it will be extensively used as a measuring stick, by which you can put some method into application on a given building, to ascertain how many people may safely be housed therein.

The third and last activity has been the preparation of eight fire prevention bulletins. One in large display type that will be bound to attract attention is on our bulletin boards. The bulletins have been simple, and I think, at least, have not hindered the cause of fire prevention. That, Mr. Chairman and ladies and gentlemen, is the substance of your committee's report.

PRESIDENT PALMER: You have heard the report. What is your pleasure? Do I hear a motion for its acceptance?

CAPTAIN WHITE: I move that it be accepted.

PRESIDENT PALMER: It is moved and seconded; all those in favor of the motion will indicate by the usual sign. Carried unanimously. It is so ordered.

REPORT OF EDUCATIONAL COMMITTEE.

Mr. Chairman and Members of the National Safety Council: It gives me pleasure to report that a safety lecture was arranged for at the University of Pennsylvania on April 20, 1917, and given by Mr. Marcus A. Dow, Safety Director of the New York Central Lines, and that he showed, for the benefit of the students, the safety film "The House That Jack Built."

At the same time I interested Dr. John Frazer, Dean of the Engi-

neering School, and left with him all of the service bulletins and the annual report for 1916 of the National Safety Council, urging upon the dean the necessity of instituting a safety engineering course at the University of Pennsylvania. Dr. Frazer has been devoting himself to the military activities of the students, but I am hopeful that later on he will give the cause of accident prevention his serious consideration.

In December, 1916, I again mentioned to Dr. William P. Wilson, Director General of the Commercial Museum of Philadelphia, the importance of establishing a permanent safety exhibit at the museum; for a couple of years previous I had, at various times, urged upon Dr. Wilson the importance of such an exhibit. On March 15, 1917, I received a letter from Dr. Wilson in which he offered space for the nucleus of a safety exhibit, which was duly reported by me to Mr. Cameron. On March 20, a special committee was appointed by Mr. Palmer, President of the National Safety Council, to look into the matter and report upon the same. The committee was made up as follows: Mr. James B. Douglas, Dr. Frederick L. Hoffman, Mr. H. W. Forster, Mr. M. M. Sheedy and Mrs. J. R. Wilson, Chairman. On April 4 the committee had a conference with Dr. Wilson and examined the space, giving promise of a favorable termination in the establishment of a permanent safety exhibit. As the Commercial Museum is visited by the public school children of Philadelphia daily and by delegations from both foreign and domestic organizations of industry, the importance of this exhibit is manifest.

On Aug. 28, 1917, the Quartermaster's Department of the City of Philadelphia made an effort to obtain extra space at the Commercial Museum and the amount of space allotted to the National Safety Council was curtailed, but we still have the assurance from Dr. Wilson that space will be given for a permanent safety exhibit.

On April 23 the Monday Conference, a public forum made up of over ninety women's organizations and clubs, devoted a session to "Safety." The importance of this session cannot be overestimated. While the audience was not large, each member was a delegate representing active, working bodies of women. The session was presided over by Mr. H. W. Forster, Vice President of the National Safety Council.

It was wellnigh impossible to do very much work along the lines of accident prevention among the (smaller) women's community groups and clubs.

up with first aid, Red Cross and preparedness work and their speakers were all selected to further these aims.

I am, very sincerely yours,

MRS. JOSEPH R. WILSON.

PRESIDENT PALMER: The next item has been covered in detail by a special meeting held yesterday, a record of which will be published in the proceedings, and the Sectional Committee's Report, I assume, will be included in the reports of the various Sections. Next is the report of the Nominating Committee. We will hear from Mr. Ray, the Acting Chairman.

REPORT OF THE NOMINATING COMMITTEE.

R. R. RAY, DIRECTOR OF SAFETY, DODGE BROTHERS, DETROIT, MICH.,
ACTING CHAIRMAN.

CHICAGO, ILL., July 10, 1917.—*To the Members 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 shall expire October 19, 1917.

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 terms 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.

CHICAGO, ILL., June 6, 1917.—MR. W. H. CAMERON, General Manager, National Safety Council. *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 Oct. 19, 1917, and also to fill the vacancy of one Director

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elected to serve until 1918, who has since resigned from the Board of Directors.

The following slate has been unanimously approved by the committee and is herewith submitted :

NOMINATED TO SUCCEED THOSE DIRECTORS WHOSE TERMS OF OFFICE SHALL EXPIRE OCT. 19, 1917.

G. L. Avery, Secretary, The Avery Company, Peoria, Ill.

Lewis T. Bryant, Commissioner of Labor, State of New Jersey, Trenton, N. J.

W. L. Chandler, Assistant Treasurer, Dodge Sales and Engineering Company, Mishawaka, Ind.

J. M. Eaton, Manager, Welfare Department, Lincoln Motor Company, Detroit, Mich.

B. F. Tillson, Assistant Superintendent, New Jersey Zinc Company, Franklin, N. J.

R. W. Straus, Secretary, Labor, Safety and Welfare Department, American Smelting and Refining Company, New York City.

V. R. Currie, Chairman, Central Committee of Safety, The Texas Company, Houston, Tex.

W. E. Worth, General Superintendent, Chicago Tunnel Company, Chicago, Ill.

John Price Jackson, Commissioner, Pennsylvania Department of Labor and Industry, Harrisburg, Pa.

C. P. Tolman, Chairman, Manufacturing Committee, National Lead Company, New York City.

J. R. de la Torre Bueno, Editor, General Chemical Company, 22 Broad Street, New York City.

Charles R. Hook, Vice President, Operating Division, American Rolling Mill Company, Middletown, Ohio.

Royal B. Meeker, Statistician, Department of Labor, Washington, D. C.

Dr. F. D. Patterson, Chief, Division Hygiene and Engineering, Pennsylvania Department of Labor and Industry, Harrisburg, Pa.

L. B. Robertson, General Attorney, Ford Motor Company, Detroit, Mich.

Charles B. Scott, Manager, Bureau of Safety, Chicago, Ill.

David Van Schaack, Aetna Life Insurance Company, Hartford, Conn.

A. W. Whitney, General Manager, National Workmen's Compensation Service Bureau, New York City.

L. A. De Blois, E. I. du Pont de Nemours & Co., Wilmington, Del.

H. W. Clapp, General Superintendent, Columbus Railway Power and Light Company, Columbus, Ohio.

A. D. Risteen, Director of Technical Research, Travelers' Insurance Company, Hartford, Conn.

George Oliver Smith, H. L. Doherty & Co., New York City.

William H. Baker, Assistant General Superintendent, the Atlas Portland Cement Company, Hannibal, Mo.

H. M. Webber, Chicago Telephone Company, Chicago, Ill.

Earl B. Morgan, Safety Engineer, the Norton Company, Worcester, Mass.

NOMINATED TO SUCCEED ONE DIRECTOR ELECTED TO SERVE UNTIL
ANNUAL MEETING, 1918.

A. H. Young, Director, American Museum of Safety, New York City.

Very respectfully yours,

C. B. HAYWARD,

Safety Engineer, Winchester Repeating Arms Company, New Haven, Conn.

R. R. RAY,

Director of Safety, Dodge Brothers, Detroit, Mich.

JULIEN H. HARVEY,

Superintendent of Efficiency, Kansas City Railways Company, Kansas City, Mo.

J. A. GOULD,

Safety Engineer, Larkin Company, Buffalo, N. Y.

ROBERT BRINTON HILL,

Manager, Bureau of Accident Prevention, Portland Cement Association, Chicago, Ill., Chairman, Nominating Committee.

ELECTION OF OFFICERS.

PRESIDENT PALMER: You have heard the report. It is in order to call for the report of the inspectors of election and also to ask that those present who have turned in their proxies, if they care to withdraw them, to arrange at this time, so that the inspectors of election may have a record of them.

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MR. R. W. CAMPBELL: Mr. Chairman, to proceed in a parliamentary way, I suggest a motion, which I now make, nominations for Directors for the several terms, as named Nominating Committee, be now closed.

MR. ARTHUR T. MOREY: Seconded.

PRESIDENT PALMER: You have heard the motion. Are you ready for the question? All in favor of the motion indicate usual sign. The motion is carried.

MR. R. W. CAMPBELL: There being no nominees in opposition to the names now placed in nomination, I move that the Secretary be instructed to cast one ballot as the representative of members in person or by proxy for the several gentlemen mentioned for Directors for the terms indicated by the Nominating Committee.

CAPTAIN WHITE: I second the motion.

PRESIDENT PALMER: You have heard the motion, are you ready for the question? All those in favor will indicate by the usual sign. Carried unanimously. They are elected.

Is there any unfinished business, Mr. Secretary.

THE SECRETARY: I have nothing.

MR. R. W. CAMPBELL: May I suggest a point of order? It occurs to me that insofar as our By-Laws require the report of the Secretary on the election of Directors that our Secretary might hand that report to all the members here in person and by proxy to them, and he would formally submit a report showing the unanimous election of the Directors. This would make the record complete, as provided for in our By-Laws.

PRESIDENT PALMER: The Secretary and inspectors will take the proper action.

The Secretary advises that there is no unfinished business. The item of new business is now open.

NEW BUSINESS.

MR. ARTHUR T. MOREY: Any one who knows the safety of this country and their quality, might well envy the privilege of being their host or having his city be their host, and he part in it insofar as he may. I have in my hand a whole sheaf of telegrams from St. Louis inviting the National Safety Council to hold its annual convention here.

is the best place to have it. St. Louis is in the center of the country, in the very heart of things, and combines the hospitality of the South with the energy of the North, the culture of the East and the progressiveness of the West. Before I left St. Louis our good Mayor—we are doing big things in safety in St. Louis and have a fine, energetic Local Safety Council that will do all that might be expected and then some—the Mayor of St. Louis said: “We will let you have the City Hall for your exhibit.” That indicates something more than the mere fact of having space to show our exhibits. It shows, too, the municipal spirit, that the town is behind the safety idea, and would do its utmost to give us a fine congress. The Mayor thought that the wide corridors and the large rotundas of the City Hall would be a good place for our exhibits.

Whether that be accepted or not—there are other places—it shows the spirit. I hold in my hand, and I am afraid if I take time to read them all, you might think I was jeopardizing the welcome I am extending, but I have telegrams from the President of the Chamber of Commerce and the Past President of the Chamber of Commerce, from our Mayor, the President of the Retail Association, from a number of clubs, and from some of our largest corporations. It is our custom to have this matter settled by our Executive Committee, but I take this occasion to extend a welcome to the National Safety Council to have its Congress in St. Louis in 1918.

RESOLUTION CONFERRING HONORARY MEMBERSHIP ON MR. ROBERT W. CAMPBELL.

MR. R. C. RICHARDS: I was told, when I came here yesterday, that a man we all know, a man whom we all love, a man we all respect and admire, a man who, perhaps, has done more than any one person or any dozen persons to assist this organization and to found it on a rock, was about to retire and sever his connection, officially, with this organization. It seems to me that it is essentially fitting that this organization should recognize, in the only way it can recognize, the splendid service that has been given by that man, to his own pecuniary loss, without any desire or wish for reward or compensation, by electing him an honorary member of the National Safety Council. You all know whom I mean—Robert W. Campbell.

I move, Mr. President, that the Executive Committee, who have

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the power of nominating members for that most honorable post be requested to report at our dinner on Wednesday evening in the name of Robert W. Campbell as honorary member of the National Safety Council. I move you, Mr. Chairman, that the Council adopt the motion by a rising vote. (Seconded.)

PRESIDENT PALMER: You have heard the motion and it has been seconded. Shall we not unanimously respond in our approval? The Council arose amid applause.)

MR. R. C. RICHARDS: Pardon me, Mr. President, if I ask for the indulgence of the Congress for a minute. It seems to me that the Resolutions Committee forgot something that was quite important. I wish to read a resolution which it seems to me the Resolutions Committee ought to have reported:

"WHEREAS, The founders of this Republic pledged their lives, their fortunes and their sacred honor in support of the war waged by them to establish a free Government, which, with the timely assistance of France—our gallant ally—resulted in establishing the real Republic the world has ever known, which has ever since been the living example to the people of all the world of what a free Government is, and after which they are all patterned, and because of the ideals represented and the liberty granted, people from every nation in the world have flocked to our shores, until now we have become one of the great nations of the world; therefore, be it

"Resolved, That the National Safety Council in Congress assembled pledge ourselves, individually and collectively, to support the Government in every possible way in the war it was forced into, which it is now waging to perpetuate liberty for all time. I move further

"Resolved, That a copy of this resolution be spread upon the minutes of this meeting, and a copy of the same be sent to the President of the United States." (Applause.)

MR. A. T. MOREY: I would like to second the resolution.

PRESIDENT PALMER: It has been seconded by the Chairman of the Resolutions Committee, who acknowledges that it should be among the resolutions acted upon at this Congress. Do I hear any supporter?

CAPTAIN WHITE: I support it.

PRESIDENT PALMER: Are you ready for the question? Those in favor of the motion will indicate by a rising vote. I move unanimously.

INVITATION TO MEET IN BIRMINGHAM, ALA.

MR. BLANKS EVERETT (General Manager, Chamber of Commerce, Birmingham, Ala.): A meeting was held in Birmingham last week renewing our invitation to this body to meet in our city in 1918. Our first invitation was presented a year ago in Detroit, and as a representative of all of the interests of Birmingham I extend to you a most cordial invitation to hold your 1918 meeting in the city where people make iron and steel for a living. We fully appreciate the great good that comes from an organization like this. When you meet at stated intervals, compare notes and exchange ideas, and get the benefit of one another's experience. You are not only promoting the interests of your own particular sphere, but you are helping all mankind. We need you in Birmingham. Your presence there will stimulate interest in safety work and will enable us to meet with you in future with a greater number from our district.

The Congress is national in its scope. The South is represented. We need you down there for one meeting, and if you will come to Birmingham in 1918 we can promise that you will leave with nothing but the most pleasant recollections of your visit, and a constant, incessant and impelling desire to return and visit with us again and again.

We have not been unmindful of the facilities necessary to handle your business in an efficient way. We recently entertained a convention in Birmingham with 50,000 visitors, so we are in a position to furnish you auditorium space, committee rooms, and hotel facilities of the highest order. We ask that you give Birmingham favorable consideration.

PRESIDENT PALMER: You have heard the invitation; the matter will be remembered. It is a matter to be settled by the Executive Committee after careful consideration.

SECRETARY CAMERON: I would like to present to the members of the Council a letter received from the Mayor of Buffalo, as the representative of the half million citizens of that city:

"It gives me great pleasure to extend to you a most cordial invitation to hold your next Congress in this city, because of our convenient location, unexcelled railroad service, excellent hotels and many attractions and conveniences. Buffalo is one of the world's greatest convention cities. You are assured of a cordial reception and courteous treatment and it will be my personal pleasure to do anything in my power to assist in the success of the meeting."

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I have received at my office a number of invitations from cities, which will be presented to the Executive Committee.

PRESIDENT PALMER: We have with us Mr. A. W. Wright, Commissioner of Labor of Canada. We welcome him to the

ADDRESS OF A. W. WRIGHT,

Vice-Chairman of the Workmen's Compensation Act for the Province of Ontario.

Mr. President, Ladies and Gentlemen: You know it is one of the privileges of a man who has done wonders on the battlefield have his name misspelled in the Gazette. (Laughter.) I am Commissioner of Labor for Canada. I am Vice-Chairman of the Workmen's Compensation Act for one of the provinces of Canada. That is all. One newspaper, intending to be friendly and at the same time complimentary, said of me that I had risen from the ranks of labor. While I recognize the kindness of the sentiment and the thought behind it, I did not exactly feel complimented because I think anyone who does useful work with his hands or brain is at the very top notch of the ladder and cannot rise higher.

If there is anything more honorable than doing useful work in the ranks of labor it is the doing of something to protect the lives and the limbs of others who are so engaged, and that is the purpose in which this association is engaged. I did not vote for the resolution which was just passed because it was especially addressed to the President of the United States, and although we in Canada represent the largest half of the continent we would not be included in that resolution.

THE WAR FOR LIBERTY.

We are, like you, engaged in a very serious matter, the war for liberty. In Boston, the other day, at a meeting of the Workmen's Compensation Board of the United States and Canada, we had an excursion around the city and harbor. One lady in the party, in a sort of apologetic way, pointed out Bunker Hill Monument to me. I suppose she thought I would not feel toward that monument as an American would. You see, I use the word American just as you use it, though you are not quite entitled to the name. She told me: "I suppose you do not feel toward that just as we do?"

fighting for the liberty of this part of the continent, in '76, you were fighting more particularly for liberty north of the St. Lawrence River, north of the boundary line, because the liberty we enjoy—which we flatter ourselves is even greater than yours, was won at Bunker Hill and Concord.”

We recognize that we are sharers on this continent of the precious boon of human liberty. Our forefathers won it, yours fighting against mine, and mine after they were beaten. Some of them, although they did fight under the Union Jack at that time, are now claiming to be first-class Americans and are even talking down to more recent arrivals.

PROFITING BY MISTAKES.

Both of our countries have things to be proud of and things to regret in their past history. I think that will be admitted, and our history, having been longer than yours, has probably been more amply filled with those mistakes and blunders of the past.

A great English writer said that ever since the conquest there had been fools. Of course, the conquest was away before the revolution, and we have had more years to accumulate a crop of fools than you have had, but still you have done very well with your opportunities. The greatest of all fools is the man who worships the great god of Carelessness; who will not take proper precautions to protect his own life and his own limbs, and so protect the happiness and welfare of his family. There are many accidents that are purely chargeable to wilful negligence. I do not know how it may be over here, but we are trying in our own way to remedy this. We have delegates here today who represent our safety associations—under our Workmen's Compensation Act we have organized safety associations. These gentlemen, in a sense, are absolutely independent of our board and we have nothing to say as to their appointment. All we have to do is to see that they do not spend too much money and give themselves too big salaries; outside of that they are perfectly independent. Let me say to you, whenever you have anything to do with workmen's compensation or anything kindred, for heaven's sake keep it out of politics.

NO POLITICS IN COMPENSATION BODY.

If Sir William Meredith, Chief Justice of Ontario and the author of our compensation law, ever did anything for which he will be gratefully remembered it will be the fact that he carefully kept poli-

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tics out of the Workmen's Compensation Act. The members of the board are appointed, not for life but until they cease to hold through want of good behavior or by reaching the age of 75 years, which is even a greater crime. I will reach that point in about 10 years, then I drop out and another man will take my place, and another man will be appointed, I hope, purely because of his fitness for the position. The moment he is appointed he is absolutely free from all political influence. The Governor General, the Lieutenant Governor or the Premier of the Dominion cannot interfere with his position and dictate his actions in any way. In that way we are free from politics, and you know it will be pretty tough, if, as we are figuring that John Jones has lost a leg, and shall receive much or little compensation according to his wages and his position under the act; sometimes the balance is held in such a way that it is pretty hard to tell which way it ought to go and whether he should be compensated or not. Therefore, it would be pretty hard if we had to consider all John Jones' relatives and those in the same political party with him and had political pull, to see whether they should give much or little, in order to help the party in power or help the party in possession. We have not gotten to that, and it will be well when everything of this kind is wiped out of workmen's compensation considerations.

That is one of the wise things our politicians did. We had the advantage, you know, of looking over the experience on your side of the line. When we formed our Confederation we had the benefit of your experience and of your blunders. Sometimes nations, traveling the road to history, make mistakes, like the man who met an Irishman coming along a bad road. He said to the Irishman, "I say, is this a good, hard road? Is there any bottom to this swamp?" "Oh, yes, sir, there is a bottom." When the man got into it he went down so that his saddle girths were under the mud and shouted back to the Irishman: "Didn't you tell me there was a bottom?" "Oh, there is, but you have not come to it yet."

THE DIVINE RIGHT OF KINGS.

Nations get into quagmires and it is well for those following to avoid them. We avoided some of yours and you avoided a great many of the mother country's. Above all, you avoided the quagmire of believing that any one had the divine right to rule over you. It is just because the whole world has not learned that lesson that this war is on. The whole world should have learned that lesson

cluding our German friends—you know, I always speak of “our German friends” in a curious way. I was brought up among Germans, played with the boys, fought with them, and learned to like them. There are no better fellows on earth than Germans when properly brought up, but it depends very much on the bringing up. Even a Scotchman would not be a good man if he had not been properly brought up, and, of course, a German brought up under autocratic rule, believing in the divine right of kings, the divine right of anybody to be his superior, is necessarily in a worse position than an American brought up in a different position. You could not get our Germans in Canada to believe what the Germans in Germany believe, because they have been brought up differently, and they are awful good stock to teach. I do not know of any nationality that you can make a better Scotchman out of than a German.

But I am only wasting your time. You have your business to attend to, most important business. I forget how many speeches are to be made at this Congress, but I felt like saying: “God help you!” It is an affliction you must bear for the benefit of your neighbors, and so far, if I am any judge of the few speeches I have heard, there has not been a word that you could afford to go away without hearing.

A TRIBUTE TO PRESIDENT WILSON,

I was struck, at the meeting in Boston, with the excellent grasp of thought of the speakers; no waste of words and good language. A few generations ago if a diplomatic document were given to the world it was so full of verbiage that for the next generation or two people were guessing at what it might possibly have meant; they had not done guessing yet at the meaning of some of the things of the past. I do not think any one will mistake what President Wilson—I almost said President Lincoln, and mind you I am not a believer in reincarnation, yet I almost suspect that if I were a believer that Wilson would be Lincoln over again. There was not a word misplaced, not a word that was unnecessary in his declaration, when he proclaimed a state of war with Germany or in his reply to the Pope’s peace proposals.

He did not feel about the Pope’s peace proposals as did the two Irish women over in Canada when they were discussing the war and its consequences. One said: “Mary, how are you getting on since Dennis went to the war?” “I am getting on fine. I am getting more money than before.” The other one said: “So am I. I am getting more money than I ever had, and yet the Pope wants to stop the war.”

Business Meeting

President Wilson's reply to the head of the Roman Catholic Church—I find no fault whatever with the desire of the Fatherland to end the war, as I think everyone has that idea and everybody who is sane. If it were over, I wish it were over before you American boys win glory or get any wounds, but they do not, I know, because they like to be in it anyhow; still I would like to see the war over. I am appalled nowadays to pick up a newspaper and read down the terrible long list of casualties—you are sure to find some one who was dear to you. It is a terrible thing to read those casualties every day. You will be doing it soon. God help you when you get to it; may He give you courage to say: "Well, the boy has gone, but he had a good death." One of my particular friends, an aviator, was killed, and his old father received the Cross of War from the French Government as a recognition of his services. He said: "The boy had to die one time or another and I would far sooner he die that way than have him stay at home and be a slacker."

A lady visited at my home at Niagara last year, her son was going to the war. She said: "When the people said to me, 'Can you part with your son? How can you let him go?' I answered, 'If I could not be willing to let him go I would think there was something wrong with my moral make-up; if he were not willing to go, and anxious to go, I would very much doubt my fitness to be a mother to such a boy.'" The boy went. One report came that he was taken prisoner, but the latest report is that he was blown to atoms and no part of him has ever been found. Yet that woman is proud of her boy and would rather have had that happen than have him stay at home and have other parents point the finger at him and say in the hour of his country's need he would not go.

Mr. Chairman, I thank you for the opportunity I have had in getting a little along in years. I went to Boston all right, because I thought that was a good, order-loving city. I went there a while, but I thought I would need a safeguard when I came to New York, so I have brought a relation with me.

PRESIDENT PALMER: May I ask Mr. Little, Chairman of the United States Employees' Compensation Commission, to step forward? I would like to have him meet Mr. Wright. Perhaps Mr. Wright will find that some of us are wise enough to feel that we ought to learn.

I know we have all enjoyed our first contribution from across the line. I hope we will have more of it during our conference.

I believe it will now be fitting to call for the report of the tel-

REPORT OF TELLERS OF ELECTION.

MR. H. B. ADAMS: Your committee has inspected the list of proxies and find 1,942 votes represented. Article III, Section 12, of the By-Laws reads: "Five per cent in number of the votes to which the members of the Council are entitled, represented by the members in person or by proxy, shall be required to constitute a quorum at any meeting of the members." Five per cent of our 14,059 votes is 702. We have 1,942 proxies, in addition to members here in person, some of whom representing several votes. As the same committee was appointed as tellers, we take great pleasure in reporting the unanimous vote of the Congress for the election of the nominees for Directors for the ensuing year.

Respectfully submitted,

H. B. ADAMS,
V. R. CURRIE,
H. R. GANNETT,
Committee.

PRESIDENT PALMER: The Secretary has a few announcements

SECRETARY CAMERON: I am requested by Mr. Little, of the United States Employee's Compensation Commission, to ask all of the district inspectors and engineers to meet him at the conclusion of this meeting. I also wish to remind you that at 2 o'clock the General Round Table Meeting will be held.

MR. LITTLE: May I include all of the new engineers recently appointed, there are a number present?

The meeting then adjourned.

National Safety Coun

General Session

New York City

Sept. 12, 1917

LEW R. PALMER, President, Presiding Officer

WEDNESDAY MORNING SESSION.

PRESIDENT PALMER: The Congress will please co: order. Secretary Cameron has an official announcem: make.

SECRETARY CAMERON: A meeting will be held tomorrow : ing for safety engineers at which we hope to discuss the fundar problems of safety.

CABINET OFFICER ILL.

PRESIDENT PALMER: We had hoped at this Congress to fe what we considered one of our most important problems a show our real appreciation of it, the protection of labor. It has truly and oftentimes said that labor is our great national asset; c ing out that thought we called upon Secretary of Labor Wilson organized labor's representative here, to speak for the men and for that branch of the Federal Government that has the prote of labor in its charge. Not relying on correspondence alone, I pleased to meet the Secretary, following a special Cabinet me and he indicated his sincere desire to meet and co-operate wi in the work we are trying to do. We all know they are wo: under great pressure at Washington and fearing some conting might arise that would prevent him from . . .

him again, and he assured us that he had made special arrangements to be here. Last night, however, I received this telegram:

"I regret very much that illness will prevent attendance of Secretary Wilson at Wednesday morning meeting of the National Safety Council.
H. L. CURWEN, Private Secretary."

We are deeply disappointed in not being able to hear Secretary Wilson on this important subject. This, however, enables your Chairman, without offending Uncle Sam, to carry out what we think is also a national policy, to place our women first. I have the pleasure of calling to the platform as our first speaker Mrs. Samuel Semple, member of our Pennsylvania Industrial Board.

PROTECTING WOMEN IN INDUSTRY.

MRS. SAMUEL SEMPLE, MEMBER, PENNSYLVANIA INDUSTRIAL BOARD,
HARRISBURG, PA.

Mr. President and Members of the National Safety Council:
I rashly accepted the invitation to speak this morning on the subject of "Protecting Women in Industry," at a very late hour. I know practically nothing of the subject as you are in the habit of considering it at meetings of this sort. I know practically nothing of the *modus operandi* of safeguarding women, as women, in the handling of machinery. I know nothing in a practical way about inventing guards for machinery, carrying out internal plant policies, about organizing safety committees among men or among women, and all my thinking in preparation for this meeting has been along other lines—along the great general subject of protection of women in industry, chiefly by legislative means and by the creation of public sentiment, tending toward that protection of women as a sex in the great industries of the war.

The general subject of safety in the industries, it seems to me, is applicable to women as well as men. Everything that has been done, from your point of view, for the safety of the human being in industry is done for women as well as for men, and so the thought arises at once: Why should we give any part of a public meeting like this to the specific discussion of women in industry; the safety of women in industry? As against that query, in one's mind, there comes this other fact, which is a fact, that there is a large body of legislation in this country, and in other countries, looking specifically

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toward the safety of women, as women, in industry; and the question comes again—the first question, more emphatically should there be this specific distinction between the consideration of the safety of the general worker and the consideration of the safety of the woman worker? This large body of legislation, directed specifically towards the safety of women in industry, is paralleled by a similar body of legislation looking towards protection of children, and one couples together in considering the enactment of labor laws, these two lines in the phrase: “Looking towards the safety of women and children.”

MOTHERS OF OUR CHILDREN.

It is like bread and butter, sappers and miners; a long list of expressions in life. We are coupled together in terms that suggest an intrinsic relation; so perhaps we have come to the heart of the matter where we should give special consideration to the safety of women in industries. Women in their relation to children, women in relation to these specific functions; the women in the world, the bringers into the world of little children, the caring for little children, seeing that they grow up to proper citizenship. Women as mothers of children seem to have a special claim upon our attention, or they have had a special claim upon our attention in the past, from the physical side; and again, in labor meetings, I have heard this put forth as a reason for special laws for the protection of women, that those women are to be the mothers of our children in the future and that, therefore, their health should not be impaired by the hard and unnecessary processes, sometimes, of labor being loaded off upon them. I have always wondered, just a little why the same line of reason did not apply to a very large extent to men; in fact, we are beginning to realize that it is these little things, taking as an example the studies on the influence of alcohol that has been important in recent years, and we find that the health of the father of the child depends, or has a very large influence upon the sum total of health of the child as it comes into the world.

If that is true, I think we might just as well, in meetings of this kind, consider the subject of undue strain upon the men of this country as well as the women, as influencing the future health of the race. And yet, aside from that, there is undoubtedly an intimate connection between the future health of the little child and the sum total of strength which its mother is able to give it.

basis, aside from any other, we have a right to consider the health of women in industry to legislate for it, to protect it, and to throw all the guards around it that it is possible to bring to bear.

There is another line of protection for women in industry, that we have not considered very much more than for men, and that is the moral safety of women in industry. In Pennsylvania the law which created the present Department of Labor and Industry and gave its duties to the Industrial Board specifies that the care of the Industrial Board shall be not only to protect the health of the people in the industry in that state, but to guard the morals of the people in industry; and yet, as it works out in actual practice in Pennsylvania, I have seldom, if ever, heard any reference made to the moral health of the men. There is very frequent reference to the moral health of the women in the industries, and there again I think it ties up with the future welfare of the little children that will be in the care of those women. It is recognized that the greater health of the mother of the child is reflected at once in the character of that child as it is trained and brought up.

WOMEN ARE WITHOUT LEGISLATIVE POWER.

There is another reason, perhaps, why we should pay special attention to the safeguarding of the women as they go out into industry and that is the legislative side, because they have not the legislative power of their own that men going out into industry have; because we deprive women or have in our civilization deprived women of a certain standing before the state that men have we are forced to make up for that, to a certain extent, by enacting particular laws for their protection in the industry. I rather think, when the time comes, as it is going to come in this country, when women will stand on an equality with men before the government of the country in the matter of citizenship that this particular body of laws for the protection of women, as distinct from men, will be very largely decreased, because it will be recognized that they have the power to force conclusions of their own in favor of workers in general, and perhaps in favor of themselves, as a sex, as workers in the great business processes of the whole land.

There is another reason, I think, and a very laudable reason why there is this particular body of protection for women, and that is really the thing that is often referred to—the chivalrous thought towards women, the thought that women have been in a certain way

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protected in the past, that it is a hardship for them to go on and make their ways in untried avenues of earning their living—untried before, because I am never, by any means, willing to let that women do not and have not in the past earned their own living in the old time in history—within the home. But as they go into these untried ways of making a living it is felt that the altruistic feeling of mankind ought to go with them and help them over the hard gap between the old life and the new and give them a fair start as they try the new way.

And then, still after that, and perhaps linked up with this, this disability, is the lack of standing as citizens in the community linked up also with this chivalrous feeling, is still another reason for this large body of protection. Perhaps I may illustrate it by some instances which came before the Industrial Board of Health at a meeting which it held yesterday. There had been reported to the Industrial Board that women were about to be employed in a factory in Pittsburgh, where the particular question at issue was the process of testing rubber gloves by an electrical machine. I am not familiar with the process, so I cannot describe it, but it is said to be a machine of high voltage and the work previously has been done by men. The question was placed before the board whether or not in the future women should be allowed to do that work. The board, two or three months ago, in considering this question decided that it was not prepared to give an answer until it investigated the process. That alone, if you please, is significant.

A QUESTION OF INTELLIGENCE.

A special engineer of the department was sent to Pittsburgh to look over the process and his report was this: That the process installed at that particular plant had one defect, which made the work dangerous for men as well as for women. He thought if that fundamental defect in the process was removed there would be no reason why women should not be employed as well as men. To see the question of safety for men there had been partially regarded. As soon as it was a question of employing women the conscience of the employer, the judgment of the inspection department of that district, arose up to demand whether or not women should be treated on the same level as men in that industry.

That was chivalry, perhaps, but back of it was a doubt of the intelligence of women. If men had been in that position...

handle that situation with the defect in the placing of the machinery, the question was: Why were not women as intelligent as men? Why could they not face that danger and handle it as well as the man had handled it?

At the meeting yesterday there came up also the question as to whether or not women in Pennsylvania were to be allowed to run elevators. There is absolutely nothing in the labor laws of Pennsylvania to indicate that women should not be allowed to run elevators. The very fact that the question was presented to the Industrial Board indicated a fundamental doubt in the intelligence of women to be trusted with the great public service of running an elevator. There is no question as to whether a boy 14 or 15 years old, if the law allows him, is able to run an elevator, but as soon as the service of women is considered their intelligence is doubted to such an extent that the subject must be presented before the Industrial Board of the state.

Also at the meeting yesterday a question was considered as to whether or not women were to be employed in certain plants in the state in the manufacture or in the handling of certain explosives—chemical substances or explosives. Men to the number of probably 2,000 in one plant and 500 in another are engaged in those processes without any question. The whole thought back in the minds of the people who were handling the subject evidently was whether or not a woman had sufficient intelligence to be turned loose in an explosives plant, taught the different processes and allowed to go her way as one of the industrial units of the State of Pennsylvania.

I think we have to get away in the times that are coming to us, immediately now, from that thought of any fundamental difference in the intelligence of men and of women—for a long, long while I have believed in the philosophy set forth years ago by Mrs. Partington: "That we are all more or less human." Some men are intelligent and some are not. Some women are intelligent and some are not, but in training people to do the work of the world I think we have to take it for granted that intelligence is without sex and that it depends on the individual capacity and the care and training that is given to that individual capacity whether or not the man or the woman is the safer unit in the industry of the country.

There is another question away back of this matter of the difference in the treatment in a legislative way of the safety of men and women in the industries, in the sheer matter of sex. Taking as an example the explosives industry that I have just mentioned, there is

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a necessity in that industry for handling, as you know, certain of chemicals. I believe it is a well-established fact that the effects of those chemicals, in the handling of them, upon men and women, differ. In certain of those industries, I believe, skin diseases appear with men and do not to any great extent with women.

In the handling of certain other chemical substances other symptoms appear with women that do not appear with men. I am told that the medical fraternity is not able at the moment to say just what makes the difference, but that they are prepared to admit that the difference exists.

WELFARE OF THE INDIVIDUAL.

Now we come down to the question of legislating for the welfare of either men or women on the basis that it seems to me it should largely be legislated upon, and that is the welfare of the individual independently of the fact that that individual is a man or a woman. If a man is made uncomfortable by certain industrial processes, he should be protected in carrying on those processes by proper legislation. If a woman is made uncomfortable by certain industrial processes, then that woman, as a woman and a human being, should be protected from undue development of those discomforts in the industry in which she is engaged. There we come to a fundamental reason for protecting either men or women in industry by legislation, by regulation within the plant, by safety organizations or whatever it is, to make that man or woman fit physically to do his or her work; to make them so fit that they may be interested in the work without irksome and girding against it, and so fit that they will contribute their best to that work and to the development of the country through the industry in which they are engaged.

When you go there, I think you can get to know the foundation for preparing for either men or women; to go back to this legislative protection for women which already exists in this country, I think we realize that it is exercised along three lines.

One concerns the hours, the number of hours that they spend in industry, and there perhaps we must admit that legislation for women should be different from that for men; in fact, I think there is little legislation concerning hours for men, except such as is enforced by labor organizations of the country, while there is a large body of legislation protecting the woman.

hours of industry, and we come back perhaps to the old Scriptural description of women as the weaker vessel physically. A woman has not so much intrinsic strength in the larger percentage of instances as a man. She ought not, I believe firmly, to go on unrestrictedly as many hours, in a great many cases, as men may perhaps exercise their working faculties without injury to themselves and to the future generation. We have also on this question of hours the restriction of working hours of women in certain states, in our own state, in Pennsylvania, I know, to daylight hours, or at least not to the midnight hours. We have, through the experience of Great Britain within these last three years of strain and stress, on account of the war—the experience of Great Britain which declares that women break down more quickly under night work than do men.

NIGHT WORK IN INDUSTRY.

The women do a lot of night work in our own homes, those who have little children to bring up. I have had little children to take care of and I know that night work does come to us in our own homes. We have broken rest, we note the effect of it the next day, and yet, notwithstanding that, it seems to me that night work in the industry is quite a different matter. Where it is a long continued strain of solid work for eight or nine hours, with the sleep put off to the next day, where those very same home conditions are happening to lessen the amount of rest the people have, because you know as civilization is at present constituted women's work in the outside world, no matter what it may be, is practically in addition to her home work. There are few men who have absolutely no home cares and there are very few women who do not make their own clothes or do some sewing for themselves; perhaps they look after light housekeeping if they have not a family on their hands, and the work in industrial processes is almost unbearable as a condition of certain other work which she does as a member of the family. That, I think, operates also on this question of the restriction against night hours for women working in outside industries.

There is a large body of legislation, as we know, concerning the protection of women in the conditions which shall surround them in the industries. As I have said before, that concerns the moral conditions which surround them. A great deal is based on this lessened resisting power of the woman as compared with the man; the fact that she is the weaker vessel frequently in the physical

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sense; that she should not be subjected to the long continuance of the long hours; that she should have more frequent rest and also that she should be allowed to sit down at her work ever that is possible, and that if less stronger than a man she not be asked to lift such heavy weights.

Going back again to the matter of the explosives industry in Pennsylvania, as before the Industrial Board yesterday, we find that a part of that industry involved for the men engaged the lifting of heavy weights, weights of sixty pounds to be lifted to a height of five feet. The men were able to do it, but it is perfectly plain to any one that women should not be asked to do that if they are put into that similar occupation.

The other part of legislation for the protection of women at the present time, refers to their wages. There is very little legislation in this country—only one or two experimental spots where something is being said or something has been done about it. It seems to me that is one of the things that we need to look forward to for the protection of women in the industries as they are going to get into them in the nature of the war conditions in this country. A woman worker who is not well paid cannot be well fed and she cannot therefore, be as effective a worker as a person who received a living wage. In Pennsylvania we have been trying to watch the restriction of the movement of women in the industry, so far as wages are concerned. We find that there is one class—at least this is the indication, I would not give it as a scientific fact—there is the indication that there is one class of industry in the state, employing largely clerical work, which is dismissing its men in order to employ women at a lower wage.

WOMEN AS BEGINNERS.

There is another class that is dismissing its men to set them free for military service and employing women in their stead. They very frankly say: "We are not going to give the women the same wage as the men who are leaving. They are beginners. It would not be fair that they should come in at the same wage as the experienced people have had before them but we will give the women who come into our employ fair beginning wages; the same wages that we would give to a man who comes in at a similar position." Those women are starting out under conditions if that promise is carried out fairly, they are starting out into labor under conditions which are not as good as those which the men had before them.

future efficiency, for their future rise in the industrial world and for the future fairness of all industry, not only for the women but for the men, too.

We people who are interested in safety in all lines ought to be interested in this, because if women go into the industry at a lower wage now, when the time comes they will be displaced again by the men, and almost surely they will be displaced by men at a lower wage than the men had before. The last condition of that industry in general will be worse than the first, so any movement toward the safety of women in industry, for the sake of the industry, ought to consider also not only the question of hours for those women, that they can bear as a physical strain, not only the question of conditions that shall ameliorate the strain for their lesser physical vitality, but also the question of wage that they may support a proper physical life, that they may support the families who are going to be dependent upon their support in the conditions of the world at the present time, and also for the condition of the men workers in the industry when they come back.

At the very outbreak of the war the Council of National Defense issued a request to the country that standards of living, standards of labor and standards of hours and conditions should be maintained. It so happened that in Pennsylvania we had a meeting of the Industrial Board three days after the Council of National Defense sent out its request. At that meeting we adopted as our final policy in Pennsylvania that outlined by the Council of National Defense. The Governor formally adopted it also and issued a proclamation to that effect to the communities and the workers of the state. The President of the United States did the same thing in a most formal, dignified manner a little bit later. We have endeavored to live up to that policy in all the months since. It has been very significant that the most pressure against that policy has come from the industries which employ chiefly women and also the industries that employ the largest number of children.

NO LETTING DOWN OF STANDARDS.

The Industrial Board has replied to all requests for a letting down of standards in the negative, not only must employers observe the laws of the state, but the board must carry out its own formally adopted policy, and I want to say on behalf of the industries of Pennsylvania that the sympathetic response has been most remark-

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able. The policy of the Department of Labor and Industry has been put squarely upon the basis of the policy issued by the Court of National Defense—that is industrial efficiency. To maintain the efficiency of the worker, the efficiency of the output, the efficiency of the business of the state, and thereby the efficiency of the nation, the worker must be protected. In Pennsylvania, simply because we have this larger body of specific laws concerning women and children, the emphasis has fallen upon the matter of the safety and health in the industries of the women and children.

There have been very few girdings against this decision of the Department of Labor and Industry, and even those have finally been set aside in a most cordial and courteous spirit. The manufacturers' association has indicated that it will co-operate in this general matter of maintaining the laws for the protection and safety of the workers.

As time goes on, we shall have more and more women in the industries, not only in Pennsylvania but in every state of the Union. As men are dismissed for military service women must take the place and if we are going to maintain matters at the level which this country needs and demands we must see that women go into places where they can do the work properly; not, as I said before, from lack of intelligence, that we doubt their ability to do the work properly, but it is a question of physical ability, physical strength, to stand the long strains and physical effects of certain industries, and the physical effects upon the nation, through the women, of allowing a breakdown of the protection that we have thrown around the women so far.

One of the industries that needs most particular and careful study is the explosives industry, the chemical industry and all its various branches. Only careful and scientific specific medical studies can determine exactly the part that we should follow. Tennyson in one of his beautiful visions of what the world shall come to be, set forth this: There have been different stages in the world; there will be different stages in the world to come. There was a stage far in the past when brutes killed men; there came, in the advancement of the world, a stage where men killed beasts. After that there came a stage in the world's history, and we know it all too well now, when men killed men. That has not been, as you well know, as safety men, merely a question of war or of military activity. It has been in a great many cases the ruthless driving of the industry

"THE WILL OF GOD."

A very advanced business man in Pennsylvania said to me: "It used to be that when we were erecting blast furnaces we expected an average of seven to eight men would be killed. It was the will of God. We knew no other way of erecting blast furnaces. We counted that in a part of the necessary expenditure."

Then he told me that it is possible nowadays to erect a blast furnace without the loss of a single human life. You see the division begins to come in the time in the world's history that it need not be that men kill men either in war or in industry. Tennyson, the inspired seer, looked ahead to a time in the world's history when men would grow wings. It seems to me that is exactly what such a body as this has in mind. It may not express it on its program, it may not express it in the outside utterances of hard-headed, practical business men such as you are, who come here to discuss these problems, and you may not express it in words, but that is the thought back in your mind.

A very great Englishman said to me two or three years ago he has never had a vision of idealism such as he had gained from America. He had been told in Great Britain and he had read America from afar as being the land of business and of dollars. He said he came over here and had the privilege of meeting some of the great leaders of business, the great practical business men of the country, and he found that America was a great deal more than a land of business and of dollars. Not one single business man that he had met, however busy they might be in the pursuit of dollars, not one of them but had back in his mind somewhere an ideal of something that he wanted to do with those dollars in the future—something for the good of others and for the good of his country.

A meeting like this, a gathering that is to give up most of the week to a consideration of the great problem of safety, is an indication of the coming of that time Tennyson speaks of, when men shall grow wings. The wings are sprouting and as they spread they will protect women in industry. They will protect the men and still more the women, and they will protect the little children in industry.

NOT A QUESTION OF PIN MONEY.

I do not for one moment think we have arrived at the real solution of the problem of the protection of children. The whole problem of handling children, up to the time of their maturity, is to fi

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them for after life, for citizenship and grown-up life, and until we recognize that and balance education in school and in industrial processes, properly, training them on both sides with a proper balance, remembering also the lesser physical strength at that age—until we get that worked out properly we have not proved a solution of the problem. The same is largely true concerning the safety of women, unless we recognize that women at the present time, and still more in the years immediately to come, are earning not only their “pin money” but their living. I know very few women who are earning merely pin money. They may tell you so, but when you get down to the cold, hard facts they are earning their living. Until we recognize that women are earning their living, and that in most cases they are earning the living of some one else, they do not have a family in whole or in part dependent upon them, until we recognize their right to earn a full share of the world’s emolument in return for what they put into it, just as in a case of a man, regardless of whether or not they have dependents upon them—we have not come to the real solution of the question of the safety of women in the industries.

We have to take into account that the Lord has not given women strength or muscle as he has men; that he has given us certain physical duties to perform in the world that lessen our powers of endurance; that he has given into our charge the care of little children, to develop little children, not only physically, but mentally, and morally—we must recognize those things in the treatment of them in industry. Finally and above all we come down to the fact that people in industry, whether children or women or men, shall be cared for so that they give their best and do their best. We may not have come to a real solution but organizations such as yours are making a big step in that direction. I thank you very much for your courtesies.

PRESIDENT PALMER: None of us in Pennsylvania doubt but what Mrs. Semple has her place in the industries of our great industrial state.

We have a real treat for you, not only in the address of one of our Vice Presidents but in the film he has written and produced for the safety of railway and industrial employes. The author “The House that Jack Built” needs no introduction. We are very glad to welcome on the platform Mr. Marcus A. Dow of the New York Central Lines.

THE PROGRESS AND POSSIBILITIES OF ACCIDENT
PREVENTION WORK.MARCUS A. DOW, GENERAL SAFETY AGENT, NEW YORK
CENTRAL LINES.*Mr. Chairman and Members of the National Safety Council:*

It is a great honor and a distinct privilege to be permitted to address a Congress of the National Safety Council. I am asked to speak of the progress and possibilities of accident prevention work and I feel somewhat in doubt as to my ability to do full justice to a subject encompassing such a wonderful record of achievement and promising so much that is possible for the future. The possibilities for future achievement can, perhaps, be fairly measured by a survey of what has been accomplished within a few year's time.

It is but a little more than ten years since the United States Steel Corporation began its systematic accident prevention work and planted the seed which has brought forth a product of such great value to humanity that its development has been one of the biggest things in the history of American industry. It was a new thing—this idea that even an industry of inherent hazard could be made reasonably safe by an ethical procedure which would benefit employer and worker alike. Those pioneers who first promoted accident prevention work entered a strange and unexplored country. It was trackless, mapless and unsurveyed—the only compass there was to guide these men was a vision—a vision of a better state of affairs wherein cripples and widows and fatherless children were to be no longer a by-product of industry.

EFFORT OF EMPLOYERS AND EMPLOYEES ALIKE.

Countless obstacles were encountered by these resolute pioneers but, gropingly, they found their way and, with a determination born of a righteous purpose, they blazed their trail through the wilderness. And now, with the aid of countless others who have followed in their path, they have at last constructed a highway of progress that is surely and unmistakably extending onward and onward toward a land of promise, the like of which but a decade ago could not have been pictured in the mind of the most romantic idealist. And so the problem of preventing accidents is today receiving the serious and thoughtful attention of men and women in every walk of life and the effort that is being made to solve this problem is not merely the effort of a few employers but is the effort of employers and employees alike in practically every known field of industrial endeavor.

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The men who inaugurated specialized accident prevention work in industries proceeded on the theory that every accident has a movable cause and that, by removing the causes, accidents could be prevented. They knew that through the application of scientific principles smallpox, cholera and other forms of epidemic could be controlled and that for any community to sit idly and wait to be devoured by such an epidemic would be cowardly and a mark of base incompetence. They realized that this also was true with respect to accidents and that it was only an ignorant fatalist who would say, "Tragedies are inevitable."

In order to remove the causes of accidents, it was necessary first to ascertain what those causes were. Therefore, one of the first steps was to classify the accidents as to specific causes. Thus, it was found that there were two elements which entered into accident prevention work. One of these was the mechanical element, involving the application of safety devices and the correction of unsafe physical conditions. It was found, however, that a majority of accidents could only be prevented by care and thoughtfulness on the part of human beings involved in accidents. Thus, the human element became an important factor to be considered and, as the work progressed, the principal avenue in which accident prevention effort was directed became the education and supervision of the human force. It was found that the making of laws and the mere installation of the best of mechanical safety devices would not eliminate the human element from the accident problem and that co-operation between the employer and the employee to eliminate not only the unsafe conditions which the employer must correct, but also to eliminate improper practices on the part of the employees, was essential to success in the preventing of accidents.

NECESSITY OF ACCIDENT PREVENTION WORK.

Before proceeding further with a discussion as to the progress it may be well to consider the necessity of accident prevention work. It is unfortunate that there are no reliable statistics of accidents occurring in the United States as a whole. Estimates based on figures gathered from various sources, however, give conclusive proof of the waste of human material due to preventable accidents each year is nothing short of appalling. A careful estimate prepared by I. Frederick L. Hoffman, Statistician of the Prudential Insurance Company of America, shows that in 1916 there were approximately 22,000 persons killed in industrial accidents.

million were so seriously injured that they lost more than four weeks from work. This estimate is considerably lower than a similar estimate made three years previous, due to the effect of accident prevention work. But in the past ten years, if the number killed in accidents each year had been as low as it was in 1916, the lives of 220,000 industrial workers—men who form the very bone and sinew of the nation—have been snuffed out. If that 220,000 had been buried in a gigantic trench, side by side, and shoulder to shoulder, that trench would now be more than eighty miles long and would have to be lengthened eight miles each year to accommodate the remains of the poor unfortunates who continue with unceasing regularity to fall victims of preventable accidents. If the hospital cots of those seriously injured in the ten years could be placed end to end in a continuous, unbroken line, that line would completely cover a single track railroad extending as far as from New York to San Francisco and back again. More than 2,500 workers were killed in the industries of the State of Pennsylvania alone during the year 1916, and 250,000 were injured, including both trivial and serious injuries. In the State of Ohio in that same year the total number of accidents reported to the industrial commission reached the staggering total of 166,200, of which 847 were fatal. The cost in compensation for accidents in Ohio during the year mentioned was in excess of five million dollars, while the medical expenses amounted to more than a million and a half. In Massachusetts there were more than 135,000 non-fatal and 463 fatal injuries to industrial employes during the year ended June 30, 1916, while in the State of New York, in the year ending June 30, 1917, the number of men injured while engaged in industrial pursuits reached the colossal number of 328,632, of which 1,584 were fatal. With the unpleasing records of these few states, multiplied many fold by similar records in every other state in the Union, the record of each state varying only according to the number of men engaged in industrial pursuits within its borders and with many thousands more killed in accidents outside of those occurring in industries and on railroads, is it any wonder that the hearts of men should cry out against this profligate waste—this colossal injustice to the human race—and that the best brains of the nation should be devoted to the study and development of systematic means for prevention?

BENEFICIAL TO BUSINESS.

The benefits that were found to accrue from accident prevention work were many. Employers were surprised to find that preventing

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the hardship, suffering and sorrow which accidental death and injury brings was beneficial to the business itself. Not only was the money saved that would have to be paid in compensation but it was found that preventing accidents increased efficiency and improved rather than impaired production. It was reasonable that this should have been so, because it is clearly evident that whenever there is a serious accident in a shop or in a railroad yard, and one or more workers are killed or seriously injured, the work of the others in that shop or yard becomes demoralized. Production is lessened and efficiency decreased. Therefore, aside from all other worthy considerations of humanitarianism and financial saving, it was found that safety work paid. It was found that to make a plant reasonably safe, to guard all dangerous places, remove unnecessary hazards and educate the employee to use that care and caution in connection with his work would make accidents the exception rather than the rule, eliminate the fear of injury from the mind of the worker and make him capable of doing a better day's work. Thus, we have found that one of the splendid things about accident prevention work is that this application of Christian ethics in industry is sound business.

HEART AND IMAGINATION.

But there is yet another reason for the wonderful growth of accident prevention work in American industries. The average American business man possesses something more than intelligence. He possesses a heart. He possesses a faculty for imagination. It was his ability to picture the far reaching and unhappy consequences of industrial accidents that first made him adopt the principle of accident prevention. He was able to see and to realize that the brightest hopes of an entire happy, contented family of virile, healthy manhood and womanhood were often blasted, and its members borne downward to the lowest depths of suffering and despair because of the untimely and often preventable injury to its bread-winning member. With his keen vision he could see that if the individual cases of social demoralization and upheaval, due to industrial accidents, numbering hundreds of thousands in a twelve-month, could be gathered together and viewed by any human observer, it would present a picture of misery so appalling, so pitiful, so horrible, that no painter who ever lived could even attempt to visualize it. It was the American employer's ability to mentally penetrate the darkness and see this condition of affairs that made him cry out in remorseful protest against it and enter upon the work of accident prevention.

determination that would permit of no failure—no retreat—and with absolute confidence in the good that might be accomplished.

And so, this life-saving, health-conserving idea was conceived and has since been marching forward with "seven-league boots." It is not my intention, nor would it be possible within the time at my disposal, to describe the many effective methods that have been developed in carrying on this work. The most important steps have been: first, to interest the employer to an extent that would make him have implicit faith in the work and become a safety advocate at heart; second, to so interest the employees that they would give their whole-hearted co-operation toward the elimination of unsafe conditions and practices and cultivate safety as a habit.

SUCCESS NOT BASED ON PRETENSE.

In respect to the employer, there have been some few who have not acquired great success because, even though they pretended to inaugurate accident prevention work in their plants, they were not good safety men at heart. Successful safety work is not based on pretense. There have been those who believed that all that was necessary for them to do was to post a few safety bulletins in their plants and let it go at that. The spirit of safety did not pervade their establishments because they were not good leaders and did not make their employees feel that they were sincere. Experience has proven that success in safety springs from a service of the heart, and an ability and determination to concentrate every energy, every resource necessary, upon the obtaining of results. It has proven that success in accident prevention, just like success in anything else, will come to those who compel it—that they will achieve success who believe they can achieve it—and who will put their whole hearts in the effort to attain that end. You will find that the spirit and the attitude of any employer—of any railroad official—will be reflected in every corner of his plant and on every mile of his road. You will find that if he is a safety man at heart accidents are reduced—that the majority of his employees are co-operating with him to that end—and yet his plant is working on the highest plane of productive efficiency.

There has, perhaps, been no greater benefit derived from accident prevention work than through the getting together of employer and employee in intimate conferences in regard to a matter of common interest and concern. Through the development of the employee's safety committee, employer and workmen have come to know each

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other, to sit around the same table, to rub elbows, to discuss a common problem, and, in the end, to understand one another's point of view. This attitude of personal relationship between employer and employee can have but one result—that of developing a harmonious feeling, and who is there who will gainsay that harmony is one of the most valuable assets of a business undertaking? It was the president of a large paper mills company who not long ago declared, "I would consider every dollar we have put into this safety work well spent even if it had not saved a life or prevented an accident, because of the get-together feeling the movement has engendered in the plant."

Let me say here that two outside factors had much to do with spurring the employer forward in the promotion of life and health conservation. One of these factors was the compensation laws of various states, which made the employer realize that the only remaining method of saving casualty expense was by preventing the accidents. The other factor was the casualty insurance companies which early recognized the many advantages of accident prevention. An emphatic proof of the value of safety work is the fact that the casualty companies have offered substantial reductions in the cost of insurance based on the extent and effectiveness of safety standards. It is recorded that reductions as high as 40 per cent have been offered employers on insurance premiums by this method.

CONDUCTING THE CAMPAIGN.

After interesting the employer, the process of interesting the employee has been quite similarly along the lines of education. The attractive safety bulletin board, containing photographs, diagrams, cartoons and tersely worded phrases of admonition and warning pointing out vividly and impressively the known practices that cause injury, has become an important part of the equipment of shops and railroad yards. Safety rallies for employees and their families where the doctrine of safety is preached, have become a permanent institution. Stereopticon views, showing the unsafe and safer methods of performing work, and motion pictures telling a forceful heart-interest story and driving home the unhappy consequences of carelessness, have played a most important part in awakening and educating the rank and file of employees.

The education of the foreman or the man charged with supervision, is now conceded to be of first importance if safety is to be maintained.

be effective. Eternal vigilance is regarded as the price of safety, and we have come to realize that the vigilance of the man in charge must extend so far as to see that the men under him are closely supervised as to the elimination of unsafe practices, and that they are taught to do their work with such care and caution as will preclude the possibility of injury. Thus the foreman becomes a most important factor on the human element side of the accident prevention problem.

But of all these important developments, perhaps there is none so potent, none so significant of progress, as the one which has brought forth the safety engineer—the future guardian of the human race. He is the spearpoint of the safety movement. It is his initiative, his ingenuity, his expert knowledge gained from ceaseless study, and his inspiration derived from a full realization of the possibilities of his work that serves to prod others into action, stimulate interest and promote the co-operative spirit in accident prevention among employers and employees alike. Operating officials, with their manifold duties, cannot keep continually developing new ideas in accident prevention. Thus the safety engineer has become almost indispensable to the successful conduct of this work. Experience has shown his territory should be confined to an area which will permit him to come into frequent personal contact with a majority of the employees under his jurisdiction. Let me cite the experience of the railroad which I represent. The New York Central Lines originally employed in their safety bureau several safety agents who covered a wide territory where close supervision and frequent contact with the men was impossible. A year ago we tried as an experiment the employment of a few division safety agents on certain main line divisions. After several months' trial it was found that the accident records on these divisions, compared with the same months the previous year, was from 20 per cent to 35 per cent lower than it was on similar divisions where there were no division safety agents. Therefore, commencing the first of July this year, the New York Central Lines took a new step in safety progress by appointing division safety agents on all of the main-line divisions of the system.

RECORD OF ACCOMPLISHMENT.

But what, you will ask, has been accomplished in all of this development of the safety idea in the way of actually reducing the number of accidents. After all, "It is by their deeds that ye shall know

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them." The record of accomplishment in saving lives in hundred industries and on the railroads forms one of the brightest pages in the history of American industry. There is perhaps a no more striking example of what consistent safety work will accomplish than the record that has been made by the railroads of the United States in the past few years—a record that has been made in spite of increasing traffic, labor disturbances, and numerous other intense operating conditions. On all the railroads of the country, during the six years ended June 30, 1916, there has been a steady decrease in the number of railroad employees killed and injured while on duty. In the year 1910, on all of the railroads, 2.17 employees were killed out of every thousand men employed, while in 1916, only 1.17 were killed out of each thousand employed—a decrease of 47 per cent in the number of employees killed per thousand employed. In 1910, 46 employees were injured per thousand employed on the railroads, while in 1916 only 25.2 were injured per thousand employed, a decrease of 46 per cent in the number of railroad men injured per thousand employed.

SUCCESS ON INDIVIDUAL ROADS.

There are many splendid records made by individual roads, and I take pride in the accomplishment of those who have worked with me. As president of the railroad I have the honor to represent prompts me to tell you that on the New York Central Railroad in the year 1916, as compared with 1913, there was a decrease of 35 per cent in the number of employees killed per million tons freight carried one mile, and a decrease of 20 per cent in the number of employees injured per million tons freight carried one mile. Actually, in the three years ended December 31, 1916, on this road 284 employees were saved from fatal injury; 6,211 from non-fatal injury, using the injury rate for 1913 as a basis and comparing subsequently yearly rates therewith and including only injury cases where more than three days was lost from work. I wish that I but had time to give you in detail the record of successful results in the long list of railroads which, through their safety work, have made reductions of equal merit, beginning with the Chicago & North Western Railway, the first railroad to inaugurate a safety campaign, and which in 6½ years has saved the lives of 200 of its employees, and including all cases of more than one day's disability, has prevented 15,769 from getting injured, through the humanitarian work of that grand old safety pioneer, Mr. Ralph Richards. But out of fairness to the industries. I must leave

railroads and tell you briefly what has been accomplished in some of the big industrial plants where safety has been made the first consideration, and the lives of their employees are considered the most valuable asset they have.

The record of the United States Steel Corporation stands out like a beacon light to dispel every vestige of doubt and uncertainty. The record of this corporation shows that in the nine years ended 1915, its safety work has saved 14,967 of its employees from death or serious injury, the injury rate for 1906 being used as a basis, and comparing subsequent yearly rates therewith, and including as injuries cases where more than thirty-five days' time was lost from work. A careful record has been kept of the amount expended in carrying on its safety work, and it has been found that through the reduction of its casualty settlements it received back all it spent in safety work, and, in addition, a sum equally as great, and totalling millions of dollars. The long list of industrial concerns, with similar records of achievement, should have their names emblazoned on a roll of honor that would inspire and enlighten the world. There is the E. I. DuPont de Nemours Company, with a record of 9.17 employees killed per thousand employed in the year 1908, but showing a steady decrease, until in 1916 there were only 2.41 employees killed per thousand employed. There is the Eastman Kodak Company, with their reduction of nearly 67 per cent in the number of accidents to each thousand employed in 1916 as compared with 1912, while from a record in the office of the National Safety Council, I have taken a list of industries showing records of accident prevention since the commencement of their safety activities that are actually astounding, and should convince the most skeptical that there is indeed a wonderful opportunity to serve humanity and to benefit industries by persistent accident prevention work. In this list are included:

The American Smelting and Refining Company.....	Decrease 24%
Cadillac Motor Company.....	" 69%
Commonwealth Edison Company.....	" 40%
Commonwealth Steel Company.....	" 69%
Corn Products Refining Company.....	" 37%
Fairbanks-Morse Manufacturing Company.....	" 72%
Harrison Brothers & Company.....	" 75%
Illinois Steel Company.....	" 85%
Inland Steel Company.....	" 35%
International Harvester Company.....	" 88%

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Milwaukee Coke and Gas Company.....	Decrease 8;
Noenah Paper Company.....	" 8;
Packard Motor Car Company.....	" 7;
Pullman Company.....	" 4;
Rochester Railway and Light Company.....	" 3;

These are but a few of the many concerns that have proven their deeds that safety work pays.

SAFETY ORGANIZATIONS VALUABLE.

I should be inexcusably remiss if I did not say a few words recognition of the splendid services rendered this movement by the two genuinely helpful organizations, the American Museum of Safety and the National Safety Council. The Museum, with its collection devices and models of safety and sanitary appliances, its library books and reports, photographs and lantern slides, illustrating the most practical methods of protecting life and health, has been material assistance to those seeking knowledge of the principles of life conservation. The growth of the National Safety Council has been most phenomenal. Even the most optimistic of that little gathering of engineers in Milwaukee, in the early fall of 1912, who launched the first National Safety Congress ever held in the United States, had little idea that out of that gathering would grow one of the greatest co-operative organizations for human betterment the world has ever seen. Beginning in a small way with a handful of members, pledged to the promotion of safety to human life in the industries of the United States, this non-commercial association unselfish business and professional men has grown in a few short years to an organization composed of 3,400 members, employing more than four and one-half million workmen. Its income, derived entirely from the dues of its members, is now approximately \$100,000 per year, every dollar of which is judiciously expended in providing actual service to its members. Through its central office, five monthly safety bulletins are distributed each year, and these bulletins, together with other forms of literature sent to its members, serve to educate both employer and workmen as to the simplest methods of preventing accidents. Its original plan was to confine its efforts to the prevention of industrial accidents, but through an irresistible force it has attracted to its emblem men and women from every walk of life, and today its activities include not only industrial safety, but public safety and safety in the home.

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Neenah Paper Company.....	"	8
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COMPLETE LIBRARY OF SAFETY LITERATURE.

Probably the most valuable of its many forms of service is through its information bureau. At its headquarters in Chicago is the most complete library of safety information in existence, and already its members are beginning to learn to take their welfare and accident prevention problems to this bureau for solution and to obtain information and enlightenment. If the information asked for is not on file in the library, a canvass of the members is made and every bit of available information on the subject desired is obtained for the inquiring member. This is a service that will develop until the time will come when the manager of a railroad or industry will go to the National Safety Council for expert advice in matters pertaining to the welfare of his employes just as he would go to his lawyer for legal advice, or to his doctor for advice as to his own physical well being.

In the final analysis as to the underlying reason for the phenomenal growth of accident prevention work, one cannot but observe that it is but a part of a process of industrial evolution. Even as in modern war, where new and gigantic weapons of destruction have forced a complete rearrangement of the technique of the battle, and brains are matched against brains to develop safeguards that will offset the increasing agencies of destruction, just so in our peaceful industrial pursuits has human invention created ponderous mechanical devices and swiftly moving engines of production and transportation, among which a mere creature of flesh and blood is a puny thing that would have small chance to survive without a complete revolution in methods of protection. Thus, accident prevention work has become, and must necessarily continue to be, an actual part of industrial and civic progress.

MUST NOT NEGLECT SAFETY WORK DURING WAR.

Even today, with our country at war, must the cause of safety be upheld and its progress continued. I have no sympathy with the thought that because lives are necessarily sacrificed for a righteous cause on the battle front other lives must be unnecessarily sacrificed at home through neglect. I cannot conceive of any loyal American employer who would, in this hour of national distress, neglect for one moment to uphold and maintain in the American industries those principles of justice and the prevention of suffering to humanity which, in another form, is the very thing the men at the front are fighting for. But aside from the proper adherence to these principles,

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the prevention of accidents today is the patriotic duty of every employer from the standpoint of helping to win the war. If it takes forty men at home to make the supplies for one man at the front, then it is important that the lives of the industrial workers should be conserved, to the end that the industrial line of defense may not be weakened. Surely, the killing of 22,000 and the injuring seriously of half a million industrial workers a year is a serious drain on the manpower of the nation at a time when every available man is needed for the work that is to be done. Here is where the safety movement and the National Safety Council and the American Museum of Safety are rendering a splendid service to the free people of the world in the hour of their peril. Our duty in this respect is clear. We must keep the workmen inspired. We must keep the machines going; keep the wheels moving; keep the industries up to their highest point of productive efficiency; keep them from having accidents, or anything else that will lessen that efficiency; and we will perform no small part in perpetuating those ideals of which our country is fighting for, and upon which the movement for accident prevention in reality was built. With this thought uppermost, and with the entire manhood and womanhood of the United States of America imbued with that idea, and working side by side to maintain this efficiency in the interests of humanity, we shall in the end see the cause of safety triumph, and the iniquity of war abolished forever from the category of human crimes. Thus will the cause of accident prevention continue to develop and grow, even through the days of our struggle for the continuance of our liberty.

POSSIBILITIES OF THE MOVEMENT.

So much for the progress of accident prevention. What about its possibilities? What of the future? Surely such a record of accomplishment as we have observed in the past few years augurs well for a continuation of that progress. There may be a temporary backward swing of the pendulum. Accidents this year are increasing even where the best of records have been made in the past. This is but the natural result of the high tension under which industries and the railroads are now operating, many at double their usual capacity. This, together with greatly increased labor turn-over and similar influences due to the war, is affecting the accident record adversely. But this only emphasizes the need for greater effort and increased safety activity. As to the future, it would seem reasonable, because it is proven that it pays, that the natural development of safety work

should, in a few years, bring forth a condition of affairs heretofore hardly dreamed of.

I should like to undertake a prophecy as to what we may expect to see within a period of twenty, fifteen, yea, even ten years or less, as an outgrowth of this wonderful truism—this practical application of the Golden Rule in our civic and industrial life. I believe that somewhere within this period the time will come when a workman who is employed will not only be expected to know how to operate a particular machine, but that his continuance in the employment will depend upon his observance of reasonable safe practices. I believe that when a workman is employed he will some day be examined, not only as to his physical fitness for the work which he is to engage in, but as to his personal habits and as to his attitude toward accident prevention. I believe that within a few years' time systematic instruction of the workman as to how to do his work with the least possible risk of injury to himself and others will be an obligation firmly fixed on the shoulder of the employer, and that the competence of a foreman will be measured in part by his ability to enforce safe practices on the part of his men. I believe that the time is not far distant when the great majority of American workmen will refuse to permit a man to work in their midst who is habitually careless.

NEW DUTIES FOR SAFETY ENGINEER.

I anticipate that the time will come when the drawings and specifications for every new building, whether it be for an industry, a church or a home, will be carefully scrutinized by safety engineers to make sure that every known precaution has been observed in planning the building and equipment. I expect the day to come when the safety engineer, or safety agent, will be a permanent and fixed member of the official staff of every industrial plant and of every operating division of every railroad in the land. I believe that within these few years every village, every town and every city will have an organized department whose duty it shall be to protect citizens from injury by accident, just as the fire department protects from fire, and the police department protects from crime, and that the agents of this public safety department, under a regular process of law, will have access to private property for the purpose of safety inspection just as the police and fire departments now have the right to inspect for hazards under their jurisdiction. I believe, too, that the subject of accident prevention will become a part of the curriculum of colleges and technical schools, and that the degree of Safety

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Engineer will be as coveted as that of a physician or a Doctor of Laws. I am convinced that eventually the children in the public schools will be taught safe habits from the very beginning of their lives, and that they will grow up to avoid unsafe practices from force of habit, because of their early training.

And when this complete process of evolution has been completed and this land has been made in fact a land of safety and freedom from preventable accidents, then the American employer, whose farsightedness, keen vision and determined effort made possible this condition so desired and so long hoped for, may with the utmost satisfaction, look upon his handiwork and say :

“And now 'tis done; more durable than brass
My monument shall be, and raise its head
O'er royal pyramids; it shall not dread
Corroding rain or angry Boreas;
Nor the long lapse of immemorial time.”

And then the working man and his wife, and his children, his mother, his sister, his brother—they shall stand forth in the full light of a perfect day, and with hands outstretched to that land of justice and of safety, with thankful hearts and in deep appreciation fervently exclaim, “America, my America, I love you.”

PRESIDENT PALMER: Mr. Dow's film, “The Rule of Reason” will be given immediately. No one can afford to miss this splendid reel. (An exhibition was given of the film.)

PRESIDENT PALMER: There will be a short executive session of the Iron and Steel Section at the close of this meeting.

Before we adjourn I think the Congress should send a telegram of regrets to Secretary of Labor Wilson. (The officers were instructed to carry out the recommendation of the President.)

I have received the following telegram from Mr. Steinmetz: “Very greatly regret that prolonged indisposition makes it impossible for me to come to New York and give the promised address. I have hoped to have sufficiently recovered at the date of the meeting to permit my attendance, but find I am not yet able to do so, and I must ask you to excuse my address.

“CHARLES P. STEINMETZ.”

We will send him an appropriate telegram of sympathy.

The banquet tonight will be a patriotic demonstration. Come and show your colors. It will be the best meeting in the history of the Council.

The meeting stands adjourned.

THURSDAY MORNING SESSION

CHAIRMAN FORSTER: I know you are disappointed at not seeing our newly-elected honorary member, Robert W. Campbell, at this meeting. I am more disappointed than you are. Mr. Campbell came East, though he really did not have the time to spare, but could not stop longer than the Twentieth Century yesterday. He is back in Chicago, or will be in an hour.

The reason for this general session, devoted to a study of fundamental accident prevention phases, is this: Last year, at Detroit, some of the younger men interested in the safety campaign—not always young in years, but young in connection with accident prevention work—said to officers of the Council: "Much of the material presented sounds very, very valuable, but it is over our heads. We are new at the work; we have not even the principles well in mind. Why not present the fundamental principles of safeguarding at a special meeting of the next Safety Congress?" The point was so well taken that the Program Committee arranged for a discussion of the five essential divisions of the accident prevention problem at this session of the Congress. The committee has selected men eminently qualified to discuss those particular phases and to present them to you in terse form.

Mr. David Van Schaack, our newly-elected President, will talk to you about "The Duties of the Safety Engineer." Mr. Van Schaack.

DUTIES OF THE SAFETY ENGINEER.

DAVID VAN SCHAAK, DIRECTOR, BUREAU OF INSPECTION AND ACCIDENT PREVENTION, ÆTNA LIFE INSURANCE COMPANY AND THE ÆTNA CASUALTY AND SURETY COMPANY, HARTFORD, CONN.

Mr. Chairman and Members of the National Safety Council: I am deeply sensible of the honor done me by your Program Committee in inviting me to speak to you today. In all the wide reaches

of the industrial field there can be nothing finer than the work which you are undertaking to do, and it is, indeed, a privilege to have the opportunity of addressing you upon the subject of that work.

I am also fully appreciative of the consideration shown me, and I might properly say you, too, by the committee in assigning me this topic. A glance at the list of subjects and speakers for this morning's meeting gives convincing evidence that the committee has exercised its wisdom as well as its discretion in carefully removing from my purview anything like full discussion of the chief divisions of the safety engineer's duties and assigning detailed treatment to me far better qualified. You will have the privilege of hearing about safety organization, safety education, safeguarding, and the relationship of accident surgery and medical supervision to safety work from men who are recognized throughout the country as leading authorities.

It seems to me that the title of my topic might well have been amplified so as specifically to mention the opportunities, as well as the immediate duties, of the safety engineer, for the two are as inseparably bound together as they are manifold. Safety engineering is comparatively a new occupation in this country, yet I think it may fairly be held that it has already attained the dignity of a profession

OUR WORK IS UNQUALIFIEDLY CONSTRUCTIVE.

There is a trite old saying that it is easy enough to make a dollar, but mighty hard to save one. Another has it that if one takes care of the pennies the pounds will look after themselves. We all know in our private lives how much more quickly we can run down than we can build up. And, publicly, in this great war now prevailing so universally the world has its clearest proof of how the constructive work of ages can be destroyed in but a moment.

Is not such a work as safety engineering, unqualifiedly constructive, slowly, perhaps, but persistently upbuilding, conservative in the truest sense of the term, and in its last analysis creative in the broadest way, worthy to be classed among the professions, and even as one of the noblest?

One need give only passing thought, I believe, to the wide and varied field of safety engineering's possibilities to appreciate that here is a profession that yields to few, if any, in its potential ability to render the highest degree of public as well as private service, to make a great and lasting contribution in many more ways than one to the social well-being of the world.

It does not fall to the lot of many of our present-day safety engineers to realize all the possibilities inherently open to their profession, but that would be too much to expect in this stage of the work's development. It is no reflection upon what safety engineers generally have already done to look forward to a time when a deeper and more widespread sense of social justice will make possible a degree of accomplishment which will cause the average accomplishment of today to be looked upon as relatively little.

I think it can safely be said, though, that a real start has been made, and that the movement has now gained such impetus that not only can there be no retrogression but failure to make rapid and steady advance will be impossible. We have already many notable examples, in our great corporations and elsewhere, of what safety engineering can do, both in the narrower field implied by a close definition and in the various allied fields which go to make up the full scope of its possibilities.

SAFEGUARDING AND EDUCATION.

I shall not attempt even to enumerate, much less discuss, these allied fields, but shall simply beg your indulgence for a few general observations upon the duties of the safety engineer in the primary lines of his activity.

Safety work proper is divided into two essential elements, safeguarding and education, both conducted under a well-planned scheme of organization. The importance of safeguarding has long been recognized, while that of education has only within recent years come to be appreciated as it should be. The comparative value of the two in solving the accident prevention problem has been the subject of much discussion, resulting at last, I feel sure, in a general belief that neither is sufficient unto itself, even in its own particular field, but is dependent upon the other for anything like complete fulfillment of its purpose. And both are dependent, separately and together, upon that cordial coöperation between employer and employees which is obtainable only through organization.

Safeguarding alone, no matter how thoroughly it may be done, can never take care of more than relatively a small percentage of accidents, for ignorance and thoughtlessness are the causes of most accidents, in whole or in part. Safeguards do prevent accidents, however, and they often tend to reduce the seriousness of accidents which they cannot altogether avert. Their provision, moreover, has a very material influence upon the educational side of safety accom-

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plishment. The success of educational work depends finally the measure of co-operation obtained from the workmen, and co-operation cannot well be expected unless the workmen reason to believe that their employer is willing to do his full share in the joint effort which will inure to their common benefit. The tangible evidence given by safeguarding that the employer does not make a platonic interest in accident prevention, but is ready to spend his money to remove or lessen the hazards of dangerous machinery and places is the best possible guarantee of his good faith.

FIRST DUTY OF THE SAFETY ENGINEER.

It seems to me, therefore, that the first duty of the safety engineer is so fully to convince his employer, if he is not already convinced, of the value of and the necessity for accident prevention that the money, as well as the organization, requisite for adequate safeguarding will be promptly forthcoming as needed. An appeal to the employer's sense of social justice, or to his humanitarian feelings often goes a long way, much further now than heretofore, but this can always be most advantageously coupled with this, if not made primary argument, an urging of the value of accident prevention in dollars and cents.

The employer who does not see that accident prevention is his duty cannot fail, if the facts are properly presented, to appreciate that it is an economic necessity. As a prominent safety engineer recently well said, "The employer who ignores the personal element in his business today is doomed to failure, and as business competition continues to increase, the more is this true."

The several ways in which industrial accidents are wasteful are too well known to call for enumeration. The cost of accidents in money, in lost time, in interruption of business activity, in consequent spoiling of material and product, in uncompensated overhead in labor turnover, has been pointed out so frequently and forcibly that it needs no repetition here. The strenuous business competition of today calls for the highest degree of efficiency if success is to be attained, and industrial accidents are such an actual and potent cause of impairment of efficiency that they cannot be ignored.

Once the opportunity to do adequate safeguarding is obtained and the means of accomplishing it are at hand, the actual provision of safeguards must be approached in a truly scientific manner if maximum results are to follow their installation. Only a careful study of the

ing conditions, a painstaking analysis of accidents occurring under them, and a searching inquiry into potential causes of accidents that may not have occurred will determine truly the hazards to which workmen are exposed and indicate the correct means of overcoming them. No remedy can be effective which is based upon a wrong diagnosis.

SAFEGUARDING MUST BE PRACTICAL.

Conversely, the best of diagnoses will be futile unless it is followed by the furnishing of the right kind of remedy. The nature of the safeguard to be provided is of just as much importance as the determination of the risk. A safeguard has two functions, that of effect and that of appeal. To fulfil these functions, it must not only be necessary, and calculated really to prevent the accident which it is designed to avert, but it must serve its purpose without unnecessary interference with the doing of work. In a word, it must be practical, wholly practical, and nothing but practical. If a safeguard is impractical, whether in effect or in appeal, it is useless and a hindrance rather than a help to the cause of accident prevention. You can not expect an employer to continue spending his money for unnecessary safeguards, for safeguards which do not guard, or for those which do guard at the expense of a too material loss in efficiency. You cannot expect a workman to use a safeguard, if use can possibly be avoided, when its predominant appeal to him is that of an unnecessary interference with his work.

Of course, the best time to provide for mechanical guards, and many other safety conditions, is when the machines are building or the plant is being planned, but unfortunately much safeguarding is still an afterthought. This can be avoided to a large extent by the careful checking of plans and specifications for new machinery and equipment, and, too, in perhaps a more limited degree, for new construction, and for alterations, repairs and rearrangements in order to see that every safety requirement is covered so far as possible. As for the rest, the best must be done with the opportunity at hand.

The standardization of safeguarding is progressing steadily, but there is much yet to be done, and the safety engineer will do well to adopt every possible means of keeping in touch with the experience of others, both generally and in his own line of work. The service and congresses of the National Safety Council, its local councils and the activities of its sections offer valuable aid in this respect, as well as in the other branches of safety work.

FOREMAN AND WORKMAN.

There is no better way of assuring that a safeguard will be thoroughly practical, will fulfil both of its functions, that of effect and that of appeal, than to enlist the aid of the man on the job—the foreman and the workman. No one else knows so well the true risks of the work involved, the ways in which these risks lead to accident, and the manner in which they can be avoided with the least interference with work. And there is a psychological result of such coöperation the value of which cannot well be overestimated. If the man on the job feels that he has actually had a real part, even though a small one, in the provision of a safeguard for work which he is doing, or which is being done under his supervision, he is pretty sure to use it or to see that it is used. He comes to look upon it as his guard, and naturally to take the keenest interest in its maintenance and use.

It is coöperation, indeed, which is the basis of all really effective safety work, of safeguarding as well as of organization and education. Without coöperation little worth while, nothing either far-reaching or permanent can be accomplished. If you are to achieve anything like the full measure of results, you must get the men interested as well as the bosses, and you must everlastingly keep them interested, both men and bosses. You must be an advertiser—not blatantly but persistently. The familiar saying, "It pays to advertise," applies nowhere better than in safety work.

MAKE THE LESSON VERY CLEAR.

The facts about accidents should be brought forcefully to the attention of both bosses and men. Photographs, stories, reports, all should be made use of—prepared in form graphic and interesting, gruesome and gripping. You must make the bosses feel the cost of accidents, appreciate that they are a serious leak in the business, that they can be prevented and must be. You must make the workmen see that accidents do happen, no matter how immune they may individually consider themselves, and you must make it clear how accidents happen and how they can be avoided.

It is only by arousing, and keeping up the interest of both bosses and men that you can obtain the coöperation which is vitally essential to the success of the cause, and I might say incidentally to your own success. You will never get adequate recognition of accident prevention adequate results from your work in its behalf, or adequate

salary for yourself, until you convince your employer that your department is as important as any in his plant. You will never get, and keep, the workmen with you until you convince them not only that hazards exist, but that accidents happen or can happen from them, and that it is possible to avoid these accidents. Without keeping both bosses and men continually interested you may get some safeguarding done, but it will fail of full effect; you may create an organization, but it will be an empty shell; you may start educational work, but it will be chiefly teaching with little learning.

The coöperation of the workmen is even more essential than that of the bosses. No matter how much interest the bosses may take, no matter how much aid they may give, it is upon the attitude of the men, in the last analysis, that the greater meed of accident prevention depends.

WORKMEN'S SAFETY COMMITTEES.

I am not going to attempt to outline the many ways of obtaining the coöperation of the men, for that will be done in detail by other speakers; but I cannot refrain from infringing upon Mr. Price's province to some extent. No talk on safety would be worth its salt which did not at least mention workmen's safety committees. There is no better way of arousing the interest of the men in a plant than by instituting such committees as a leading feature of your safety organization. The principle is as correct as it is old that the way to get a man really interested in a thing is to give him something to do in connection with it.

The inspection work done by workmen's committees will not only call attention to many hazards and result in suggestions for avoiding them, whether in the form of physical or mechanical safeguards or otherwise, but it will also convince the workmen serving on these committees that prevention of the great majority of accidents is not possible by the employer alone, but requires the active coöperation of the men themselves.

Men who serve upon workmen's committees come to have a clearer understanding of the accident prevention problem than they could get in any other way, and become the finest sort of missionaries among the workmen generally. They are in the best possible position to vouch for the employer's honesty of purpose, and to point out the prominent part which the workmen must take in accident prevention. A few words from, or the example of, one of them carries more weight than anything that you or one of the bosses might say or do.

You safety engineers have a large part to play in connection with these committees, in educating them both as to the value and as to the details of their work; but the more you can be stimulator and adviser and the less mentor, the better. In most of your work you will find suggestion far more effective than coercion. It will pay you generally to be an "easy boss."

"GET THE SAFETY HABIT."

One of the pioneers in safety work struck the keynote when he said that the best safety device was a safe man. Another has put it that the greatest factor operating toward the prevention of accidents is not the prevention device, but the "prevention spirit." The safety slogan which has the strongest appeal to me is "get the safety habit." There is a lot of meaning in that phrase. Safety habit is but another way of spelling caution, which is the one and only preventative of so large a number of industrial accidents. The safety habit may, perhaps, not be so easy to acquire as some other habits of which we know, but it is certainly much more worth while.

I do not think I exaggerate in making the statement that promoting the safety habit, getting the men to think safety and to think it unconsciously, is the biggest thing you safety engineers have to do, and the most difficult. It is the leading feature of the general educational work which is the keynote of all successful accident prevention campaigns. Workmen do not intentionally get hurt, but ignorance and thoughtlessness are the most prolific causes of accidents, and these causes can be eliminated only through a comprehensive plan of education.

Promoting the safety habit is a more difficult problem here than in such a country as Germany, where the workman from childhood is trained to have the utmost respect for authority, to obey the most minor and trivial regulations in his daily life. A German has only to know that a thing is "verboten" to avoid doing it. The American workmen, however, must be shown.

It has often been said that recklessness and carelessness are among our national characteristics. I prefer to believe that it is the American workman's fine sense of independence that leads him instinctively to pass his own judgment upon matters affecting his safety as well as all other matters. He must, therefore, be educated so that his judgment will be correct. He must be made to see

them, and that he must habitually exercise caution if he is to avoid their consequences.

VISUALIZE THE ACCIDENT.

He must be brought into such a state of mind that when the time comes for taking the dangerous chance he will instinctively visualize the accident which may result if he takes it. His imagination must be developed and pointed in the right direction. It is curious how many workmen seem unable to picture themselves in the place of a man injured. It is curious, too, how many will appreciate one danger and fail to see another, even one correlated. There are workmen who will be scrupulous to use only tools in good condition but will fail to wear goggles when grinding those very tools.

That blind confidence in the record of the past, so generally present, must be overcome—that feeling that because nothing has happened while the work was done in the good old way, nothing ever will happen. So, too, must the frequently held belief that the introduction of guards and safety practices is a reflection upon the workman's ability to take care of himself. Workmen are just like the rest of us. Through long usage, they fall into confirmed habits and are resentful of innovations.

I do not wish to appear as belittling the value of discipline, of creating and then enforcing rules. I think, however, that great care should be taken in the framing of rules and that they should be as few as possible, and I believe that discipline should always be a last resort. Of course, every rule that is made should be rigidly enforced when necessary. Otherwise no rule will command respect. A great aid in securing obedience to a rule is, before promulgating it, to get some leading men in the work affected, if possible a majority of all the men, to follow the desired practice. Their example, procured by a combination of suggestion, education and persuasion, will obviate much of the need for coercive measures. Especially should the foreman be in full sympathy. Not only is his the closest authority, but he is the natural teacher of the men and the example whom they emulate. The foreman often makes the best rule book and danger signal.

The ways of educating workmen into the safety habit are almost innumerable. I should be stealing some of the thunder of each of this morning's speakers if I should attempt even briefly to outline them. Practically every step you take in your safety work has its part in this education, and you will do well always to keep this fact clearly in mind. The provision of safe working places and

safe tools is a feature of education, as well as a direct means of preventing accidents. So, too, and most notably, is the formation of the workmen's committees, and, I might add, about every other phase of safety organization, for the promotion of fellowship, through bringing the men, and the men and the bosses, together, is a very vital factor in safety work.

HUMAN ENGINEERING.

Safety engineering is really human engineering, and the only way to get anything like the full measure of results is to obtain the sympathetic coöperation of every man in the plant who can be reached. Not only should an endeavor be made to reach every man individually, so far as possible, but you should reach them collectively through meetings, say once a month. Among other things, you can show them moving pictures bearing on general industrial education subjects, and you can, through stereopticon slides, visualize outside experience in accident prevention work as well as that of your own plant. A good camera, by the way, is an essential part of a safety engineer's outfit, for through it foremen as well as workmen can be effectively reached. Picturing to meetings of foremen the hazards of the plant, the need for good housekeeping, etc., is apt to be of great aid.

You cannot get the coöperation of workmen by preaching to them, but you can get it by a sympathetic method of arousing their interest. In a way they must be approached as entirely ignorant of a new subject. As I have said before, they must be shown, and one of the best ways of showing them is to let the facts, of risks, of accidents, and of other shops' experience, speak for themselves, through photographs, slides, exhibits, etc. A well-conducted bulletin board, for instance, is one of your most potent aids.

Everything tending to keep safety uppermost in the minds of the men, such as the showing of safety slogans in one way or another, is of great value. So, too, is any means of stirring up the emulation of the foremen and men. There is nothing like getting the spirit of emulation into safety work. If you can get the foreman and workmen of a department interested in beating their own safety record, or in competing with the safety records of other departments, it will be a tremendous help.

The one man in whom you should be supremely interested is the foreman. If you can interest him, if you can help him to see clearly the causes and remedies of accidents, if

feel that accident prevention is worth while, I venture to say that three-quarters of your entire work is accomplished. The foreman is potentially your most valuable assistant. If he will only give the matter his serious attention, he is in the best position to note the real hazards of the work and to determine the true causes of accidents. It is he, too, who can best avoid the accidents so often due to men not being carefully instructed how to do their work or not being suited to it. He is also closer to the men than anyone else in the plant can possibly be, and his influence in inducing them to acquire the safety habit can be enormous.

MAKING FRIENDS AND GETTING RESULTS.

You yourself are, of course, familiar with every nook and corner of your plant. You are continually inspecting for hazards. If you have got close to the foreman, if you have been able really to make him your friend, an off-hand suggestion to him as to how he can improve his department from the safety standpoint will have the best effect. The more of this verbal correction that you can do the better. As I have already said, safety engineering is human engineering in its greater part. It is the habits of men that you have to change, and to accomplish this there is nothing like the close personal touch. You should not fail to try to make every foreman your friend, and so far as possible every workman.

There is just one more feature of accident prevention, and a very important one, to which I should like to call your attention. This concerns itself with the selection of men for work and their instruction in it. Too little attention, from the safety standpoint, is often given to these matters. To put a heavy, slow-thinking man on a job requiring both bodily agility and mental alertness, or vice versa, is simply inviting accident. So, too, is assigning a man to work without carefully instructing him how to perform his duties safely as well as otherwise efficiently. Every new man on a job should be carefully instructed in general safety as well as in the safe way of doing his particular work. Especial pains should be taken with the recent immigrant and with all non-English speaking men.

Here, too, our friend, the foreman, is indispensable. He is in the best position to see that men are properly instructed in safety practices as well as in their work. It is he who can refrain from assigning a man to work for which he is not suited, or who can see that he is promptly shifted to other work should unsuitability later

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develop. He is better able than anyone else to study the man and give each the individual handling which is so often necessary. It is strange how much is apt to be taken for granted in the handling of men. The most careful study is given to a machine, while men are the most uncertain and at the same time the most important factor in both production and safety, are so apt to be considered as cast in one mould, and that not infrequently the mould in which their immediate boss was cast.

A WORK WHICH REQUIRES PERSONAL QUALIFICATIONS.

I have touched only the high spots of my subject, have discussed accident prevention in the broadest way and in the most general terms, but I trust I have been able to say something which will aid in reaffirming and strengthening the conviction which I know you all have of the importance of your work and of the necessity of bringing to bear upon it every high quality which you possess. It is a work which requires nearly every personal qualification that can be found in successful men in all walks of life. It calls for initiative, persistency, judgment, diplomacy, leadership, and, perhaps above all, that quality of sympathy without which we can have no real or permanent influence upon our fellow men.

There can be no doubt of the great value of safety work, in itself and in the stimulus which it inevitably gives to other branches of industrial betterment. Safety work is conservation, and in the highest sense of the term—conservation of the world's biggest and the most wonderful gift of God, human life. It points the way not only failingly to other fields of social well-being. It contributes to individual happiness, to the better understanding of man by man, to that spirit of fellowship which makes life worth living. Industrially, it is economic, it is humanitarian, and in this crisis of our country and our world it is highly patriotic.

A speedy and successful termination of the great war is dependent upon the conservation of man-power in our industries. If every man in the trenches must stand five men in the shop and five in the field. The front presented by our industrial army must be as firm and unbroken as that of our military and naval forces, and it is your privilege and duty to be of material and vital aid in the maintenance and strengthening of this supplementary American line.

Now, more than ever, safety engineering is a work in which

CHAIRMAN FORSTER: The address of our President will be a source of inspiration to those new in the work and will help reconsecrate some of our veterans to the cause we are trying to serve.

The Program Committee sometimes has difficulties in picking the best man in an organization to present a good topic, but when it came to the subject of "How to Organize for Safety" the vote was unanimous in favor of Mr. C. W. Price.

HOW TO ORGANIZE FOR SAFETY.

C. W. PRICE, FIELD SECRETARY, NATIONAL SAFETY COUNCIL,
CHICAGO, ILLINOIS.

Mr. Chairman and Members of the National Safety Council: A few weeks ago I met my friend, A. H. Young, of the American Museum of Safety, and he said: "Yesterday one of the professors of a large university, in the course of a discussion, remarked: 'Mr. Young, I do not know anything about the safety movement; tell me what is the most significant thing that has occurred in the movement in ten years.'" Mr. Young said to the professor: "I cannot answer that off-hand; give me an hour to think it over." Later he said: "In my estimation, professor, the most significant thing is that we have absolutely demonstrated that we can eliminate three-quarters of all the deaths and serious injuries in industries." I thought it was a mighty good answer, and I asked myself: "What is the second most significant thing?" In my estimation it is this: That at every step of the way manufacturers have demonstrated that it pays dividends to conserve the human equipment of their plants; therefore, this great safety campaign has been incorporated into the efficiency movement and has become an indispensable part of efficient shop organization.

I asked myself, what is the third most significant thing that has come out of the movement, and this thought occurred to me: To the surprise of all of us, who were early in the work, some ten years ago, we have demonstrated that about 65 per cent of all the remarkable work that has been done in saving human life has been accomplished entirely outside of anything that you can buy with money or build with iron or steel or wood. Two-thirds is a matter of education and of organization, and it is on this last feature that I am to speak this morning.

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FUNDAMENTAL FACTORS IN SAFETY WORK.

In my five years' work in Wisconsin, and during my first year work as Field Secretary of your organization, it has naturally fallen to my lot to spend a good deal of time with managers, superintendents and foremen of plants where they are just beginning safety work, plants where they have done nothing in the work, or have made a failure of it; naturally there have been borne in upon my mind a few fundamental factors that seem to me indispensable in order to really get results in protecting human life.

I do not wish to attempt to say anything new, rather I want to say those things that are old and have been demonstrated. I cannot add anything to what our President has said; what I shall attempt to do is to point out five things—the five indispensable features of an efficient safety organization necessary to get the results. Not one of the five things can be left out if we are to have an efficient organization.

The first is to convince the general manager—the man who holds the pocketbook—and get him actively interested; he must be active and continuously identified with the safety movement from its initial stages. I have gone into numbers of plants where they were not getting results in safety work; within five minutes I knew why. If the manager was not convinced, he was not informed in regard to safety work, he had never sent an order down the line to put safety on the map. In every case, gentlemen, where I have succeeded in getting the general manager to go with me before his foremen and put the thing squarely up to them as he would issue an order, and then identified himself with the movement, things have happened. If you do not get that co-operation you have not really started the work.

The most remarkable example of the effect of such a step was that of the Consolidated Power and Paper Company, of Grand Rapids, Wis. Mr. Mead, the manager, is a young man of about our age, a graduate of an engineering school, and a fine, square type sort of a man. He had not been doing much safety work. He said: "Prior to this I want you to come and help me with a little meeting on Sunday afternoon." I went. There were 150 men in the room, foremen and workmen. He stood up and said: "Boys, this is the first time in the history of this plant we have ever come together. Our meeting today is for the purpose of discussing how we can prevent our men from being killed or injured. During the six years I have been your manager several men have been killed."

been seriously injured. These accidents would not have occurred if I, as general manager, had done my part. I am sorry to say it, but it is true. Men have been killed or injured here who never would have been killed or injured if the men had done their part. We have both fallen down, boys. Mr. Price has told you what other companies all over this great state have done in saving human life, and if they can do it, so can we. Tomorrow morning the Consolidated Power and Paper Company is going to start a safety campaign, and I want every man in this room to start, when the whistle blows, to help in the movement. I expect every foreman and workman to do his part. I assure you, as the general manager of this company, that anything that money can buy to protect human life in this plant will be forthcoming. I will go the limit if you will go with me."

This is what happened, Mr. Chairman: It became one of the model plants of Wisconsin in a very few months. The general manager gripped the situation and all of the foremen and workmen were with him. I remember they had a contest among the paper mills of the State and the Consolidated Power and Paper Company took the banner.

SAFETY MEETING ON COMPANY TIME.

One of the finest examples illustrating this point I found at Pittsburgh a few months ago, in the National Tube Company's McKeesport plant. The general manager is intensely interested in safety and every month takes one department and closes it down at twenty minutes to 12. He pays a personal visit to the department and tells the men what the company is trying to do, what they are willing to do, what the workmen have lost during the last month in wages and suffering from accidents, and asks them to pull with him. This has proven a most effective means of putting life and interest in the movement.

The second point is to teach the foremen who are intelligently interested—I mean who are convinced that safety has arrived—that safety is not just a little outside frill, but it is an inside proposition; that it is a part of efficiency, and that any foreman who has any respect for himself or any ambition as a foreman ought to give it his hearty support. More and more I believe safety engineers are coming to say that, in the last analysis, the attitude of the foremen absolutely determines the attitude of the workmen. In my experience in Wisconsin I never found a plant where the foreman was lukewarm and indifferent, where he was able to get his workmen with him.

On the other hand, I have never known a plant where a foreman was intelligent and was sincerely interested and showed his interest every day, by what he said to the men and by what he did himself that did not finally win his men.

INITIAL STAGES OF SAFETY WORK.

How can you get your foreman interested in the initial stages of safety? I want to make two suggestions: *First*, have a meeting of the foremen and at this meeting the superintendent and manager should be present. Have them place before the foremen, very simply and very plainly, what has been the splendid experience of numbers of companies; what reductions have been made, what money they have saved, how the great safety movement has arrived and is recognized everywhere as a legitimate part of efficiency. At that meeting put safety on the map and give every one of the foremen to understand that from that time on he is expected to do his part along these lines just as much as he is expected to do his part in fire prevention or anything else that prevents waste. Make it unmistakable; make it sound like an order.

Second, at that meeting, or at the first two meetings in the initial stage, agree on a definite program; agree on the first twenty-five points in the plant to be guarded; agree on the standards for guards, the education and organization features that are to prevail and the rules that are to be adopted. I heartily agree with Mr. DeBlois on the point made at the Tuesday meeting in regard to taking the foremen into the proposition from its earliest stages, so that the educational features, the form of organization, the rules, and the points to be guarded will have been considered by them and they will have a voice in formulating the standards.

What is the *third* most important thing of these five indispensables? A safety engineer. I only want to add one word of emphasis to what our good President has said. In my recent work in visiting the twenty-one plants of the government arsenals and navy yards the first thing that was borne in upon our minds was this: One of the reasons why so little had been done in the government plants was because they have had no one who was informed in regard to safety, no one who had any authority to enforce it and no one who had any time to attend to it.

The most remarkable example of what a safety engineer can do I saw in a plant out in Omaha, where safety was sadly hampered by an incompetent safety inspector. Then they selected for

The first question is especially important if there is a limit placed on the amount of money that may be expended during a certain period, and of course it is important also that the most hazardous places be guarded first.

A preliminary inspection will point out situations that require immediate attention, because men are employed in close proximity to hazards where a misstep or a moment's thoughtlessness may result in contact with some moving part, causing an injury. These obviously dangerous situations should be taken care of at the earliest possible moment, not only because they may result in an accident, but to leave such glaring hazards exposed will interfere with your educational campaign and put a damper on the co-operation of the men because of the apparent insincerity of the management in the movement as indicated by allowing such conspicuous hazards to continue.

SAFETY BULLETIN A LIBERAL EDUCATION.

A study of the reports of accidents that have happened both at your own plant and those reported in the bulletins of the National Safety Council will be a liberal education as to where and how accidents occur, and will point out things that should be done to prevent repetitions of those accidents. All of us know of accidents repeating on the same machinery or on similar machinery. We even find similar machines standing side by side, one of which is guarded and the other not. The explanation given is that a man was injured on this machine, so we put a guard on it to keep the fellows out, but they had stopped there. No one had been incautious enough to project his person into the other machine, so it was not guarded.

Let it be a fundamental principle that when a man is injured on certain machinery that you comb the situation carefully to see that a similar condition does not exist anywhere under your supervision. Advertise the fact that an accident occurred in a certain way and get every one working against the occurrence of an accident under similar conditions. This advertising of how accidents occur is also an important feature of the educational work you are presumed to be carrying on at this time.

Conferences with foremen and workmen will point out things that it would take a man a long time to discover merely through observation. They will know not only of accidents that have occurred on machinery under their control but also of "near accidents" which have never been reported because no one was injured. It is

through these "near accidents" that much valuable information can be gleaned and steps taken to prevent an injury through a similar occurrence.

They may tell you that they do not remember of any one having a narrow escape from injury through the failure of the machinery, and they are perfectly sincere in their statements, but inquire further. They may remember of parts of their machinery that have been strengthened or changed because of its breaking under load. The fact that no one was injured when this part broke may be entirely due to the good luck that no one happened to be in a position to be injured. You may find similar machinery in other parts of **your** plant that has not been strengthened like the one that broke down and there you still have the possibility of an accident.

Your inquiries will bring out that shafting has broken but no one was injured, cables or hooks have broken, piles have toppled over and damaged material and caused considerable trouble from an operating standpoint but no one was injured; handling material has been delayed because of bad floors tipping over trucks, too narrow passageways or obstructions blocking traffic and causing confusion, but not resulting in injuries, and other operating difficulties, all of which have a bearing not only on production but also on accident prevention. Where this has seriously interfered with production you, doubtless, will find that the difficulties have been rectified, in that particular location, but you may find that similar situations exist in other parts of your plant especially if it is a large one, and there you can do good service both from a safety and an efficiency standpoint by applying the remedies used in the first instances to similar situations in other locations.

Watch the different operations and new and unthought of possibilities of accidents will appear. A man unfamiliar with an operation many times will see dangers that escape the notice of the foremen and operators because of their familiarity with the work. You will see the work from a different angle and your mind not being occupied with the details will discover hazards that have been overlooked or not thought of by the workmen because of their attention being taken up with the details of the processes and the production of the machine.

FOLLOW THE OILER.

Go about with men whose duties take them into out of the way places. If you follow an oiler, for instance, you may find that he goes into a number of places that are exceedingly dangerous. He

may have to climb up to bearings where a misstep or a slip would throw him into moving machinery; his path may take him close to unprotected shafts, belts and gears; his ladders may be unsafe and he may be walking out on beams and doing stunts that should be confined to a three-ring circus and the admiring gaze of a morbid crowd. The oiler, if he loses his balance, will only be rewarded by "Don't he look natural."

To leave seeming generalities and come to the more specific guarding of moving parts of machines, the rule that gears should be guarded, no matter where located, should be as the laws of the Medes and the Persians. Many a man has been maimed or killed by gears that were not dangerous because no one ever went near them while they were in motion, or because they were in an isolated place where no one ever went. No one ever did go there except the poor oiler, and the inspector and riggers and millwrights and repairmen and maybe an electrician or two. You can take it as a fundamental fact that exposed power-driven gears will sooner or later get their man if allowed to operate without a guard.

Clutch and other couplings with exposed mechanism can be placed in the same class as gears. Revolving set screws, projecting bolts, and keys also should be so classed.

The hazards of shaftings, pulleys, belts, balance wheels, etc., is governed somewhat by their location, though if they are to be approached while in motion they should be guarded against accidental contact regardless of their location.

A number of state industrial boards and many employers have ruled that these mechanisms, when within a certain distance of the floor working platform, or when they must be approached while in motion, shall be guarded. It is a safe rule to set this distance at seven (7) feet, in order to keep material as well as men from coming into contact with the moving parts.

Then let it be a fundamental principle that any portion of a shaft, pulley, belt, rope drive, etc., that comes within seven (7) feet of the floor or platform or that must be approached while in motion, shall be guarded.

Now, then, what have we got? There is overhead transmission, low transmission and the transmission on the machines themselves. The rule covers all of this mechanism though the style of guards will be different.

usually suspended from above, and the guards for same are ordinarily suspended from above.

Then there are the vertical or inclined shafting or belts connecting the overhead with the low or machine transmission.

Then the low transmission and the machine parts which may be and usually are both horizontal and vertical shafts and belts.

In guarding any of this transmission machinery I do not think it necessary to make a distinction as to the height of the guard or openings between the members of the guard, whether the thing guarded happens to be a shaft, belt or rope drive.

OVERHEAD TRANSMISSION.

Overhead Transmission—These guards, as stated, are ordinarily suspended from above and should guard any moving part that comes within seven (7) feet of the floor, both on the sides and the bottom. If the thing guarded is merely a shaft, a trough or U-shaped guard extending a little above the top of the shaft will be sufficient. If there are clutches or couplings or gears on the shaft, they should be enclosed by stationary guards.

Overhead belts and pulleys will require a more elaborate and usually a stronger constructed guard, because in case of the belt breaking the guard should be capable of withstanding not only the weight of the belt, but blows or stresses due to the possible entanglement of the belt. These guards should be smooth on the inner surface, a little wider than the belt and should be brought up around the pulleys, especially around the pulley upon which the belt travels downward, to avoid the broken end whipping around the guard.

Overhead heavy or fast running belts more than seven (7) feet above the floor, when so located that breakage would endanger men below, should be guarded underneath. As to what constitutes a heavy or fast running belt, opinions vary. The State of New Jersey places the width at six (6) inches or more, Pennsylvania places it at ten (10) inches or more, Massachusetts at twelve (12) inches or more in width and running at a speed of thirty (30) feet or more per second. Had the board of Massachusetts used "or" instead of "and," making the rule read twelve (12) inches or more in width *or* running at thirty (30) feet or more per second, I would consider their rule the best.

Overhead pulleys near shaft hangers should be so placed that the distance from the hub or rim of the pulley is not less than one inch in excess of the width of the belt, or so guarded that the belt cannot

come off on the bearing side. Pulleys should be so spaced as prevent belt wedging between them or guards provided to prevent belt falling between them.

Provide belt shifters for tight and loose pulleys, so construct that belt cannot creep from loose to the tight pulley and accidentally start machinery.

When these guards or enclosures are placed within six (6) inches of a moving part the openings in the guard should not be greater than one-half ($\frac{1}{2}$) inch if there is a possibility of fingers or material projecting through the openings.

LOW TRANSMISSION AND MACHINE PROTECTION.

Belts, pulleys, shafting, flywheels, or other dangerous moving parts which are less than seven (7) feet above the floor or platform level should be guarded in accordance with the following:

(a) When the guard is placed not less than fifteen (15) inches from the nearest moving part, a standard railing, forty-two (42) inches high, constructed of rolled shapes may be used.

(b) If the guard is placed less than fifteen (15) inches and not less than six (6) inches from any moving part it should extend from a point two (2) inches below the lowest moving part to six (6) feet above the floor or platform level with openings in the filler not greater than one and one-half ($1\frac{1}{2}$) inches.

(c) Where the guard is placed within six (6) inches of a moving part the openings in the filler should not be larger than $\frac{1}{2}$ inch.

(d) Where the moving parts are less than six (6) feet above the floor or platform level the guard may completely encase the moving parts on the top and sides instead of being made six (6) feet high, or a standard railing may be placed at least fifteen (15) inches and not more than twenty (20) inches horizontally from the moving parts.

(e) When belts or shafting pass through the floor the guard should extend to the floor and be equipped with a six (6) inch toe-board around the floor opening.

A guard should not be placed so far from the thing guarded as to invite the workmen to get between the guard and the moving parts, or so far as to make it inconvenient to reach bearings, etc., while standing outside the guard. It is recommended that the maximum distance at which a guard be placed from the thing guarded should be 20 inches. We advocate the following standards as to heights of guards and sizes of openings in the same:

<i>Distance from Thing Guarded.</i>	<i>Height of Guard.</i>	<i>Size of Openings.</i>
15" to 20"	3'6"	....
6" to 15"	6'0"	1½"
0" to 6"	6'0"	½"

GEARS, SPROCKETS, FRICTION DRIVES, KEYS, SET SCREWS.

All gears, wherever located, should be completely incased, or, where this is impracticable, should have a band guard provided with side flanges extending inward beyond the root of the teeth.

All sprockets should be thoroughly guarded.

All friction drives should be enclosed.

Where there is a spoke hazard the wheel should be enclosed or blanked on the exposed side.

All dangerous projections on revolving shafts, such as keys, bolts, couplings, etc., which cannot be removed or made flush should be completely enclosed or guarded in such a manner as will prevent clothes catching on them.

All revolving set screws should be placed in safety collars, countersunk or covered by a guard.

Each power driven machine should be equipped with an approved starting and stopping device.

Pulleys (including step cone pulleys) should be equipped with belt shifters. These should be permanent mechanical devices by means of which the belt may be shifted without touching it with the hand.

CONSTRUCTION OF GUARDS.

Metal is preferable to wood in the construction of guards. Wooden guards, especially if oil soaked, increase the fire hazard; they also are more expensive in upkeep. Metal guards are practically indestructible and are more substantial. Where guards are subjected to acid fumes, wooden guards may be necessary, however.

All guards should be of rigid and substantial construction. The railing guards placed from 15 to 20 inches from the moving parts, should be of the double type with the top rail 3 feet 6 inches from the floor and an intermediate rail midway between the top rail and the floor.

If constructed of rolled shapes their section should be at least equal to that of 1½x1½x3/16-inch angle iron. Where subjected to considerable handling or stresses it will be well to make them of

2x2x $\frac{1}{4}$ -inch angle iron or its equivalent. If constructed of pipe, the should be not less than $\frac{1}{4}$ inches inside diameter. If constructed of wood, the posts should be not less than 2x4 inches, or its equivalent section, and the rails not less than $\frac{7}{8}$ x6 inches, or its equivalent section. Uprights in all instances should be spaced not more than 8-foot centers. Preference is given to railings constructed of rolled shapes as they are less likely to fail; the use of wood should be avoided where practicable.

Guards consisting of framework with mesh or plate filling will vary as to strength of material used, according to the area of the guard.

If the guard is 6 feet in height and fastened to the floor without other support or bracing the metal frame of the guard should have a section at least equal to that of $1\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{1}{8}$ -inch angle iron. The filling material is usually attached to an angle frame by means of $\frac{3}{4}$ x $\frac{1}{8}$ -inch flats fastened to the angle by $\frac{3}{16}$ -inch bolts or rivets, spaced not more than 10-inch centers, or by 1x1-inch wooden strips fastened to angle by $\frac{3}{16}$ -inch bolts. Perforated or sheet metal is bolted or riveted directly to the angle or spot welded. For a pipe frame a $\frac{1}{4}$ -inch open seam tube is recommended with the filler clamped in the seam of the tubing.

When the dimensions of the guard are not more than 3 feet, or where it is braced every 3 feet, the frame should be equivalent in strength to 1x1x $\frac{1}{8}$ -inch angle iron, or $\frac{3}{4}$ -inch open seam tubing.

FILLER.

Filling material should not have openings larger than $\frac{1}{2}$ inch when the guard is placed within 6 inches of a moving part, nor larger than $1\frac{1}{2}$ inches when more than 6 inches and less than 15 inches from the moving part.

When the area of the guard between braces is 4x4 feet it is recommended that wire mesh be at least No. 12 U. S. gauge, $1\frac{1}{2}$ -inch mesh or perforated or sheet metal of at least No. 14 gauge. In steel mills we ordinarily use No. 10 gauge because of it being subject to hard bumps.

No. 16 gauge, perforated or sheet metal, will make a substantial filler when the area between stiffeners does not exceed 3x3 feet.

The filler used for smaller areas may well be of smaller gauge, but we do not believe a gauge smaller than No. 18 should be used because of the short life of guards of lighter construction.

All guards should be substantially fastened in place and where it

is necessary to have access to machinery, portions of the guard should be arranged to swing or slide.

All sharp edges of filler should be protected and where hand holes are provided the edges should be reinforced by at least No. 24 gauge sheet metal, but No. 18 gauge is recommended. When a gate or door is required it is recommended that the frame be at least equal to $1 \times \frac{5}{8} \times \frac{1}{8}$ -inch angle, and that means be provided to hold it securely in place.

Care should be exercised in the design of guards to provide convenient access to parts which must be repaired or maintained. This may be done by making the guards movable or by providing doors or removable panels.

BUILDINGS AND YARDS.

Let us suppose, now, you are selected to supervise the safety work for a company building a new plant. We will take it for granted that the engineering department has taken care of the proper construction of the floors, walls, roofs, etc., but it is your duty to see that the safety features are taken care of.

In checking the plans for this new plant, first you would see that safe and convenient routes were provided from the plant entrances to the work places, having in mind future installations of buildings and yards. We sometimes find modern plants carefully laid out for handling material from the receipt of the raw stock to the finished product so that the handling of the material in the processes is reduced to the minimum, but no thought apparently has been given to getting the workmen safely to and from their work. They have to pass through dangerous yards or through other buildings, making conditions in those buildings congested and increasing the accident hazard both to themselves and to the workmen employed in those buildings. Then we find buildings so completely filled with machinery that there is but little room to move about and no provision has been made for ordinary passageways or means provided for escape in case of an accident or fire.

When you are checking such plans, see that roadways, subways or viaducts, as the situations may require, are provided through the yards and that the men do not have to pass through some other operating department to get to their work.

See that the floor spaces in the buildings are not only ample to accommodate the machinery but also will leave room to move about and work safely. In some buildings, where there is machinery

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See that the floor spaces in the buildings are not only ample to accommodate the machinery but also will leave room to move about and work safely. In some buildings, where there is machinery

in continuous operation, it may be necessary to provide subways or viaducts from one part of the building to another part.

In checking stairs in these buildings, in addition to seeing that they are properly constructed, railed and lighted, in accordance with the Council's Safe Practice Leaflet on Stairs and Stairways, also consider the number of workmen who will use the stairs during the change of turns and also the number that may use them in a rush as the result of an emergency. There should be more than one way of escape from an upper floor.

LIGHTING AND VENTILATION.

Consider the lighting and ventilation of the buildings, remembering that adverse weather conditions may require the shutting out of considerable natural light, and even though a night shift is not going to be employed, there are a number of months in the year when artificial light will have to be used on the day run. The lighting problem is too large to attempt to cover in a paper of this kind, but much valuable information is now on file in the Council's library on this subject, and there is no excuse for such lighting as will result in eye strain, accident hazard or reduction of output.

In buildings where overhead traveling cranes are used it is not a serious expense to install a walk on the building columns paralleling the crane runway, and its installation will not only prevent many an accident but it will be a great convenience in repair and maintenance work.

Other fundamental principles regarding buildings are to see that the elevators, if any, are safely constructed. Carefully prepared data on this subject can be procured from the Council. Provision should be made by the installation of walks or other means so that the windows may be safely cleaned, and the windows should be kept clean. When there is a hazard from falling glass due to the location of windows or skylights over passageways or work places, wire glass should be used or wire netting should be placed under the glass. No bad floors should be allowed, and if there is an opening, hatchway, or hole in a floor, no matter where its location, it should be protected by a railing and toeboard or other efficient means.

BOILER PLANTS.

I do not want to pass boiler plants without calling your attention

the A. S. M. E. That report in conjunction with the Safe Practice pamphlet issued by the Council covers the subject very thoroughly.

ELECTRICITY.

Relative to the subject of electrical equipment I would again refer you to a publication—that of the Bureau of Standards, Washington, D. C. In the code published by this bureau you will find all you are looking for and more. The great fundamental principle of safety around this apparatus is to have it so guarded or isolated that accidental contact with current carrying parts is improbable. It is not possible to say where the line may be drawn between dangerous and safe current.

PRIME MOVERS AND TRANSMISSION MACHINERY.

Practically all of us have to consider the hazards around prime movers and transmission machinery. The prime mover may be driven by gas or steam or by rotary electrical equipment. Volumes have been written on the safe handling and guarding of these, and full data can be gotten from the Council's files.

While you are carrying on the guarding of machinery already installed, take such steps as will insure that machinery purchased will be provided with the proper safeguards. This can be best handled by sending out, with inquiries for bids for machinery, safety specifications that must be met. As an illustration, when getting bids on machine tools send with the inquiry safety standards required, something like this:

SAFETY SPECIFICATIONS.

General (This clause applies to all machines)—All gearing shall be *completely enclosed* with substantial cast-iron or sheet-metal covers, so designed as to make the parts within readily accessible. All couplings, set screws, keys, bolts, etc., on revolving parts shall be countersunk or covered in such a way as to eliminate danger of accident. Unused portions of exposed keyways shall be filled so as to present a smooth surface.

In addition to the above general specifications, the following provisions shall be made for the machines designed:

Planers—Planer-beds shall be substantially covered with cast iron or steel plate. The latter, if used, shall be not less than one-eighth inch in thickness.

Drills—Wherever possible, counterweights should be placed in-

side the vertical columns of drill presses. Where this cannot be done a guard or enclosure shall be provided, to retain the weight in case the supporting chain or rope should break.

The belts of multiple-spindle drills shall be guarded across the front, where a breaking belt might endanger the eyes of the operator if unguarded.

Lathe Dogs shall be of safety type, having no projecting set screw or other part on which clothing might catch and cause accidents.

When purchasing boilers, engines, cars, overhead traveling cranes, emery wheels, tools, etc., inquiries should be accompanied by safety specifications to be met. The Council has complete data, I believe, on any subject you may select, and if they do not have it in their files, they will go out and get it for you.

KEEPING EVERLASTINGLY AT IT.

CHAIRMAN FORSTER: Gentlemen, I urge upon you, when this treatise of Mr. Young's appears in printed form, to give it much credence. The Illinois Steel Company was the first large organization in America to take up accident prevention work in a systematic manner. Its safety work goes back twenty years, and yet, as Mr. McKenna told us the other day, they recently made a 50 per cent reduction by virtue of a new drive. It is a splendid example of keeping everlastingly at it—there is always something more you can do.

We will now take up topic No. 5, "Educational Activities in the Safety Field." The speaker, whom you all know, received his safety training in the Commonwealth Steel Company's plant, of which our Past-President Arthur T. Morey is the general manager. I will call upon Mr. Earl B. Morgan, now of the Norton Company, Worcester, Mass.

EDUCATIONAL ACTIVITIES IN THE SAFETY FIELD.

EARL B. MORGAN, SAFETY ENGINEER, NORTON COMPANY,
WORCESTER, MASS.

Mr. Chairman and Members of the National Safety Council: Safety engineering work naturally divides itself into three main divisions: *First*, accident record and claim work; *second*, mechanical safeguarding, and, *third*, safety education. The last division is the one I shall dwell upon particularly.

Educational work, to me, seems to be simply a sales proposition. You have to sell it, first, to the management; second, you have to sell it to the foreman—you have to show that safety is just as much a part of the work as production. The logical presentation is to base your educational work on the good will and helpful co-operation of the foreman. If the foreman is with you and will give you a lift in accident prevention your success is assured. The foreman must understand that safety work is essential and that it does not do to turn out a thousand dollars worth of work a day and injure a thousand dollars' worth of human resources.

SELLING SAFETY TO WORKMEN.

You have to sell safety to the workmen and that is a difficult job. Here you meet a vital factor in labor turnover—the human equation. It does not make any difference how well a man knows a thing or how strongly you impress it upon him the first time; you have to constantly stimulate his interest or he becomes careless. We all know the effects of carelessness and I will not dwell upon that phase of the work.

Each and every one of us have distinct problems in our plants—simply studies in human nature. One day the men work one way, the next day they work another. You may be able to discipline them—our friend from South Chicago said to discharge them—but you have to go about it very carefully or you will get into deep water, especially during the present crisis in our labor market. Far be it from me to discount that method—it works in some places, but I want to voice a note of warning: Be careful; study your ground before you adopt the plan. There are plants where, if you attempted that method, the men would simply say: "All right; I will go across the street and get another job." Again, if you resort to the plan of laying off men for two or three days you may find that the men will not come back as they do not care for jobs of that sort. You have to weigh these questions carefully and keep in mind the source and supply of labor.

GENERAL EDUCATION WORK.

The first main subdivision in safety education work is one of general instruction or general education for the entire plant. In treating this phase of the work let us first take up the subject of bulletin boards. This topic is so important that I find it necessary

to repeat some of the experiences of our members who have already spoken on the subject.

Several interesting features develop almost at once upon the adoption of bulletin boards and the putting of them into practical use. You can easily secure the very best kind of a bulletin board and if it is properly placed, so that the men can see it quickly and without wasting too much time, it proves its value, but I am inclined to believe that most of us put too much on our bulletin boards. I like the idea of putting one bulletin in the center of the board and changing it every day. Some of our production men complain when we display a number of bulletins at one time that we are running a big billboard, as they call it, and say it takes the men half an hour to read it—they object to the time lost in reading so many bulletins. A foreman said to me: "I do not mind putting up a new lesson every day, I am heartily in favor of it, but I do not want the men standing there for an hour."

I think the plan of posting only one bulletin a day is worth trying. Our plants met with good success in adopting this plan and I firmly commend it. The men get one safety punch, then they are through until the next day, but you have to keep this in mind: The bulletin must be fresh and interesting. If you do not keep changing the bulletin every day the men will say they have seen it and will not look again and when you put up something you want them to see they pass it by.

SOURCE OF BULLETINS.

What is the source of supply of bulletins? First, of course, we have the distribution of the National Safety Council. These bulletins are valuable but in many plants you will find, out of the week's distribution, only one or two pertaining to your problem. My thought is that we should supplement the Council's bulletins by making our own. You do not need to go to the trouble of making cuts; if you have a large organization you can afford to do it, but you can use a lot of material—clippings and cartoons can be used to great effect or you can sketch your own cartoons.

I like the idea of taking photographs of immediate hazards or the causes of accidents—the safe way and the unsafe way. Put them on the board, head them with "Attention!" Some very good schemes have been developed, of which you are doubtless familiar. I like the scheme adopted by the Pierce-Arrow Company at Buffalo. They have a large bulletin board in the factory, and it is

prints themselves; their advertising man works it out in very nice shape. I think it lends local color to the system. If a man sees a picture of something right in his own shop he realizes what would happen if an accident occurred. If he sees something which happened a thousand miles away, he says: "Oh, that does not happen here; that does not apply here at all!" But if you show how Jim Jones met with an accident in the shop it will have its effect on his fellow-workmen.

Another source of supply is to exchange bulletins with other firms. I think you will find other members of the Council are quite ready to exchange with you at any time. You simply have to make the request.

After securing the bulletins you come to the matter of posting them. This will be an expensive proposition or an economical one, depending on the thought you put into it, especially in a large plant where it takes several hours to get around to all the boards. Some plants have thirty or forty bulletin boards and if the bulletins are changed every day it is quite an expensive service. You can assign this duty to the fire inspector, while making his regular rounds, looking after valves and matters of that kind, or perhaps the watchman can handle the matter economically. If the duty is assigned to an employe who can attend to it in connection with his regular routine it will prove an economical solution of keeping the boards fresh and interesting. A lot of us make the mistake of posting bulletins without analyzing them and making sure that they apply directly to that particular department—you have to select your bulletin intelligently.

In our organization each week we assemble all the bulletins from the several sources I have outlined, talk them over among ourselves and decide which department a particular bulletin will especially interest. We mark the number of the department on the back and the bulletin is posted there.

DISCIPLINE AND SAFETY LITERATURE.

Under the subdivision of general education we have the matter of discipline and of safety literature. That cannot, of course, be handled by all plants. Some plants may be too small to stand the expense, but even the small plant has access to them through the National Safety Council, the American Museum of Safety and through the various publications that are issued from time to time. You have noticed that the conference board issues a little booklet

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of cartoons; that is one of the things accessible at a nominal price. A lot of plants that are large enough to afford it print their own safety bulletin; that is simply a matter of presenting your own problems and solutions.

The second general subdivision is that of individual instruction. I think that is the most important part of safety work—the personal contact. First of all, begin with the new employee. When a man is hired is just the time to get in your first punch. His mind is receptive, he has not been given the job as yet, he is willing to take what you say as a part of the specifications for employment. For instance, if he is going on a chipping job, if you give him strict instructions to understand before you employ him that he has to wear goggles while doing his work he will most likely follow the rule. A lot of us who are fortunate enough to have the co-operation of the plant employment bureau overlook this valuable opportunity to interest the man when he is being hired.

If you will bear with me, I will outline our practice in educating our new workmen. We have a follow-up man, as we call him, and he has no other duty than to follow up new employees. He does not work for the safety engineer, he does not work for the fire department, but he works with both; we try to make him a free lance. We want him to get acquainted with Jim Jones and to be a good fellow. His duty is to find out from Jim Jones how he lives and how his wife and children are; in other words, we hope that the man can accomplish what we know we cannot do. He talks to the new man three or four times and finally he becomes friendly.

DUTIES OF FOLLOW-UP MAN.

The follow-up man meets the new man immediately after he has been physically examined, and talks to him about the job and the specifications of the work he is to be placed on. He tells him, in language he can understand, as nearly as possible what is expected of him and what he will be required to do. The work does not stop there; a week later the follow-up man makes it a point to visit the new man on the job, and when I say visit, I mean visit. If he cannot do anything else, he “kids him along”—he has to study each individual case. He visits a man, a chipper, and if he is not wearing his goggles right then and there he gets in some good punches. He shows the new chap in dollars and cents that he is going to be the loser, and how such things work out. He has explained all this to him beforehand, but if he does not

instructions he tries again. He does not recommend dropping that man off the employment list until he is pretty sure he is lined up as a careful workman.

Another thing a follow-up man can do: If a man is absent three days we want to know about it. If he is sick we want to help him; if he has any injury we want to see that he gets proper medical attention; if his family is sick we want to help them, if we can. Our main object, of course, is that we want to get the man back to work as soon as possible. If a man is absent three days he is reported. We have discovered some very interesting things; one little example: A man had been absent for several days and when the follow-up man got to his home he found the man had a badly infected hand, but he had hard work to convince the fellow that his hand was in bad shape. After a good deal of talk he finally persuaded him to come to the plant hospital, and there, after quite a struggle, we saved the man's hand. When the time came to make a final settlement with the man he told me: "I appreciate what you have done; you will have to fire me if you want to get rid of me." We secured the services of a loyal worker, a man that will stick, and I claim he is a direct product of our educational safety work.

INSTRUCTION TO INJURED EMPLOYEES.

Another point is individual instruction to injured employes. Of course, that is not preventive, but it is the next best thing, as accidents will happen, and we should take advantage of the lessons to put over our punch. It is my experience, and I believe others will bear me out, that the injured employe, upon returning to work, will be receptive and see the faults and mistakes he has made. I think developments along that line will show in your labor turnover. How? If you take an interest in a man and try to get him back on his job, if you get him in the right frame of mind you are going to get him back on an average two or three days sooner than you would otherwise. If he sees that you are his friend he will return and try the job you are holding for him, and he will do it quicker than if you try to drive him back. Many days can be saved from the lost-time factor and from nonproductiveness of machines by following this method.

There is another point in personal contact and in following up all accidents. If the safety inspector sees the man and sees his immediate foreman he finds out why the accident happened and

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how a recurrence may be prevented. You may say that is a bit of some detail. What is the use of investigating to see why Jim J smashed his finger by missing the nail with the hammer? I say it is worth while, if for no other reason you make the foreman realize that some one higher up does care whether he has an accident that he is expected to explain why it occurred. You also make the man realize that the company cares when he is hurt, no matter how trivial the injury may be. The more I see of this work, the more I believe that you have to impress upon your men that there is such thing as a trivial accident. All accidents are serious. They might get by, but I do not like the word "trivial." I think you have all run into the same experience and that it shows you that these so-called trivial accidents develop into some of your worst losses.

SAFETY SUGGESTIVE SYSTEM.

We come now to the safety suggestive system. I will pass it quickly, and simply say that I think the one important point in the safety suggestive system is to see that the men receive quick and prompt acknowledgment of all actions taken on their suggestions including the receipt and disposition of the suggestion. The matter of awards, I think, is more or less of a local proposition. If you have started the award system you will have to keep it up. A lot of plants do not give awards and have success with safety suggestion. It is largely a matter of local management.

The investigation of safety suggestions requires the services of a technical man. You cannot sit in an office or at a desk and rule on a safety suggestion. You have to go into the plant and see things for yourself. I know of many cases where the safety inspector in following up a safety suggestion, stumbled on to a very worthy proposition. Even if it accomplishes nothing it drags the inspector out on the job, and I think the weakness of most of our safety work is the inclination to sit at a desk and try to run the work from there. You have to put on a jumper and run the machine so the man can see and understand the point you are trying to make. I believe in going into the plant, taking over the machine and teaching practical lessons. There is a lot of work ahead of us along that line. When you have a number of accidents on a certain operation, go down and stick with it, not a minute or five minutes, but weeks or months, if necessary; you cannot expect to master an intricate productive measure in any other way. That is real research work and something every safety engineer should do.

Now we come to the matter of conference with the foremen. Previous speakers have outlined the regular meetings of foremen and I like the idea of safety engineers meeting with the foremen on the same basis as production managers. If he calls the foremen into his office to meet him as a special privilege it will reflect on the reception of his propaganda. To make my point clear I will resort once more to our own practice.

We have a general meeting of all our foremen at a stated hour every week and every foreman has to be there on the minute. Each department is given ten minutes on a program lasting one hour to dwell on any desired subject. The next ten minutes is taken by the operating engineer and so on. That elevates the safety work and when we get through our program the manager sums up the work; he says this is just as important as that, and so forth; each department gets its share of consideration.

PERSONAL CONFERENCES WITH FOREMEN.

The matter of personal conferences with the foreman is important. There are many methods, but I like best to meet the foreman in his own office, not sending for him but going to his office. "John, we have had five accidents in this department," I say to him; "what are you doing to cut it down? What is the matter? Let us get down to brass tacks." It takes a lot of study and patience to win the confidence of your foremen. You have to encourage some of them, you have to put screws on others; each is an individual case and you have to solve it for yourself.

We had a foreman who was very hardheaded and could not see the safety movement at all; he did not want to be bothered with it. We worked and worried with that fellow for several months, but finally one of my men noticed that he had a month in which he got by without an accident. He suggested that we write a letter to the foreman and congratulate him upon the zero of accidents in his department, telling him that we thought it was due to his careful efforts. We did it. We sent out the bait and he took the hook, line and sinker and ran after the pole. Today he will do anything we ask—he beats us to it as a rule. He is the best safety man we have. We kidded him into it, I admit, but we got him. I think it is a good cause even if we do have to play that kind of game occasionally.

Finally we come to the matter of safety itself. There are lots of methods, but Mr. Price knows more about that in a minute than I do in a week. The only comment I have to make is not to let your

committee meetings be like the session of a coroner's jury. Put some pep into them, do not have a meeting unless you have something interesting to present.

The matter of the selection of committeemen and so forth, I think is a minor matter, but you must be very careful not to throttle the initiative of your men by placing them on a committee with me somewhat higher up—some men simply will not open up when their bosses are present.

Educational work is unlimited in its possibilities and I have scarcely scratched the surface. I am constantly thinking over new methods. To me it is the highest form of applied industrial psychology. I thank you.

CHAIRMAN FORSTER: We have enjoyed your impromptu speech Mr. Morgan; it seems to reach the spot. Our next speaker is the Chairman of the United States Employees' Commission, Dr. R. M. Little. We have all heard of the excellent work of the commission and I am sure a description of its activities will be very valuable.

UNITED STATES EMPLOYEES' COMPENSATION COMMISSION.

R. M. LITTLE, CHAIRMAN, UNITED STATES EMPLOYEES'
'COMPENSATION COMMISSION.

I am very glad of the opportunity to tell you of the fine, patriotic service the National Safety Council has rendered the Federal government during the past three and a half months in making a safety survey of government establishments, particularly the navy yards and arsenals. It all occurred in this wise:

When the new Federal Compensation Commission was organized, the middle of March, we felt that one of our first duties was to make a survey of the government establishments and ascertain the conditions under which civil employes labored. To make such a survey we felt our need of a competent safety engineer to go with us in a personal visitation to the establishments. That was about as far as our idea of a survey had developed. We knew of a very efficient gentleman engaged in safety work and we wrote to him, requesting his help, but the letter did not reach him. While waiting for an answer there came into our office one day the President of your organization, Mr. Palmer, who was in Washington to offer his services to the Council of National Defense. I explained to

him what we wanted to do and that we hoped to secure the assistance of Mr. C. W. Price. He replied: "Mr. Price is our Field Secretary." I remarked, "Then you are the man with whom I want to do business." "Mr. Forster, our Vice President, is also in Washington," he said. "Invite him to your office." In about fifteen minutes Mr. Forster was with us. In an hour and a half we had outlined a tentative plan for a safety survey of government establishments. This was on Friday.

The following Monday Mr. Price and the above mentioned gentlemen met at the office of the commission. A more comprehensive plan for the survey was mapped out and offered tentatively to the Secretaries of the Navy and War and also to the Secretaries of the other Federal departments in so far as they have large shops in their departments where there are particular hazards. The plan for the survey was approved by the Secretaries and representatives of their departments were delegated to sit in conference with the commission upon the subject of the survey, its general scheme, the way it was to be carried out and the results hoped to be achieved. An important factor in the survey was to be a Committee on Standards, which Mr. Palmer organized, composed of members of the National Safety Council. By enlisting the help of competent men with varied experience the survey was inaugurated, effectively covering the entire country. We had to make haste and we did so by your splendid help.

COUNTRY DIVIDED INTO DISTRICTS.

The country was divided into districts, Mr. Price acting as director for the commission; Mr. David S. Beyer of the Liberty Mutual Insurance Company of Boston directed the survey at the Charleston navy yard, Boston, and the Springfield and Watertown arsenals in Massachusetts; Mr. A. H. Young, director of the American Museum of Safety, New York, was placed in charge of the Brooklyn and Philadelphia navy yards and the Watervliet, Picatinny and Frankford arsenals; Mr. H. A. Schultz of the American Steel and Wire Company conducted the survey of the Washington, Norfolk and Charleston, S. C., navy yards; Mr. R. J. Young of the Illinois Steel Company directed the survey of the Rock Island arsenal and the Quartermaster's depot at Jeffersonville, Ind.; Mr. J. R. Brownell of the Industrial Accident Commission of California had charge of the survey of the Mare Island yard, across the bay from San Francisco, and Mr. V. A. Hancock of the Aetna Insurance

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Company had charge of the survey of the navy yard at Bremert Puget Sound.

Mr. Price with his associate directors brought into the service the government some twenty-five other engineers, and if time would permit I should like to name each one of them as a mark of honor for the service which they rendered the government. With the approval of the Secretary of War and the Secretary of the Navy a letter was sent by the commission to the commandants and commanding officers of the navy yards and arsenals, outlining the survey and setting forth its purpose. Mr. Price personally visited each of the establishments, with proper credentials from the head of the department meeting the commandant or commanding officer, then the leading men in the several establishments. He introduced his associate director, who, in turn, introduced his assistants. They went to work at once and made a careful detailed inspection and study of the various yards and arsenals. It was continued for about three months and was as complete and thorough as it was possible to make a survey within that time.

CO-OPERATION OF COMMANDING OFFICIALS.

What was the attitude of the commandants and commanding officers? Fine; this was their attitude from the very first. Indeed this was the attitude of the representatives of the various departments, and twelve keen-minded men who assembled with the commission to consider and approve the plan of the survey. They wanted to know what it meant and what it would amount to; did it mean simply to find out the condition of the government plants and to write out technical reports to be filed with the departments, wrapped up in red tape and left in the file with nothing accomplished? If so, they did not think it worth while, but, if a survey was to be made by practical men who could do something to make the government establishments better, all right; they were for it. This seemed to be the cardinal idea of all the engineers of your Council who were engaged in the survey—practical results. They made their reports, therefore, and we have many volumes of them in detail. The reports were dependable—there was a practical aim from the very first; therefore, the heads of departments, commandants and commanding officers, were all sympathetic, cordial and co-operative to get the best results possible.

What were the conditions found? Well, gentlemen, the conditions were about such as you would expect to find.

establishments lying outside of the field of safety and not touched particularly by state or government inspection. Some safety work had been done in many of the establishments; here and there good mechanical safeguarding had been installed by a few officials who were greatly interested in the subject of safety, but many were without any particular knowledge on the subject. Mechanical safeguards were irregular and most of them were not up to the right standard. The idea of organized educational safety work, that is, the social engineering side of safety work as it is involved in this propaganda had not touched the government establishments. The officials had heard of it, perhaps, but never in a comprehensive way. This is enough as regards conditions—they were not as bad, perhaps, in every respect as you might think, but they were bad enough; they ought to be, and can be, bettered.

VALUES OF SAFETY INSTALLED.

What was the practical outcome of it all? We were not very long on the job until we saw that the government ought to have in its establishments everything that is good, approved and dependable in the safety movement which you have discovered in the practical world outside of the government establishments. The well-wrought-out values of safety work are to be carried out, incorporated and continued in the government establishments, in order to put Uncle Sam's business in class A as regards safety, sanitation and output. This is the opportune time because the government establishments are being enlarged as rapidly as possible. Their task today is bigger than it was ever imagined or planned to be and only by first-class safety work which shall contribute to efficiency and output can the government plants meet their obligations.

To introduce the safety movement it was necessary to secure the appointment of competent, high-grade, practical safety engineers, who could take the results of the survey and put them into practice, effect safety organizations and gradually standardize the work. As this was the evident need of the government plants the proposal was made to the Secretary of the Navy and the Secretary of War during the progress of the survey. Some difficulty was experienced in persuading the departments to appoint safety engineers and approve safety organizations, but it was finally done. Good things were being accomplished all the time. When the Quartermaster General received reports as to conditions in his depots he issued orders that conditions should be corrected and recommendations carried out.

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Many improvements were made, fine things were accomplished, they were only the promise of what ought to be and will be done. When the departments decided to appoint safety engineers the commission was asked to nominate them. We, in turn, requested Price and his associate directors to secure the engineers for the commission to recommend to the departments and I am happy to tell you that today we are just rounding up all the work at this Congress and ten or twelve of the appointed engineers are present. I look into the faces of a few of them in this audience as I speak of young men who have been selected out of the best industries, with good academic and technical training and a few years' experience, alert and competent young men, not only competent on the mechanical side but on the teaching side, who will carry into the government plants your safety movement and make it effective there. The young men leave this Congress to go to their various posts of duty. They are as follows:

SAFETY ENGINEER APPOINTMENTS.

Chester C. Rausch, formerly with the Liberty Mutual Insurance Company, goes to the Portsmouth navy yard at Portsmouth, N. H.

Thomas Stanion, formerly Assistant Secretary of the White Sewing Machine Company, Cleveland, becomes the safety engineer at the Boston navy yard.

Charles Herman Behr, formerly an assistant in the American Museum of Safety, takes charge of the Watertown and Springfield arsenals in Massachusetts.

James L. Price, formerly with the Anaconda Copper Mining Company in Montana, has come East from Butte to take charge of the Watervliet, Sandy Hook and Picatinny arsenals.

Albert S. Regula, first assistant in the American Museum of Safety, becomes the safety engineer at the Brooklyn navy yard. Mr. Regula has been conducting safety work in the yard for several months; in fact, the American Museum of Safety has been very much on the job from the first in all its power and service.

John S. Spicer, now Captain Spicer, formerly with the Department of Labor and Industry of Pennsylvania, who will become the safety engineer at the Frankford arsenal.

Oliver J. Smith, formerly of Chicago, with the National Workmen's Compensation Service Bureau, goes to the Philadelphia navy yard.

Raymond Heath of the same bureau takes the Washington navy yard.

A. H. Lintz of the American Steel and Wire Company becomes safety engineer at the Norfolk navy yard.

Kenneth E. Berray of Pickands, Mather & Co. of Cleveland assumes the duties of safety engineer at the Charleston, S. C., navy yard.

Russell H. Guerrant of the American Founders Company will have charge of the Rock Island arsenal.

F. T. Crossley, formerly of the Liberty Mutual Insurance Company of Boston, goes to the Bremerton navy yard at Puget Sound.

Clarence E. Ralston of the Jones & Laughlin South Side works, Pittsburgh, goes to the Mare Island navy yard.

PERMANENCY OF THE WORK.

This concludes the quota of men thus far selected for the positions, except that we are hoping to take over practically the American Museum of Safety, especially its director, and have him with us in our Washington office to a great extent to counsel and correspond with the engineers on the job; to establish proper standards, to circulate safety literature and to unify government safety work until we can get action from Congress enabling the Compensation Commission to have a safety engineer as a permanent member of its staff, in order that safety work may be continued in the government plants.

I wish I had time to speak of the splendid service your Council and the great business organizations you represent rendered the government in its time of stress and need—without stint, without grudging and without price. A competent and practical survey of the government plants has been made and results have been accomplished which, if paid for by the government, would have cost between \$40,000 and \$50,000, but it has cost less than \$3,000. Apart from paying the salary of your Field Secretary during the period of the survey the other engineers served the government at the nominal cost of \$1.00 per year and incidental traveling expenses.

The financial part, however, is the least important. It was the fine spirit, the technical skill, the vision and understanding that was brought to the service which was most inspiring. Your Field Secretary is the most irresistible optimist, tactful enthusiast and persevering patriot I have met in the last three months. What shall I say of Mr. Forster—the lightning-wired man who sits in our midst and makes our minds and nerves tingle with expectation? Ubiqui-

tous Lew Palmer, making end runs like he did on the team at Princeton, dodging here and there, always trying to make a touch down! What shall I say for Harry Schultz, for David Beyer, for the Youngs, De Blois of DuPont's and the others? I wish I might name them all, gentlemen; it has been only one splendid expression of the service that the business interests and the commercial interests of America are rendering the Federal government at this time of imperative need. Every department of the government is receiving the patriotic, ungrudging, devoted service of the brain power of practical, idealistic America. It is being given to every department where it can be used. We have every reason to believe in our country, to love and serve our country. I believe in our government, I believe in our citizenship, I believe in our world function and I believe in our destiny as a great republic of men.

STIMULATED IN MIND AND HEART.

As I sit in your Congress—and I have sat in a great many national congresses and conventions of one kind and another—I have been stimulated in my mind and heart by the way in which you practical men grip the great purpose of human life as represented in industrial affairs. It seems to me that the safety movement represents three fundamental ideas and realities of life. The first is the great economic idea—safety is good business. The second, a true social idea—that of justice and better relationship of man with man. The third idea, without which life lacks sweetness and life, is the idea of altruism—the touch of brotherly love, that a man is of more value than a machine. The Great Teacher's question is being answered in the affirmative by the safety movement, representing the industrial life of this great republic, that the man, the humblest toiler, is of more value than anything else.

When you couple together these three great ideas—the economic idea with its compelling power, the idea of justice with its driving force and the idea of altruism, surrounding the others as with a spirit or an atmosphere in which to work, all furnishing the motive power for thought, for plan and for activity, you are sending forward human life on a high plane of righteousness and achievement which makes life worth while for all. It deepens life and renders clear its ultimate meaning. Such service as this sweetens life for us all and that, in the last analysis, is the meaning of life—of the life which now is and of the life which is to come. Some of us have been preachers, but we have heard more practical Christianity in

this Congress than we have heard from pulpits for many a day. Some of us have been teachers, but we have heard more real pedagogy here than we have heard in the halls of universities. Some of us have been philanthropists and have worked for the uplift of society, but we have here the real fulcrum by which society can be benefited more largely than by philanthropy. Some of us have been workers in the ranks and we have found here the touch of brotherhood and the promise of a larger, richer life. You have helped to bring it into our government—the government which is to serve you and which you are to serve. We are all bound up together for weal or woe and it must come to a good end in the scheme of life.

CHAIRMAN FORSTER: Do you doubt that the United States will set the pace in accident prevention and safety work? The National Safety Council has done all in its power to help the work forward. After the splendid address of Mr. Little we will all go home inspired and enthused to strive harder than ever to improve our records.

We have had a very valuable and interesting session and I will not call for the last topic on our program as the subject has been quite fully covered by the Health Service Section.

I wish to call attention once more to the splendid exhibit at the Grand Central Palace. It will be open evenings until the close of the Congress. You will find it well worthy of careful study and I hope every delegate takes full advantage of the opportunity to familiarize himself with the exhibits. Your badge is the only requisite to admittance.

There being no further business the session now stands adjourned.

National Safety Council

General Round Table

New York City

Sept. 11, 1917

A. H. YOUNG, Chairman

Director of the American Museum of Safety, New York City

TUESDAY AFTERNOON SESSION

THE first General Round Table discussion of the Sixth Annual Safety Congress was called to order at 2 o'clock.

CHAIRMAN YOUNG: The time for a round table discussion is far too precious to be taken up in airy persiflage or an extended speech on the part of the Chairman. The National Safety Council came into being because of the need for a clearing-house of the ideas and experiences of its members. The round table discussion represents that great primal function of this institution more nearly than any other form of meeting and is possibly the most important meeting on the program. It is also the most democratic meeting. The discussions are entirely informal. I give you my word that there are no prepared papers to be handed in. What we want, in order to start discussion, is a statement of something that has been done; to perpetuate the discussion, and keep the meeting lively, we want questions as to why it was done in that way.

If you are thinking of a plan and have doubts as to the practical adaptability of some of its refinements, we want you to put your thoughts forward and have them answered by men who have had experience. Further than that, if you have tried a plan and it has been unsuccessful, we would appreciate very much your frank pro-

nouncement of that fact, so that others may benefit from your experience. I know how we all like to tell of the finally successful things that have been accomplished, but sometimes it is just as fruitful for the body politic to know of things that look well on paper, but do not work out, and possibly it can be shown to you or indicated to you how, in the judgment of others, the adjustment of the matter might have reached the proper degree of success.

UNSELFISH PURPOSE OF COUNCIL.

Heretofore our meetings have been largely for our own good; that is, in putting up the problems we wanted to solve for the purpose of establishing a great safety record for our own particular shop or our particular division of a shop. As was indicated this morning, the purpose of this Congress is far broader; we want this experience, we want those benefits to come to us, not only that we may establish new records in our own plant, but that we may help successfully to support those boys who are carrying Old Glory across the sea.

In your discussion this afternoon please make your contribution as broad and as general as it can be, to be of the greatest assistance to the greatest number of people. The three topics for discussion will each receive an equal amount of time. There are five of us on the platform, of pretty good size, including "Big Ben." Promptly at the indication from "Big Ben" that the time for a particular topic has been exhausted, the subject will be turned over to the Chairman in charge of the next topic, with about a three-minute interval, during which we want you to propose questions which you would like to have answered before you leave the Congress. We will then endeavor to put your query before men who have had experience—and bring either their answer to you, or put you in touch with some one who we think can help you, so that there need be no unfinished business. If you have safety troubles, let us know them, and if we do not reach them during the discussion we will try and give you all the help we can before we get away.

It is the general function of the Chairman to introduce the speakers and announce the topics. In this case, the speakers and topics are all too well known to you to need any introduction, and, rather than act in that capacity, I am going to preside as referee, and see that the time is well apportioned; possibly I may assist my colleagues in adhering strictly to the line. The subject under discussion is "Educating the Sub-Foreman." We have a large number of execu-

tives and administrative officers present and if you have a particular topic that is not exactly germane to safety, that may be of great value to them, and try to get away with it, see how successful you are. If you succeed, all right; if not, do not be vexed about it. We will now turn the meeting over to Mr. Stephen W. Tener, the topic of the discussion being "Educating the Sub-Foreman."

EDUCATING THE SUB-FOREMAN.

STEPHEN W. TENER, SUB-CHAIRMAN, MANAGER, ACCIDENT AND PENSION DEPARTMENT, AMERICAN STEEL AND WIRE COMPANY, CLEVELAND, OHIO.

Ladies and Gentlemen of the National Safety Council: No speeches and no addresses. We listened this morning to the choir singing and the opening exercises, and we will now listen to the sermon, which I am glad to say is coming from the pews and not from the pulpit. There are four M's of business: "Men, Money, Materials and Methods."

Perhaps we are not all of one opinion as to which of these is the most important, but there is no doubt in my mind that the man is the most important. We are gathered now around this table to discuss the best methods of "Educating the Sub-Foreman."

It has often been said that a child, to grow up to be a worthy man or woman, should be very careful in the choice of his or her grandparents, and the education of a foreman, as I see it, begins far back in the history of the company with which he is identified.

The meeting is now open to a discussion of this all-important subject.

I have heard there was a recent very successful meeting on the subject of "Education of Sub-Foremen" in Illinois, and as Mr. T. H. McKenney, of the South works of the Illinois Steel Company, Chicago, is here, I would like to have him open this meeting and give us his experience.

ESTABLISHING A RECORD AT SOUTH WORKS.

MR. T. H. MCKENNEY (Illinois Steel Company): I do not know just why the Chairman selected me to start the discussion, unless he wanted to get a big chap who can stand all the criticism that may be made in reference to his speech-making. I suggest that Mr. X...

put a flea in Mr. Tener's ear when he spoke of our meeting at South works.

Early in the year we held a meeting of executives to discuss ways and means whereby we might reduce our accidents. We came to the conclusion that we had to get closer co-operation from our foremen and sub-foremen. Accordingly, we called a meeting of our foremen and sub-foremen, leaving out the superintendents of the various departments. They all wanted to get in on it, but we did not let them.

At a meeting the general superintendents and assistant general superintendents were asked for their co-operation and close attention at all times to get the undivided attention of foremen and sub-foremen to bring about a reduction of accidents; in fact, they were told at that meeting that a reduction must be brought about—that the superintendents would be held responsible; the superintendents would hold the general foremen responsible, and the general foremen the sub-foremen. Therefore it behooved everybody to get on the job.

The campaign was a success. We have had and are now showing a 57 percent reduction in accidents over last year—it is the best year the South works has ever had. Mr. Young and I worked together for four years. He was very successful, but when he left it was my ambition, of course, to do even a little better. Well, I am not going to say anything. When I met Mr. Young in the corridor he said:

"Tom, one month might be an accident, two months might be an accident, three months might be an accident, but seven months—never. You are doing good work at South works."

RECORD ESTABLISHED ON NUMBER OF EMPLOYEES.

CHAIRMAN YOUNG: Speak up, gentlemen; let us have what is on your mind. Please give your name, address and affiliation distinctly so that the record may be correct.

MR. T. H. CAROW (Pennsylvania Railroad): I would like to ask Mr. McKenney if his 57 percent reduction was based on the same number of employes, on the same number of hours, or the same amount of business?

MR. MCKENNEY: About the same number of employes, yes, sir. About 145 foremen attended our meeting.

A DELEGATE: How many were fired?

MR. MCKENNEY: We did not fire any. They got on the job. That is the reason we got the reduction in the accidents.

MR. CONNERTON (Endicott-Johnson Company, Johnson City, N.

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Y.): I would like to ask Mr. McKenney how he keeps the interest of the foremen and sub-foremen in this movement?

MR. MCKENNEY: We hold their interest by having meet occasionally, but the superintendent is on their trail all the time. When we have an accident in our plant some one has to explain it and if it is not a good reason, they go out of the service. Unless you have the support of the management, you cannot get anywhere in accident prevention. You must have that support, and we have it at South works.

CHAIRMAN YOUNG: You begin with the grandparents, do you?

MR. MCKENNEY: When I say anything to Mr. Young about our wonderful campaign he says: "Go to it, Tom; it shows what I taught you."

CHAIRMAN YOUNG: That is very interesting.

MR. WATERS: How does Mr. McKenney define an accident—mere scratch, or time lost?

MR. MCKENNEY: Over seven days' lost time.

TAKING ACCIDENTS SERIOUSLY.

CHAIRMAN YOUNG: That is a very important contribution to what can be done to awaken the interest of the sub-foreman who is not inclined to regard accidents seriously. Has any one an idea as to what discipline could be meted out to that man, if any, and what would be the best discipline to awaken his interest?

MR. FELLNER (St. Louis): We have started a campaign recently in one of the larger works in southern Illinois. We are hoping to get the interest of the foremen and there are quite a good many of them; altogether about forty-five. The management of this particular works does not believe in prizes of gold watches or things of the kind I heard described at last year's Congress in Detroit, although some companies believe in them. I proposed to the management that we have the foremen meet informally every month the day after the General Safety Committee meeting. The foremen were to be made acquainted with the accident records for the months just past and with the recommendations handed in by the General Safety Committee. We had a lot of fun at the first foremen's meeting. Those fellows came in and they thought: "Oh, well, it is another one of those new-fangled affairs—some more work!" Then the recommendations of their own men were read to them.

The instructions of the General Safety Committee were these:

The men of the safety committee were to turn themselves loose and look for conditions which they would change if they owned the plant. Of all the stuff that was unearthed! It was wonderful. You ought to have seen the faces of those foremen. Well, we had one youngster in attendance and his attention was called to a condition in his shop. He grinned all over himself and said: "Well, that might have been so, but it isn't so any more."

He was asked: "Why, what has happened?" "Oh, nothing," he said, "only I pumped the safety committee before I came here." You see, that is one of the things that will tend to keep the interest of the foremen alive.

You will be surprised—even a manager will be surprised—after he turns a committee of his workmen loose in the plant, to learn just how many things he is slack in in the administration of that plant. He has the spirit of co-operation started from the top to the bottom and has it permeating the entire organization.

Only in that way are you going to get results. Your sub-foreman, under most circumstances, is a sort of a crucial point; he is the fellow, I find, in the safety engineering work that does not really want to take part. The top, the management, after it has been spoken to on the subject of safety, usually is enthusiastic. The rank and file are particularly interested, but the sub-foreman is the crucial point and to get him interested is quite a problem.

In this instance the method we followed worked out very nicely, and every month the men report to me that they have just the right kind of success and a good deal of good feeling and co-operation from the foremen.

WHAT CONSTITUTES AN ACCIDENT.

MR. G. G. EVANS (Brier Hill Steel Company, Youngstown, Ohio): Just one question in regard to what constitutes an accident. I would like to ask the gentleman from the South works whether the accident definition is based on a state law, making seven days an accident, or whether it is a rule of the safety organization?

MR. MCKENNEY: We have a Workmen's Compensation Act in Illinois, and we start paying after the seventh day. We have a rule in the corporation as to the classification of our accidents. We follow the line of the state law. Of course, we have accidents. We call everything an accident; if a man goes to the hospital to have something taken out of his eye, that is an accident; but we do not compute our figures on accidents of that kind.

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MR. J. C. SMITH (Safety Director, Inland Steel Company) : I want to endorse what the speaker previous to me said about incentives by the sub-foremen being a very good thing. I was the one who brought up the gold watch proposition at the Detroit Congress. I know a good many managements are opposed to the prize system but we worked out a new stunt during the past year.

In order to arouse the interest of the sub-foremen we are giving gold watches to the foremen. The scheme that I outlined at the last Congress was to give watches and other prizes for suggestions. This scheme, however, merely gives watches and prizes to foremen in order to stimulate their interest.

ESTABLISHING A "BOGEY."

We have one plant employing about 5,500 men, with seventeen or eighteen operating departments. A "bogey" is established for each department, based upon its previous record, which gives the certain percentage with which they have to work in order to get into a class showing a decrease in the percentage of accidents, as compared with their previous year. The departments showing the greatest decreases are the ones that get the watches. We donate watches each month. Those watches cost about \$10 apiece, or about \$100 a month for prizes. No one department gets over one watch a month, after they have already won prizes.

The superintendent, in order to encourage a certain foreman, takes an interest in accident prevention during the next month, and he goes up to him and says: "Mike, if we win the watch this month, you are the man who gets the watch. It is up to you to get busy and prevent accidents." Mike has to do it, or else he loses his turn and he has to wait until all the other foremen have won.

We have one department that has gone pretty nearly a whole year with 100 per cent each month. We have several departments that have nearly 100 per cent each month, and I believe in all departments of the plant our system has stimulated a great deal of interest on the part of the foremen. Personally, I do not see any objection to giving prizes, because it is the same principle as giving a bonus or an increase in production. You are merely stimulating your foreman to give additional interest to a certain part of his work for which he receives a prize for accomplishing certain results.

MR. O. S. DIXON (Pennsylvania Railroad) : I would like to ask Mr. McKenney what type of accidents he has reduced.

men accidents or due to a lack of guards? Just what did the foremen do that they were able to reduce accidents? Was it because they had dangerous conditions about the plant, or did they educate the men? Take a man hammering, for instance; they all fail at times. The same is true in pulling a wrench. Was it lack of guards that caused them to get hurt? Is that the type of accidents you reduced?

MR. MCKENNEY: We have not spent \$100 on guards this year. If a man has an accident in our plant, if it is a foolish accident, we fire him, or lay him off, or discipline him. We are strong on discipline. If you are going to let a man hang around, if he is a dangerous man, after a while he is going to hurt himself or someone else seriously. We keep tab, on our employment records, of all the accidents that happen to each and every man, and when two or three accidents have happened to that man we notify the superintendent of the number of accidents and the nature of the accidents. We make a recommendation according to the accidents, "It seems that this man is dangerous: it might be well to get rid of him or lay him off."

MR. DIXON: Can you afford to lay off a man now?

MR. MCKENNEY: Yes; it is better to lay him off than hurt someone and lay the other fellow off.

MR. DIXON: I thought all the steel companies, railroads and everyone else in the United States were from 20 to 50 per cent short of men.

MR. MCKENNEY: Well, we might be a little short, but what good is a man when he is laid up? He cannot work. You want the man on the job and if you have men around that injure themselves you are going to have a shortage. If you have 10,000 men working for you and none of them are sick and none of them lay off and none get injured you will not have a shortage; you will have your 10,000.

STARTING AT THE TOP.

MR. DIXON: This is one of the most interesting statements I have ever heard: To reduce injuries 57 per cent, taking into consideration that fully 50 per cent of all the injuries occur from circumstances that men and women cannot anticipate. It seems to be the most glorious chapter in the history of safety. If you can tell us what the foremen did; how you brought about this revolution in their minds; the psychology of the campaign, I would be extremely glad to hear it. We have had an extraordinary turnover on our road. If you would put the proposition up to one of our superin-

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tendents—to dispose of a man because he was injured—why would lose your own job. I venture to say there is not a division a shop, nor a station on our railroad, nor on any other—I assure you the same condition applies in all other business enterprises—that from 20 to 40, even as high as 60 per cent short of help. What I want to ask you with all sincerity is to make clear what your foreman specifically did to change the minds of the men and attain the wonderful result in accident prevention in so short a time?

MR. MCKENNEY: Our officials started at the top of the line and came down. The general superintendent told the superintendents that they must not have accidents. When an accident occurred the general superintendent was called in and put on the rack. He was asked: "How did it happen?" The superintendent did not like to be called into the office, so he went after the foreman. The foreman did not like to be called into the office, and he went after the sub-foreman. The sub-foreman did not like to be called into the office and he went for the careless man. They know, all along the line, they will have to go into the office—that is discipline.

A great many of our accidents occur somewhere around a moving body; that is, a traveling or locomotive crane, a dinky engine, a charging car. It may seem a little strong on discipline, gentle but when we have an accident in the operation of any of these machines the operator immediately goes out of service, whether it is his fault or not. If an accident happens on a traveling crane the crane man down below and the crane man up above immediately go out of service until an investigation has been made of that accident.

What do we gain? It is the true American spirit of independence. Men do not like to "squeal" on each other; men do not like to say "That man did an unsafe thing." They do not want to be tale-bearers to the foreman. When you enforce a rule such as the one we have adopted every man is called upon to protect himself. It is against the rules in our plant for a man to jump on a crane—just as it is in all other plants. If a man violates the rule and boards a moving crane the operator does not like to go to the foreman and "squeal" on the man. Our rule requires the operator to stop his crane and say "Get off." He probably says: "What are you trying to do? You want to make me lose my job?" The crane man has to stop and order the man off in self-defense and for his own protection. We have reduced our accidents materially by enforcing this rule.

It is our general campaign of discipline all along the line.

TRIALS IN THE MILL.

CHAIRMAN TENER: Mr. McKenney has found one way of reaching the sub-foremen, through discipline; Mr. Smith reaches them through prizes. Perhaps a little experience of my own might be helpful. We have tried in many ways to influence and secure the interest of the foremen and sub-foremen. For instance, we hold trials—amicable trials—in the mill. An accident has occurred and we want to find who was to blame. A jury is impaneled and witnesses are brought in. They are questioned and their answers recorded. The last question asked every witness is: "Have you anything to suggest to prevent the recurrence of a similar accident? Speak freely." Then the verdict is brought in. We try to fasten the blame directly on some person, or indirectly on some person or object.

These are the questions: "What happened? Who is directly to blame? Who is indirectly to blame? What can be done to avert a recurrence of such an accident? What discipline shall be meted out to the guilty party?" The last question was abolished. We do not like to discharge a man. Occasionally the jury decides to lay a man off for a day. A jury once brought in a very unique penalty. The guilty man was sentenced to make a safety address to all his associates—it was one of the very best verdicts we ever had. The man said: "I will do it! I caused the accident, and I will do it!" We had that man's interest ever afterward.

This discipline was very simple—was it not? In our company, which is a large one, we are able to compile comparative reports. A is compared with B and C with D and so forth. I can compare the mill in Worcester with one in Birmingham; and, of course, a spirit of friendly rivalry springs up right away. I show the cause of accidents per quarter; I show the number twice. I show it once on the severity test, "How long was the man off duty?" and again on the frequency list, "How many accidents were there?"

Our report system has helped a great deal in the education of foremen and sub-foremen, but I think, beyond all that, the way to reach a sub-foreman is to give him to understand that when there is a chance of an increase in salary or a chance of promotion or of reorganization. Mr. Sub-Foreman the superintendent will at least look at you. The sub-foreman knows that, when the question of advancement is up, I will ask "Is he a good handler of men? How was his product in quality, in tonnage, and in low cost?"—assuming he

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is a sub-foreman of a manufacturing department. Add another factor, "What was his record with regard to safety?" Let that sub-foreman understand that he is not going to be promoted exclusively on the three industrial factors, but that his safety record is going to be taken into consideration and you will have his interest.

I am very much interested in the question of discipline. I am skeptical about absolutely dismissing a man unless he is wilfully negligent, utterly regardless of all safety matters. There are some employers who would discharge a man without really adequate cause. The man simply gets another job tomorrow and really has not been disciplined. I would rather let him off for one day. I would rather let him suffer the loss of one day's wages, because he will come back, but, as I said, I think there are other ways of reaching him without causing that suffering.

MR. MCKENNEY: I do not want to be misunderstood. Because we have an accident, it does not mean that we discharge the man.

CHAIRMAN TENER: I understand your system, Mr. McKenney.

MR. MCKENNEY: Our system is much like the one Mr. Tener has described. The last thing we do is to discharge a man.

BEST HOUR FOR SAFETY MEETINGS.

MR. SIDNEY W. ASHE (Pittsfield Works, General Electric Company): In educating the sub-foreman, I would like to use your experience as to the best time of day to attempt it. I have tried to get hold of men the second half of the noon hour, 12 to 1 o'clock. It has worked out very successfully, except in one department. About a month ago we started the sub-foremen meetings and the men were so interested that everyone stopped work. A number of men do a little work during the noon hour in this particular department, and as a result of the meeting production dropped about eight tons. When a thing like that happens, and you have the earnest co-operation and interest of your executives and the workmen in your foundry, immediately you have created a new situation. Because of labor troubles and difficulties in handling them just now, why, it is important to maintain production.

I was wondering, in a situation like that, whether any other time of the day would be suitable for the meetings. We all realize that the time to get hold of the men is when they are at work, rather than try to get them back in the evening or at some other time.

CHAIRMAN TENER: The question raised is the best hour

somewhat on whether the man is a day worker or a piece worker. Is it best to call him from work in his own time or on the company's time? Is Mr. Regula here?

COMPARING ACCIDENT FREQUENCY.

MR. ALBERT REGULA (Safety Engineer, Brooklyn Navy Yard): We have worked out that problem at the Brooklyn yard—as a matter of fact we have tried both ways. In one division it was entirely possible to get the foremen and sub-foremen together during the noon hour. We placed before them the accident frequency and the experience of large corporations, compared them with our own and showed them what foremen in other plants had done. In that way we attempted to enlist their interest and co-operation.

Our meetings were usually called about 12:30 and continued until about 12:50 o'clock, giving the men about ten minutes to get back to work.

In another division we found it entirely impracticable to get the men together during the noon hour, so we tried various intervals at different hours during the working day. We arranged meetings, perhaps at hour intervals, at the different shops, following the same program of educational work. In this matter we managed to get to all the foremen in that particular division.

As to whether it is entirely practicable to hold foremen's meetings during the noon hour or during working hours, this, of course, depends entirely upon particular conditions in the plant. If it is possible to do so during working hours, and not detract or take away from the man any part of his earning capacity, or reduce the time set for that day, meetings ought to be held on the company's time. If industrial operations will not permit meetings during working hours, the most practical solution is to hold them either during the noon hour, or just before or just after the men have quit work for the day. It is a matter depending entirely upon conditions in your plants. It is impossible to set a hard and fast rule and say that foremen's meetings shall be held at any particular time of the day.

In conducting our educational work, we started, just as you do in all your shops, at the head, and worked all the way down. We started with our industrial manager by having a lecture given to him, a lecture in which the audience was one man—the industrial manager. Before we were through we convinced him that the safety effort in our establishment was worth while. From the industrial

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manager we went to the heads of the various departments—machinery and public work. We convinced them. There, again was a one-man audience.

From the heads of departments we went directly to what we correspond to your superintendents or general foremen—we call them quarter-men. Again we gave the same type of lecture. We went over the ground, comparing the experiences of industrial corporations with the accident frequency at the yard. Then we got to our foremen, again hewing over the same ground. When we were through with the foremen we went directly to the workmen going over the same ground, and asked their co-operation in safety work. We showed them what had been accomplished elsewhere, and then the attitude of the officials, and showed them how much concern the officials were taking in safety work. The men have taken the work to heart and are endeavoring to do everything possible to prevent accidents. We emphasized that we wanted to give each and every one of them an active part in safety work; we could not do it alone; the officials could not do it, and unless we could get their co-operation and make each feel he was a committee of one, all working together, we would get nowhere. Then we told them what we had in mind with respect to foremen and the safety committees. We told them what we expected each and every man to do, and here is the result:

MEN ASK TO BE PLACED ON COMMITTEES.

In several of our shops, after outlining our workmen's committees, we have had men come to us after the lecture and ask to be placed on safety committees. They were interested and wanted to give us more of their co-operation. They knew of conditions that they thought might be remedied. They would not, at that time, tell us what they were, but if we would put them on a safety committee and give them a chance to show us how much they were in earnest in safety work, why, they were with us. In the Brooklyn yard we have the industrial manager and men all the way down to 200 apprentice boys in our industrial school—all pushing and talking safety.

MR. L. A. DE BLOIS (Safety Engineer, E. I. Du Pont de Nemours & Company): I would like to give you the results of about two years' experience in a large plant of interesting the foremen. It has not been a small undertaking. We have about 50,000 men in sixty plants, and in the past two years we have had exceptional opportunities; that is, an enormous labor turnover, new processes, an

war conditions, but at the same time a pretty good working factor or background.

In other words, our plants were pretty well guarded and we had a low accident rate. That meant we had what I think is the hardest proposition for the safety engineer to face. We also had a complex condition in small plants, some under 100 men while others employing up to 17,000, with a mixture of nationalities.

We have had competitions, we had foremen's meetings, we had safety rallies, and safety talks and lectures. I think we have tried pretty nearly everything in the last two years—all the recognized avenues of safety application. The big thing that we learned was this: That you do not reduce accidents by simply pouring safety talk into the men's ears. You may have a beautifully organized system of rallies and moving pictures and "The House That Jack Built," and lantern slides; you may have your foremen's meetings, and you may have meetings all the way down the line as far as you can go without breaking down your position, but as long as you maintain the one system of pouring things into men's ears you do not get definite results. You may do it if you have a bad accident factor and poor conditions, but when you have once broken the ice, I do not believe you get results in that way at all. In life we are only mildly interested in what people tell us; we are vitally interested in what we take an active working part in. When we come to the foremen's meetings those meetings become valuable only when you give the foremen some definite, concrete piece of work to do.

I cannot take your time at this meeting to dilate upon this question, but I want to take just a minute or so on the question of the formulation of the works' rules we have tried out in two of our plants.

FORMULATING SAFETY RULES.

We decided—or, rather, the management decided (and, by the way, the management should decide things, not the safety department) that we should formulate safety rules for the various buildings and processes, and that the formulation of the rules should be undertaken by the men who were to be in charge of them—in other words, by the foremen. All right. Foremen's meetings were organized. You start the discussion at two or three meetings of what are the prevalent accidents, or prevalent hazards in your building or factory. That is preliminary. Then you devote certain meetings to the formulation of rules for those particular areas, or for buildings, and each of the plants start in that way. Now, note the difference. One plant,

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after the foremen have submitted their rules, and perhaps give a week to it, passed those rules on to the next officer, in our case supervisor—the supervisor takes the rules to his office and reads them, so they will not interfere with the continuance of his duties and so on—then he passes them on to a rules committee which has been appointed. The rules committee chops and twists and ranges the rules and submits them to the manager. Finally they are returned to the committee; they are turned back to the foreman. “Here are your rules; now, enforce them!” The foreman looks at the rules and generally says “Oh, hell! Those are not my rules. He does not recognize them. He has not been brought in touch with the changes; he does not know why the changes were made.

Take the other plant: They draw up rules entirely in meetings. They discuss them and their meaning. They even spend hours on trivial points—as to whether rules should be posted in the building or outside; but, what have they accomplished? They have helped to make the rules from beginning to end, and then they only have one more O. K. to go on them, and that is the O. K. of the manager of the plant itself. If he is wise he attaches his O. K., unless they are rotten. They probably will not be, if the meeting has been carried on properly. The men have their rules, the rules they make themselves, the rules they are called upon to enforce. The other men have a lot of stuff that is as much not theirs as is a suit of hand-me-down clothing. Now, of those two plants, in which are you going to have the best discipline for the enforcement of rules? And in which will you get the greatest active interest in safety?

CHAIRMAN TENER: I thank you, Mr. de Blois. I think you have given us quite a new phase of this whole matter. It is instructive and beneficial to find that allowing the men to formulate their own rules has worked out successfully. I know from experience that a foreman will insist on his men using a guard on a circular saw if it is his own invention rather than use one that has come from some outside source. It is only a natural feeling that it should be so.

FOREMAN MUST USE HIS EYES.

MR. R. C. GRISWOLD (Hopewell works): I feel that a lot of time has been spent this afternoon that has been lost to me, particularly the topic of “Educating the Sub-Foreman.” We have talked about browbeating sub-foremen, all the way from the manager down, and when you have forced a man into safety work out of fear of losing his position you have lost the point of it.

that man's get-up in doing safety work. Mr. de Blois has told you of some of the work that we have carried on in our plants. We have tried the lectures. The gentleman from the Brooklyn Navy Yard has outlined practically the day's itinerary we have followed for two years, with a great deal of success.

What are we doing, what is any company doing to educate the foreman when he walks through his building? We are educating him to use his eyes, instead of keeping them on the floor or on the clock; to see whether a certain ladder is safe. If we have a building where acid fumes are attacking the timbers, is he having a drilling made of that timber to see if it is safe? Does he know that those bolts are getting weak and are liable to cause an accident? Are they weak? Are the walkways safe? Does he test them himself? Does he go to the top of the ladderways and see the places where men have to go frequently? Does he know they are safe? Does he see that all the wiring in his plant is insulated in such a way that men will not come in contact with some bare portion and fall to the floor below? Does he see to every operating condition in the building? He is supposed to be of superior mentality, as he is supposed to be the hirer of the men working under him. He should spend a portion of his time, at least, in seeing that every condition in the building that has contributed to accidents is now all right. It is very easy. We tell him all about it. We are taking an accident in a particular line and going to the foremen and describing it to them, telling them how it happened and what was the result—the idea being that the foreman would go to his men and explain those very conditions, so that the man may know what caused the accident to his fellow-workers. I do not believe that hammering and discipline and laying-off and discharging and giving prizes is going to be of any great effect, because it is not permanent. We must get the humanitarian spirit of the safety movement into the heart of every man.

CHAIRMAN TENER: I thank you for your attention. The meeting is now turned back to Mr. Young.

MR. A. H. YOUNG, CHAIRMAN.

CHAIRMAN YOUNG: Are there any questions, any suggestions or experiences which you would care to propose, which we might submit to a jury to be selected? I will not let you know who to get after, but are there any questions which you want to put to the men whom we can group together and answer them?

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MR. G. G. EVANS (Brier Hill Steel Company, Young Ohio): In regard to the statement made by Mr. McK Whose carelessness was largely corrected—that of the sub-f or that of the workman?

CHAIRMAN YOUNG: A good question. We will see th get in touch with Mr. McKenney. I imagine Mr. Griswold w have a question or two. Are there further questions?

MR. JAMES GIBB: I would like to hear more of the gen give their experiences in educating foremen.

CHAIRMAN YOUNG: Have you a question you want answ

MR. JAMES GIBB: I am waiting to give my experience in e ing foremen.

CHAIRMAN YOUNG: I am very sorry that we cannot have experiences. If you have a question you wish to ask we w and have it answered, but the allotted time has passed and we be inexorable. Are there any other questions?

MR. MACLACHLAN (Toronto Electrical Manufacturing As: tion): What is the best method to use in educating the sub-for of a public utility? Its men are spread over so much territory impossible to get them together at any one point.

CHAIRMAN YOUNG: We will try and put you in touch wit authority on the subject. Are there further questions? If no will switch to the next subject, which is just a little of an inn tion. Heretofore, in our round tables, the discussions have on questions involving the educational, the psychological sid safety work. I never dared to use that word in South Chicago, since I have been in New York I like it. Curiously enough, in se ing the subject "Handling Materials," to get something conc definite, physical in its aspect, there has probably been more psyc ogy drawn into the question than in the purely academic discuss on educational matters. The subject needs no introduction to y neither does Mr. "Chemically Pure" Tolman.

HANDLING MATERIALS.

C. P. TOLMAN, SUB-CHAIRMAN, CHAIRMAN OF MANUFACTUR COMMITTEE, NATIONAL LEAD COMPANY, NEW YORK CITY.

CHAIRMAN TOLMAN: The subject should need no introducti as it is probably one of the oldest problems in human industry; t very pyramids of Egypt depended

ling material for their erection. The Egyptians had a rather different problem, from the industrial standpoint. To them time, labor and expense meant little or nothing. It is very fair to presume that they had a similar attitude toward their casualties.

The subsequent development of mechanical aids in handling materials has decidedly other phases. First of all is the economical phase, and aside from being obliged to use aids, simply because the materials are too heavy to be handled in any other way—the problem of the pyramids—the materials must be handled by machinery in order to save the time of the workmen and to save money and expense, and last, but not least, to save exposure of workmen to industrial hazards.

Using machinery in that way, as we do, we must be careful, and that is one of our large problems here today—to so use machinery that it does not in itself constitute a hazard to workmen.

CHANGE OF ROUTINE CAUSE OF ACCIDENTS.

Mechanical handling of material is different in its relation to the workman than the ordinary mechanisms of manufacturing in that a man working, say on a lathe, has established through habit a certain amount of immunity from accidents. It is true, I believe, that a large percentage of accidents in the use of ordinary machines of manufacture are due to the interruption of the man's physical routine of operation. It may be a very trivial thing, a noise in the room, something falling, a change in the sound of the shaft, or the general hum, and for that instant his attention is attracted and he makes a little change in his routine, an involuntary movement instead of an automatic one, and his hand is injured. In that way, I believe, occur a great many of the ordinary industrial accidents.

The machinery used in handling material is different from the ordinary work tools in that it does not come into regular contact with any given man, nor does it always come in contact with him in the same manner.

For example, we may take a piece of material to a certain workman from the end of the shop this time, and across the shop another time. It would perhaps be a different kind of a piece and it is a new condition, absolutely. There is none of the safety through immunity on account of habit. Therefore, it is necessary to safeguard machinery even more carefully than the ordinary work tools. Psychologically, it requires more care and more thought. It is necessary, I believe, to put one's self in a certain attitude of mind toward

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it. The solution of a given safety problem in machinery of sort should be first of all as simple as possible; second, it should involve, as far as the men are concerned, only natural means: if there is a handle to be operated, the handle should be within reach of an ordinary man. The throw of the handle should be such that it is within the range of operation of an ordinary man. It should not employ unusual muscles, it should not be too hard to work, and so on. The controller handles for a crane, for example, we should know, and the man designing such a machine should know, just what condition exists. If he knows, or has reason to believe that the man will find it convenient to lean out of his cab window, he must then be sure there is no controller handle that will strike when he leans out of the cab window. He must not be content. He must see, if the man wants to look out, he can look out of the window in the rear of his cab. He must know if the man cannot do it, and the safety engineer will know or should know, that he will not do it.

OBJECT OF SAFETY APPLIANCES SHOULD BE OBVIOUS.

Safety appliances should be designed, if possible, in a manner that is perfectly obvious to the workman, obvious in the sense of making clear to him that a direct object has been accomplished. Perhaps I can best illustrate my meaning by saying that, assuming in a certain shop a heavy casting of a certain kind is regularly handled, it will be a direct economy to the shop to have a suitable cradle made to receive such a casting. When such a casting is brought in by the crane and lowered to the shop floor, instead of gathering together a miscellaneous assortment of blocks and building up a pile more or less secure, according to the safety training and supervision of the men, this cradle will be waiting to receive the casting and the crane men can deposit it quickly and securely. The very ease and naturalness of the operation will appeal to every one and the cradle will be properly used.

That is what I mean when I say that the result must be obvious. There are operations where the results cannot be so obvious and in such cases we have to fall back on training the men, so that they will understand and reason out the purpose and the success of the method employed. When we have successfully accomplished this preliminary work we will receive

Handling machinery is rather difficult of classification. We have cranes—bridge cranes and monorail cranes with their several variations—and steel men know of more kinds of lifting and carrying mechanisms than the ordinary man dreams exists—of handling materials too heavy to be moved by brute force. It is very difficult to classify them, but in general the operating parts of the mechanism are electrically driven. The use of the mechanism itself, as with all handling mechanisms, sets the pace for the particular type of the work, and from an economic standpoint, the apparatus must be kept in order.

A CRANE HOSPITAL.

I have found it very satisfactory, in the operation of monorail cranes, to have what we call a "crane hospital." It serves a double purpose—economy and safety. In the "hospital," which is simply a convenient place to which monorails can be run, sheltered from the weather, is a repair-part board on which is a place for every repair part used in the crane—motor brushes, brake springs and liners, and the like. The superintendent in passing on his shop rounds can see at a glance whether every part is there, ready for use on the cranes. There is an ammeter on the wheel, and the control circuit in the "hospital" is connected to the feeder, through the ammeter, so that the electrical operation of the crane can be similarly checked up. Extra fuses and all the rest are there, and, moreover, platforms of convenient working height, properly safeguarded, for giving thorough attention to the crane in the easiest, simplest and most direct manner. That means that the crane is repaired before it gets out of order. We do not have breaks and similar hoisting accidents.

I am going to ask the audience for suggestions to stop over-hoisting of apparatus of cranes of various sorts. It is, I believe, one of the commonest causes of accidents and one for which we have the fewest successful cures, and those usually are only applicable in certain special instances. The problem of hoisting with one crane, either very heavy or very light loads, and the question of overload stops, that will operate equally under each condition, is a question in which we are all interested. Will someone start a discussion of that phase of the question?

We would like to hear from Mr. Bailey of the Duquesne works, Carnegie Steel Company.

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TWENTY-ONE YEARS WITHOUT AN ACCIDENT.

MR. BAILEY (Duquesne Works): I am afraid I am not in condition to talk today as I have a terrible cold which almost prevents me from speaking.

CHAIRMAN TOLMAN: Have you a friend from the plant who can talk on this subject?

MR. CARL L. SMITH (Carnegie Steel Company): Our inspector, a man who has operated cranes for twenty-one years without an accident is in attendance. I refer to Mr. Dixon, who will speak on the subject.

CHAIRMAN TOLMAN: Now, Mr. Dixon.

MR. DIXON (Carnegie Steel Company): Do you refer to the running of the blocks?

CHAIRMAN TOLMAN: Yes, over-hoisting, as they call it.

MR. DIXON: What they call limit switches; they are set at a certain point, the switch winds out and prevents the blocks from running up. We do not have accidents from that source.

CHAIRMAN TOLMAN: Have you found a limit which does not give you any trouble as between heavy and light loads? What is it set—how much clearance have you?

MR. DIXON: About five feet from the drum. That is insured every day.

CHAIRMAN TOLMAN: By actual test?

MR. DIXON: Yes, sir.

CHAIRMAN TOLMAN: By heavy or light load or when idling?

MR. DIXON: Heavy and light load, both.

CHAIRMAN TOLMAN: I am familiar with limit switches, but very few are made substantially enough. What current do you use in your plant, A. C. or D. C.?

MR. DIXON: D. C.

CHAIRMAN TOLMAN: D. C., series wound motors?

MR. DIXON: Ours are Westinghouse.

CHAIRMAN TOLMAN: Series wound, or shunt wound, or compound wound, I would say. I think that covers that phase of the question. I would like to hear from Mr. Regula of the Brooklyn Navy Yard.

CRANE OPERATION.

MR. ALBERT S. REGULA (Brooklyn Navy Yard): The part of the condition that Mr. Tolman has in mind is the condition of the crane when it is in operation.

apparatus, but rather on the limit stop, on the runway itself. We had a most peculiar condition of two cranes, forty and sixty-ton, I believe, operating on a three-rail runway. The sixty-ton crane operated on the two outer rails and the forty-ton on the inside and one of the outside rails. The bridge girder on the larger crane came so low over the center rail as to give improper or insufficient clearance to use a bumper on the end of the runway—perhaps there was a bit of a corner on the track as well. It is rather difficult to explain this condition. I am going to draw a picture on the board and perhaps you can understand it a little better. (Mr. Regula drew a diagram.) The sixty-ton crane operated on the two outer rails, the forty-ton on the outer and the central rail. Our operations require that both cranes pass this point of the shop, the center. The bumper at the end of the runway is located here. We felt that it was placing too much on the operator to require that he watch when he came to this point on his runway when operating the forty-ton crane. If he should strike the bumper it might precipitate the forty-ton man to the shop below. We were stumped, for a while, how to remedy the condition. Our suggestion was to equip the motor, on the bridge trestle itself, with nothing more nor less than the old type of dynamic brake, so as to cause that brake to function and trip on the building column, just on the safe side of the runway. That was our suggestion and I believe it was Mr. Colman's idea to present it to you as a possibility of employing dynamic brakes on bridge traveling motors in conjunction, perhaps, with the ordinary types of either rigid or spring bumpers. That is a matter for your consideration, the possibility of the dynamic brake for bridge traveling motors. About the same type of dynamic brake is employed for hoisting or limit switches on cranes, where it is practical in every sense.

CRANE SIGNALS.

CHAIRMAN TOLMAN: Thank you. I would like to hear a discussion on methods of signaling between men on the floor and crane operators—whether whistle, bell, or visual signal should be used. As between the several methods, which do you think is the better?

MR. SANFORD (General Electric Company): Our method is to use a whistle signal to attract the crane operator only; after his attention is directed to the man below we use manual signaling. We have ten cranes in one building and if whistle signals were used by every man there would be a bedlam that no one could understand.

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MR. G. G. EVANS (Brier Hill Steel Company, Youngstown, Pa.): On the charging floor, we find that a bell attached to one of the axles, ringing constantly when the charging man is moving, is the best signal. In the stockhouse of the same building we have whistles and Klaxon horns. Both of them are noisy and sometimes they only distract the minds of men. We have substituted visual signals.

CHAIRMAN TOLMAN: What do you think of the suggestion of using audible signals to attract attention, and then the visual signals?

MR. EVANS: I think it would be very good, although we have not adopted that signal yet.

CHAIRMAN TOLMAN: You now have the chance.

MR. EVANS: Yes, sir.

CHAIRMAN TOLMAN: Any further discussion on this type of signal? I presume the hand is used in ordinary signaling. Have any attempts been made to standardize such signals?

MR. SANFORD: Some attempts have been made to standardize them but each factory has its own signals. They work out very well in particular cases, but there has been no attempt to standardize throughout all our factories.

CHAIRMAN TOLMAN: Study of the semaphore code of the Army and Navy might be enlightening. Such a study might result in making things clearer and not susceptible of misconstruction. In many good shops I have noticed the difference in intent between two radically different signals is often very slight.

MR. CHANDLER (Dodge Manufacturing Company): What progress is being done by the National Safety Council towards standardizing signals? They have had something in preparation for some time.

CHAIRMAN TOLMAN: That will be investigated and a report made. Any other gentleman?

MR. HART (Birmingham): We find a common flashlight is a very good signal, because a look-up man will have his hands occupied. We find it advantageous in preventing accidents.

CHAIRMAN TOLMAN: You find the switch on the flashlight is sensitive enough—the button on the ordinary flashlight?

MR. HART: Yes, sir.

CHAIRMAN TOLMAN: Does your code consist of long and short dashes or total number of flashes?

MR. HART: Our method is similar to the railroad light signal.

CHAIRMAN TOLMAN: The signal does not depend on the number or length of the flashes?

MR. HART: No, sir.

CHAIRMAN TOLMAN: That answers the question I had in mind. I have tried telegraphing with the flashlight and the results were unsatisfactory.

MR. ROBERT A. SHAW (Safety Engineer, Ford Motor Company, Detroit): Formerly every one gave signals in our plant, but now the signalman carries a whistle. One whistle means one way and two the other way. We find it very satisfactory.

MR. F. W. SHEPARD (American Cast Iron Pipe Company, Birmingham): Does he use a pneumatic gun when giving signals?

CHAIRMAN TOLMAN: What other noises are there in the shop where they use the whistles?

MR. F. W. SHEPARD: Too much noise.

CHAIRMAN TOLMAN: Yes?

MR. F. W. SHEPARD: We have a large craneway and a large number of presses. There is a good deal of noise. You cannot hear people talk, but they still use the whistles.

CHAIRMAN TOLMAN: The general pitch of the noise is very different from the ordinary whistle. Perhaps the noise does not drown the whistle.

MR. CHESTER: What is the answer when you have a pusher and a great deal of noise—what kind of signals would you use? We have the Klaxon horn.

CHAIRMAN TOLMAN: The question is: What kind of signal is best on a charging car in a motor plant, where there is a lot of noise, steam blowing off and so on, to cover even the sound of a Klaxon horn? What is the suggestion for signaling in that case? Two men are visible, one operating and one giving the signal?

MR. CHESTER: The operator runs the car.

CHAIRMAN TOLMAN: Electrically or steam operated?

MR. CHESTER: Electrically.

CHAIRMAN TOLMAN: Cannot the man who gives the signal interlock something, so that the car cannot be moved until he has closed or opened the door?

MR. CHESTER: This is simply to prevent a collision.

CHAIRMAN TOLMAN: Such as a man on the track?

MR. J. C. SMITH (Safety Director, Inland Steel Company): We use an inverted gong, attached to the driving rod of the pusher. A small pipe is fastened to the axle and a small ball is inside of the

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pipe. That lets the gong turn around the ball, it drops through pipe and strikes the gong. It works out very satisfactorily. We have used it a good many years.

CHAIRMAN TOLMAN: Could you write a memorandum of question and send it to the Council? We can then answer your question properly and perhaps be of assistance.

CRANE DIRECTOR GIVES ALL SIGNALS.

MR. LEVENCOCK (Pittsburgh): We have several cranes continuously moving through the shops. We do not use whistles. Any man here has ever worked in a carshop where they are cutting and driving rivets, using perhaps a dozen gongs at a time, they appreciate that a whistle would be useless.

We have a crane director in each aisle of our carshops. The crane operator has his eye continually on the man who is giving instruction—the signals. If there is a movement to be made at the end of the shop and the crane is idle, the man who is working the car goes to the crane director and tells him what he wants and the crane director sees that the crane is brought up. He does all the signaling. We have had only one accident of any consequence in the past three years and that one was not due to improper handling of a crane or faulty instructions given by an employee. It was simply due to carelessness in the raising of a car.

CHAIRMAN TOLMAN: Just how did you pick out the man in the position of director? How was the man selected?

MR. LEVENCOCK: We generally pick an old fellow, not a young old fellow, but a man who is active and intelligent enough to know what movement ought to be made—a man brought up in the shop. He knows the general run of the work and what has to be done.

CHAIRMAN TOLMAN: Is he put on as a helper for a while, or something of that sort, before he is established on the job?

MR. LEVENCOCK: Oh, no.

CHAIRMAN TOLMAN: Often a man will fall down.

MR. LEVENCOCK: Oh, no; I think we all appreciate that it is a very important job and that we must have an intelligent man, one who knows how material should be properly handled.

CHAIRMAN TOLMAN: You pick him from his job records?

MR. LEVENCOCK: We pick him from his job records and he becomes crane director on his merits.

MR. ROGERS: There is one distinct advantage in hand signal-

machinery or taking machinery apart. The crane director or foreman and the operator establish a code of signals so that a man can move and operate in a very simple way; whereas, with a whistle or a signal of that kind, the operator does not know whether to take hold or move the load, so that both can be working together. We find it a great advantage to have the crane operator watch the foreman, and the foreman, by assisting in the working of the device, can get practically any strain he requires.

MR. G. G. EVANS (Youngstown, Ohio): We have had only one serious accident from overhead crane movements, but we have had a number of errors to correct. When the crane operator allows his trolley to rack over a little too far, and, instead of bringing it back directly over the load, tries to save time by picking up the load when the crane is not directly over it, the operation is dangerous, I assure you.

CHAIRMAN TOLMAN: That illustration is symptomatic of the hazards in all crane operations.

USE OF LIMIT SWITCHES.

MR. J. C. SMITH: It seems to me that the subject of limit switches was not covered thoroughly enough to give the proper information. There is one kind of limit switch in general use around Chicago—I do not know whether it is commonly used around the country—but it was described in a pamphlet issued recently. It is of a block type, there are two blocks, having a contact point with a hinge at one end. The load being hoisted brings the contact points together, and shoots off the juice on the hoisting motor. There is also the Youngstown switch, which is very positive and self-marking, so that you do not have to receipt it each time it is worked. In regard to the handling of materials, it seems to me that, from my experience, the economical end is not the big end of it on this subject. I recently made an analysis of the causes of 1,860 accidents occurring during the first half of this year and I found that 49½ per cent were due to men dropping things on their hands and feet. This indicates that the human element is the most important thing in handling material.

CHAIRMAN TOLMAN: We are coming to that.

MR. J. C. SMITH: I read a little article in a magazine and I thought it covered the point very well. It was entitled "The Dropsy Habit." It said one-half of all the accidents in all the plants are classified under the head of hand-labor accidents, and that one out

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of every four is due to a disease generally called "dropsy." is not the kind of disease the doctor's books tell about—the symptoms are noticeable when a man gets "butter fingers" is, when he takes hold of a rock or lifts a pig of lead, when he holds a board or holds one end of a plank and lets the end drop on his feet. The trouble seems to be that the man with the "dropsy" habit is afraid to get a good hold on anything—everything looks like a red-hot potato to him. The instant he takes his fingers begin to soften up before the rock or pig or board goes through them and lands on his feet and poor Mr. "Dropsy" is lame perhaps for life. The "dropsy" habit is easily cured by fixing your mind on your work. This article appeared in the *American Refining and Smelting Company's Review*. I think it covers the subject thoroughly. It seems to me that this is a most important part of this subject. It is training the workmen so that they do not drop things on their hands or feet. We have not solved it yet. I do not know who has, but I think it is very important; it is responsible for about one-half of all our accidents.

A PSYCHOLOGICAL POINT.

MRS. JOSEPH R. WILSON: It seems to me, Mr. Chairman, that this is the psychological point, if I may use the word, to bring the question of women and children into safety work. I see some of them here. They are in a congress of men. We are anxious that safety work shall come before the children and the women. The "dropsy" habit begins in the home—it is the sense of touch and the measure of sense that we possess is not considered at all scientifically in the home. Children are made to roughly grasp things. They are taught to handle things with care and delicacy and affection. A child grabs readily; he tears and he grips and his whole career is one of devastation and destruction, whereas, it should be something else, and it seems to me that we should take up this question of higher training in the school. Then we will not have minds divided as they are now. The trouble, I think, is with the presentation of the accident problem, and it would never be if we trained our children in the schools and if they are taught to fix their attention. Every accident is caused by divided attention. The rails are split asunder when a locomotive comes plowing over the rails. The rails are fastened and fixed and the rails of the mind should be fastened and fixed, so that there will not be accidents. With children we must do this.

are appealing to you men as fathers. How many of the Local Councils are reaching into the homes that the children may be spared? When I saw them handling materials, I wondered how it could be. The subject seemed to be confined to cranes, but then I thought of canning, gentlemen. I think that I am in order.

MR. R. G. GRISWOLD: I would ask that the discussion be diverted from the handling of materials by cranes and that for a time we consider the handling of material manually.

A CLASSICAL EXPERIMENT.

CHAIRMAN TOLMAN: I beg your pardon, but I have allowed two speakers to intervene before taking up that phase of the question. We are ten minutes behind our schedule. I am sorry to interrupt but we have only a few minutes and I would like to get to the other phase of the work. Taking up the question of handling materials by hand, with regard to co-operation on the part of the workman who has to see something accomplished to impress it on his mind, a classical experiment was made in one of our prisons with a group of prisoners who were not given regular exercise. Careful strength tests were taken and then the men were set to work moving a pile of bricks from one side of the yard to the other. When that had been accomplished they were set to work moving them back to where they were originally. After one month of that a new strength test showed that all the men had deteriorated, because of their total lack of interest in the work; in fact, their disinterest. A workman putting bricks into a wheelbarrow, knowing the barrow is to be wheeled only a few feet and the bricks dumped out, is not and cannot be made to put the bricks in with proper care and attention to piling.

One of the great industrial developments for saving these hand accidents in the last eight or ten years is the developing of the elevating type of truck, where relatively cheap platforms are used. The trucks are well made and the platform stays with the material throughout its transit, thereby making it worth while psychologically to the workman to put his goods on the platform properly. The pigs of iron or lead are piled securely and the pigs may stay there a month. It is not a case of wheeling them on a truck to the warehouse and throwing them off to be repiled when the foreman's attention is directed to the importance of correct piling. Even he can see it without much motive force behind him, or whatever form it may take, and the result is more quickly and effectively attained.

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USE OF ELEVATING TRUCK ENGINE.

I would like to hear something of your experience in the elevating truck engine. I believe there are some eight types of such trucks, both hand-power and electrically. We have about three minutes, gentlemen, so we must make use of our time. I would like to invite suggestions or remarks from any one as to their experiences on the question of training men to handle materials correctly.

MR. G. G. EVANS: The handling of wheelbarrow loads, the positioning of wheelbarrows, is largely up to the foreman if accidents are to be prevented. Too frequently the laborer gets between the wheelbarrow and the ground when throwing material on the wheelbarrow, instead of turning the handles on one side or standing to one side when loading. In this way the overturning of the wheelbarrow, which would cause injury to the lower limbs should he stand between, is avoided.

CHAIRMAN TOLMAN: You count on your foremen to do that?

MR. G. G. EVANS: After all, it comes back to the foreman. What we are trying to do today in our plant is to make the foreman responsible for accidents that happen to his men.

MR. F. C. FRAME (United States Cast Iron Foundry, Birmingham): I would like to ask a question as to handling materials manually: What rules have been determined upon when the chains are used in service? It is seemingly a very important question.

CHAIRMAN YOUNG: I am very sorry but the time allotted to this topic has expired.

The subject of "Labor Turnover and Its Relation to Safety" is the bone which is thrown into the pit. Mr. Forster will pick it up.

LABOR TURNOVER AND SAFETY.

H. W. FORSTER, SUB-CHAIRMAN, GENERAL MANAGER, INDEPENDENT LABOR BUREAU, PHILADELPHIA, PA.

Mr. Chairman and Members of the National Safety Council: The subject of "Labor Turnover" is actually before you. As you know the "coming-and-staying-awhile-and-going-on work" is a fact. Some of you, perhaps, do not know the way in which labor turnover is ordinarily figured and expressed—we ordinarily use a percentage form.

There are many industrial plants in this country today that have a turnover of 200, 300 and 400 per cent—big, prosperous, well-managed organizations—but we think the industrial minimum is perhaps 20 per cent. Any plant, under present conditions, with a turnover of less than 100 per cent is doing well—50 per cent is doing very well.

What does it cost, this labor turnover?

COST OF LABOR TURNOVER.

I presume the average laboring man we take in to train, and lose, will cost \$10—the average man in American industry, not the highly technical or skilled type. The cost in a steel, metal or foundry plant, or in an ordinary assembling shop is, perhaps, \$50. It costs a great deal of money every time you pick out the wrong man for a certain job. If you multiply the turnover in a large plant by \$50 a man, you have \$150,000 a year, and that plant may have accidents costing approximately as much more.

From an economic standpoint, labor turnover has accident liability and compensation payments definitely backed off the books.

Is labor turnover good for anybody? Is it good for the foreman who is acting upon the inner propaganda we so well know? It is not good for the foreman, because he is hired to get certain results and the poorer the material with which he works—the man-material—and the more frequently it changes in a yard the more difficult is his job. Is it good for the workman? It might be if every time the workman changed he got a better job and went on and on and put himself into the superior realm which a few may ultimately reach; but, does the laborer, who has the turnover habit, get into that particular realm? He does not; "the rolling stone gathers no moss." Recently I stated that was a Biblical quotation, but the Vice-President called my attention to the error, and I want to show him that it made an impression upon me. I have not made that slip again. The man who stops a short time on a given job and then tries something else does not get anywhere in civic interest or in friendly relation with his job. He does not secure promotion, neither does he provide a permanent home for his family, proper schooling for his children or the other things that only come by sticking to the job for which he is as well fitted as possible.

There is no benefit to anyone from labor turnover, and with the country at war and the economic and industrial need as great as it is, there is a particular reason why our energies should be bent to reducing labor turnover to a minimum. I am almost prepared to say

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that I hope we will get a conscription of labor which will put them where they belong and keep them there, not permitting them to do what they are doing today. That is what they had to do when the proposition began to get serious.

A DELEGATE: Do not employ the man who comes to you from another plant.

CO-OPERATION OF SUB-FOREMEN.

CHAIRMAN FORSTER: Is it possible to reduce the labor turnover? Yes. In certain plants accurate and reliable records are kept and real progress has been made in the last two or three years. The key pin is the man—foreman, sub-foreman, straw boss or whatever the man may be called—who is in direct contact with the laborer. A laborer in a rolling mill does not judge the American Steel Wire Company by the caliber of its safety director or its president—he judges it by the men immediately above him. The foreman is one of handling men in an intelligent, kindly and patient manner.

I wish I might make my introductory longer, but I was warned by the Chairman that I had just seven minutes to put before you the fact that labor turnover was a serious proposition.

The function of this meeting is to bring out, in three-minute talks, the points of contact between safety and reducing labor turnover. The safety man who is thoroughly alert to his job has a wonderful opportunity, because most companies have not as yet taken up the personnel of work. He has the opportunity of going to the management and saying: "Accident prevention is only one of a dozen human relation activities that we can take up with our men. I shall be very happy if, in your wisdom, you see fit to take up other lines of activity." Labor turnover, accident prevention and welfare work are closely tied together. Our Directress, Mrs. Wilson, has made an excellent point. I hope you will give us your experiences and tell us how pushing forward accident prevention helps to reduce labor turnover.

IMPROVED SHOP CONDITIONS.

MR. C. P. TOLMAN (Chairman, Manufacturing Committee, International Lead Company, New York City): The subject is very important and I am much interested in it, particularly so in view of the results we have obtained. In all of our works we have installed lockers for each worker.

result, within six months after installation, was a reduction in labor turnover and a marked improvement in the quality of labor. We have also installed drying-rooms, with plenty of heat and ventilation, and men coming to work on a wet day can change to dry, warm shop clothing and by noon their street clothing will again be ready for use. We have enclosed steam sheds, where the men may put their luncheon pails or boxes, if they desire, and an hour or so before lunch time the steam is turned on. This work had an immediate effect in reducing labor turnover.

MR. EARL B. MORGAN (Safety Engineer, the Norton Company, Worcester, Mass.): We have found one point that has helped a great deal in reducing labor turnover—it has been a very good preventive proposition. When a man is injured we try to find him a job in some other part of the plant where he can work until he fully recovers. We have been very successful and are pushing the system. A man with a hand all bandaged up may be sufficiently familiar with the work in another part of the plant for us to place him to advantage. A man with a broken finger was found a place where all he had to do was to make a mark with his left hand. He did not miss a single day and the only time lost was for treatment in the hospital, about an hour. That is one way to reduce the cost of preventive work.

MR. HAMMOND: Who takes charge of placing the men, the safety engineer or the doctor?

MR. MORGAN: The safety engineer; the doctor does not know enough about the work.

MR. CONNERTON: We have the same system; that is, I act in the capacity of employment manager and also as safety man. Every injured man who is able reports two or three times a week to the employment office and if we can find a suitable place for him in any part of the mill we put him to work. In that way we have succeeded in reducing labor troubles.

CHAIRMAN FORSTER: Dr. Shelvey has the floor. He has done valuable work in these lines.

WORK OF THE INDUSTRIAL PHYSICIAN.

DR. SHELVEY (Bethlehem Steel Company): I would like to answer Mr. Morgan by saying that if the doctor does not understand the plant it is time he did. The doctor should know his plant; he should be acquainted with the foremen and understand the work. He should say: "This man can work; give him a job." There

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ought to be co-operation between the man, the doctor, the sub-man and the superintendent. On the proposition of the physical condition of the man and the man on the job, the doctor knows if the man is not physically able to work. You cannot expect a man to come to work when he physically is unable to do so. When I am able, I send him to work. They tell me certain things and the high spots; I mark up the high spots for the supervision of help.

We do not have a physical examination of the employees at time of employment, but that should be done. We should examine them from the top of their head down. In your examinations, do not forget the teeth. Re-examination should be held once in a while—it all fits in with labor turnover. If the men know you are earnest and are trying to help them they will come to you. Protect your men from dangerous diseases, occupational diseases, faulty working conditions and faulty living conditions.

HOME AND FAMILY TIES.

To cure some of these things get a good medical staff; get the man in sympathy with the laborer and with the work he is doing. It does not make any difference how small the injury is, tell the workman to see the doctor. At first you may have to force him, but after awhile as quick as anything happens, the injured man will hurry to the doctor. Then you can prevent accidents through co-operation of the safety engineer and safety committee working with the foremen and the doctor.

You may look into other things from the standpoint of the home and family life. The man must have proper living conditions, proper food, proper clothing, and proper relaxation and recreation because all these affect his health. If they do not have proper food and water and good milk for themselves and their families, what happens? Accidents! I could tell you of a man who had been working overtime; he was all right the first twelve hours; he worked a second shift, but on the thirty-six-hour shift he was injured. The accident occurred because some one did not know the man had already worked two other shifts.

The work of the visiting nurse also affects labor turnover. We have milk stations for our employees. Milk supplied by the dealer in our city is not always of the best and through the bad milk conditions the child of one of our employees was very ill. We heard about it and tried to help the family by supplying pure milk.

to quit his job and move to another town. The baby, however, was doing so well on the milk supplied by our station that the mother said "No, Sam; stay on the job for the baby's sake."

The whole problem is one of education; as soon as your men see you are doing something for them they will stay with you.

CHAIRMAN FORSTER: Thank you, very much. Dr. Shelvey did not refer to it, but he has done good work in getting injured men back on the job. The cheerful and brotherly attitude of the medical staff and proper treatment has had a splendid effect. Men have gone back to work and never worried about their injuries. That is economy in turnover.

MR. B. F. TILLSON (New Jersey Zinc Company): In the New Jersey Zinc Company if the doctor thinks the man can fill some position around the plant without retarding his recovery, the doctor gets into direct touch with the foreman of the department in which the man has been injured, asks the foreman if there is a job the man can handle under the present condition of his injury. That has worked out very satisfactorily.

MR. HAYWARD (Winchester Arms Company): One other point: In considering our reports we have found that some of the girls who had been constructing shells had contracted a rash, not a serious injury, and for that reason they would go elsewhere for employment. In order to overcome this condition the safety department has gone into the departments, found the girls so afflicted, and made recommendations to the employment bureau that a change of work be found for the girls, in an effort to keep them in the plant. We have adopted a plan similar to that outlined by Mr. Earl Morgan. We find work for a man after he comes back from an injury. We find that these activities reduce our labor turnover.

"FIT OR FIRE."

MR. A. L. THOMAS (Du Pont Company): All this work comes back to an educational proposition. Some time ago a book was written entitled "Fit or Fire," and I think a great deal of our labor turnover is due to not fitting the man for the job or getting the right man for the position. As a rule, a foreman sends for twenty men for a certain division, and if you have a good foreman he will take an interest in the men and see that the right kind of men are sent that place, otherwise the men are dissatisfied with the job and the foreman is dissatisfied with the men.

In the plant I am with we try to impress the new man along

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safety lines and instill in him two things: When look him over and see if he will fit into a certain do not want a labor turnover; then we show him and impress the safety habit on him, so that we will not lose a good number through an accident. The cost of this is heavy, but careful selection and proper training are important features of employment, and after you get a man at work it is your duty to take care of them.

MR. FISH (Boston): It seems to me this is a question of how many people are co-operating in trying to solve the problem. You have a physician, whose function it is to see if he has an expert knowledge of men and he is able to give a point of view, what should be done. The safety engineer's function—that of determining when it will pay to employ a man—to work after he is injured—that is largely financial. The employment man knows where he can place him and where to place him—that is the employment man's function. Just as soon as the safety engineer determines that it is possible to place him and the physician has determined that it is possible to place him. In dealing with labor turnover, dealing with so many things that it is impossible to solve along the lines of safety is cutting down our turnover. There may be things that we take credit to ourselves for, but beyond our powers to control, but if labor turnover is always a little bit inclined to think that we had :

A DELEGATE: Is it going down?

MR. FISH (Boston): It is, in our case; I do not know that is universal or not. I rather suspect it is not. In this instance, I might say, that before we started work on the movement our labor employment was 170 per cent; now it was 110; the last month or so it was about 70 per cent.

A DELEGATE: Per month?

MR. FISH (Boston): Per year. One thing occurred to me by one of the previous speakers: That we should carry safety work to an ultra degree as a matter of fact if a man knows he is in danger of being laid off if he takes some of them want vacations occasionally—but there is no danger nowadays, for instance in Worcester, if we lay down punishment for three or four days or a week, we are at the end of that time that he is working for the A
and W. C.

to me it is a pretty dangerous thing to assume that we can use the lay-off as a punishment today.

There is one other question I would like to put before the Congress, and that is this: If your men are at all educated, if they are the product of higher grades and have been in the high school with you, are they subject to fewer accidents? Our observation—I have no figures, I am sorry to say, but I will have by another year—is that the longer men stay in school the less they are apt to leave us for trivial reasons and the more careful they are.

MRS. JOSEPH R. WILSON (Philadelphia): It seems to me that labor turnover is very closely allied with the home. Members of Local Safety Councils should encourage the men and lay before them the all-important question of the home. How can a man go to business who has had a quarrel with his wife in the morning? Labor turnover problems should deal with the home. I am going to give you just one rule and then stop talking: The rule for peace in the home is firmness.

MR. BAILEY: The question of straw bosses has not been touched on except by the Chairman. Is the foreign straw boss a necessary evil? Has he anything to do with labor turnover?

CHAIRMAN FORSTER: Will some one answer Mr. Bailey's question?

A DELEGATE: A number of foreign corporations make it a rule never to employ a foreman of the same nationality as their gang. For instance, I find it is very easy to operate a gang of foreigners with an Italian foreman. It is also very easy to work a gang of Italians with a Hungarian straw boss. I find that as soon as you put a Hungarian straw boss over a force of his own nationality he becomes overbearing and insolent; he believes himself to be higher than the rest. A very liberal policy of transfers should be had in all of the large mills and whenever a man becomes incompatible in temperament he should be sent to another department. To reduce labor turnover by hundreds of per cent, I would strongly advise that each and every department or subdivision have a competent bureau or plant man. If the men can give expressions to their feelings you will be able to reduce your troubles automatically.

It is very important that you establish a legal aid department either within the industry or within the community in which it is located. The establishment of such a department in my bureau has worked satisfactorily. Hundreds of men have brought their complaints to me—home and family troubles—and they received imme-

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mediate adjustment through me or with the help of the plant, also strongly advise a policy of neutrality and good will. If we are not able to Americanize our foreign-born men, we shall not be able to reduce our turnover, until we Americanize ourselves.

CHAIRMAN FORSTER: Thank you, Mr. Price, you have

EXPERIENCE OF FIELD SECRETARY PRICE.

MR. C. W. PRICE (Field Secretary, National Safety Council): Bearing on the last point made by this gentleman, I recall my experience I had in Wisconsin. I met the young manager of a factory employing about 500 men who had come to the state to report his income tax. He told me he was reporting \$83,000 a year before he took charge of the plant they were losing money, but the last year they had 500 employees and had hired just two new men. I asked: "How did you do it?" He said: "By putting in effect two things. First, I know 450 of the 500 men by their names and I have done my level best to make those men feel that I am their friend. I am interested in them. Second, I have instituted a bonus system which enabled my men to increase their wages 30 per cent." His experience bears out the force of the suggestion that you can do anything in the world for a workman, but if you convince him that you are helping to forward his ambition and his ambition for a little home or whatever it may be—he is ready to be on your side.

MR. DIXON (Du Pont Company): It would seem that one of the chief remedies for this big labor turnover, and it is one of the troubles at Burlington, is the transfer system. It is the option—a square peg in a round hole. The point has been brought in our discussion of men loading bricks in a wheelbarrow—they do not be careful in their work if they are not interested. Mentally, that is the principle we have to go on in cutting accidents and in eliminating a large percentage of our labor turnover. The two are more closely related than we think.

We are now working out a system under which, if a man has accidents of any kind, particularly for more than three times in a given time—probably two months—in place of firing that man, hammering at him, we are going to try and find a place for him in another department where he will be more interested in his work, say, in a position for which he is better adapted physically. I have had a case of that kind which furnishes a very valuable illustration.

An Italian was working on a punch press and he lost a finger. In the first place, he was not of the right temperament and should not have been placed at that work. He was highly excitable, nervous, quick, and the monotony of the punch press working got him out of phase with things until his finger got into the die. The logical thing, when that man returned, was to put him back on the work he knew. He had lost his nerve—did not want to go back in that shop. He said to me: "Every time I go on that machine, boss, I get all cold inside." It looked for a time as though the man would not make good; it was a question of his going back to his old work or we could not use him. Finally I found a position for him as watchman, and after two months he made one of the best watchmen we ever had. He is on the job every minute of the day and while the job that he was put on was temporary, that of watching at a temporary gate to open it for construction purposes, he is such a valuable man that he is the last man that the head of the protective staff would part with.

CHAIRMAN FORSTER: Thank you very much.

CURIOUS PEAKS IN LABOR TURNOVER.

MR. BROWN: We have tried practically all of the things that have been referred to and have had some success under the conditions which now prevail, but there are one or two points that have not been touched on. I would like to ask if any one has considered the waves in the turnover through the year. We had some curious peaks that may be of interest.

Again, going back to the methods of reducing both turnover and increasing safety, going right back to the education of the foremen and sub-foremen, one point not touched on I want to bring out—the drawing out from the foreman of a suggestion, the bringing out of a criticism, and then getting it carried out. If you do not do that the foremen feel that you do not recognize them. If you do not recognize their efforts they cool off and you block the whole game. The main thing is to get the foremen to make suggestions and see that every one of the suggestions is carried out to the letter, even though it does not appeal to you in the same force it does to them; unless there is some strong reason for not doing so, carry it out, for the purpose of satisfying the foremen and the men under them.

CHAIRMAN FORSTER: I would like to hear from Mr. Herbert; I feel he is full of the subject.

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ANALYSIS OF ACCIDENT CAUSE AND PREVENTION.

MR. J. S. HERBERT (Cambria Steel Company): The safety labor turnover and safety seems to me rather a misnomer. I do not believe there is any connection between the two. If there had been "Labor Turnover vs. Safety" I would have gone along with that. At Cambria, about four years ago, we started a safety movement and we began to dig for the cost. We had one of the largest industrial hospitals in the world and we wanted to eliminate the effect. Following out various lines of research we secured the information desired. Our accident record began to go down until we felt, figuratively speaking, it was like the snowball—when it gotten it started and it would roll itself. That was during the latter part of 1914 our accidents took a jump. Soon after that we began to jog the general manager, so we could find out why. We went over our records for the three years previous and found several things. Then we studied the record for a single year and found that a great many who are here today were at the Welfare and Efficiency Convention at Harrisburg last year, where I showed lantern slides made from actual graphic charts. The result of our investigation showed that the new man, a man employed under thirty days, was relatively a new man, was twelve times as liable to injury in an iron and steel plant than the man who had been employed for over thirty days. Those are actual figures.

As a result we went after the cause and we felt that education of the new man was necessary. Our new man line has gone down. I believe our weekly record, at the present time, shows the minimum number of new men employed during the history of the company, but the accident line has gone down. We have regained all that we lost during the four or five months we were trying to find out why. Not only have we regained that, but we are again on the downward trend. Outside of the months of June, July and August for the past years we have never failed in any one month to break the previous best monthly accident record, not very much at times, but we are headed in the right direction.

That twelve times as liable to injury may not sound very bad, but if you are running in a lot of new men you will find it true. Some of the other figures show that this year our new accident hazard has been cut in half. In other words, the new man is six times as liable to injury as a trained man.

the result of education among the new men. worked out mainly through the foremen.

CHAIRMAN FORSTER: Mr. Herbert, you made that point excellently. You have proved definitely that the green man is more liable to injury and by training the men you cut into that proposition.

MR. HERBERT: I have some more figures.

CHAIRMAN FORSTER: Make it as brief as you can.

MR. HERBERT: We found that lost time for the old men averaged 0.13 per day per month, while the lost time for the thirty-day worker reached 2.41 days per month. Proof that injury is more serious to the new man than to the older employe is found in the fact that 14 per cent of older employes that were injured went to the hospital, while 41 per cent of the new men injured went to the hospital for treatment.

CHAIRMAN FORSTER: Thank you, very much. Dr. Farnum of the Avery Company will now speak.

WORK FOR PHYSICAL DEFECTIVES.

DR. C. C. FARNUM (Chief Surgeon, The Avery Company, Peoria, Ill.): I have been waiting to hear one thing discussed, hoping some one else would bring it out better than I could present it, and that is the question of stabilizing labor by properly fitting men for the work they are required to do, physically as well as industrially. One peculiar group of statistics is open to those of us who have been making physical examinations carefully for a number of years: That your labor turnover is inverse ratio to the physical condition of your men. That sounds like a paradoxical statement. It is not. Therefore, what are you going to do with the physical defectives? Those of us who have made careful examinations for a long time know that 90 per cent of all the men who apply for work have something the matter with them physically. My figures are approximately correct and range from 85 to 99, dependent upon the carefulness of the examination. You are going to do your work with physical defectives, 85 to 99 per cent of them. Therefore, the only way you will be able to take care of such men is to fit them to the work they are able to do.

Another peculiar statistic is the fact that your fine, physical fellows are the ones that shift jobs all the time. Therefore, if the jobs in your plant are classified and such a man, when he is wanting work, comes in for a job, put him into a one-armed job and he will stay. The man who is physically perfect, in these times of labor

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shortage, knows that if he does not work for you, tomorrow work for some one else; so I would make a plea for a census of the jobs in your shop and a careful analysis of them to apply for work. Get the man and the job together that suited each to the other.

CHAIRMAN FORSTER: Thank you.

MISS MCINTIRE (National Electric Light Association): Have any of the firms represented here made use of the service of a vocational councilor in determining the fitness of men for vocations?

CHAIRMAN FORSTER: I think I can answer that question, Miss McIntire. A very considerable number of the big corporations represented here are making vigorous efforts along those lines. The question is whether the corporations are making use of experts in the placing of people in jobs—that is, along the lines Dr. Farnum suggests. It is being done more and more, and they are lines of wonderful solution.

We have just enough time for Arthur Morey, our beloved President, to tell us something about the situation in East

THE EIGHT-HOUR DAY.

MR. ARTHUR T. MOREY (Commonwealth Steel Company): We have attempted to solve the problem in our part of the country the best we could. We have helped certain classes of men by improving our shop conditions, but in other classes of workmen we have a large turnover. I have been a very attentive listener, but we have a great deal to learn in this matter. Perhaps our committee had in mind that I would speak on the eight-hour day. It has a very effect in our shop some time ago. Fatigue has a very close relation to accidents, and most accidents seem to occur along toward the work period, morning or afternoon; more, again, toward the end of the day or the end of the shift. This can be borne out by statistics, and, to a certain extent, by our own experience.

We expected to get some relief from accidents when we introduced the eight-hour day, but one factor entered into it in some way that interfered with this desirable condition. We work three shifts; we have to run our shop twenty-four hours, upon a furnace operation. To get three shifts we had to cut down the lunch from half an hour to fifteen minutes. I think we have learned something of the lessening of fatigue by the reduction, but we

had the condition in operation long enough to speak with any scientific accuracy.

In the matter of labor turnover, of course, men like to work where conditions are the best, and under normal conditions an eight-hour shop is a very desirable place, but there, too, we have not given the matter a fair trial, there have been so many conflicting interests.

The matter of wages—our business is the steel industry—has attracted a certain amount of floaters, “bummers,” as we call them, and, while we have done much to stabilize the tradesmen, we have not accomplished nearly as much as we should have, I feel, in the matter of stabilizing what we call the laborers. Human nature is pretty much alike in all of us, and we know that better and safer shop conditions attract men. I am a firm believer that an eight-hour day, with all the good conditions we get into our shops, very materially tends to decrease labor turnover.

I would like to have heard more along Dr. Farnum's point—the physical examination of men. I believe a good many of us conduct these things very loosely. We go at it in a certain way, but too often we are not considerate enough about the men we reject. It is difficult to know just what to do, but we have to face that problem—the physical examination of men—and not make so many rejections. We have to be clever enough and considerate enough to work out positions for the men who are not fitted for the particular work we had in mind when first considering their employment. I think we are going to involve that very important question in difficulties from the laboring classes of the country if we do not handle our physical examinations with a great deal of consideration and wisdom. I think the labor unions are making complaints—perhaps some of you gentlemen do not have a union shop to contend with—and we have to consider the point of how to help physically defective men and fit them for some other kind of work.

CHAIRMAN FORSTER: Thank you. In spite of the fact that many of us, I think, could make valuable contributions to the subject, it is my duty at this time to turn the gavel back to Mr. Young.

CHAIRMAN YOUNG: On behalf of my colleagues, I wish to thank you for your very kind attention, which is very much appreciated.

As there is no further business the meeting stands adjourned.

National Safety Coun

Banquet (Informal)

New York City

Sept. 12, 1917

ARTHUR WILLIAMS, Toastmaster

President American Museum of Safety, New York

PRESIDENT PALMER: According to custom, it is necessary to transact some formal business before proceeding to the pleasing part of our program.

My first item is to announce the names of our newly elected officers. It is a pleasant duty and I am sure you will be pleased to learn of the selection by your Executive Committee. The first on the list is that of one of our most dearly beloved members, who has been in the front rank of safety for many years; in fact, he was one of the pioneers in the Safety First movement. I am sure that those who have grown up with our organization know who it is Mr. David Van Schaack. (Applause.)

PRESIDENT-ELECT VAN SCHAACK.

Mr. President, Ladies and Gentlemen of the National Safety Council: I am deeply sensible of the signal honor you have conferred on me in electing me President of your organization. It is a rare privilege you have given me, as rare, indeed, as could well fall to the lot of any man.

I believe the National Safety Council is destined to become, by year, an increasingly potent factor in furthering the well-being of the people of this country, and this not merely in the relatively narrow field implied by a close study of the

of social justice and of the essential brotherhood of man. To be asked to share so prominently in the counsels of those serving in such a cause could not fail to give rise to a feeling of the liveliest gratification.

I use the word "share" most advisedly, for shaping the activities of the National Safety Council has never been, and never can be, a one-man job. The National Safety Council practices what it preaches. It has always furnished in itself, in its Executive Committee, in its Board of Directors and in its membership generally, a striking example of that close co-operation it urges so strongly upon others.

However conscious one may be of one's own shortcomings, and I think no one could approach the work to which you have called me in any other spirit than that of true humility, one cannot fail to take courage from a feeling that he can count upon the cordial and constant co-operation of all his fellow-workers. I now most earnestly bespeak myself that same high degree of co-operation which you have so freely given my predecessors. With its aid, and through the Divine Providence to whom we all look for guidance, I hope that I may be able to justify in some part the confidence which you have placed in me.

VICE PRESIDENTS AND GENERAL MANAGER.

PRESIDENT PALMER: The other officers elected are our Vice Presidents and the General Manager. Mr. Stephen W. Tener, First Vice President; Mr. J. M. Eaton, Second Vice President, and Mr. William L. Chandler, Third Vice President. (Applause.) Mr. William H. Cameron, General Manager. (Applause.)

GENERAL MANAGER W. H. CAMERON: *Ladies and Gentlemen:* If I could express my appreciation in fifty languages, and you could understand them all, I could not express to you all the gratification I feel on this occasion. I am deeply happy to have your approval of this election. I thank you. (Applause.)

PRESIDENT PALMER: Mr. C. W. Price, Field Secretary. (Applause.) Mr. J. J. Lamont, Assistant Secretary, and Mr. Edwin R. Wright, Editor.

EXECUTIVE COMMITTEE.

The list of the newly elected Executive Committee, not including the new members who have been or will be brought in from the newly elected Chairmen of the Sections, reads as follows:

Banquet

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| H. J. BELL, Safety Inspector, Chicago & North Western Railway, Chicago. | L. R. PALMER, Chief Inspector Pennsylvania Department of Labor Industry, Harrisburg, Pa. |
| D. S. BEYER, Vice President, Liberty Mutual Insurance Company, Boston. | E. K. PRITCHETT, Secretary, Tacey Company, Grand Rapids. |
| W. L. CHANDLER, Assistant Treasurer, Dodge Sales and Engineering Company, Mishawaka, Ind. | H. H. ROBERTSON, President, American Protected Metal Company, Harrisburg, Pa. |
| L. A. DE BLOIS, Engineering Department, Safety Division, E. I. du Pont de Nemours & Co., Wilmington, Del. | C. B. SCOTT, Manager, Bureau of Safety, Chicago, Ill. |
| J. R. DE LA TORRE BUENO, Editor, General Chemical Company, New York. | DR. L. A. SHOUDY, Chief Superintendent, Bethlehem Steel Company, Bethlehem, Pa. |
| J. B. DOUGLAS, Manager Claim Department, United Gas Improvement Company, Philadelphia, Pa. | F. P. SINN, Superintendent of New Jersey Zinc Company, Paton, Pa. |
| MARCUS A. DOW, General Safety Agent, New York Central Lines, New York. | G. O. SMITH, Supervisor of Safety, Doherty Operating Company, New York City. |
| J. M. EATON, Assistant to the President, Lincoln Motor Company, Detroit, Mich. | C. M. TALBERT, Director, Department of Streets and Sewers, St. Louis, Mo. |
| E. H. FIESINGER, Safety Engineer, The Solvay Process Company, Syracuse, N. Y. | S. W. TENER, Manager Accident Pension Department, American and Wire Company, Cleveland, O. |
| G. T. FONDA, Safety Engineer, Bethlehem Steel Company, South Bethlehem, Pa. | B. F. TILLSON, Superintendent, Jersey Zinc Company, Franklin, N. J. |
| H. W. FORSTER, General Manager, Independence Bureau, Philadelphia, Pa. | C. P. TOLMAN, Chairman, Manufacturing Committee, National Lead Company, New York City. |
| J. H. HARVEY, Superintendent of Efficiency, Kansas City Railways Company, Kansas City, Mo. | DAVID VAN SCHAACK, Aetna Life Insurance Company, Hartford, Conn. |
| DR. F. L. HOFFMAN, Statistician, Prudential Life Insurance Company, Newark, N. J. | A. W. WHITNEY, General Manager, National Workmen's Compensation Service Bureau, New York City. |
| J. P. JACKSON, Commissioner, Pennsylvania Department of Labor and Industry, Harrisburg, Pa. | W. E. WILLIAMS, Safety Engineer, Packard Motor Car Company, Detroit, Mich. |
| V. H. MANNING, Director, United States Bureau of Mines, Washington, D. C. | G. E. WILLIAMSON, Strathmore Paper Company, Mittineague, Mass. |
| A. T. MOREY, General Manager, Commonwealth Steel Company, Granite City, Ill. | J. M. WOLTZ, Safety Director, Youngstown Sheet and Tube Company, Youngstown, Ohio. |
| E. B. MORGAN, Safety Engineer, The Norton Company, Worcester, Mass. | G. W. WYLIE, Clyde Steamship Company, New York City. |

HONORARY MEMBER.

Complying with a request from the floor at our general meeting yesterday, the Executive Committee approves the nomination of Mr. Robert W. Campbell as honorary member of the National Safety Council. (Applause.)

We only wish that he was here to respond, but it was necessary for him to leave this noon for his home in Chicago. After the eloquent words of Mr. Ralph Richards yesterday, when he placed Mr. Campbell's name in nomination, it is very difficult for one to add to that tribute, so well deserved and so well merited, and we can only say that we hope that his reward will be as full as the cup he has so freely given.

It is a real pleasure tonight to welcome a co-worker in the field of safety, the President of a national institution which is working hand in hand and in closest co-operation with the National Safety Council, with whose help we hope to effect a real service to the people of our nation. In turning over the gavel to our Toastmaster, I wish to comment on a significant fact: This gavel was loaned to us by the American Museum of Safety, to assist us in our meetings. It is one more evidence of the close co-operation that is developing between our organizations. Ladies and gentlemen, your Toastmaster, Mr. Arthur Williams, President of the American Museum of Safety.

TOASTMASTER ARTHUR WILLIAMS.

THE TOASTMASTER: *Mr. President, Ladies, Guests, and Fellow Members:* I am deeply conscious of the honor conferred in asking me to preside as Toastmaster on this most auspicious occasion, an honor which I accept, or did accept, much more largely on behalf of my colleague, our new Director, Mr. Arthur Young, and our Board of Trustees, many of whom have devoted themselves constantly to the cause so splendidly represented in your great organization, in its work continuing throughout the year, and this great Congress which is now in session, I am very happy to say in session in this city.

I am very happy also that your new President is a member of the Board of Trustees of the American Museum of Safety, thus bringing us still closer together. He was recently elected to our board, to the great satisfaction of its membership, and those who see our publi-

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cation this month will notice a very good but not too flattering
duction of one of his recent photographs. (Applause.)

DEVELOPMENT OF THE NATIONAL SAFETY COUNCIL.

I wish to congratulate you upon your extraordinary develop-
during the few, if I recall rightly, the four years of your org
existence. It is just about four years ago that you met in New
—perhaps that was not your first meeting—in the Hotel Mc
and Mr. Palmer tells me there were forty-two members at tha
I think you need not be told that the weekly pay envelopes o
membership now approximate \$75,000,000. That is an extraor
development. It shows the purpose and the occasion and the
for the existence of your great profession and I am very hap
representing the American Museum of Safety, that we are n
such united and harmonious progress.

I understand that your attendance is between two and
thousand, that you have representatives here from practically
State in the Union, and that in your membership you not only
this enormous representation of American industry, but tha
have members, almost to the number of 150, from nine cou
other than our own—including the Sandwich Islands, Japan,
land, Argentina, Cuba, Mexico, Chile, Australia, South Americ
—Canada. I want to include Canada in our American membe
I have never been able to feel that Canada was a foreign cou
(Applause.) I am told that the keynote of your Congress is
dustrial Preparedness," conserving through the safety move
the man in the labor trenches. I congratulate you upon that tho

How can we doubt—how can it be doubted—the great pu
of your calling, when, if I am rightly informed of the lowest esti
of the saving in human lives—an estimate being based upon
figures of Dr. Hoffman, one of your distinguished members and
of our trustees—that the annual saving in human life is no less
5,000 at the present time; that is to say, no less than 5,000 live
saved in the producing, manufacturing and commercial ranks o
country. In those figures, I understand, Dr. Hoffman does no
clude a great many losses which would not come within that gi

I am reminded of what Judge Gary said at a recent luncheon,
"To save one life was a great event." The profession which you
resent not only leaves at the end of the year, as the result of it
fort, 5,000 lives, as a minimum, 5,000 men and women—mostly

—saved in our industries, but eliminates between 50,000 and 100,000 serious accidents, and roughly estimating, I should say 500,000 minor accidents in the industrial life of the country, and the end of your organized, intelligent effort is not yet.

A WAR TIME CONGRESS.

I appreciate the purpose of the Toastmaster is not to do much talking, but I desire to take a moment more to express, as a sign of the times, perhaps as a sign of the active, constructive thought of the industrial life of our nation, the fact that at such a time as this, when for the most part gatherings such as these are being suspended, your organization, your profession, which is devoting itself so constructively to the protection of human life and health, holds its largest and most successful convention. If I recall rightly, there was a thought that, under the stress of the times, this meeting and the great exposition at the Grand Central Palace would have to be abandoned, and some of us felt, as did that great American citizen and leader of thought in New York, that great patriot, Mr. Frank Vanderlip, who in passing, I might say, was either the first or second treasurer of the American Museum of Safety, showing in a practical way his interest in that movement, he said some months ago that if there ever was a time when human life and human health were important to this Nation the time is now.

I was one of those who took great encouragement from what Mr. Vanderlip said and am more than pleased that thought prevailed in our organization and that this great Congress has been possible.

It does not seem to me that you need any assurance as to the greatness and righteousness, the economic necessity for your calling, whether it be from the humanitarian standpoint or from the purely economic. Take the reception that you have had from the administration at Washington, take the opportunities the officials there have given to our representatives, to do what they thought necessary to protect the employes of the government, the employers of industry doing government work and the men in the Army and in the Navy. Little has been said of what has been accomplished. The matter cannot be gone into publicly at great length, but it seems to me that we cannot let the occasion pass without noting the extent of which the authorities at Washington, who are doing such splendid work in conducting the war at the present time, without referring to it in just a general way. In close touch as I was with the Spanish war, I can view

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the attitude of our two governments—the government then and the one today—more clearly than those who did in contact with governmental efforts at that time, which were really, in fact, no effort toward safety on the part of the government. There was no appreciation, as at the present time, of the human life and health in the industrial life of our country, nothing of camp life as it was organized during the Spanish

There has been a remarkable change, and to my mind a part of a great organization, an organization with a vision with a comprehension of the tremendous task which is resting at the present time, to accomplish the object which it has

In an audience such as this, which first of all appreciates perhaps few audiences can and do, the value of education—a large percentage has had the advantage of university training would have a great deal of hesitation in presuming to introduce you our next speaker, the distinguished President of Harvard University, President Lowell, whom I am presenting and not attempting to introduce. (Applause.)

A. LAWRENCE LOWELL,

PRESIDENT OF HARVARD UNIVERSITY.

Mr. Chairman, Ladies and Gentlemen of the National Council: Every great catastrophe turns our thoughts to the ties that underlie human life. We are moved to ask what is superficial and what is eternally true? What our lives and our principles signify, whether we are like butterflies, enjoying what pleasure we can from sunlight and flowers, living a life without instinct, and dying when the least danger overtakes us; or, whether our lives should mean the building up of moral principles that will make life nobler, better and happier, not chiefly for ourselves but for those who shall come after us. As we look back over the long stretches of history we feel sure that the men who taught the world morals, enlarged the bounds of human sympathy, and did great deeds; have permanently enriched and ennobled human life. What do such thoughts lead us in entering the present war?

We are witnessing the greatest catastrophe that has befallen Europe, certainly since the wandering hordes overran the Roman Empire and destroyed its civilization. After the fall of Ro-

plane, no doubt, but by a long and very painful process. For centuries we have been working slowly upward, with many obstacles from ignorance, from prejudice, from short-sightedness, from selfishness, individual and co-operative, but still with a striving toward a better justice, more mercy for the unfortunate and oppressed, keener sympathy with suffering, and a fuller respect for the right of every man, woman and child to be treated, not as a mere tool in the social workshop or a pawn in the great game of national ambition, but as an end in himself, whose happiness, whose material, and above all, whose moral welfare should be the aim of civilization. We are very far, as yet, from having achieved such a result, but that is the direction in which the best men have been striving to move. The question now is whether we shall continue to work that principle or substitute for it the doctrine that the fruits of the earth belong to the strongest people, who may take them by any means within their power, however ruthless these may be.

VIOLETION OF SOLEMN TREATIES.

The striving to make life more humane has not been confined to times of peace. In the case of war also an effort has been made for generations to mitigate, through the rules of international law, the injury and suffering inflicted by protecting the rights of neutrals by confining the operations to the armed forces of the antagonists, leaving non-combatants unmolested, and forbidding looting and sparing property not directly needed for military purposes. Mercy has even been extended to soldiers, by the provision of the Hague treaty, for example—which was signed by Germany—forbidding the use of poisonous gases in war. In the present conflict the German armies have violated all these rules, not under stress of calamity, but deliberately. Those who believe that Providence, or a moral power rules in the affairs of men may well point to the fact that if Germany had not, in violation of a solemn treaty, invaded Belgium, it would have been difficult, if not impossible, to bring the English people to the point of taking part in the war, however eagerly any British statesman might have desired it; that if it had not been for atrocities in Belgium, and the dropping of bombs from the air on defenseless towns in England, recruiting there would have been far less rapid, and the British Empire would not have put forth so gigantic an effort; that had it not been for the sinking of merchant ships on the high seas and the drowning of

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their crews, the United States would not now be in arm Germany.

The Allies believe that the German military autocrat this war with malice aforethought, to enlarge the territory the power and expand the commercial prosperity of the The German people have been taught by their rulers the result of an attempt by England to drive Germany, who for peace, out of a place in the sun; although those rulers that England was in no condition to fight, and were obviously appointed when she took part with France. But no one that the United States planned the war, or had any share in it on. Wholly unprepared for hostilities abroad, contrary long established principle of keeping clear of conflicts in we have been drawn in by violation of the rights of ourselves and by the spectacle of barbarous treatment of neutrals combatants. No one suspects that we have any national to gratify, any lust of conquest to be fed; but we shall fight less vigorously from righteous indignation and from a civilization that we will not suffer the enemy to destroy

IF GERMANY SHOULD WIN.

No vast upheaval that lays bare the foundations of society can pass away and leave things as they were before. Social convulsions may destroy the soil formed by ages of growth and thickly falling leaves, replacing it by a barren or they may heave upward veins of coal and ore or precious that, unsuspected, lay deep below the surface. This will leave the world as it was before. The result must be either world or a better one. If Germany should win, the present government must triumph, the ruthless rule of forcing the earth for the benefit of the strong, suppressing others and beating down small, weak or peaceful nations. If should be a drawn battle, a stalemate, with Germany in this state of mind, the whole world will probably become a armed camps, preparing for another fray, and compelled very conditions by which they are faced to adopt the method warfare Germany has introduced—that is, the nation in a every resource at its command and striving to destroy means the resources of the people to which it is opposed

Can any one contemplate without horror a planet whose inhabitants devote their efforts to devising scientific processes

making it unfit for human habitation? Yet, such is the result that we must at least contemplate if the present war should decide nothing, leaving the belligerents with their former ambitions and principles, with fiercer hatreds and a better knowledge of what the next war will signify.

IF THE ALLIES WIN.

If, on the other hand, the side on which we are fighting wins, it may mean a better world, reorganized on a basis of justice and peace; and much of the result may depend upon us, both in the field and at the council table.

Let us be perfectly clear in our own minds. We proclaim that we are fighting for democracy, but President Wilson has put it more accurately when he said that "We are at war to make the world safe for democracy." We are not fighting to impose any form of government upon an unwilling people. That would be contrary to our principle of political liberty. If any people prefer to be ruled by a monarch it is their affair, *provided* they mind their own business, leave other nations alone and live peaceably with their neighbors. A military autocracy, that goes forth conquering and to conquer, the world must subdue, or it will have no peace.

WHY WE ARE AT WAR.

We are at war to prevent any nation from imposing an autocratic military system on the world or on any people, and when the Allies have succeeded in so doing, they, and any other peoples that sincerely desire a better and more peaceful world, must solemnly resolve that no such catastrophe shall occur again. For this purpose they must not again split apart into discordant fragments or hostile groups, but must combine to police the world, and bring in a reign of international justice among men. We often boast that we are both an idealistic and practical people, and in the reorganization that will follow this war we have the only chance we shall probably ever have to show these qualities on a world wide scale. We are now a world power engaged in a world war, and we cannot by shrinking into ourselves when it is over, evade our duty or shut our eyes to our own future security. In league with the other free nations of the earth we must set up an international court of justice with a sheriff armed with such force as may be needed to summon offenders before the tribunal. By so doing we can fulfill a great destiny for our nation and bring peace and good-will among men. (Applause.)

PRINCIPLE OF COMPENSATION NOT NE

TOASTMASTER ARTHUR WILLIAMS: In addition to the pleasure of listening to President Lowell's charming address, I am very pleased when I heard that we were to have him with us to act as the head of that great institute of learning he might see men and women who are forming the nucleus of this great movement with which you are identified—a profession which, I need not remind you, had no place in our economic order prior to a short time ago. While speaking of the safety movement in this country, the youth of the safety movement in this country very much surprised, as perhaps many of you will be, to find that the principle of compensation for injuries in selected hazardous occupations is more than one hundred years old. The principle of compensation was adopted for the employes of German coal mines more than one hundred years ago, and shortly after in Austria for the employes of the miners. Of course, the more generally applied principle of compensation, and the more general effort for safety, legally and in the interest of the general public, is of a very much later date, but my basis for the above statement, surprising as it is, is found in the annual industrial reports of our government and I have no doubt that it is absolutely true and correct.

Our next speaker needs no introduction to this audience. New Yorkers all know him by sight and those who are from other parts of the country know him by reputation. I understand from good authority that there is a pronounced distinction between oratory and after-dinner speaking. That he has humor I know, but he mixes an enormous amount of splendid common sense with it. If you want to know who will be our next speaker noted for his humorous addresses, please look at the most serious looking man behind this table, Mr. Hedges. (A

THE HON. JOB E. HEDGES.

THE HON. JOB E. HEDGES: (New York): *Mr. Toastmaster, Ladies and Gentlemen:* The most serious-minded man at this table is always the one who is to speak next. (Applause) President Lowell had that distinction just before I was presented. In all his dignity and grace, I noticed a preparation for the fight though he had reduced his remarks to writing—I have no doubt that it is in my mind and heart I hope to transfer to yours.

we swung into the serious part of the evening. One was the delightful evidence of the doctrine of the direct primaries, where you just announce a result as if it had had general discussion (laughter), the election of a set of officers, which expresses your composite mind, without your having anything to do with it and yet, which meets your entire approval. (Laughter) This is a bit of statecraft, refined, efficient, permanent.

No one can follow President Lowell with any advantage to himself. It is not untruthful for me to say that some of his preliminary sentences embraced ideas that I had intended to offer. (Laughter). With his argument I shall not endeavor to compete. He was somewhat selfish, unintentionally, in covering the entire field. The only thing he did not tell us was—how to do what we ought to do. He told us what we ought to do, probably more clearly than we had felt before. He has left the responsibility where it belongs, in each man's conscience—that I have no objection to supplementing and filling in. This war has weighed heavily on my mind. I hope it has been equally heavy upon the minds of the American people at large. They have such confidence in the momentum of their institutions that they usually have nothing to do with them. (Laughter.) Feeling that they are predestined to be the final exposition of refinement in government and uplift, they hesitate to participate in those activities which effect concrete results.

HOW ANOTHER MAN WOULD CONDUCT YOUR BUSINESS.

The result is that in the past generation or so, we have become, unintentionally it may be, a sort of an anti-people, instead of a pro-people. The average man can tell you exactly what is wrong about a situation, without the slightest capacity to remedy it. He can explain in great detail what his neighbor ought to do until the efficiency which we talk about has come to be in ordinary parlance the manner in which another man would conduct your business at your expense, if you would let him. (Laughter.)

I am not nearly as old as President Lowell, although since I have been able to read and hear we have advised all the nations on the earth how to run their affairs; knowing just what they ought to do and telling them at frequent intervals, when we are holding our elections, how much better we are than they, thus making a contrast in favor of ourselves. It is difficult to make one hundred millions of people think upon the same thing at the same time, and there is no more difficult problem before our republic than that of how to make

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our vast numbers center their thought on reasoning and are on the same line toward a concrete result. Self-preservation is common to us all. This problem is particularly pertinent in this war. Our purposes, fundamentally, of the Allies and our country vary little. Intelligent selfishness borders close upon altruism.

The problem with us is no more our rights than our obligations. The value of a man's right is read in terms of obligation performed. No man can enjoy an exclusive right, apart from all others, and each has met his obligation toward the common body of citizens.

We were warned by Washington not to mix up in European affairs. We have not. European affairs mixed us up for two and a half. (Laughter.) My own belief is that as a nation we voluntarily went into this war. The Almighty watched us closely and was disappointed at our lack of soul; took us by the scuff at the neck and threw us in to preserve our self-respect. (Laughter and applause.)

MORALS NOT A MATTER OF GEOGRAPHY.

There was never any doubt but what we had to get in; no slightest; because morals are not a matter of geography; and what is wrong there, is wrong here; and a thing that is wrong here is wrong there; and correspondingly in the matter of what is right. When Germany went into Belgium, she declared war on the civilized world. (Applause.) And declared war on us, as much as if she had called us by name—only we were so busy we did not notice. (Laughter.) No intelligent man could assume that Germany would do what she did, and Germany cannot understand today exactly what she did it. (Laughter.) And yet, there are men in this country, not only speaking from soap boxes, but from heights of social and professional positions, who say that we should not send men abroad but should wait till Germany comes over here, and then, if she comes, say then "We will just take and crush her." This thought is so absurd it might well be called the progeny of a hope and a regret. (Great applause.)

I dislike to use the words "German kultur." I speak to have pronunciation correct, Mr. Lowell, but I prefer to use the word "culture," so as not to get too near the original.

German "kultur" is the over-education of the heart and mind at the expense of the soul. It is mechanical perfection without spirit. It is the surrender of man's life, thought, everything, to a state of mind. When everything was sacrificed to the state of mind.

state himself. When something is thrown into the machinery that clogs it, he calls upon the Almighty. In this case the Almighty has heard, but has directed his answer—to the Allies. (Applause.) And therefore, from my way of thinking, we are providential instruments.

Germany has prepared skilfully on all her mechanical warlike propositions, but she has failed in her psychology. Germany never could comprehend a thing which was not tangible. She saw England asleep, and did not have sense enough to let her sleep. (Laughter.) She saw us chasing the almighty dollar—and God knows we have chased it. She assumed that we would not get in, and she nearly guessed us correctly. The fact is that this is the first time in half a century that this nation of ours, which we all love, has thought nationally. It is the first time that the American people have been compelled to think of themselves as a great composite entity, and yet a unit in the world's affairs. We have been financially drunk for half a century, and are just coming out of the stupor. And yet we are overlooking just one important fact. Theoretically this is a nation of law and order; practically it is a sentimental gathering of a host. The American people, as a rule, concentrate their thought on a serious proposition when it has a sentimental feature. With all our business perspicacity and notwithstanding the great commercial momentum in our affairs, fundamentally the American people are sentimental.

I talked recently with a friend, a return missionary from Persia. He told me that in that ill-fated country, between the times when the Russians went out, the Turks came in and the Russians returned, the little compound that he represented kept 25,000 Armenian and Syrian Christians from starvation. The missionaries were shut off from communication with their own government and their own financial resources. It was a question of starvation, literally. The best that could be done for the unfortunates was to furnish them a meal a day of cooked grain. The grain with which this was done was purchased by the missionaries from Mohammedan merchants at 10 per cent below the market rate without a formal contract in writing. In this country, with our boasted civilization and refinement, it takes the strong arm of the law—we might as well face the facts as they are—to prevent sellers to the government and to the people in time of great emergency, to obtain necessities at a rate commensurate with a fair profit. With our soldiers at the front, going to the front; with the necessity of feeding them, of feeding our own population,

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of furnishing munitions and military supplies, they are in so stances being held up at the expense of the nation's honor and defense requirements for profits beyond the realm of avarice

WE SAVED MILLIONS BUT NOW SPEND BILLIONS.

In past years when it has been suggested that this country have an adequate army, navy and merchant marine for self-protection and not to type aggression, it has been pleaded that this provoke a militant spirit among the people and we would soon be a military nation. The absurdity of this is shown by the fact there can be no military nation when the people vote the taxes. All the people are practically military by instinct. The result is the saving of a few millions of dollars requires the expenditure of billions, that our lack of preparedness will cost us thousands of our own lives, and our inability or unwillingness to assist at once costs hundreds of thousands of lives among our present allies. This is punishment for not having mind and brain synchronize.

Recently I watched 25,000 of our troops march down Avenue. They were applauded and heartily and wholesomely received by the entire citizen audience which lined the avenue. A wholesome feature of it, however, was the fact that there was vigor in the faces of all the observers a solemnity which meant that the people's hearts were being touched. I trust that the emotion created by the presence of these troops will lead to a higher spiritual citizenship.

Why is it that from the time Germany went across the Belgian border and from the time war was declared by this nation the intensity of patriotic fervor has been different in the varied sections of the country. Some months since I was invited to a social gathering when German atrocities were read and known by everyone follows the record of public events. My hostess informed me among the guests was a gentleman of German sympathies and asked me to be particular in my conversation lest his feelings should be hurt. I suggested to her to send him home. I said to her that I had no desire to interfere with the general enjoyment of the evening of hospitality, but it was impossible for me to restrain utterances of convictions upon matters affecting my country's welfare. Through recent months the atmosphere seems to have been charged with disinclination to talk openly before Germans regarding the war. They are the people with whom to talk about the war. The time arrived in this country when everyone is either for or against

against it. Whoever is not for it is against it. Whoever permits a treasonable utterance to be uttered in his presence without rebuke adopts that sentiment as against this country.

PRUSSIAN GOVERNMENT AND GERMAN PEOPLE.

We are told officially that there is a difference between the Prussian government and the German people. I trust there is. Events do not show it. In the Reichstag, while there is factional fighting on nearly every topic, they vote as a unit on the war. For a half-century the German people have been taught until they believe it is their duty to surrender their mental independence to governmental direction. The position of the American German is clear. Of all Americans he should be in the front rank with the allies, fighting under the direction of this country for a common purpose with those allies. If the German people have been dragooned by the Prussian government into this war the American German should fight to release the German in the fatherland from the domination of the Kaiser. If the German people and the Prussian government are acting officially and sentimentally together, the American German should yearn to fight to defeat them both to save the world from the common savagery exemplified by the Prussian armies.

The position of the pacifist is different. He is a man whose brain and spine do not synchronize. When his brain acts his spine is not rigid. When his spine is erect his brain is somnolent. He is the example to be avoided. He should be studied as antipodal to national loyalty in the midst of these stirring, trying, heartrending times, for every life must be lived with consecutive purpose. The pacifist seems to be the illegitimate offspring of a hope and a regret.

President Lowell has told us what we should do. Whence is to come the propelling force to make the American people take this wholesome, intelligent, necessary advice? The observation of everyday events convinces me that about 15 per cent of the human race divide the ideas and initiative of the rest. The people who think must take the lead. The people who have the best opportunity of acquiring knowledge of facts, of studying conditions, of making logical deductions, must explain to those less favored their convictions. This must be done without variableness or shadow of turning, without hypocrisy, without timidity. The American people can be led but not driven. They sometimes will follow men when they will not follow precepts. They will go where someone whom they believe to be rightminded is leading. They may be hesitant in initia-

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tive even though the proposition is sound, if they don't see the taking his position in advance. Sometimes the most casual stance creates diversion from the otherwise impelling action. When the war began a presumably conscientious woman said she didn't raise her boy to be a soldier. These words were heard throughout the United States and were discussed, as an argument against this country not going into the war. Of course she didn't raise up her boy to be a soldier; but if, having brought him up, unwilling to be a soldier in order to help save his country and contribute to the continuance of civilization, he might just as well die in childhood.

LOYALTY TO OUR GOVERNMENT.

Theoretically every citizen is presumably endowed with a measure of initiative. Practically the average person waits to ascertain the public sentiment is before declaring for or against a given position. In the present international imbroglio it is no longer conceivable for us to be doubtful as to our individual mental attitude or loyalty to the government with the nation at war. There are many remaining in the background not only so far as physical strength is concerned, but they are not sentimentally sympathetic with our allies in this great struggle or giving support to our own government to which they contractually owe allegiance. This is shown in public and private utterance. Apart from the harmful influence of this circumstance it is well to remember that the American people, slowly aroused, are intense when working toward a common purpose. With the army at the front, the officers of the government engrossed by official duty, there are still men who will not permit sedition and treason to be acted or vocalized throughout the land. Continued I have no doubt there will be organized unofficial committees in this country who will stamp out treasonable utterances by unofficial means. Freedom of speech does not mean freedom from responsibility. Freedom of speech which would destroy freedom of life becomes merely an attack on our established institutions. Time of war which justifies not only moral rebuke but physical punishment.

IF DEMOCRACY IS TO LIVE.

Apart from the Lusitania, apart from the violations of international law, the United States are necessarily and logically in the

right from God himself, or by favor from temporal man. It is being fought out whether, with his first breath, man is endowed by his creator with inalienable rights which we Americans proclaim and are crystallized in our laws, or whether he shall be content to have another being tell him how he may live. The whole drama was set forth when the British army, representing the modern democratic style of thought and government, went into Bagdad. There in that great Mesopotamian valley we have seen in remarkable juxtaposition two extreme views of life. On the one hand was the wreckage of those four great nations of antiquity, Assyria, Babylon, Persia and Media. Their remnants were seen in tombs and monuments, with no institutions tracing directly to them and no real contribution to modern thought-life. They had advanced centuries before the German view that force should supersede right and that an army could control conscience. The British army, representing modern thought and democracy, representing the allies, planted its flag in that same Mesopotamian valley and said in substance: "A new era has dawned. We represent the proposition that men and women have a right to live and to govern themselves. If they have not such a right, there is no object in living and no fear in death."

One reason we have not duly sensed this war is on account of the 3,000 miles lying between us and Europe. Actually there is no distance in human affairs these days other than that marked by the period of time during which an electric spark can convey information from one point to another. My greatest regret at this moment is that I am not privileged to enlist. Never since the birth of time has government or church inaugurated a more high-minded, spiritual or comprehensive crusade than that carried on by the allies today. It is more than a duty to participate in it. It is a privilege to be able to participate in it. It is a greater privilege for this nation than almost any other one. Many experiments in self-government have taken place. It is frequently said that we are the last great experiment and that our failure would mean the failure finally of the idea that men can govern themselves. After the tragedies of the Mesopotamian valley Greece became the most predominating government in the Mediterranean sections. She contributed much to the world in the way of philosophy, science, art and theory of government. In practice, through her great city, Athens, with 40,000 free citizens and hired mercenaries, she conquered the world. Greece then fell because she had no moral standard of citizenship other than a fictitious one and admitted no universal human rights.

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THE BIRTH OF FREEDOM.

Greece yielded to Rome and the latter took up the problem of world dominion. In fact, Rome conquered the world and the world. Rome fell after many valuable contributions in the domain of human rights and theories of government. Rome fell but rights all came from governmental dispensation, and were permitted to be inherent and God-given. Government thus became a minority and the minority fell. Modern thought worked great change from Rome, through cities of middle Europe, to England. It gained more strength, freedom of conscience, Magna Charta, jury system, bills of rights. The next visible change was the formation of the United States. Our fathers, having already having won their independence, laid deep foundations. They stepped out the range of history. They subjected every experiment of an unknown to them with the acid test of discussion and investigation. They finally evolved the proposition that mankind is born with inalienable rights — life, liberty and the pursuit of happiness, the latter meaning; broadly speaking, the right to acquire proper property to worship as conscience dictates. These are the fundamental principles of our government, so simple that people have forgotten them. The revolutionary fathers, as if distrusting their own judgment in any event, seeking to support it, said that these rights came from birth from the hand of the creator. Therefore they launched the Constitution as the product of their best judgment and gave it providential underwriting. Every citizen in the United States is under contract with every other one by virtue of this Constitution not only to insist on these rights for himself but for his neighbor.

A SPIRITUAL REBIRTH.

It is unnecessary here to discuss questions internal to the United States, as our thoughts are on international matters, although usually they involve the same principle. It has been my belief since the first declaration of war in Europe that this terrific contest would prove a spiritual rebirth for our country. I am glad to have my judgment confirmed by so profound a thinker as Lowell. The flames of the European war should reflect the States to themselves.

Within a year our Congress was brought to a death standstill almost over the simple proposition of compulsory military training. The proposition of modest, moderate, physical, hygienic and disciplinary training to breed respect for law and order and fur

groundwork for self protection was fought as conscientiously as if it were attacked by a foreign enemy. The country has since gone to war and the bill is still pending. We see the result in human suffering of a lack of preparation as opposed with thorough preparation. The picture has been clearly painted to us of boys with hands cut off so they may not become soldiers, of girls with their hands cut off so that the doors of matrimony may never open to them, of women physically mutilated so that they can never perform the sacred function of motherhood. We have seen every law of God and man violated to demonstrate that German efficiency does not overlook anything. We stood mute for two years and a half without courage to go into the war. Then Providence threw us into it. We all have underlying confidence in our country and she will contribute all her resources and men for the success of this great country and the war. Lack of vision, hesitancy and unwillingness to face visible facts will cost us thousands of lives unnecessarily and billions of money. This is the price of democracy when it substitutes materiality for spirituality. The war will demonstrate that no one can be civically respectable who is not morally respectable and responsible. Fewer silly remarks are being made from day to day. We no longer are compelled to listen to talk in high places that Germany would not dare attack us, or that a million men could be summoned to our defense in a single day.

It has recently been argued that we had no right to send troops abroad for the purpose of defense; that the fact of sending them abroad meant aggression and that aggression was unconstitutional. That theory has since been exploded because it has been found that the Constitution maintained no such proposition.

A man with a good reputation in business and in social life told me recently that his interest in the war was much diminished because it compelled us to ally ourselves with Great Britain. He said as Great Britain had fought us in 1812, destroying much of our shipping, it was wrong for us to ally ourselves with her. A hundred years have passed since then and Great Britain has progressed materially and spiritually.

THE HYPOCRISY OF COWARDICE.

I thank God today that England has a fleet. We have lived under its protection for a hundred years because we have not had the moral courage to build one ourselves, lest we might make ourselves with our own money a military nation. This was the hypocrisy of

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cowardice. The fact is, we were unwilling to spend our money for such purpose. The British fleet has been a barrier between civilization and barbarism. It is probable that the history of Greece may contain acts she would not repeat, but no nation ever entered into a conflict with higher or more unselfish motives than has Britain in the present war. I am grateful that France had an army and navy. France has fought for us now as she fought for our revolution. I am grateful that Italy had an army and navy. I am grateful that Greece is recovering from its official relations through marriage with German royalty.

When Zimmerman wrote his official note endeavoring to bring Japan and Mexico with the United States he unintentionally gave us a kindness. It quickened the American conscience and aroused intelligence. It requires no process of reasoning to understand the significance of the situation then. It was a case where it was stated that with our people fact disturbs argument however true the matter may be—as it was when information was given to the use by the Swedish Legation at Washington of its diplomatic code to convey information for Germany. Again our people were forced to believe something which they could have readily disbelieved but hoped might not be the fact. As time goes on the West, the Middle West, the Central West and the Central Middle West will rise to the awful significance of this war and we will hear less of foolish talk of the war being a proposition for the United States and that it should be supported by the men who are taking money out of it. They are finding that this is their war and they will support it by men and money. They are in a different position than we in the East were at first. The momentum lost and the awful price to be paid for our unwillingness to grasp and admit what we subconsciously felt were facts is a dreadful lesson of the hour.

SAFETY THROUGH MORAL COURAGE.

The scope of the business of this organization, embracing the watchword Safety First, is appealing. Safety, however, can only be assured in war or peace except through breadth of mental conception of big problems and the moral courage and willingness to pay the price in service. Permanent safety is predicated alone on the virile virtue. Prayer is a spiritual necessity, but prayer without service in helping a neighbor misconceives the purpose of the

No degree of the discussion of governmental theories, however learnedly conducted, will accomplish permanent results without upright, persistent, unselfish civic conduct. The nation cannot live on the titillating effects of audible cheers, nor can it survive in pride of past events. When our history is an inspiration for our present and our present bears the same relation to our future that the creditable things in our past does to our present, it means permanent growth. We cannot avoid responsibility by indulging in only that degree of affirmative conduct represented by our individual numerical relationship to all the rest of our people. Every man and woman with a heart, mind and moral courage must seek every moment to impress American ideals on every other person until there will appear a course in this country which will drown out every note of disloyalty, encourage those charged with responsibility in officialdom, and demonstrate to those with whom we are at war that the American people are an irresistible unit in working at any price of service and means to establish the right to live as conscience dictates and not as a ruler may permit.

I read the other day that on the shores of Brittany, where the main industry is deep sea fishing and every family has lost some loved one, that these quaint folks gather there every year on the seashore; that as the waves dash upon the rocks it makes a sort of mirage of the mist, wherein they imagine they see the spirit of their departed ancestors. They talk with them and ask them questions, and they imagine they are answered. They open the innermost recesses of their souls, and with that communion they return to their affairs benefited and morally uplifted.

I want to ask you good people a question, a question that I have put to myself; it is an illustration that is so clear to my mind that I do not hesitate to repeat it if there is anyone present to whom I have offered it before. It is what to my mind is an unanswerable argument to the American people, no matter where they are, and I can illustrate it this way:

"IS THIS YOUR COUNTRY?"

Some two years ago, I went to Princeton on Labor Day, and that great university was not in session. I went there to prepare myself for a speech and to be in an atmosphere or environment not complicated by the contentions of our activities here; as I stopped off the train I heard the chimes of a nearby church, which were endowed by a God-fearing woman to play popular airs on holidays and

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sacred music on the Sabbath. I wandered through that I revisited every nook and cranny that memory could seated myself and I was proud that from my *alma mater* of the great plans of the Constitution and theory of government from which choice was made; and I went further to church, the Westminster Abbey of Princeton, and I saw tombstones of the heads of that great institution. I saw resting place of high and low, rich and poor, of favored and favored. I saw marked there the names of people, men and women who had gone out throughout the earth to preach the gospel of Christ, as they understood it, and as I stood there, wrapped in my own reveries, leaning upon a headstone, those chimes came there came to me, through the atmosphere with its awful new note, and that note was an inquiry. The tune said came to me, "My country, 'tis of thee, sweet land of liberty I was conscious of a tear trickling down my cheek, and I could cry, because when men or women cannot have their emotions moistened with emotion, they are dead; and I looked to see that tear fell, and it fell upon the headstone of a Union and I knew then my mission—that wherever God should give an opportunity to address my fellow citizens, in thoughtful addresses, it was to ask them—"Is this your country, and will you give the price for the right to say it is your country?" And we can answer that question in the affirmative, as you rise from your knees in prayer, you have risen to the full height of American citizenship, and the result of this way, with one hundred million people breathing that sentiment, makes the result beyond (Applause.)

WORK OF MR. R. M. LITTLE.

TOASTMASTER WILLIAMS: Some time ago, early in the year, I referred to the extent to which the national government accepted the services of our joint organizations in suggesting providing means of safety in sanitation in the navy yards, parks and cantonments of the government, and in the industries which are very actively engaged in the production of supplies for the government.

We have with us tonight the man who, more than any other, with the possible exception of President Wilson and members of his Cabinet, is responsible, and a man who Mr. Palmer said was a vision, of whom Mr. Young writes: "Mr. R. M. Little. C

of the United States Employees' Compensation Commission, took office March 19, 1917, and on May 10 he arranged with Mr. Lew Palmer for carrying on safety work in all Federal establishments, in which undertaking the American Museum of Safety took part with the National Safety Council. Mr. Little chose to conserve the funds of the commission, which are to be paid to injured government employees and their dependents, by the very productive plan of preventing those injuries."

I want to say on your behalf, and on behalf of the American Museum of Safety, to Mr. Little, how much we appreciate the opportunity which he gave us to work with him, and in this respect, on behalf of the National Council—I am acting on behalf of the President—to assure him of our active co-operation in every possible way in the future; in any way that it may be possible to further the objects which he has in view. I wish that we could have called upon him to speak, but he asked that he be excused.

I will now turn over to the President the gavel of the Museum of Safety, which he transferred to me a short time ago, and which we, on behalf of the Museum, are very glad to have used here on this most auspicious occasion. (Applause.)

PRESIDENT PALMER, TOASTMASTER.

TOASTMASTER PALMER: There is little for me to add, but a date caught my ear. Mr. Little, it is rather interesting to me; on March 19, the National Safety Council, at a special meeting of its Directors, offered the services of our organization to the Federal government and one of our first efforts has been directed in co-operation with your commission.

As Mr. Williams has well said, we of the safety movement feel that you are doing a great work and we are willing and glad to do anything in our power—both organizations—to assist you in continuing the work that you have so well started.

During the interesting talks and addresses I chanced to glance down at the picture on the program. It reminded me of someone sitting on the side of the line and I thought, perhaps, that this is the way the new team that has come into power can look back on those of us who are retiring from active service. There is a new captain and I am sure he will enjoy the same teamwork that has been given to me. It is with pleasure that I turn the gavel over to Mr. David Van Schaack.

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I would say, if it is your pleasure, a film will be shown, the subject being "The Reason Why." We have it through the courtesy of Mr. C. L. Close of the United States Steel Corporation and the meeting is in your hands, Mr. President.

PRESIDENT DAVID VAN SCHAAK IN THE CHAIR

PRESIDENT VAN SCHAAK: Ordinarily, the only function of the incoming President, at this stage of the proceedings, is to close the meeting and adjourn, but if I sense the sentiment of the members properly I feel sure that you would like to see this picture. I therefore, ask to have it displayed.

(The moving picture, "The Reason Why," was displayed.)

I hope that expresses the sentiment of all of us. The business of this meeting being now transacted, we stand adjourned.

National Safety Coun

Health Service Sectional Meeting

New York City

Sept. 12, 13 and 14, 1917

DR. C. G. FARNUM, Chairman

Chief Surgeon, The Avery Company, Peoria, Illinois.

WEDNESDAY AFTERNOON SESSION

THE meeting was called to order by Dr. C. G. Farnum, Chairman.

CHAIRMAN C. G. FARNUM: In the discussion of paper afternoon I am going to ask that you step forward, please, and give your name and address and the organization you are affiliated with. It will make the report of this Sectional meeting very much more valuable.

The work conducted by the Health Service Section since the last Congress, as you know, has consisted of very little beyond the bulletin work. Many of you are aware of the fact that the Health Service bulletins sent out through the National Safety Council last year were not backed by an authentic bulletin committee. It was a misfortune. We realized that, perhaps, more than you but in spite of our efforts, protracted continuously over a number of months, we were quite unable to satisfy ourselves with any group of men who would assume the responsibility for these bulletins.

Some of the bulletins were subjected to rather sharp criticism, justly, no doubt, but every one of them went into the hands of several men in industrial medicine before they were put out, so

of some group of men—and we are all permitted our opinion, you know. The other activities of the Section have not been very great, because our work is primarily here. We hope when we have rounded out this bulletin requirement to give you something next year that has a definite and authentic backing, and then, if you have any protests to make, you have the comfort and satisfaction of knowing where to take them.

The next item is the report of our Secretary, Mr. G. L. Avery, the Avery Company, Peoria, Ill.

REPORT OF SECRETARY.

Mr. Chairman and Members of the National Safety Council: The proceedings of the Fifth Annual Congress held at Detroit, Mich., Oct. 18-20, 1916, contain the proceedings of the Health Service Section, on pages 603 to 770, inclusive.

Since then there was one general meeting of all the officers of this Section at Chicago, when tentative plans were made for this Congress. Later a meeting of the officers was held at Peoria, Ill., when the semi-final plans were outlined and discussed. General Manager Cameron contributed much help at our meetings in Chicago and in Peoria, as well as throughout the year.

Through the efficient and untiring work of Dr. Loyal B. Shoudy of the Bethlehem Steel Company, South Bethlehem, Pa., your Chairman of the Program Committee, is presented for your consideration the program of this Congress.

Your officers cannot adequately express to you the valued service Dr. Shoudy has rendered this Section the past year.

COMMITTEE ON EMPLOYES' BENEFIT ASSOCIATIONS.

CHAIRMAN FARNUM: If there are no suggestions or corrections the report of the Secretary will stand. Are there any committees that should report at this time?

There is one matter that I am sure has been a source of disappointment, due to the fact that we were promised last year at Detroit a definite committee and a definite sub-organization upon the subject of Employes' Benefit Associations. I am very keenly cognizant of the need for that particular line of work and I believe that it has a place here. I should like, through a motion from the floor, the privilege of appointing a committee to take care of this

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matter—one which will give us, at our next meeting, the results of a year's continuous work upon standardization of these so-called Standard Forms. I believe this work is very important. Do I hear a motion for its adoption to take effect?

MR. G. E. MORTON: I move you that a committee of five be appointed to consider the matter and report at the next meeting.

CHAIRMAN FARNUM: You have heard the motion. Is it second?

MR. H. E. WRIGHT: I second the motion.

CHAIRMAN FARNUM: It is moved and seconded that a committee of five be appointed to look into the matter of Employment Benefit Associations and report back to us at the next Convention. Are there any remarks?

MR. W. L. CHANDLER (Dodge Sales and Engineering Company, Mishawaka, Ind.): We had a similar committee appointed last year, appointed by the retiring officers. I would suggest that the appointments be made by the incoming Chairman.

CHAIRMAN FARNUM: Without putting it in the form of a motion, that will be very agreeable to me. (The suggestion was accepted and the original motion.)

MR. ALEXANDER FLEISHER: Is it customary in this Section to have the Nominating Committee to make suggestions?

CHAIRMAN FARNUM: The appointment of committees has been in the hands of the Chairman of the Section. This one will be in the hands of the incoming Chairman. (The motion was taken to a vote and declared to be carried.)

APPOINTMENT OF NOMINATING COMMITTEE.

CHAIRMAN FARNUM: The next item on the program is the appointment of a Nominating Committee. I shall ask Dr. R. B. Cameron of the Republic Rubber Company to act as Chairman of the committee; Dr. T. R. Crowder of the Pullman Company, Chicago, and Mr. Avery, Secretary of the Section, to serve as members of the committee. They will report on Friday.

I am going to ask your indulgence, and we will divert the program a bit at this juncture, chiefly because the Chairman of the Section, who is the next speaker, made a few notes last night which he dictated this morning and the stenographer has not yet turned them. We will go to the next item, which is the report of the Standard Forms Committee, consisting of Dr. Schereschewsky.

Dr. Hayhurst, Dr. Lauffer, Mr. Avery and Mr. Fleisher. Dr. Schereschewsky, will you read the report for the committee?

REPORT OF COMMITTEE ON STANDARD FORMS RELATING TO THE CONSERVATION OF THE HEALTH OF WORKERS.

Mr. Chairman and Members of the Health Service Section, National Safety Council: In making this report your committee wishes to emphasize the occurrence of certain great changes in industrial conditions which cannot fail to influence profoundly their subsequent development. Prior to the momentous events of the last three years, industrial conditions differed greatly from what may be expected in the future. Owing to the flood of immigration the labor market was kept continuously supplied with unskilled workers, so that there was never any anxiety, in undertaking industrial enterprises, whether the necessary personnel would be forthcoming or not. Because practically all of this labor was unskilled, it became necessary to substitute mechanical apparatus for individual dexterity. This led to an ever increasing substitution of machine processes for skilled hand labor, and permitted the employment of the unskilled or semi-skilled men in place of the highly skilled mechanic. This was only a natural development in view of the apparently inexhaustible supply of unskilled help. While these conditions made for tremendous stimulation to industrial government, from the mechanical side, and permitted the wholesale production of necessities and luxuries to a hitherto undreamed extent, in the last analysis they produced a situation which was fundamentally bad, in that we temporarily lost sight of the human element in industry—that we considered industry in terms of machines and production rather than of men.

MAN-POWER OF THE NATION.

The great chain of events which has plunged us into the present world struggle has opened our eyes as never before to the necessity for the rehabilitation and co-operative mobilization of industry in this world war and the future civilization to which it will give birth. We now realize acutely that it is the man-power of the nation which lies behind all communal effort; by which life is rendered worth living; through which successive planes in advancing civilization are reached.

No longer can we rely on the great influx of immigrants, as in the

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past, to carry on our industries. No longer can we be prodigal of the lives and health of our workers. At this time, each individual social unit has undergone enormous valorization; the industrial environment can no longer be a matter of indifference either to industry or to the nation. In this war of resources in which the actual production must continuously approach the theoretical maximum, the nation must be assured that each individual worker is being employed in the most efficient way; moreover, the conditions under which he is employed are such as to insure consistent and continuous efficiency on his part. That health, safety and continuous employment are the fundamental factors in production in this condition is so obvious as not to require argument.

As in all other great human enterprises, the basis of our power to produce such favorable conditions lies in knowledge. We must find some way by which we may estimate the effects of industrial environment on man-power. We must have certain records which all industries will agree to collect and transmit to central offices, be they state or federal, so that industrial health and safety can be studied and improved in the same manner that health departments endeavor to watch over and improve the public health.

Let us then discuss the records which will enable the nation to ascertain the condition of health and safety of individual industries. After due consideration, your committee recommends that, in addition to accident records, the keeping of which is provided for by workmen's compensation laws, the following records relating to the physical condition and health of workers would be of the highest value:

1. Record of physical examination.
2. Weekly reports of sickness.
3. Weekly report of absenteeism.
4. Report of labor turnover.

Your committee desires to furnish the following discussion of the value and significance of each of these forms of record and the results which may be expected to follow their collection and compilation.

RECORD OF PHYSICAL EXAMINATION.

The value of physical examinations in industries as a means of health conservation is so familiar to you all that it need not be entered into here. What is needed, however, is some minimum standard of the extent of such physical examinations and the

imum amount of data which should be recorded. In making up the records of such physical examination, it is well to remember that they consist of two parts, both extremely valuable—one relating to the industrial and social history of the individual, the other to his actual physical condition. It is evident that the first part of the record may readily be obtained by a clerk or other employe, whereas the data in regard to the physical condition must necessarily be secured by the examining physician himself.

At least the following personal data should be collected: The sex, age, race, nativity, years in the United States, ability to speak English, marital condition (single, married, widowed, or divorced), and number of children both living and dead. Of great interest to those who study occupational diseases would be a brief notation of previous illnesses and injuries.

Next should follow a brief occupational history, which would give the following data:

1. The name of the industry in which the individual is actually employed or seeking employment.
2. The department in that industry to which he is assigned.
3. The process in that department in which he is engaged, the technical name being given in every instance.

A brief record of the previous occupations of the worker, together with the times spent in such occupations, should be added to the record. This portion of the record will become increasingly valuable as the years go by, as it would form the basis of valuable deductions in regard to many important industrial considerations, such as the percentage of "floating labor," the effect of previous occupations on the present physical condition, the average duration of individual productivity.

PHYSICAL EXAMINATION.

Naturally we should endeavor to reduce the physical examination, itself, to the simplest possible terms, without, at the same time, omitting any essential data. It is recommended that at least the following points be recorded in the physical examination: Apparent age, height, weight, posture, chest and abdominal circumference, condition of teeth and gums, eyes, ears, the vision in all industries involving eye work, the condition of the heart, lungs, and abdominal viscera, the condition of the spine, articulations, and extremities. Keeping the record is simplified by checking each space for these

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observations when the findings are normal, and noting in a c of their own, deviations from the normal. In this way, tabu from such records are readily made.

WEEKLY REPORTS OF SICKNESS.

Vital statisticians all agree that it is the amount of sickne not of deaths which gives the true index of the degree of san in a community. The tremendous annual economic loss due t ventable illness in industries has been pointed out over and again. There is no doubt that if weekly or monthly records morbidity causing loss of time among workers and the cause be collected, great differences would be revealed in the amo sickness in various industrial communities, according to wheth industrial and community environment were favorable or the re

Your committee wishes by no means to imply that the si recorded by such means would necessarily be due to factory tions alone; on the contrary, the very nature of the sickness might indicate that defective public health conditions were the

It must, however, be remembered that illness from wh cause, if preventable, represents a net loss to industry, and quently to the nation. Industries, therefore, have quite as gr interest in the maintenance of community sanitation as they in sanitary shop conditions, for it is evident that it avails little t round the worker with healthful conditions in the shop if durin hours away from work he is exposed to the dangers of poor munity environment.

Because probably rather more than one-fourth of the popu belongs to the industrial group, it is evident that the collecti morbidity statistics in this large part of the nation would inestimable value, not to industry alone, but to health officials are emphasizing the need for the collection of these statistics prerequisite to the maintenance of public health, but yet cons bewail the fact that such statistics are extraordinarily diffic collect. The collection by industries of such statistics would c an enormous addition at once to public health data, besides pe ting analysis of the incidence of disease, so that the morbidity to occupational diseases and to defective community conditions be separated and analyzed, and proper measures instituted for prevention.

The incidence of sickness among workers is already a

of record in a number of industrial corporations, usually because of the existence of sickness benefit funds. Because absences are also a matter of record in practically all industrial establishments, it should not be difficult to record and determine the cause of the absence as well. Your committee, therefore, recommends the general recording of morbidity in industry. Such morbidity should be divided into two parts, *i. e.*, illness causing loss of time and illness not causing loss of time. The records of the latter should be kept at the works dispensary, in co-operation with the foremen of various departments; the records of the former, by co-operation of the time department and the medical department.

The records should provide for the collection of the following data:

1. Industry.
2. Department of industry.
3. Occupation of the sick.
4. Nature of illness.
5. Total time loss.
6. Average number for the period in the department where sick were employed.

ABSENTEEISM.

The percentage of absenteeism in industry, and by that I mean the percentage of absences of the average number employed, gives important information as to the general industrial conditions. It is evident that a low percentage of absenteeism means continuous employment with consequent high production—a contented and efficient personnel and a minimum of illness. High percentages of absenteeism may be due to a high morbidity rate, industrial over-fatigue, unpleasant character of the work, abnormally high wages, excessive drinking and other factors. The percentage of absenteeism, therefore, reflects surprisingly the prevailing industrial conditions. It is, therefore, of importance both to the nation and to industry to reduce absenteeism to the lowest possible figure. This can only be possible by the institution of the practice of the general collection of these records, so that the causes for an unduly high rate of absenteeism may be studied and the proper remedies applied. Normally, under present industrial conditions, we may expect that approximately five per cent of the average personnel in any industrial establishment will be absent.

The record of absenteeism due to illness, combined with the

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record of general absenteeism, would give information of highest value, as it would enable one to determine:

1. The net loss to industry, due to illness as a whole.
2. The net loss due to preventable illness.
 - (a) From industrial conditions.
 - (b) From community conditions.
3. The net loss to industry due to voluntary absence arising causes other than illness.

In making such reports of absenteeism, which would be prepared by time departments, the following points should be recorded:

1. The industry.
2. Department of the industry.
3. The average number on the payroll for the period.
4. The number of those absent.
5. The total time absent.
6. Percentage of time absent.

The value of the record would be increased if the cause of absence, besides illness, could be recorded.

LABOR TURNOVER.

Your committee understand "labor turnover" to mean the number of men who must annually be hired in order to keep a work force at a constant numerical level. The cost of "hiring and training" is one of the net economic losses to industry to which attention has been directed over and over again. There is no need to suppose the desirability of a minimum labor turnover by argument. It is well known that an excessive labor turnover constitutes one of the greatest bars to industrial efficiency. When labor turnover is excessive there is always something wrong, although in many instances the industry itself is not to blame. Whatever the cause is at fault, both the nation and the industry are entitled to know the facts, that by study and co-operation needful remedies may be applied.

Your committee, therefore, recommends that records of labor turnover be kept for the purpose of aiding in the improvement of industrial conditions. As in the case of previous records, these should be kept for weekly or monthly periods, should give the industry by name and department, the average number on the payroll for the period under consideration, the number entering employment, and the percentage that leave employment.

number. In this way we are enabled to separate establishments which are expanding their departments and thus employing additional help from those in which replacements are excessive.

Such, then, are the records the keeping of which by industry as a whole would give us a type of industrial vital statistics which if intelligently used as a basis for remedial measures could not fail enormously to improve the general efficiency of industry.

Let us not imagine for a moment that this need for the improvement of industrial conditions is imperative solely because of the present emergency. The labor shortage which is now felt is one which, in the opinion of your committees, will persist long after the war. The enormous destruction which results in every war creates demands during the period of rehabilitation which should be little if any less than those existing at the present time. We shall no longer be able to look to Europe to supply our labor market, as there will be need for every man they have in their home countries. It has been suggested by some that many will emigrate to this country after the war to avoid the onerous taxation caused by the payment of war debts. It need only be pointed out, however, that such emigration will not be permitted in foreign countries, as these debts can be discharged only by the use of the earning power of the nation. We may, therefore, expect that this country must rely largely upon the development of its internal labor resources. This it should seek to do by utilizing the labor that it possesses in the most efficient possible way.

J. W. SCHERESCHEWSKY, *Chairman,*
Surgeon, United States Public Health Service.

CHAIRMAN FARNUM: I am sure you are pleased with this very excellent report. It will be turned over to the National Safety Council and be printed in the proceedings. Very fortunately, too, because these ideas for standard forms, from one like Dr. Schereschewsky, are eminently valuable to us.

We will now hear the report of the Health Insurance Committee, by Mr. J. M. Eaton, formerly manager of the Welfare Department of the Cadillac Motor Company, but now with the Lincoln Motor Company of Detroit. The members of this committee are Mr. Eaton, Mr. Whitney, Mr. Chandler, Mr. Williams, Dr. Warren and Dr. Frankel. Mr. Eaton has been called away on important business, but his paper is in the hands of the Secretary, whom I will ask to read it.

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REPORT OF HEALTH INSURANCE COMMITTEE

To the Chairman and Members of the Health Service & National Safety Council: At the Fifth Annual Congress, Detroit during October, 1916, the Chairman of this section appeared as a Committee on Health Insurance Messrs. Eaton, W. Chandler, Williams, Warren and Frankel, the need of such a committee being apparent from the interest shown in a meeting of executive officers of employes' benefit associations, attended by 200 persons upon one of the latter days of the Congress.

The subject of health insurance is one which will, within the few years, receive at the hands of society consideration such as has been given few subjects in the development of the race. Whether that consideration will result in the adoption of laws providing payment of benefits to those of us whose earning power is temporarily or permanently suspended by reason of sickness, or whether it will result in the adoption of greater and more efficient means of preventing that sickness, remains to be seen. Certainly health insurance no more guarantees health than life insurance guarantees life, and it would almost seem that the thing for which we are striving is not health insurance, but rather disease prevention. The proponents of health insurance rely to a large extent upon the argument that just as accident prevention was stimulated by the enactment of workmen's compensation laws, so will sickness prevention and health conservation—be stimulated by the enactment of health insurance laws. It seems to me that they are upon doubtfully tenable ground. After all, is health insurance as it is commonly understood the thing we need and want? Certainly this Council is not prepared to go upon record on so important a subject without the most careful investigation and deliberation.

LACK OF ACCURATE KNOWLEDGE.

There is, so far as I know, no difference of opinion as to the motives of all those persons who have advanced plans for health insurance in this and other countries. They have, so far as we are able to see, no ulterior motive, and all should be commended for the thought and time they have put upon the subject. It is unfortunate, however, that there is so wide a difference of opinion even among the authorities themselves as to existing conditions, and this undoubtedly is the result of a lack of accurate knowledge upon the part of all those who have given the matter even a cursory consideration.

There is, in this country, an appalling quantity of printed matter upon this subject—much of it written by men biased in their opinions as to the worth or worthlessness of a compulsory state or nation controlled fund for the purpose of insuring the rank and file of American workmen against loss of time by reason of sickness. There seems to be no difference of opinion as to the value of health insurance itself, any more than there is a difference of opinion as to the value of insurance against fire in the business world. There is, however, much quarreling over the question as to whether or not a paternal government may demand of its citizens insurance, a small part only of the cost of which is to be borne by him, against disaster caused by sickness or death, any more than it may demand of that same citizen that he insure his business against loss by fire or burglary. If insurance, whether voluntary or compulsory, prevented disease, there would be no room for argument, but unfortunately insurance itself will no more prevent disease than it will prevent fire.

FURTHER STUDY NECESSARY.

I feel that your committee, in having been given this subject upon which to study and report, has been assigned as great a task as will ever be given any committee of any organization anywhere, and it seems that to properly handle the subject and to submit to this Section a report in keeping with the size and importance of the national body of which we are a part, it should be given the assistance of an organization not possible at the present time and a sufficient number, of months to enable it to organize and carry on, for a long time, an investigation, which will give it information not now available and without which no intelligent analysis of conditions in this country can be made.

In the consideration of any scheme for insuring the health of workers, it is necessary to know as nearly as possible the exact time lost annually, not by a small group of employees but by the mass of employees in this country. Up to the present time those authorities on health insurance who have broken into print widely disagree as to whether the average loss per man per year is six days or nine days, the difference of three days amounting to many millions of dollars annually in the cost of maintaining any sort of fund.

I do not, at present, believe that an adequate survey of conditions in the United States can be made without governmental help or possibly governmental authority and supervision, nor that any form

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of health insurance, either voluntary or compulsory, can be recommended until a proper survey of existing conditions and a thorough study of and compilation of American experience can be laid before our lawmaking bodies. If there ever was in this country a time when we were wholly willing to be guided in our statute-making by the experience of foreign countries, more particularly of Germany, that time is past, and we shall be satisfied now with nothing but the positive knowledge of our condition and experience. A plan worked out as a result of what we know and learn and will give us positive assurance before its adoption of a satisfactory operation.

MAKE REPORTS OBLIGATORY.

No very complete plan has been adopted by any municipality for securing reliable data upon the health of its citizens. There is no profession in the world as loosely supervised as is the medical profession. A plumber or a bricklayer must report more fully to local authorities the class and extent of the work done upon a building than does a doctor in reporting upon the treatment of cases. A few of the communicable diseases are required to be reported, and beyond the initial report of the existence of a particular disease no information is obtainable. It would seem, therefore, that one of the first steps to be taken in the matter of an investigation of health conditions in this or any other country, would be to make it obligatory upon the medical profession to report not only the contagious but all cases of sickness of any kind, and to follow such a report as closely and as accurately with subsequent reports as the manufacturer is required to do in the reporting and re-reporting of his industrial accidents.

Only in some such way can we discover the cause and duration of illness, and ignorant of the cause we are powerless to propose a preventive. To properly secure such data would require an organization fully authorized to penalize those failing to fully cooperate in its collection.

So it would appear that while your committee has accomplished little, there is yet a crying need for such a committee, and if it is out of place at this time I would suggest that your Committee on Health Insurance be continued through another year, substituted in place of the present Chairman some gentleman able to give the subject and the committee work such time and thought as is demanded by the importance of the subject in hand.

J. M. EATON, Chairman

CHAIRMAN FARNUM: The Committee on Hernia will now report. This committee consists of Dr. Harvey of Chicago, Chairman; Dr. Patterson of Harrisburg, Dr. Hopkins of Chicago, Dr. Lauffer of Pittsburgh and Dr. Mock of Chicago. Dr. Lauffer is the Secretary of the committee and he will now read the report.

REPORT OF HERNIA COMMITTEE.

DR. A. M. HARVEY, DIRECTOR MEDICAL DEPARTMENT,
CRANE COMPANY, CHICAGO, ILL.

Mr. Chairman and Members of the National Safety Council: The Hernia Committee, appointed at the Detroit (1916) Congress of the National Safety Council, sent out a questionnaire to ascertain the causes of herniæ, as revealed to surgeons by the anatomical findings at the time of operation. The tabulated experience of surgeons operating herniæ cases would be more conclusive, it appeared to your committee, than any other available data, in illuminating this vexed problem.

The surgeons, to whom this questionnaire was addressed, were requested to tabulate, if possible, their cases available for such a report as follows:

1. Congenital hernia, with the age at which the hernia was determined.
2. Acquired hernia, without the history of trauma.
3. Traumatic hernia—under this form of hernia give the condition of the sac, whether caused by the trauma or whether of a congenital type or due to anatomical defects of parts involved in the hernia.

Your committee procrastinated, and this questionnaire was sent out too late to secure the co-operation of all the surgeons addressed. In the replies received it was disclosed that relatively few of the doctors made a statistical study of the cases they have examined. Few of the operating surgeons take notes of the findings at the time of operation from which tabulated data may be derived for the statistical study of the causes of herniæ.

The responses received, being general, rather than specific, this preliminary report will be of like nature.

The Hernia Committee has failed to meet as a committee to summarize the reports sent in; this work has been assigned the Secretary.

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PRELIMINARY REPORT.

In submitting this preliminary report, your Secretary feels that the labors of the committee should be continued another year, and that a new committee be appointed to whom the valuable material already collected may be given.

Hernia cases puzzle employers and perplex referees and trial boards in every state. The educational campaign on this subject should certainly be continued.

It is unfortunate that some physicians, as well as the laity, use the term rupture as a synonym for hernia, thus confusing the public mind.

It is likewise unfortunate that the term traumatic hernia is used in the literature and on the tongues of physicians and attorneys when such a term as latent hernia, or developmental hernia, would better explain the underlying anatomical defects that are responsible for nearly all herniæ.

As 92 per cent or more of all herniæ are of the oblique inguinal type, occurring in the groin, along the course of the spermatic cord, our inquiry is chiefly concerned with this type of hernia. Indirect hernia, umbilical hernia, femoral hernia, and direct inguinal hernia, all of which are admittedly caused by anatomical defects, are classified as due to sickness, rather than injury. The storm center is the oblique inguinal hernia.

OBLIQUE INGUINAL HERNIA.

1. The sac is the essential part of a true hernia. The hernial sac is a process of peritoneum. The peritoneum is a tough serous membrane, not easily pouched out to form a sac.

2. Efforts made on the cadaver at the internal ring, in an attempt to force the finger from within into the inguinal canal are futile. "No finger is strong enough to stretch the normal peritoneum to form a sac," says Dr. R. W. Corwin. Others have tried the experiment.

3. For a hernia to arise suddenly there must necessarily be a pre-existing sac. The sac may exist for years, as an embryonic remnant, and remain empty. The filling of the preformed sac by omentum, or a loop of intestine, is generally the first intimation of the existence of the hernial sac.

4. The palpating finger of the examining surgeon will

Hence, in plants where careful physical examinations are conducted the record card may show that an employe had no hernia when he entered the service, yet a hernia may subsequently develop, and, at the time of operation, the hernial sac may be quite large and thick, indicating that the hernia is not a recent one.

5. The peritoneal fluid serves as a dilator for the sac of a latent hernia before the hernia acquires solid contents. When sufficiently stretched to admit a segment of intestine, this, in turn, serves as a dilator.

6. The descent of the testicle leaves a weak place in the belly wall. The processus vaginalis is an extension of the peritoneal cavity into the inguinal canal, caused by the descent of the testicle; nature is not a perfect architect, an imperfectly closed processus vaginalis predisposes to oblique inguinal hernia.

7. There is a dimple in the peritoneum and the infundibuliform fascia, covering the internal ring; this dimple may be deepened and widened by oft-repeated increases of the intra-abdominal pressure.

8. This dimple at the internal ring deepens to form a sac for the hernia more rapidly if the inguinal canal is too patulous.

9. The factors producing an overpatulous inguinal canal are: (a) Inherited thin abdominal muscles. (b) Excessive fat, by increasing the mobility of the peritoneum, and by pressure atrophy of the abdominal muscles. (c) Emaciation, by absorption of the subperitoneal fat, and the fat within the tissues of the spermatic cord.

10. The developmental hernia (into the pre-existing processus vaginalis) and the acquired hernia (the shoved-out peritoneum and infundibuliform fascia) are both accelerated by an overpatulous condition of the inguinal canals thus produced. Both types of oblique inguinal hernia are thus due to anatomical defects.

11. A hernia into a sac of prenatal origin, or into a slowly acquired sac, is not an accident, because the filling of the preformed sac merely leads to the discovering of a previously existing anatomical defect.

12. Hard work develops the muscles of the abdominal walls, so that the well-nourished artisan is less inclined to hernia than the ill-nourished clerk of sedentary habits, though statistics of various occupations in relation to hernia have not been adequately tabulated.

13. The factors which increase the intra-abdominal pressure are: (a) Respiratory Diseases—Coughing, etc. (b) Gastro-Intestinal Diseases—Enteroptosis, constipation, etc. (c) Genito-Urinary

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Diseases—Stricture, vesical tenesmus, etc. (d) Obesity, incisional, perirenal and subperitoneal fat.

14. Oft-repeated increases in the intra-abdominal pressure predisposed individuals, having anatomical defects in the peritoneal fasciæ, rings, canals or muscles, tend to develop a hernial sac; the process is slow and gradual; the hernia is often well developed even scrotal in extent, before the patient knows he has a hernia.

15. An increase or aggravation of an existing hernia is not to be expected; hernia should always be treated surgically; the operative treatment is in any given case contraindicated.

16. Direct violence may produce true traumatic hernia. A hernia is accompanied by intense pains, shock, vomiting, tenderness, swelling, ecchymosis; operation discloses hemorrhage and laceration of tissues, and *no demonstrable hernial sac*.

17. "A true traumatic hernia, if inguinal, is nearly as much a local injury as if it were produced on the abdomen in other regions."—Dr. C. H. Mayo.

18. While the sudden projection of hernial contents into a formed sac may produce distressing symptoms, a surgical operation will disclose the sac; as the sac is (a) an embryonal remnant, (b) pouched-out peritoneum, which never arises instantaneously, becomes evident that a hernia results from anatomical defects.

19. The term traumatic hernia, predicated violence to the normal structure of the body, should therefore be reserved for exceedingly rare cases of hernia, in which direct violence has been applied, and which exhibit evidences of local trauma.

20. Your committee appreciates the courteous co-operation of the surgeons who responded to the questionnaire, and if time and space allows, we would recommend the reading and discussion of a portion of the replies. By practically unanimous voice the surgeons classify herniæ as due to anatomical defects rather than to trauma.

CHARLES A. LAUFFER, Secretary
Medical Director, Relief Department, Westinghouse Electric
Manufacturing Company, East Pittsburgh, Pa.

CHAIRMAN FARNUM: I am sure we are all very much pleased with this comprehensive and carefully prepared report.

The next report is from the Committee on Medical Work. Mr. Lowe of the Goodrich Company at Akron is Chairman of the committee, but I am told he is not here today. Dr. W. Irving

of the Norton Company was to report in the absence of Dr. Lowe, but he is also absent. As the report is not available, we will proceed to the next order of business, which is the report of the Committee on Interpretation and Evaluation. Mr. Alexander Fleisher is Chairman of the committee. He is Supervisor of the Welfare Division of the Metropolitan Life Insurance Company, and with him on the committee are Mr. Gould, Mr. Fitch, Dr. Shoudy and Dr. McCurdy.

REPORT OF THE COMMITTEE ON INTERPRETATION AND EVALUATION.

Mr. Chairman, Ladies and Gentlemen of the Health Section of the National Safety Council: Your committee was appointed to consider the possibility of determining methods by which the welfare work at present being done in industry could be measured, and to set standards for doing such work most effectively. It has given consideration to these problems. The extent and newness of the field in which it was asked to work and the lateness of its appointment have made it necessary to make this report only a tentative one. The committee has had to limit itself to an outlining of the problem with an indication of the difficulties to be met, and to the suggesting to the Section of plans for continuing the study.

The need for more adequate measurement and evaluation of welfare activities is directly traceable to a change in the attitude toward welfare work. Even the term generally used has become a misnomer. Welfare work is no longer charity; in most cases it has ceased to be considered a mere addition to wages; its source lies no longer in the generosity of the individual employer. Employers are coming to appreciate that welfare work—the fundamental concept of which is that only the present labor of the worker, and not his future earning power and capacity, is bought for wages—reduces waste, machine as well as human; that besides giving a concrete return to the worker it humanizes industry and makes it more efficient. Welfare work is becoming an integral part of business. As such, it must be treated as are other factors in business. It must show a proper return for the money expended, and it must be conducted in the most efficient way possible in order that that return be as large as possible.

Welfare work must show a return for the money expended. How may its success be determined? No absolute measuring devices

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have as yet been set up. Formulas are lacking, but the : have been suggested are worthy of the most careful consi We have some such measures in absence, in labor turn-ove production.

ABSENCE.

If welfare work, especially such work as concerns health cessful, it should be possible to show a reduction in sickness the workers affected. In order to determine the amount o tion, careful records of the number of persons sick in a giver arranged by sex, are necessary ; statistics of the number of sickness per person as well as seasonal and departmental tions are also of value. When these figures are compared wi prior to the installation of welfare work the result should gi of the desired information.

If welfare work makes for more contented workers it be shown by a reduction in the number of absences not ca sickness. The average length of service for workers should i and there should be a marked growth in the number of lo employees.

The monetary return from welfare work, as shown by : can, in some cases at least, be demonstrated. During 1916 the clinic of the Metropolitan Life Insurance Company furnish scriptions to more than 800 employees. If these had been co to consult oculists and opticians it would have meant a loss that would have averaged over four days per person. The conducting this branch of welfare work, exclusive of the it rent, heat and light, was \$1,500; in other words, there was a of approximately 3,500 days at an expenditure of less than 5 per day.

LABOR TURN-OVER.

Another method of measurement is that of labor tur Because in this is frequently reflected the attitude of er towards their employers. If a reduction in the amount o turn-over can be attributed to welfare work it should be possible to determine this fact by comparison of totals befce after its introduction or extension. This applies particularly t who leave an organization of their own volition or because o positions that may be offered them. If the standard form for uring labor turn-over, prepared by Mr. E. H. Fish of the :

ciation, were generally adopted the necessary comparisons could be made. The reduction of labor turn-over in the Ford Motor Company as outlined to the Section last year by Dean Marquis is an interesting example of the use of this form of measurement.

PRODUCTION.

Production figures are in most cases easily obtainable. If welfare work is accomplishing its object it should be reflected in the quantity and in the quality of the output. Reduction in time lost through illness and from other causes such as tardiness and unnecessary absence should mean a decrease in production cost per unit. The waste of idle machinery should be noticeably reduced. The necessity of carrying an extra force to substitute for persons absent should be, in large measure, eliminated. The amount of defective material and the number of errors should be lessened. The standard of the product should be raised.

An article in *The Survey* of May 12, 1917, describing the reduction of working hours in a shoe factory from fifty-five to fifty-two per week, with an accompanying increase in output is illuminating. Similar examples are plentiful.

MONETARY RETURNS.

In seeking to determine the monetary returns of welfare work by these methods or by any others that may be suggested, great care should be taken not to include items for which welfare work is not directly responsible. Many factors affect savings in industry. It is frequently impossible to find a single cause. On the other hand, the importance of intangible results and of the good that welfare work is doing should not be lost sight of. There are many sides of welfare work that cannot be gauged. The improvement in the standing of the corporation in its community or in the country as a whole because of the attitude that it has assumed towards its employees cannot be accurately measured, nor can the increase in control over the labor market, resulting from a liberal attitude towards employees, be easily determined.

These methods of measurement should be carefully analyzed and efforts made to determine the possibility of utilizing them generally. But it is of perhaps greater importance, at the present time, to determine standards which will make it possible to secure the desired results. *Welfare work must be conducted in the most efficient way*

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possible in order that the return be as large as possible. know not only whether our work pays but also how it can most expeditiously and what should be the proper expenses to secure the maximum return. Here again your committee is confronted by the difficulty that there are no standards for measurement and no formulas to make possible the statement "This is the best" or "This plan will be successful." In order to be in a position to state in which way welfare work can be most efficiently and effectively done, three kinds of standards are needed. First, to determine the kind of person best qualified to do a definite kind of work; the best types of equipment for various kinds of work; the best ways of carrying on welfare activities; and the best ways of determining the results of welfare work be determined.

WORKERS.

In order to determine the worker best qualified for a given position we must know the demands of the position in question. We should know what kind of a person would fit the immediate position, the personality, training and experience that are required. No persons are definitely qualified to fill definite kinds of positions. No persons do not necessarily fill the requirements of another position in the same plant and in a closely related field.

The indirect method of determining standards for welfare workers has been used by various writers on the subject. They have made a survey of the problem and have sought to determine the fundamental requirements for the welfare worker. A more direct approach to the problem has yet to be made, one that would study welfare positions as they now exist in industry and from the information obtained draw conclusions as to the type of worker best qualified for the particular work. In conjunction with this, a census of welfare workers should be taken. This should seek to determine the position, training, and experience of those now engaged in handling the human problem in industry. It may be that such an analysis of the census will lead to general conclusions similar to those that have already been reached. It is likely, however, that the findings will be very different whatever the result. It is certain to produce accurate knowledge of the work to be done and of the type of persons best qualified for it.

The need of correct standards for welfare workers is an example of the problem always present in dealing with any given

ciency can be obtained only when corporations can readily place workers in the positions for which they are best fitted.

EQUIPMENT.

Standards of equipment for certain types of welfare work have already been given some consideration. Standards in safe practices and in the development of mechanical means to reduce accidents are rapidly becoming a reality. In the field of ventilation the efforts of engineers and of sanitarians have brought forth definite standards that will make for more efficient work and for healthier work-people. Similar studies of fire prevention and lighting are also producing standards. Efforts are now under way to standardize washroom, bath and toilet facilities in various industries. It is true that in all these subjects there is still diversity of opinion, but the extent of the interest in these problems leads to the hope that adequate minimum requirements will soon be formulated.

A beginning is being made; much still remains to be done. Standards of many kinds of equipment have yet to be determined. They must be made for individual industries with special grades of employees; they must be extended to cover all types of industries.

All employers who have undertaken welfare work have developed experience which could be of help and which should be utilized. It is true that the problems confronting corporations which undertake welfare work, no matter on how limited a scale or in how narrow a field, are exceedingly varied and difficult. The experience of other organizations, however, will tend to simplify them. Many perplexing problems would be solved were existing information made available. To take the installation of lunchrooms as a single example in the wide field: The experience tabulated would indicate the amount of space required, the most satisfactory ways of securing patronage, the types of necessary equipment, the cost of up-keep, the percentage of the cost to be borne by the employer, the prices to be charged for food, the kind of food and service best adapted to the needs of various types of employees.

METHODS.

Most difficult, however, is the determination of the methods that will bring the largest and otherwise most satisfactory results. If we are to determine the most satisfactory methods and are to standardize our efforts, uniform records must be kept of work done. In all probability some records are being kept by almost all organiza-

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tions that have undertaken welfare work. Regular reports
mitted to executives by their welfare workers. But in ho
cases is this record more than simply an improved time slip,
that the worker has been in the plant and has been consult
given number of persons? In how many organizations are
used to compare results, season by season or year by year?
many instances are they utilized as a check on the work that
done? How often are they used to compare the work of
firms?

The records of welfare work are seldom kept in a w
would make measurement possible. Were such records p
kept they would lead to more effective management. It w
possible to tell the number who utilize the service offered,
compare annual records in order to determine whether each
of welfare work holds its following among the employes and
their intelligent co-operation. A serious falling off in the att
of a dispensary or in the number of persons who have availed
selves of lunchrooms or bath facilities might indicate a reduc
of these developments. More probably, however, it would
unsatisfactory management or improper facilities. A study
ports would point out the difficulty and suggest the remedy.

STANDARDIZATION OF FORMS.

Some efforts towards the standardization of forms for re
and for securing comparable results have been made. The
mittee on Tuberculosis of the Charity Organization Society c
York, with the co-operation of the New York City Departm
Health, has secured the introduction of standard forms for r
examination in a large number of plants. The examinati
employes made for various concerns by the Life Extension Ir
is a hopeful beginning in the standardization of methods. The
of the committee of the Detroit Executives' Club on Standard
tice on Medical Supervision in Detroit Plants is suggestive. Th
the efforts of Dr. Thaddeus P. Hyatt, dentist-in-charge of the
of the Metropolitan Life Insurance Company, standard record
for dental work in industry are coming into general use.
greatest advance in securing the adoption of standard report
and uniform analysis in any branch of welfare work is the
form for the analysis of labor turn-over, mentioned above.

The value of such scattered efforts as these indicate the
for established standards for carrying on welfare work M.

the material required for the establishing of these standards is already in the hands of individual members of the National Safety Council. Little more seems necessary than to have such material collected and compiled.

Your committee consequently recommends the appointment of a committee to report to the 1918 Safety Council on the points outlined. It recommends that this committee be instructed to collect and tabulate such material as may be obtained from the various members. It suggests finally to the members that they co-operate to the fullest extent possible with such a committee should one be appointed.

Respectfully submitted,

W. N. FITCH,

J. A. GOULD,

LOYAL A. SHOUDY, M. D.,

ALEXANDER FLEISHER, Chairman.

CHAIRMAN FARNUM: This completes the reports of committees for this afternoon. One rather striking thing is the fact that three out of the four committees have felt that they have to advise that similar committees should be appointed or that these committees should be continued to carry on the work. Do you wish to take up that matter or shall we leave it to the incoming officers of the Section? Unless there is a motion for immediate consideration that course will be followed.

There is an error in today's program, that of the omission of a paper by Dr. Harry E. Mock of Sears, Roebuck & Co., upon the subject of "The Human Maintenance Department for the Industrial Army." Dr. Mock is not with us today. He is in the service and is stationed at Fort Riley, Kan. In order that his paper may be properly recognized and be recorded in the minutes I will ask the Secretary to read it by title and submit it to the national organization.

A HUMAN MAINTENANCE DEPARTMENT FOR THE INDUSTRIAL ARMY.

HARRY E. MOCK, CHIEF SURGEON, SEARS, ROEBUCK & CO., CHICAGO.

Mr. Chairman and Members of the National Safety Council: During these days of preparedness for the conflict into which our country has been forced, we hear much concerning the great industrial army which is being mobilized to care for the increase in manufacturing, agriculture, and almost every line of industrial activity.

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The medical department of the military army is recognize absolute essential and the federal control of this department made of it an efficient and well-trained branch of the army. The medical department for this great industrial army is just as necessary, and, for the period of the war, at least, it should be under federal control.

The government, at this time, is forcing hundreds of men to take on new employees—many of them “green hands”—in order to increase output in munitions, ships, leather goods, food supplies, etc. Therefore, the government should at once enlist a large number of medical and surgical officers and safety engineers to establish a comprehensive system of health supervision, surgical care of injured, accident prevention in every industry connected in any way with the preparedness plans of the government.

CARE FOR THE INDUSTRIAL ARMY.

The conservation of the health, limbs and life of this industrial army is just as essential as the same conservation in the military army. A comprehensive plan of industrial medicine and surgery established in a large industry or as a unit in the neighborhood of a number of smaller industries, is the best proven means for the conservation among employees.

A number of large concerns throughout the country have established medical and surgical departments in direct connection with their plants, in order to supervise health, prevent disease and accidents, and care for the injured among their employees. Some have extended the work to the care of the sick employees, as well. The growth of industrial medicine and surgery during the last few years speaks for the effectiveness of these medical departments. Well-minded as well as “hard-headed” business men say that their medical departments pay greater dividends than any other department in their plants.

Whenever these industries are forced to “speed up,” as, for instance, during the busy season, there is usually an increase in the amount of sickness among the employees, and there is always an increase in the number of injured; in fact, the work in the medical and surgical department always increases in direct ratio to the increase in production. This is due, in a large measure, to the number of workmen employed at such times. Proper supervision and direction

a minimum, thus rendering an invaluable service to that industry during this period when an active working force is so necessary.

All industries connected in any way with the preparedness plans of the government are now in that state of "speeding up." Rapid production and output are the greatest essential now. Everything tending to increase efficiency is of paramount value and should be adopted at once. The workers—the great industrial army—form the very foundation of these plans for industrial preparedness, and therefore the government should immediately form a human maintenance department for this army.

HUMAN MAINTENANCE DEPARTMENT.

The human maintenance department in an industry must consist of the following:

1. A well-equipped doctor's office.
2. A medical and surgical staff, the size depending upon the number of employees.
3. A staff of industrial nurses to assist the doctors and to visit the sick employees.
4. A safety engineer or a safety committee from among the employees.
5. A connection with some good hospital for the care of the more serious cases.

The above are the essential requirements; many others may be added to facilitate the work.

The duties of the human maintenance department are as follows:

1. Supervision of the health of employees:
 - (a) The examination of all applicants for work.
 - (b) The periodical examination of all employees.
 - (c) Protection from contagious or infectious diseases among fellow employees.
 - (d) Protection from occupational disease.
 - (e) Protection from faulty working conditions.
 - (f) Protection from faulty living conditions.
2. Curative measures for sick employees:
 - (a) Either by the medical staff of the industry, or
 - (b) Supervision of the treatment rendered by the family physician.

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3. Care of the injured:

- (a) Immediate treatment of all injured employes, no matter how slight the injury.
- (b) Proper hospital arrangements for after-care of the seriously injured.

4. Prevention of accidents:

- (a) By safety appliances.
- (b) By co-operation between the surgeon and the engineer or safety committee.

In outline form, the above seems like a huge order, but a carefully prepared system a fairly small staff can accomplish this work, and the results obtained far more than compensate the maintenance of such a department.

HIGH STANDARDS OF HEALTH NECESSARY.

It is at once obvious that, during the war, at least, the government should be very vitally interested in maintaining as high a standard of health as possible among the industrial workers of the country, especially those connected with industries preparing supplies for the government. This same is true with all agricultural workers, and a similar plan could be extended to them.

In France and England, where the majority of the medical men have gone to the front, the medical care of the industrial workers at home, and of their families, has been greatly neglected. In France among their industrial armies has been an ever-present foe. At this time tuberculosis is making such inroads into the civilian population of France that soldiers must be recalled from the trenches. In the industries essential to the maintenance of the army to avoid this same calamity our government should adopt this system, which will give at all times proper medical and surgical care and proper supervision of health to the industrial workers of the country. Such a system, built up under proper Federal control, could be extended to the families of these workers, and, better yet, to the families of the soldiers who are away in the army. This would be much wiser than to allow these families to neglect their health because of financial inability to seek early medical counsel.

Many new recruits must be added to the industrial army to replace those employes who go to the front as soldiers. The medical examination of these recruits for work, before they are employed,

is just as important as the examination of the recruits for the military army. First, efficiency demands such an examination. By the old, haphazard method many a man, rejected for the army, will seek employment and will be placed at a job for which he is totally unfit physically, whereas, if he were examined for work, a proper position could be chosen for him where he would be an efficient employe, and which at the same time would not be detrimental to his health. Likewise, by this examination of applicants for work, many a man or woman having some organic disease totally unfitting him or her for work at the time will be discovered and proper medical treatment can be recommended and supervised, thus restoring the applicant to health instead of throwing him in the scrap heap prematurely. Best of all, applicants with some contagious or infectious disease, such as tuberculosis, would be prevented from spreading that disease among the old working force. All of these facts apply to the periodical medical examination of the old employes, as well as the applicants for work.

In fact, no better plan of disease prevention among the civil population during the period of war could be adopted by the government than this system of medical examination of the industrial workers, combined with a proper supervision of the medical care of the sick. Through the aid of the industrial visiting nurse and the other visiting nurse associations this supervision could be extended to the families of the workers and the families of the absent soldiers.

Many new industries are springing into being, due to the demands of war. Overcrowding of old plants and construction of new, temporary quarters are becoming necessary. New dyes, new chemicals are now being used. All of this demands proper medical supervision in order to protect the industrial army from sickness, injury, and especially new occupational diseases.

EASY TO OVERLOOK PREVENTION.

The question of prevention of accident and of proper care for the injured among the industrial workers of the country is of the greatest economic importance to the government at a time when able-bodied men are at a premium. In the rush for production it is easy to overlook prevention. If, in the effort to meet the demands of the government for war material, a few employes are killed or injured, it seems excusable—so many soldiers are being killed—but the industrial worker dies without the glory of death in battle; in fact, he is often censured for his carelessness, and especially for

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crippling the working force, if he be a valuable employee. Federal supervision of accident prevention and of proper care of injured would be a very farsighted policy during this "speeding up" supplies.

In many industries the immediate care, by a surgeon, of injured employees, no matter how slight the injury, has proved to be the greatest life-saving measure ever adopted. By this means infections and other complications following injuries have been avoided, permanent disability is lessened, and the time lost from work after accidents has been greatly reduced. This *immediate care* is the great Safety First movement for the injured. Naturally, the Safety First movement is the prevention of these accidents, and the safety engineer, or a committee on safety from among the employees, is indispensable. This engineer or committee should work in close conjunction with the industrial surgeon, for the latter has an insight into accident prevention that makes him a valuable asset in preventing accidents.

Federal control of all industrial medicine and surgery during the period of the war would mean a standardization of all methods of supervision of health and disease prevention, of all accident prevention, and of the best curative efforts for both the sick and the injured. Such standardization would give the maximum of results and would add impetus to the great wave of disease and accident prevention which is sweeping the country. After the war, the conservation of human life among industries would be an established fact. The educational propaganda, which must of necessity go hand-in-hand with this movement, would spread to the families of the employees, and every community would be immensely benefited.

There may be some legal handicaps to placing these maintenance departments in all industries at once, but in a crisis such as this the government could undoubtedly overcome these obstacles. Accident insurance companies, at first thought, may object to such a plan as a curtailment of their business, but because of fewer accidents and quicker curative results for the injured, these companies should be the staunchest supporters of such a system. There are millions of employees connected with industries that are actually working for the government at this time. As a war measure, to insure the health and safety of these employees, in order to keep production at the highest possible standard, the government could well insist upon medical and surgical supervision, similar to that which prevails in the military.

PLAN FOR STANDARDIZATION.

The standardization of the medical and surgical work and its supervision and enforcement could be accomplished by the following plan:

1. Establish a board of industrial medicine and surgery under federal control at once, consisting of

- (a) An industrial surgeon.
- (b) An industrial physician.
- (c) An accident-prevention engineer.

2. List all industries (and their locations), preparing materials of any kind for the government.

3. Commission a medical officer in each district to supervise medical and surgical work, and the accident and disease prevention work, in each industry listed in that locality.

4. Commission a staff of industrial physicians and surgeons, safety engineers and industrial nurses to take charge of this work in one or more of these industries, under the supervision of the above officers.

Many industries already have their medical and surgical staffs. Commission these as medical reserve officers and bring them under the same system of supervision.

By making these physicians reserve officers the question of compensation could well be left to the industries and the insurance companies. The expense of installing such a system would be more than compensated by the results obtained.

We boast that we are profiting in this country by the mistakes our allies have made in this war. One of their mistakes was their failure to provide for proper medical and surgical care of their civilian population during the war. Prevention of disease was evidently ignored. The same is true of prevention of accidents. In France it is estimated that there are half a million of wounded and disabled soldiers and half a million of tuberculosis patients at the present time. Without some form of health supervision the same conditions will soon exist in our own country.

With health supervision and the conservation of the limbs and lives of our great industrial army, and the supervision of their families which naturally follows, we have at hand the means of controlling disease, preventing epidemics, especially tuberculosis, which

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is so prevalent during a period of war, reducing the number of deaths and saving many lives of those who are injured.

A human maintenance department, therefore, for our army is a real economic need and would play an immediate role toward winning the war.

CHAIRMAN FARNUM: Those of us who are familiar with this work regret that Dr. Mock cannot be with us, but we admire him wherever he is, because he is one of the pioneers along these phases of this splendid work.

Miss Tarbell is not with us today, so I will turn the matter over to Vice Chairman W. L. Chandler of the Dodge Manufacturing Company of Indiana.

MR. CHANDLER IN THE CHAIR.

CHAIRMAN CHANDLER: Dr. Farnum had one motive in coming here to take the chair, that I act as referee during the reading of his paper.

THE IDEAL INDUSTRY FROM THE STANDPOINT OF HEALTH AND SAFETY.

DR. C. G. FARNUM, CHIEF SURGEON, THE AVERY COMPANY,
PEORIA, ILL.

Mr. Chairman and Members of the National Safety Council: An ideal, we are told, is that which is conceived or taken to be the highest type of excellence or ultimate object of attainment—it is not merely a thing that has been attained, but the best conceivable thing that could, by any possibility, be attained.

In the work of modern industry the accomplishments in the fields of health and safety have been so great, the strides so rapid, that the ideals of yesterday are the working plans of today and the ideals of today, which seem far away and visionary, will be reached tomorrow. Ideals are ever changing things, and, if we possess vision and imagination, no matter what our labors are or have been, no matter what our strivings or accomplishments, we never reach them. As we progress we find that our ideals are constantly changing, are advancing, are unceasingly beckoning us onward.

In days not very far removed, matters of a man's health and safety, of his education, his recreation, his personal habits,

and where he lived were considered his own particular business, and any interference with these was looked upon as interference with personal liberty and the rights of the individual. These ideas are based on such false and unfounded premises that they have no standing in the business or sanitary codes of today.

In order to produce a good article it is essential that one have good material—competition is keen, criticism is sharp, and the most must be made of the resources at hand. Our laboratories have reached a state of perfection where the ordinary materials used in production can be and have been standardized. The big problem now is not with inanimate material, but with human material.

An ideal must be based upon some sound fundamental principle and the principle upon which our ideal is founded is that of the value of the human being—a value above property, above institutions. The ideal industry must be one which gives much that it may receive much. Any industry may attain the degree of health and safety that it desires to have, or with which it is satisfied.

The activities that are to work toward ideal conditions as to health and safety shall radiate from and center about a chief executive, who should be an officer and director in the company, and the success of the movement will depend on his broadness of vision, his courage and his honesty of purpose. What the department is called and how the field is divided is immaterial. What it shall include in its activities is highly essential.

ACTIVITIES CLOSELY INTERWOVEN.

There must be the department of labor, which deals first with the human material; the department of medical supervision, which examines, classifies and assists in placing this material where it will be most useful and productive and looks after its repair when necessary; the safety department, which protects it from injury or destruction; and the welfare department, which looks after the general wellbeing of the human material while it is in the employ of the company. These may be subdivided or combined, but the field remains constant and the activities of the various phases of the work are so intimately and intricately interwoven that they absolutely cannot be separated, nor can any one of them be isolated or omitted.

The first branch of the department of labor is the one of employment. The applicants are interviewed personally and intimately as to the work they have done, what they wish or hope to do, and

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why. Their recommendations are examined and checked and they are sent to the foreman, who has with the employment man a requisition for such a workman as this man gives promise of making. Accurate records are kept so that, as vacancies occur, replacements may be justly made. The superintendent of employment must know men; he must be able to quickly and with true accuracy make fine distinctions between plodders and drones and between enthusiasts and mere babblers; between steady men and floaters. His technique is immaterial, but he must get results.

The head of the department of labor must be thoroughly familiar with the matter of hours and wage, of overtime and bonus, of working conditions and standards, and he must be keenly alert for the last word on scientific management. Here his work brings him into consultation with the plant superintendent, and their combined ideas must determine the general labor policy of the plant.

Another phase of the work of this department is the provision of work instructors, whose business shall be to teach the new employee how to do his work efficiently and safely. We hear much and read much data on what it costs to "hire and fire"—of the appalling waste of labor turnover. Efficient instruction in the work to be done promptly reduces this enormous waste by reducing the amount of spoiled material, damaged machines, accidents, and time lost in gaining efficiency.

The department of labor sees to it that new employees become familiar with the plant as a whole, with the finished product. The new man may be able to develop very little enthusiasm in the job of grinding castings or of packing boxes, but let him see the part this plays in the ultimate result; make him familiar with the part he takes in production, and it dignifies his job and thereby steadies labor.

MEDICAL SUPERVISION ENDLESS IN SCOPE.

The department of medical supervision in the ideal industry is one of endless scope. It begins with the applicant for work who is given a complete physical examination by the chief surgeon and assistants—not a mere inspection but a thorough and painstaking examination, such as would be made by a careful diagnostician in his offices or in a hospital. This examination often brings out many unsuspected things, and it is upon these physical findings that the final decision is made as to the work that the man is to do, for the proper making of the man and the job is one of our highest duties.

FEW PHYSICALLY PERFECT MEN.

The number of physically perfect men is so few that the vast majority of the world's work must be done by those with varying grades of physical defects. How important, then, that an employe shall have work that is compatible with his condition in order that the ability he possesses may be conserved and his days of productivity lengthened.

The result of the examination is then communicated to workmen verbally or by letter, or both, for improvement can only come through the co-operative efforts of the doctor and the man. Re-examinations are made periodically of all the men in the plant and very frequently in the case of the defectives. It is positively exhilarating to see the enthusiasm and conscientiousness with which men follow up the suggestions given them on the basis of these examinations. It means much to them to know that some one is watching out for them and caring for their physical interests. They appreciate and co-operate.

Formerly much was said on the subject of rejections, and from certain quarters opposition to this work rose on that ground. That is a thing of the past. The question of rejections does not exist in the minds of those who think, for the industrial physician and his associates do not start out with the idea of whether or not the applicant shall be given work, but his dominating idea is: What job in this plant is best suited to this man's condition from a standpoint of health, safety and efficiency?

It is true that men with active tuberculosis, malignant syphilis, scarlet fever or smallpox cannot be put to work, but they are not material on the labor market. They are public menaces. They do not belong in industry. Their place is in an isolation hospital. We believe that practically every man is capable of doing some work and of doing that work safely and well, and the task we face is to get that man and that job together.

We are continually asked what we do about men with one arm or one leg, with bad vision or defective hearing, with those who have hernia or Bright's disease, or high blood pressure or heart disease, or any other of the thousand and one defects that American workmen possess. What *do* we do? Why, we put them to work, *but* we put them at work compatible with their condition and get busy on the improvement of that condition. Jobs in a plant should be analyzed and classified from this point of view and then if a man happens to possess but one leg, put him at a one-legged job. To reiterate: Get

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the man and the job together. Some of us have statistics of several years showing that under this system the worse the defect, the less the accident incidence. Is that paradoxical or not. It is the proof of our contention. Moreover, these same statistics show that labor turnover is inversely to the physical defect of the laborer. The reason and the remedy are apparent.

INFLUENCE ON THE HABITS OF MEN.

By no means the least of the values attached to this work is the influence it has on the habits of the men. If the matter of teeth is followed up it brings general cleanliness. The question of food or of exercise lead to better health; of sleep or exposure to better habits until, gaining power with their own momentum, habits of betterment make for a clean shop and healthier men. Even the question of booze—the biggest habit problem in industry—is rapidly disappearing, and, regardless of legislation, soon cease to be an economic problem.

In the ideal industry the department of medical supervision not only cares for the injured promptly and efficiently in a properly equipped dispensary or hospital, but assumes the complete medical, surgical and dental care and treatment of all sick employees. The physicians of the department visit them in their homes or in the hospitals. The nurses of the department contribute their share in the medical, surgical, dental and educational work in the plant and in the homes, and less lost time, lower labor turnover and healthier and more efficient employees are the result.

Occupational diseases are combated constantly, whether the glaring and easily recognized ones or the more insidious ones creep upon a man slowly and gradually. The re-examination ferrets these out, and if preventive measures fail, the man is transferred to different work. General plant sanitation in all its phases come under the department of medical supervision, and light, ventilation, water supply, washrooms, toilets, etc., must all have their proper attention.

A very prominent factor in the education of the men and the enlistment of their co-operation along these lines is the health bulletins, which are issued regularly, written in the language of a layman, upon various topics of health, sanitation and right living. These have a wide range of value, and are found to be carefully studied and greatly appreciated, not only by the workmen themselves but in their homes among their wives and children.

Verily, the work of the company doctor in these times is a man's job, and no physician's training and no physician's skill is too good for this work. He must not only know medicine and surgery, prophylaxis and sanitation, but he must know men and recognize their worth, and, above all, he must recognize the delicate and intricate manner in which his work is interwoven with that of labor, safety and welfare, and how much will be destroyed if any attempt is made to separate any one of them.

BUSINESS AND HUMANITY WORK TOGETHER.

Industrial medicine must be preventive for the masses, not merely curative for the individual.

When one thinks of the astonishing rapidity with which the safety movement has grown from a few isolated individual efforts to its present international size and importance, one is impressed with the fact that here at least we have the unusual sight of business and humanity working hand in hand for the common good of labor and capital on common ground, with aims and ideals the same. Is it any wonder that it has grown? Is it strange that the ideals of yesterday are obsolete tomorrow and that our dreams of tonight will be found realized when we waken? As one of the old safety inspectors put it: "You go to bed tonight with a lot of fine ideas of what you are going to do next week and wake up tomorrow to find that some gink did it yesterday."

The ideal plant has a very definite accident and fire prevention organization. This consists of a safety engineer, his varied grades of inspectors, designers and workmen; general and department committees, and fire, police and watchman departments. Under the direction of these safeguards are made and installed; inspections of machines, apparatus, buildings and conditions are made; safety meetings are held; accidents and near accidents are analyzed; and preventive measures considered and installed, and general police and watchman duties performed.

Safety is not merely mechanical or legislative. Both may contribute their part, but there are other vital essentials. It is variously estimated that mechanical safeguards are responsible for from 25 per cent to 30 per cent of accident reductions. The other elements that make up the remaining large percentage are: First, safe men, properly inspected and properly fitted to their work; and, second, the education and co-operation of these men. This, then, is the big job of the safety department.

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Education takes time, and co-operation comes after effort. There is tradition to be gotten rid of, suspicion to be cleared, interest to be awakened and enthusiasm to be developed. It is a task that calls for all a man has of tact and skill, of patience and fortitude. It calls for brains; it calls for courage; but most of all it calls for heart. This is the essence of humanitarianism, worthy of any effort necessary for its highest attainment. No department is or can be self-sufficient. Here, of all places, combined resources be brought into play. The ideas of no one or of one plant are enough. The combined experience of the members of the National Safety Council must be utilized, and in each own plant the policy of the labor department must be for the employment man must talk it; the medical department teach it; the welfare department preach it; and the safety department itself live it constantly.

BACILLUS HUMANITARICUS.

First, the man higher up—the officers, the directors, the superintendent, the foreman and the sub-foreman—must be inoculated with this germ of safety, which we might call the *bacillus humanitaricus*. Then, and only then, may we expect it to become epidemic among the workmen throughout the plant.

When accidents are analyzed and workmen consulted and remedies are offered, the workman's suggestions are secure when his interest in this is awakened you have not only made a worker, you have also made a teacher. Department committees made up largely of such men and should be changed frequently.

A suggestion department supplies a constant stream of ideas, the values of which no man can estimate. Some of the things in safety have come from workmen, and until their enthusiastic and whole-hearted co-operation is established no industry can expect to have really more than a start toward ideal safety. Safety devices are utilized, both those of the National Safety Council and local devices based on local safety conditions and accidents, for when accidents do occur they must be capitalized and none of their teaching value lost.

Production, which in the old days was paramount, must now share its place with protection. By this production is not detracted but elevated to a higher level when protection is enthroned beside it. Of late, in the industrial world, the center of gravity has shifted. The dividend is still a weighty matter, but more and more...

is being paid to those things formerly considered not to be distinctly profit-producing. The richness of human life is being considered above the richness of human purse. Welfare work is not new. In isolated places it has been developed, and to a very high degree, for a number of years, but as a movement that possessed any breadth of scope it is a modern idea. It has now become such a fundamental part of all business that it is not a question of whether we have it but of how much we can get and how quickly. Its growth has been phenomenal and its value inestimable, but in order that it shall obtain the highest degree of perfection its channels of growth must be kept idealistic rather than materialistic.

I have often wondered if its growth can be indefinitely prolonged. In nature we have the periods of growth, development, decadence and death. May we hope that this work will escape this law of nature. The question is unsettled, but one thing is certain: This or any other movement can escape the decadent process only so long as a distinctly upward growth continues. There seems to be no state of lasting equilibrium.

HONESTY AND JUSTICE.

Just how work shall be divided to produce the ideal conditions, is not essential; whether lighting, ventilation, lockers, washrooms, etc., shall be under the sub-head of medical supervision, of safety, or welfare, does not matter. In fact, as I have said before, these works so overlap and are so interwoven that only by going hand in hand can they produce the greatest good. The fundamental principle upon which they are based must be honesty and justice, and any system based on any other foundation will surely fail. One of the broadest and most fertile fields is that of education. The range of this field is without boundaries.

It may be the simple matter of the education of the foreigner, or it may be the technical one of the young man in the industries. It may be the continuation of the common school work with the boys and girls who, by circumstances, have been lifted out of school and thrown on the labor market. Or it may be the domestic education of girls and women, or it may mean the direct training of men for given work. Whatever the character of the educational work may be, the value is so great and its possibilities for good so limitless that if our welfare department did nothing else, they would here find ample justification for their existence.

Another of the important activities of the welfare department

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in the ideal industry is the employees' benefit association. The of organization, the breadth of scope and the plan of condition are still an open question, but they are actual necessities. They exist, and the welfare department is the proper place for their tion; and later for their encouragement and actual supervision maintenance. The welfare department supervises lunchroom restrooms, social activities and recreation and the æsthetic s industrial life with all their multitudinous activities.

One of the big problems of the welfare department is t homes and housing—a problem that offers a field, the surf which as yet has been barely scratched, yet one which, under cultivation, will bear abundant fruit. We are keenly cogniz what developments here will do toward the solution of many o hardest problems.

MEN BEHIND THE WORK.

Do not imagine that the installation and development of work as I have here briefly outlined will give you an ideal It alone will not. The really colossal thing in all this work : men behind the work; the chief executive, the labor head, the surgeon, the safety engineer and the welfare superintendent m of the highest type and of the finest training. The spirit of hum must possess their souls, and the love of humanity must be religion. They must be idealists, men of vision, if we are to life out of the commonplace and make tomorrow better than t They must be men whose life is an inspiration and whose me will be a benediction. Without such men your work will be naught. With them all things are yours.

DISCUSSION

CHAIRMAN CHANDLER: Ten minutes is allotted for the di sion of each of the papers, and as this is the first one to be the Section will be pleased to hear from the members.

MISS NORRIS (Manager, Service Department, Connecticut I Company): I would like to ask how the doctor gets his health letins in different languages?

CHAIRMAN CHANDLER: I will ask the doctor to answer tha

MISS NORRIS: I would like to make one other suggestion. two years I was welfare manager of the Curtis company an found our employes objected to the word "welfare," so I worked in my own way a service department

medical, employment and social service—and the social service covers that end of it known as “welfare.” I eliminated the word which was so objectionable to the employees.

MR. ARTHUR T. MOREY: The word “welfare” has been long used. A certain amount of fraternalization has been attached to that word and we found the same objection to it that Miss Norris has, so we use the word “fellowship.” We call our department “The Safety and Fellowship League.” The word “fellowship” seems to have a little more warmth and meaning to it than the word “welfare.”

POISONOUS OR CONTAMINATED ARTICLES.

DR. H. J. BLUMENSOHN (Health Department of the City of New York): I would like to call your attention to the relation of industrial hygiene to the general public. You can see, in the transportation, storage and manufacturing of articles, on the ships, on the piers, in the warehouses and in the storerooms of factories, that poisonous or contaminated articles—for instance, like hides—have been exposed to anthrax infection and are not kept separate from the finished products. That is one thing that leads to the spread of disease or the spread of poisons to the public. Another is the lack of proper facilities, like washing and drinking and so on.

To illustrate: On the ship, you will find poisonous or infected hides right next to dried beef—in wrappers which are often torn. A piece of dried beef is put on our table. It has not been cooked before, say, smoked beef. One of us gets an attack of gastritis, but the doctor diagnoses it as ptomaine poisoning. There might just as well have been a little arsenic on the cells of our meat, and one of us got it and the other did not. The meat has not been analyzed. No test has been made of the people who had the trouble to see whether one had more resistance than the other. If the test had been made the chances are that you could not have proved anything. I suspect, in many of these cases, some poisonous substances have gotten onto a product.

The same thing occurs on a pier. The longshoreman one minute will handle arsenic or some other deadly poison and the next minute, without washing his hands, he will handle a piece of meat or some dates. These we eat without investigation. The result is the same as before. Very often, on a pier, for instance, there will be one washroom for some 2,000 men.

A lady will buy a pocketbook in a store. She may get anthrax,

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perhaps the only one to contract the disease. Well, that po had been kept with some infected hides in a storeroom. Th we can trace in a great many cases.

About a year or two ago a prominent health official w article for a newspaper showing that it was impossible for a contract anthrax from a piece of sable fur, because sables do anthrax. He did not know the situation, or did not think the time, perhaps, but sable furs may be placed right next to skins, or something like that, on the piers.

CHAIRMAN CHANDLER: Just a moment, please. I am g ask Dr. Farnum to answer the question, "Where do you sec translations for your home-made bulletins?"

MISS NORRIS: He said that he had health bulletins in languages.

DR. C. G. FARNUM: We can discuss that when we cl paper.

PHYSICAL EXAMINATION OF EMPLOYES.

DR. HARPSTER (Chief Surgeon Toledo Railways and Light pany, Toledo): I want to commend the excellent paper the Ch of this Section has read. It impressed me when he said th *bacillus humanitaricus* must be neatly installed in the executi a lot of corporations. It is my privilege to be the chief surgeon extensive corporation, operating many interurban railways, e light plants, power plants, heating plants and so forth, and on t of February of this year, under separate departments, we ha into effect a physical examination of all our employees, the wo ing in charge of examiners. We also use nurses in our work. are considering the question of emergency hospitals and so on

The point that the doctor made; that a poor physical exami is worse than useless, is an excellent one. We have a false ser security engendered unless a very careful physical examinatio made. Now, as to rejection: I was glad of the nice way in the doctor settled this important point—that is, the rejection c applicant for a position. Many times these men fear—and ; so—that they will be rejected. It has been our policy not to a man unless he has a very serious contagious disease or some serious defect that would impair him from any line of labor we are able to give him.

Regarding the establishment of the emergency hospital. I

every morning and they send to us the men requiring a surgeon's attention.

Another point: The highest type of industrial surgeon must be employed if his work is to be a success. The old idea that a railroad gave its surgeon a pass as compensation and that other corporations gave their surgeons rain checks, must be done away with. The surgeon must have some real money with which to carry on his work and his compensation should be on the same plane as that of the highly paid attorneys. Corporations pay attorneys \$25,000 to \$100,000 a year and never wink an eyelash, while, in the past, what they have given their surgeons has been equivalent to a pass or a rain check. Gentlemen, I thank you for your attention.

TRANSLATIONS OF BULLETINS.

MR. EDWIN R. WRIGHT (Editor, the National Safety Council): In reply to a question asked a few moments ago, I would like to say that I can put General Manager Cameron's bulletins into seventeen languages. That will be sufficient, I believe, to meet any demand. We had an inquiry the other day for translations into Croatian, Servian; Italian, Swedish and Maltese. I could not get a translation into Maltese. As near as I can understand, the Maltese language is something like Yiddish; it is a mixture of other languages, principally, I believe, Italian. If any one wants translations into any one of a dozen or more languages they can secure this service through General Manager Cameron.

CHAIRMAN CHANDLER: Translations are not always accurate. Some safety work was printed recently in Flemish for the benefit of the Belgians. One man—he was not labeled as some danger signs are, to tell you what a thing is supposed to be—said he would like to know what it was. He said he had asked a Belgian and he could not read it. He asked a Hungarian as to another notice, but he could not read it. The safety engineer was shooting over the heads of his men.

MR. S. W. ASHE (General Electric Company): I would like to ask Dr. Farnum if, in his medical examinations, he has any difficulty in detecting cases of tuberculosis. I find it is fairly easy for the average surgeon to detect hernia or heart trouble, but when it comes to tuberculosis our people seem to have more difficulty. Are there any extra precautions to be taken? For instance, last year we had three cases of tuberculosis that had passed our medical examination during a period of three months.

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MR. N. B. DAVIS (Asbestos Protected Metal Company) : like to ask if the doctor includes in what might be called a medical examination blood pressure, pulse rate and all the things that go into a medical examination for life insurance companies, or is it an examination which is somewhat less complete.

CHAIRMAN CHANDLER: The doctor is making notes of questions. He will cover them at one time.

EDUCATION OF WORKERS.

DR. J. W. SCHERESCHEWSKY: As long as the question of circulation of health bulletins and so forth has been brought before Section I want to emphasize that, at the present time, we can direct our efforts toward the education of workers—that the circulation of such bulletins into foreign languages should not be necessary. At our present stage of national history, if there ever comes a time when we should endeavor to cause English to be spoken by workers, we should institute educational measures in the English language, now is the time. When we consider educational measures among workers we ought not to give them the opportunity for maintaining their native speech but make them understand that the time for them to become true American citizens and to speak the language of this country.

MR. W. ERNEST WILLIAMS (Packard Motor Company) : I like to ask Dr. Farnum if he has run across cases where men in a shop were suffering from hernia, and if so has he put them to work on the molding floor or some easier work? It is a case of trying to put a round peg into a square hole, or a square peg into a round hole. We have tried to do that very thing and in the *modus operandi* we used they could not earn as much on the bench as on the molding floor and they would prefer to quit their jobs and go elsewhere.

MR. S. W. TENER (American Steel and Wire Company, Lorain, Ohio) : I wish to indorse what Dr. Schereschewsky said about confining our work to the English language. At one time I put out a little book in thirteen languages and I thought Slavish was good for all the Slavonians. An incipient strike occurred at one of our plants because we omitted a certain language, or rather, a certain nationality poked fun at a certain representative of a South European nation—if you can call it a nation—because we had not recognized them. They said: "Why, the company did not think of putting your language in the book." For that and other

sons it is best to confine our work to English, and we have pretty well abandoned the idea of using any other language.

CHAIRMAN CHANDLER: Perhaps some one can tell of the work that is being done on the lines of Americanization—not the work that is being done so much as the source of information. I do not know but there may be doctors in the audience who might be interested in tackling a job of that kind and we may secure very valuable assistance for our committee.

ACCIDENTS TO ILLITERATES.

DR. WINTHROP TALBOT (Bureau of Emigration, New York State Industrial Commission): The United States Bureau of Education will shortly publish a bulletin giving names of text books available for teaching foreigners English. I compiled a bulletin on this subject last spring. The Bureau of Emigration of New York, through Miss Marion Clark, has instituted a number of investigations during the past year, regarding the relationship of a knowledge of English and illiteracy to accidents. Her figures will be presented at the meeting of the New York Manufacturers' Association in December. They go so far as to show that the number of accidents reported for compensation in the State of New York is very much larger among illiterates and the non-English speaking foreigners than among those who speak the English language. As far as we have gone at the present time it seems that the question of foreign languages is very intimately bound up with the question of occurrence of accidents, and, for that reason, during the last year there has been a great effort made by the Department of Education, the Bureau of Education at Washington and by the State Industrial Commissions here and in other states, not so much to promote the night school as to promote the establishment of classes for teaching English in the works. These classes are related, in every instance, to the public school system. The bulletin on adult illiteracy, published last spring by the United States Bureau of Education, will be of interest to those who are studying this subject.

During the next year there will be an opportunity for any one who is interested in teaching English to foreigners to get such information as they may desire from the Bureau of Emigration of the United States Industrial Commission.

MR. ROBERT A. SHAW (Safety Engineer, Ford Motor Company, Detroit): A few years ago our problem in Detroit was to issue a bulletin in forty-two different languages. We had the problem of

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forty-two different nationalities and the first thing that we was that we would use only the English language. Every sign danger sign or instruction notice was put into English and the first thing we had to do was to start an English school. I am so glad a man is not here to tell you all about it. At the present time we have a large enrollment. Our men work eight hours, but they come to the school after work. Some of them work from 12 o'clock to 8 o'clock, as the plant works twenty-four hours a day. They use their time, one hour after their work of eight hours, to go to school and I am sure it is working out very satisfactorily. We have solved a big problem in regard to our safety work. One of them has a diploma and the other day he was approached by a man who said: "I will give you \$25 for that." The fellow shook his head. He said "I will give you \$100." He shook his head. The price was raised to \$125, but the man would not part with it. This shows that the foreigner appreciates his diploma after he has won it.

TRUSSES SOLD AT COST.

MR. CARL SMITH: I want to answer the gentleman's inquiry regarding the molder preferring to take a position other than as a molder. It is natural that a man who serves an apprenticeship of four or five years as a molder would put up some little concern about taking a position as a coremaker or chipper or something of that sort that he is not competent to do. The chief physician has stated this to be so and the thing we have to do, as Dr. Farnum stated, is to remedy the condition. To meet this condition we have in stock in our dispensary quite a number of trusses with which the men are fitted and which are sold to them at cost price. These men go back to work temporarily and our chief physician interviews them as Dr. Farnum stated, at the next examination. If the men agree we arrange for an operation which will remedy this condition, and it can be well taken care of in perhaps six or seven weeks. That takes care of the hernia question. I do not believe there is any concern in an industry that obviates more likelihood of rejections than one condition if physicians reject men for that cause.

In regard to the teaching of English to foreigners, I would like to say that I have personally taught English to foreigners in the plant. The first year we did this work ourselves. The second year Mr. Morey, our general manager, interested the various industries in our community in a co-operative scheme and a committee was

They established free schools in the various settlements—the idea being that it was hard for the foreigner to go to the factory, perhaps quite a distance from his home on cold, rainy nights, but he would go if the school was adjacent to the particular territory wherein he lived.

So they established various schools in the community on a pro rata basis, that is, each company carried the expense and prorated it to the number of men employed in that particular institution. It has worked out very well. We do not need any foreign signs in our plant because it is not necessary. If a man, a foreigner, comes to work there we expect him to learn English. From a safety standpoint he must learn it. It is no use to him to put up bulletins in a foreign language but you can have the preacher of his church speak to him in his own language.

COST OF OPERATION FOR HERNIA.

CHAIRMAN CHANDLER: Who pays the cost of the operation for hernia?

MR. CARL SMITH: The man himself usually is very glad to pay the cost of operation. Our chief surgeon donates his services. The only costs the workman has to pay are the hospital expenses, perhaps \$10 a week for six or seven weeks. If he is so fixed that he cannot pay for the cost, we will arrange a loan whereby he can pay it in monthly installments of \$5 a month or so.

MR. R. G. WILLIAMS (Worcester): I want to thank Dr. Farnum for the very clear way in which he has handled this problem and emphasized the value of medical supervision. Dr. Irving Clark has gone to France to make a detailed study of what they are able to accomplish in the way of providing work for the men who are seriously injured. When he comes back he will be in a position to supply not only to our industry but to other industries expert advice as to just what to do with men who are not physically normal.

In the whole question of medical supervision, particularly in connection with the United States Public Health Service, we must look to careful investigation as being a means of solving the question of health insurance. Without any question the next big legislative problem with which we must deal is that of health insurance and the industrial physicians hold the key to the situation.

MISS ELIZABETH M. BURNS (The J. H. Ladew Co.): May I ask Dr. Farnum how many physicians make physical examinations and find incipient tuberculosis or early kidney conditions? Does he refer

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such men back to his own physician or do the men get treatment side of working hours?

CHAIRMAN CHANDLER: The doctor has made a note of this question. Any further questions or discussion on this subject?

MR. G. G. EVANS (The Brier Hill Steel Company, Youngstown, Ohio): This question may have been asked before I came in this room. I represent a company that does not have a physical examination of employees. In these days, when men are so badly needed, are frequently told that there is a letting down of the bars at steel plants in order to get a sufficient number of workmen. I would like to know, since I am urging the necessity of a physical examination of the plant which I represent, to what extent this is true or is it true at all?

CHAIRMAN CHANDLER: I believe that is quite a timely question. I do not know whether anybody wants to say what they think about it or not.

Another point that might possibly be discussed is the attitude of the man who now applies for a job. The chances are ten to one that he is the professional type of floater. What is his attitude toward medical examination?

LETTING DOWN THE BARS.

MR. WILLIAMS: Before you get past the question of letting down the bars, there is another phase to the question which must be brought into consideration: Our industrial physicians are becoming more and more educated every day and they are finding that men whom they thought it was necessary to bar can be used, provided the industrial physician can have the proper supervising of that man while he is on the job. In other words, I know a company where certain degrees of handicap were enough to absolutely bar a man. A man is now taken on, without report, who has such a complaint, and he is really less of an accident hazard than a man who is apparently normal.

DR. H. P. HOURIGAN (The Larkin Company, Buffalo): I very much and I thoroughly appreciate Dr. Farnum's paper. We expect good things from him and we always get them. I think if examinations are made of men, the idea of ultimately improving the physical makeup of the men and not for his rejection from a job and your industry establishing a reputation for caring for your men physically and doing what it takes to help them after that examination, you won't have to let down the bars on any examination. We do not let them down and we have no trouble in getting labor.

CHAIRMAN CHANDLER: Any one else? Dr. Farnum, we will listen to your answers to the questions that have been propounded.

DOCTOR FARNUM: Some one asked about translations of bulletins into foreign languages. I think I must have articulated badly and was misunderstood. I said these were written in the language of the layman. We have quite a joke about our plant concerning the language of a layman. It is not an easy matter to write stuff in this language. I have been writing and editing bulletins for the National Safety Council and when I get one of them done and then look it over and remember that there are from 3,500,000 men to 4,500,000 men to whom they go, I assure you I wondered many, many times if I had it in such shape that it could possibly be comprehended when read.

SHOP TALK.

That brings up the matter of shop talk. At our plant we do not believe much in the education of our men *en masse*. We believe in direct contact with the individuals. You can educate men if you talk to them in groups, but if you are going to get down to brass tacks you have got to get across a table with him—sometimes it is fortunate that the table is there.

Did you ever stop and think why it is that men do not understand what you are talking about? Did you ever stop and think why it is that men swear? It is because they have so few adjectives. Did you ever stop and think, in the language of the rough molder, what a convenience the word "damn" is? I have tried to figure this out philologically, and it seems to me that the word "damn" is worth thirty adjectives to any one.

After living and working for a number of years among a bunch of men of this sort I assure you there is no such thing as profanity. Think that out. Those men are not profane. They use expletives it is true—wonderful expletives, many-sided expletives, expletives that are capable of the most intricate and remarkable twisting—but I never talk with a man and have the remotest difficulty in understanding what he is saying. I have learned a lesson and try to fix it so that when I talk to him there is not any question about his knowing what I am talking about.

The consequence is that we do not have any difficulty. There is none of the circumlocution of diplomacy about what we say and consequently it does not take long. Consequently, likewise, I am very familiar with shop talk, and it is a mighty valuable thing to be

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familiar with. That same word "damn" that I spoke of while ago is capable of most remarkable modification—i anything. Of course, you have to modify that word "da eral times, but a man must understand what you are talking and you must talk to him as an individual. At one time I ta ministerial association on this subject, and feeling that I w over their heads, I talked shop talk. It was the most human that I have ever experienced, I think, and I had some fun i

Mr. Ashe, I believe, asked: "Did you find tuberculosis course we did. If we did not, we would not hold our job, tuberculosis is there. We also found poliomyelitis, and v insular sclerosis once in a while.

CHAIRMAN CHANDLER: This is shop talk?

DR. FARNUM: This is also shop talk.

MR. ASHE: I do not think I made myself clear. I wante out whether you had any great difficulty in locating tubercu

DR. FARNUM: The only remedy is in having a man on the knows these things when he runs into them, and in his givi individual case the amount of time it honestly deserves. \ these examinations, as a careful diagnostician should, in tl or in a hospital. I mean that, literally.

CHARACTER OF EXAMINATIONS.

Some one else asked about the character of the examin whether or not it was as good an examination as a life in company gives. If I did not make a better physical examin every man that came into my plant than the average old line surance company makes of their applicants I would drop the tomorrow. We go farther than the average life insurance co cares to go. That is because life insurance companies are ju far behind the times, but they are coming to it. I had a rather altercation some time ago with the medical director of a ver life insurance company in which I criticized his examination I said to him: "Here is a chart, what do you think of it? looked it over and said, "Why in the world would any fool thing like this?" I said: "Because he is fool enough."

It is true, on our chart are 114 items. That sounds like a s dous job, and it is a stupendous job, but the working of this s thing does not make a clerk out of the doctor. It is not nec that a doctor should out his time

of somebody else's at one-tenth the remuneration, in taking height and weight and certain things of these men.

The items are very carefully segregated. It will take at least four really efficient assistants to keep one up-to-the-minute physician going in physical examination. If you do not have proper assistance you are wasting a lot of valuable time for somebody, mostly yourself.

WHAT WILL HE DO WITH IT?

To come back to our question of tuberculosis. We find tuberculosis. What do we do with it after we find it? Tuberculosis is one of our big problems and I suppose every organization has its own method of handling this particular subject. In our incipient cases we handle them in exactly the same manner that we handle a patient that comes to our office, except that we have one huge advantage. If a man comes to your office and says: "I am the teller in the Commercial-German National Bank," and you find he has incipient tuberculosis you have to take him out of the job, but if a man comes to you in your plant and has incipient tuberculosis you have from one thousand to a great many thousand places where you can put him and let him go on safely and well, because that incipient man is not a menace to his fellows. With advanced cases the problem is just the same, with the added advantage of having a big organization back of you to help that man.

Let me cite you an incident. When our physical examination was first instituted we found that a man who had worked thirty-six years for our corporation had incipient tuberculosis. We followed the case carefully and he did not do well. It is an easy thing to follow industrial matters because you have so many advantages that you do not have in ordinary medicine. In ordinary medicine you depend on your patient to come back when you ask him to. In industrial medicine you send for him when you want him and he comes. This man was sent to a sanitarium and he stayed there nearly eight months, because it was necessary. Then he returned and went back to work, well. That is your answer.

The next question was in relation to physical defects; what are we to do with them?

Mr. Tener asked regarding heart cases and Mr. Williams, I believe, about hernia. Well, here you are! You have the jobs in your plants, you classify them; it becomes simply a matter of routine treatment of a given type of heart case and hunting up a place in

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your shop to see if you can put the man there. If you can place you are in the same position you are when a big, husky comes in and says: "I am a molder," and asks for a job. you are sorry you have not a job for him. With hernia same is true. Mr. Hinkley asked me just now if we encountered any difficulty in certain physical examinations. I remember distinctly that we had a few objections. I will admit that were starting a system of physical examination of employees be wise to start it rather discreetly. If you are going to station throughout the plant it becomes a question of who is to first. Let me cite you an instance:

EXAMINED THE PRESIDENT.

We planned to begin our work of physical examination on Monday morning, so on Sunday I went to the plant to be sure the thing was in working order. It was not very easy, because I knew much about it then. A very large man came in, who had to be the president of the company. He said: "What are you here today?" I said "Getting ready for tomorrow."

"What are you going to do tomorrow?"

"Start examining every one of our men."

"What are you going to do that for?"

We told him and he said: "Do you think that it is a good thing to examine these fellows?"

I said: "Don't you?"

"I think we will find out before you are through," he said. He began taking off his clothes. That little act of the president of the company was a blacksmith's helper in the shop a number of years ago. But it is not really difficult. The amount of work that one has is infinitesimal, but I grant you it requires a little tact.

The matter of referring cases was brought out. Just at present we do this: A man comes in with chronic Bright's disease or one of our youngsters with blood pressure that is up a bit. We make a microscopic examination of the urine, which is routine, of course, and discover the complaint. We call the fellow in and say "Jim, you have got something here," and he asks: "What is it?"

Then you sit down and tell him and you go over the matter of his habits. You go over his diet, his exercise, his

source, hunting the focus of infection. You always find it if you hunt long enough, because it is there.

Then you say: "Now, here is the situation. You need certain things done to you by a dentist or a nose and throat man or you need your tonsils removed." You refer him just exactly as you do in your own office.

If it is an incipient Bright's case you send him to his physician, and here is the biggest value that can come from the system as it now exists. The physician he goes to, knows someone is checking him up.

I remember sending Jimmy to Dr. Jones. He looked Jimmy over, in a cursory way, and I asked him when he came back: "How did he examine you?" "Well, he examined me, doctor, by looking at me, and he gave me a few pills." "What did he give you in the line of advice about your tonsils or teeth or in the line of diet and a regimen?" I asked. "I don't know what that means, but I didn't get it," said Jimmy.

WHEN THE DOCTOR SLIPS.

I called Dr. Jones on the telephone and said: "Here Bill, you are slipping! What is the matter? I sent young Jimmie So-and-so down to you and he came back here with a few pills. I told him to throw them in the river. If the river is too far away he need not bother about going."

The doctor mighty soon knows that someone is checking him up and you can take it from me that there are a number of physicians in our city who will give my cases—our boys—a lot more consideration and a lot more time and study than those boys would otherwise receive.

About letting down of the bars—that, I think, has been satisfactorily answered. There is one other matter, and that is a question of the amount of authority that the physician should have in the plant. Our good friend, Ralph Richards, whom everybody loves whether they know him or not, is always talking about the education of the bosses. That is all right and no doubt in places it is necessary. My boss is educating me all the time and I rarely get to the point where I can educate him. The consequence is that when your chief executive (my chief executive happens to be your Secretary) really understands the work of the National Safety Council, the physician is not going to have any difficulty. When you coalesce the labor side of employment, the safety side, the welfare

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side and medical supervision, there cannot be any question of one trying to keep off by himself.

The physician must have authority. It is a question, not of authority; but of consultation between the safety man, the management man, welfare department and the doctor all the time. It is not a question of one man's authority or one man's object, but a question of the combination.

CHAIRMAN CHANDLER: Dr. Farnum, please resume the

DR. FARNUM IN THE CHAIR.

CHAIRMAN FARNUM: I am especially sorry that Miss Tarbell is not here to deliver her very wonderful paper. She assured me she would be here, and I am confident that something unforeseen prevented her appearance.

I have just received the following telegram:

"Mrs. Florence Kelly will not be at your meeting this afternoon. She has been called away from the city and desires you to accept her apologies to the audience."

I regret this especially, since this is our first meeting. Mrs. Kelly's work, as you know, is very wonderful, and we all know that Miss Tarbell is the greatest living woman journalist.

There being no further business, the Section stands adjourned.

THURSDAY AFTERNOON SESSION

MEETING called to order at 2 o'clock, Dr. C. G. Farnum in the chair.

CHAIRMAN FARNUM: One rather interesting thing developed in the first session of the Health Service Section—the matter of turnover among women. Yesterday Mrs. Kelly and Miss Tarbell failed us. Today, I have a telegram from Dr. Alice Hamilton stating that she will not be able to attend this meeting, although she will forward her paper. Next year we are going to have someone write a paper upon "Labor Turnover in Programs."

I have one fine thing in store for you tomorrow that you do not know about. One of our most distinguished workers was on his vacation, and because of his conscientiousness, Dr. Sherrill, our Chairman of the Program Committee, did not put down the name of Dr. C. A. Lauffer of the Westinghouse Electric

for a paper upon "Artificial Respiration and Resuscitation." I do not know anything about the paper, I have not read it, but if it contains the ideas of Dr. Lauffer I assure you it will be a classic because Dr. Lauffer is one of the best posted men in America on this subject. I am very happy to tell you we are going to have such a paper tomorrow.

Members are urged to visit the National Exposition of Safety and Sanitation; it will be found very interesting and instructive.

Our meeting tomorrow afternoon will be held in the ballroom on the first floor. Several Sections have altered their programs to permit their members to attend the meeting of this Section and I am confident we will fill the large room down stairs.

The first paper this afternoon is on "Health Instruction" and is written by Dr. C. E. Ford, Chief Surgeon of the General Chemical Company, New York City. Dr. Ford is not able to be with us, but has arranged that his paper shall be read by Mr. J. R. de la Torre Bueno.

MR. J. R. de la TORRE BUENO: I should like to say Dr. Ford was called to Cleveland to look into the question of employment of women in the chemical industry and asked me to express his regrets.

HEALTH INSTRUCTION.

C. E. FORD, M. D., CHIEF SURGEON, GENERAL CHEMICAL COMPANY,
NEW YORK CITY.

Mr. Chairman and Members of the National Safety Council: The subject of health instruction is so comprehensive in its detail as not to permit of more than general discussion. I shall not attempt to promulgate a set of specific rules for disease prevention, as volumes have and will be published on the subject, but to my mind the method of presentation is of greatest importance, not only to the public and individual patients but to the growing group of industrial physicians and surgeons. An apparently successful system is:

1. Orally—By lectures.
2. Mechanical—Stereopticon and motion pictures.
3. By the Works' Physician—Directly to individual patients.

It has been my practice in lecturing to groups of employes and their families to discuss industrial medicine in accord with the following scheme:

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MAKE THE SESSION VERY CLEAR.

Physical examinations—their immediate and remote value in placing the human body to a well-known machine in the plant, illustrating the analogy between the worn out and exhausted and the organs of the human body, emphasizing the vital importance of maintenance and repair.

This method can easily be applied to such organs as kidneys, liver, circulatory apparatus, teeth, eyes and ears, muscles and bones, hands, feet, etc. The acute and chronic conditions, whether of industrial or general origin and their importance pointed out. For instance every surgeon knows that wounds of the thumb or little finger are more to be feared than those of the other fingers, because of the greater possibility of infection of the hand, or palmar abscess, which nearly or quite destroys the function of the hand and in so doing produce permanent disability. It is emphasized that employees must give immediate attention to abrasions, however slight, in order that probable possible disabilities may be avoided.

PERSONAL HYGIENE.

Venereal infection and its effects are discussed freely as one of the most important of community diseases, heretofore shrouded in mystery or crime and not discussed with candor and intelligence. It is always enlisting and holds the attention of audiences. It is pointed out that the average of even higher training knows absolutely nothing of the remote effects of venereal infection.

The subject of personal hygiene is simply presented, utilizing the eyes, teeth, stomach and digestive organs and the results of neglect and defects as a basis for example.

The subject of sanitation is presented systematically by following the plan of organization of our modern public health department and their various divisions.

For instance, the department of sanitation. The discussion includes the nuisances: Sewage and sewage disposal; garbage collection and disposal; domestic animals, flies, mosquitoes,

COMMUNICABLE DISEASE.

Under the head of communicable disease, the epidemic treatment, a simple discussion of antitoxins, vaccines, their nature and use. length and importance of quarantine, etc.

Tuberculosis presents a wide and interesting field. Its relation to housing, overcrowding, food, hours of labor, fatigue, rest, sleep, etc. .

In connection with the child hygiene, in addition to the child itself, pre-natal care, reference to obstetrics and obstretrical procedure, infant feeding is discussed.

Under the heading of food and dairy inspection, the production, cooling, handling, shipping, storage and delivery of milk, together with its food value, importance of bovine tuberculosis, etc.

In connection with vital statistics, birth registrations and its importance invariably attracts the attention, especially during the present war period.

The laboratory affords opportunity for a discussion of culture taking and examination in diphtheria, gonorrhea, syphilis, etc., is always an attractive subject. A description of the examination of water and its importance is listened to attentively.

These and other health department activities presented even with haste hold the attention of an audience for half to three-quarters of an hour.

LECTURES AND MOTION PICTURES.

Supplementing the lecture, it is advisable to offer a motion picture show, as stereopticon and motion pictures appeal to the shop employe and large and appreciative audiences are readily obtained by utilizing employers' time.

Films are available from many sources. The government at Washington maintains a Bureau of Commercial Economics which has a large series on most of the subjects relating to personal and public physical welfare. The various state and municipal health departments and practically all of the state or national organizations for promoting health have series of pictures presenting strong dramatic appeals on the subjects of their special attention.

The National Society for the Study of the Prevention of Infant Mortality, the National Association for the Study and Prevention of Tuberculosis, the American Medical Association and others will supply for a very modest fee sufficient material for a season of monthly or bi-monthly lectures.

WHAT THE WORKS PHYSICIAN CAN DO.

Proper lectures by the works' physician are difficult to obtain for the reason that most works physicians, especially in small plants.

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are part-time employees and have neither the disposition nor time to discuss public or community problems. Naturally, the physician is trained to individualism, seeing on and not viewing disease as a community problem. His is usually limited to advice to individual patients. If intelligent and conscientious this, of course, is of unlimited value, and to the highest credit for the proper discharge of this responsibility.

In addition to the foregoing, the surgeon should point out the importance of first aid, instruct the first-aid crews, specify shock and resuscitation, the prevention and care of chronic diseases, especially those following accidents peculiar to the industry in which he is employed.

It is desirable that the surgeon be qualified to discuss building inspection, hazards peculiar to floors and their openings, walls and openings, stairways and treads, runways and platforms, apparatus, electricity and its transmission, power transmission, elevators and cranes, building hazards, tanks, platforms and railroads.

DISCUSSION.

MR. ALEXANDER FLEISHER (Supervisor of Welfare, Metropolitan Life Insurance Company) : Mr. Bueno will remember us of the educational work that is being done by the General Chemical Company. The *General Chemical Monthly* is distinctly interesting and suggestive. I would like to hear Mr. Bueno further on this subject.

CHAIRMAN FARNUM : We will have Mr. Bueno tell us about it later.

DR. A. O. BUCK (Singer Manufacturing Company) : Do you stand we can get these films from Washington?

CHAIRMAN FARNUM : Mr. Bueno will make a note and answer that question also.

DR. GEORGE M. PRICE (New York City) : What attempts have been made in the General Chemical Company to give educational instruction in the dangerous trades to foreigners?

DR. J. A. DARROW : I would like to ask how to get an audience of workmen? Are lectures given during their work hour or at night? How do you keep the men together to listen to you?

CHAIRMAN FARNUM : Mr. Bueno will tell us about it. We will have one tell of his own experience in the matter.

ted a certain definite amount of time toward the discussion of these papers, and we would be very glad to hear from you.

MISS M. L. MORRIS (Connecticut Mills): When I was with the Curtis Publishing Company we had a course of eight talks on health instruction for the girls. They were given at the noon hour. As the girls number 1,800 and as they go out in groups, half an hour apart, the same talk was repeated six times. I arranged the schedule by putting the most interesting talk first and so awakened their curiosity. After hearing our first lecture they came to all the others.

ARRANGING FOR SAFETY MEETINGS.

MR. W. L. CHANDLER (Dodge Manufacturing Company): We have had some experience in trying to get audiences. They are darned hard to get. Our greatest success has been just before whistletime at noon; that is, after they come back from dinner. That is the psychological time to hit a man anyhow, they say. We found that we could get them together about twenty minutes before one o'clock and they would listen till time to go to work. Probably they were not quite up to the full standard at the start, but, like our audience here, they soon came in. We found we could get a bigger crowd at that time than we could at night or any other occasion unless we had some mighty strong pulling subject to speaker. If we had a high time or a feed, or something like that at one of the clubs, we could get a good crowd, but just to hear a lecture, it was almost impossible to get them out unless we took them on company time or just before one o'clock.

DR. GEORGE M. PRICE (Director, Joint Board of Sanitary Control, New York): I have had charge of the safety, sanitary and educational activities of two large metal industries in this city, comprising about 85,000 men and women. We have had considerable experience in educational activities during the last seven years, and one of the secrets of our success is that we have been conducting educational activities with the people themselves; in other words, jointly and co-operatively with the people we are trying to interest. We held them together in shops through their own shop chairman. We have done a great deal of educational work and probably you have read our reports.

I want to draw your attention to one phase of our educational work, at present being done by a lady at one of our locals (Local No. 25), consisting of 25,000 waistworkers. Most of them—I would say 60 per cent—are foreign born. This lady has come in contact

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with the community centers and has selected one school I believe; she has made that a center in our educational work. The workers came there, not for educational work exclusively for shop meetings—their own shop meetings—to discuss their affairs and also to have lunch after their work. Meanwhile have a number of educational activities, lectures, film shows, a great many talks by various people on forms of vocational work.

I believe community-center activities in the public schools furnish a good means for teaching health and sanitation and should be employed more frequently than they are at the present time.

CHAIRMAN FARNUM: We will now ask Mr. Bueno to answer some of the numerous questions.

EMPLOYEES' MAGAZINES.

MR. J. R. DE LA TORRE BUENO: Mr. Fleisher asked his question with malice aforethought. The General Chemical Company publishes the *Employees' Bulletin* every month and Dr. Ford, company physician, has a page or several pages. He devotes a page to what, in newspaper parlance, we call "squibs" on various topics—one or two or three lines, so that they can be easily read and will stick in the memory. They are on almost any subject from the proper methods of bringing up babies, to not smoking another fellow's pipe without first washing and disinfecting the words to that effect.

He also publishes, from time to time, longer articles on general and particular phases—for instance, on tuberculosis. Last year he published an article on "Poliomyelitis." Whatever may be the tune, either to the season of the year or to any particular disease that may be prevalent at the time. Once in a while he buttresses my own specialty and talks about insects in disease, but I censor his articles very carefully.

Replying to the question regarding pictures: I understand that government departments have films which they loan from time to time, but what films are available I do not know; the only way to find out is to write directly to the proper department.

The question as to how to instruct foreigners is one that we have always with us. This is the United States of America and every man who comes to this country, I think, should learn the English language. In many of our plants, or in most of our plants, we have foremen or sub-

spoken by the foreign workmen at the plants, and these men are used as interpreters on given occasions.

Regarding the time when we get men to come to talks: that depends very largely on conditions. At many of our plants we have what are called service buildings with adequate meeting rooms; we are liable to have meetings there any noon hour. Sometimes we have meetings in the evening at which we show our "Sulphuric Acid" film. At other times we have meetings of foremen or of the first-aid corps on the company's time—not on the men's time. In general, when we want the men to be on hand we call the meeting on our time. They are there with bells on, perfectly ready and willing to take a rest. In fact, it is sometimes a little hard to keep them away.

From time to time we have been able to make arrangements with local schools to have the use of their halls for our lectures. These have been given in the evening and have been of a more or less popular character. I hope this answers the questions that were brought forth.

MR. ALEXANDER FLEISHER: Perhaps I could answer the question in regard to the Bureau of Economics. I do not believe it is a branch of the Federal Government; in fact, there is an argument between the bureau and the government because of their using stationery that looks like that used by the government. The bureau is under the management of Mr. Francis Holley, and is being run by a large number of corporations on an assessment plan. They have a large number of films on hand. I think they run the street educational work as well.

CHAIRMAN FARNUM: We are very glad to have that particular question answered. The next paper on the program is:

MEDICINE IN THE INDUSTRIES.

GEORGE M. PRICE, M. D., DIRECTOR, JOINT BOARD OF SANITARY CONTROL, NEW YORK CITY.

Mr. Chairman and Members of the National Safety Council: Medicine has progressed from a simple art of empirical healing to the science of preservation of human health, the ideal of prevention of disease, and the art of prolongation of human life.

During this progress, which took many centuries, medicine has gradually come into close and closer relations with all human activi-

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ties, and the medical profession rightfully assumed the lead in the wonderful growth and progress of society and mankind.

Even during ancient and mediæval times, under the slave and feudal systems of production, when the lives of workers were of little value and their health of no consideration, even medicine and its professors knew of the effects of occupational health and of the ills of the various vocations. Thus you find in the works of Hippocrates, Galen and other older medical writers frequent reference to vocational dangers and occupational diseases.

Not, however, until the end of the sixteenth century do we find a systematic work on the diseases of workers. I refer to the epoch-making treatise on "The Diseases of Artisans" by Bernardo Rammazzini, published in the year 1700, or earlier, in Modena, Italy:

FATHER OF INDUSTRIAL HYGIENE.

Rammazzini is rightfully regarded as the father of industrial hygiene, for he was the first to scientifically establish the relations of work to health, of industry to disease, and to institute a study of occupational dangers and the effect of those upon the health and life of the workers.

For a long time—for nearly two centuries—Rammazzini's writings on the subject being compilations and translations of his own remarkable work. Meanwhile, the feudal and guild system of production gave place to the so-called capitalistic method of industry and a new industrial society had arisen, grown and revolutionized the whole economic and financial as well as the intellectual and moral state of society.

In spite, however, of the immense expansion of human industry, of the course and international commerce, in spite of the great progress in the accumulation of wealth and capital, in spite of the extensive economic and financial activities—in a word, in spite of all the remarkable revolutionary changes in the state of society and of the world, there appeared a fundamental defect in the new system of production, namely, the total neglect of the essential human factor in industry.

GROWTH OF POVERTY AND SLUMS.

Wealth grew to immense proportions, but not less so did the poverty of the masses.

and thousandfold, but so also was multiplied the misery of the working population. Manufactures grew with unheard of rapidity, but so also did the slums of the industrial towns. New discoveries and inventions caused remarkable progress in factory output and general production, but so also have they displaced the worker from his crafts and shops, while with a great spurt of commerce and production there was also a tremendous increase in the exploitation of workers, a decrease in the wages and earnings, an enormous increase in the labor of women and children, and a general neglect of all the conditions necessary to the health, welfare and life of the working population in industrial establishments.

During this period of economic growth and industrial expansion it was the medical profession that first raised its voice to protest against the extreme exploitation of the workers and the iniquities of the new system of production, and it has endeavored to prove to the employing class that not only is it not just but that it really does not pay to "kill the goose that lays the golden egg."

During the middle and latter part of the nineteenth century industrial hygiene received its greatest impetus and development. Layet, Levy, Tardieu and others in France; Hirt, Erlenberg, Albrecht and others in Germany; Glibert of Belgium; Teleky, Rambousek and others in Austria; Carosi, Davoto and others in Italy, and Arlidge, Oliver, Collis, Legge and others in England, are but a few of the shining lights of industrial hygiene in the European countries.

OF RECENT ORIGIN IN THE UNITED STATES.

In the United States the progress of industrial hygiene and the attention of medical men to industrial conditions is but of recent origin. When, in 1904, I was asked by the editor of the Reference Handbook of Medical Science to prepare an exhaustive article on "The Hygiene of Occupations," I could find but very scant literature on the subject. Dr. Tracy's article in Buck's "Hygiene and Public Health" and Dr. Lloyd's treatise in "The Twentieth Century Medicine" were practically the only sources on the subject.

Since that time great progress has been made in bringing medicine in closer relation to the industries. The work of the Washington Home Commission, the Illinois Commission on Occupational Diseases, and that of the New York State Factory Commission, though of comparatively recent origin, stand as monuments of progressive America's advance in industrial hygiene.

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LEADERS IN THE WORK.

The work of Dr. George Kober, Dr. Alice Hamilton, W. Gilman Thompson, Dr. Hanson, Dr. Landis of Philadelphia, Dr. Schereschewsky, Dr. Hayhurst, Dr. Harris and a host too numerous to mention, show the intense interest of men and the medical profession in industrial hygiene and bettering the industrial population.

On their part the leaders and captains of industry have a new and enlightened attitude toward the care and welfare of the human factor in industry and have given due recognition to the importance of medicine in industries.

Doubtless much further progress in industrial hygiene will be gained during the next few years, and much of it will be due to the men and women of the Health Service Section and to the progressive organization of the National Safety Council.

DISCUSSION.

CHAIRMAN FARNUM: You have heard this very excellent report of medicine in the industries. Dr. Price is an authority upon all of these subjects and this is an excellent opportunity to secure very valuable information if you wish it.

MR. R. F. CAMPTON: I would like to ask the doctor what they use for treating burns?

DR. G. M. PRICE: You will have to ask that of the surgeon. They come after me on the program.

CHAIRMAN FARNUM: We will give you the information. If there is no further discussion we will proceed to the next item.

CARREL-DAKIN METHOD OF TREATING INFECTED WOUNDS

DR. A. V. S. LAMBERT, ROCKEFELLER INSTITUTE, NEW YORK

Mr. Chairman and Members of the National Safety Council: There have appeared so many weird misstatements and exaggerations concerning the irrigation treatment of wounds that it is a pleasure and privilege to have this opportunity to speak to you concerning it.

The treatment has raised a spirited discussion, and, like all new things, has had its share of criticism.

It will be one of the things which will result from the war and be of value to mankind.

It has come as a surprise to most surgeons; few, if any, anticipated that the great advance in the treatment of wounds would be a return to the use of antiseptics. Most of the surgeons had come to think that wounds healed better if treated with bland solutions and felt that, on the whole, antiseptics delayed if not actually prevented repair. This attitude was quite correct in regard to the antiseptics which we were employing and in the strengths in which we were using them. We felt that an antiseptic to be of value must destroy bacteria and yet no one had discovered a solution which would not at the same time injure the cells of the body. This is the great service which Dakin has done. He experimented with a large number of substances until he found one which possessed these particular properties, namely: The power to destroy bacteria; that is, was bactericidal and yet would not injure the cells of the tissues in the strength in which he used it. He found hypochlorite of sodium to be such a substance when employed in the proper strength.

NOT A NEW, STRANGE MATERIAL.

This is not a new, strange material, hitherto unknown, for it has been recognized for many years as an excellent antiseptic.

Dakin's solution, the name usually given to the solution of hypochlorite of sodium employed, has certain definite qualities. It must be of a fixed strength, somewhere between 0.45 and 0.5 per cent; it must be quite neutral and must not contain any free alkali. All the other solutions containing sodium hypochlorite have been very caustic on account of the free alkali, which has made them injurious to the body tissues and both Javal water and Labarraque's solution are too strong and contain free alkali.

In addition to its bactericidal action it has other properties which are important. It disintegrates dead tissues without attacking or injuring the living tissue. Lumiere studied its action on the toxins contained in pus and demonstrated that it neutralized such products of bacterial growth.

To recapitulate: Dakin's solution contains hypochlorite of sodium up to 0.45 to 0.5 per cent of free alkali. It destroys bacteria and then toxins. It destroys dead tissues and sloughs, but does not injure the cells of the living tissues.

Such, then, was the fluid which Carrel had with which to treat war wounds. These are all infected, some less than others, but all

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seriously enough to menace the limbs if not the lives of the patient. Carrel now employs one of the oldest of surgical principles. He advocates large incisions and the removal of all infectious material and dead tissues. He opens up all the pockets. He mechanically cleans up the wound as much as possible. He has devised a clever system of drainage tubes by which the antiseptic may be introduced into the recesses and pockets of the wound. When he found, as he did, that the solution rapidly lost its antiseptic powers after a short period of contact with wound secretions, he renewed it at short, stated intervals by flushing the wound every two hours or oftener.

WOUND FLUSHED FROM WITHIN.

The tubes are of small sizes, 4 m. m. lumen, and are perforated near one end by a series of small openings. This perforated end is placed in the depths of the wound and the fluid is then forced out at the bottom of the wound, which is thus flushed from within outward toward the surface of the wound. The tubes are connected with a bottle containing the antiseptic fluid—Dakin's solution—suspended about 60 c. m. above the bed. A nurse has simply to open the pinch cock on the tube leading from this bottle to the wound in order to flush out the wound; as a rule, this is done every two hours.

If the wound has been properly opened up and the tube properly placed it should be possible to control suppuration in from four days; oftentimes in much shorter time, even in thirty-four to forty-eight hours. It is possible to sterilize the surface of a wound in from seven to ten days. Carrel keeps careful watch on the amount of bacterial content in each wound by counting the number of bacteria found in a certain amount of wound secretion. This is recorded on a chart and a curve is made, known as the bacterial curve. When the number of bacteria reaches a fixed point this remains fixed for the proper period of time—several days—when he is able to close the wound as though it was a fresh, clean wound and as though it had never been infected.

The Carrel-Dakin treatment, then, consists in moistening the recesses and all surfaces of a wound with a 0.45 to 0.5 per cent solution of hypochlorite of sodium, in sufficient quantity and strength enough to have its antiseptic properties remain active.

The technique of how the method may be applied to the w

tory manner by Dr. Carrel. The details and modifications which must be worked out in respect to the treatment of civil cases are still in the process of perfection.

The treatment is one which should be adopted and employed in accident cases with large wounds and in compound fractures, because when begun early it will absolutely prevent suppuration and will tend to inhibit the penetration of bacteria from the wound surface deeply into the surrounding tissues, where they become inaccessible to the action of Dakin's fluid and remain a constant source of reinfection.

AMOUNT OF PAIN DIMINISHED.

The treatment diminishes the amount of pain. The patients certainly suffer less and lose less sleep than those treated otherwise. After a comparatively short period these wounds can be sutured and closed, which saves a great deal of time and also allows the patient to recover without having lost an enormous amount of strength as the result of a prolonged period of severe painful suppuration. The resultant scars also will be smaller and less painful and so the loss of function should be less. Its general employment as a prophylactic measure is a question which should receive most careful consideration.

In France all wounds are laid widely open and mechanically cleaned by the removal of infected material and the irrigation treatment begun, because all wounds have been found to be badly infected. There a control over the patients is possible, which we, in civil life, do not possess.

STERILIZATION OBTAINED.

Heretofore, we have relied simply on some chemical method to obtain sterilization; many, for example, have simply painted the wound with iodine, especially if it was small, and have resorted to incision and mechanical cleansing only after evidence of infection has become manifest and some loss of function or pain was present. At this time the possibility of mechanically cleansing the area has disappeared, for bacteria have penetrated the tissues deeply and have established a certain degree of ascendancy over the body cells, and under these circumstances the chemical disinfection of the tissues, which is at best only a surface action, will be less effective.

To determine what would be the best procedure it would be

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necessary to make a careful study and survey of each industry, to determine the percentage of infection following injuries received by the operatives engaged.

In some industries conservative treatment for small wounds of the punctured variety, for example, might be proper, where the results of injury were rarely followed by severe infection; in cases of a wide opening for every injury, however small, might prove in the long run to be the best procedure.

A difficulty would arise in educating the injured person at the point of having a wide opening made for what at the time appears to be a trivial injury.

KEEP PATIENT IN BED.

It is always dangerous to dogmatize on things surgical. From a long experience in caring for results of injury I am convinced that the average man, surgeon as well as patient, tends to treat injuries and affections of the hands and upper extremities lightly. A patient with a severe infection of the hand is allowed to be up and about because he can walk, and we have a feeling that it is economical to save the expense of hospital care for a case, when, in consequence, we are going to obtain a permanent bad functional result and so a serious economic loss. The duration of the disease is also often prolonged and the loss of time often out of sight of is a serious factor, too.

The Carrel treatment can be carried out, but indifferently while the patient is walking about, but it will be so much more successful with a patient in bed that I believe that fact alone will help to reduce the great economic loss from injuries of the upper extremities by having adequate care expended on them.

This treatment will not remove the necessity of having surgeons to care for the injured, for it is but a new tool added to the armamentarium of surgery. It does not replace surgery based on sound surgical principles and substitute for it a simple automatic method of treatment which anyone can employ with equal success. A good surgeon will obtain better results with it than will a poor surgeon. It will not undo the errors committed by a surgeon, nor will it equalize the consequences of delay due to the ignorance of the patient. It can never replace the judgment and intelligence of the surgeon.

The treatment, however, is a means of combatting infection.

will result in a saving of time spent in convalescence and an improvement of function in many cases which means a great economic gain.

DISCUSSION.

W. P. STRICKLAND (New York): I would like to ask Dr. Lambert if he considers the Carrel-Dakin treatment proper in charred burns?

DR. A. W. COLCORD (Carnegie Steel Company): I have been very much interested in the doctor's paper, because it is a subject that is just now receiving as much attention as any other one thing in surgery. I do not know any treatment or remedy that has had the extensive advertising that the Carrel-Dakin method of treating wounds has had. For the last eight months I have treated a good many hundred cases of wounds with the Carrel-Dakin method.

As the paper was on infected wounds the discussion should be confined to that.

I believe that we should distinguish sharply between hospital cases and ambulatory ones. Without question, the Carrel-Dakin method of treating infected wounds has been almost miraculous in its results in those cases that can be kept in hospitals, where its use can be controlled, where the patient can be watched and where the application can be made by trained nurses or internes. But most of my work is upon ambulatory cases, and I confess that I have had a great deal of trouble in successfully applying the Carrel-Dakin treatment to infected wounds.

RECOVERY OFTEN DEPENDS ON PATIENT.

As the speaker so well said, it soon loses its disinfecting germicidal powers in the wound and must be renewed every two hours. Who is going to renew it in the ambulatory cases and how are we going to do it? Of course, we have devised a method of a bottle and something like a medicine dropper which holds about an ounce. We insert the tube and we give the patient this bottle and we tell him to inject it in the tube every two hours. We show him how, and in perhaps 50 per cent of the cases the patients will do it intelligently. In the other 50 per cent they put in too much, they neglect to put in any at all, or they do it wrong, and we do not get the results.

It burns when they get it on the skin and we have had several pretty severe burns as a result of poor handling. The Carrel-Dakin technique provides for the application of sterile vaseline

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gauze to an area varying according to the wound and the cause. Of course, we try that, but in spite of all we have patients that put in too much, and the treatment goes beyond the skin. When you have once burned a patient he is gun shy, and you have to change your treatment or he is coming back to you.

I might say that every industrial wound is probably an infected wound—potentially infected. The greatest thing that we rely on—to destroy the germs—is the healing power of the body. The defenses that nature give us are the opsonic power of blood serum and the lymph. It is leucocytosis that affects the healing. I believe that if Dakin's fluid has any virtues—and I believe it has—it is mainly because it stimulates those body forces better. It stimulates the leucocytes and the opsonic and germicidal powers of the blood. It brings fresh blood there, and anything that does that is certainly good, so we can divide the various antiseptics into two groups: First, those that inhibit leucocytosis and those that stimulate. Carbolic acid inhibits leucocytosis and iodine does, and for that reason I am not enthusiastic about the use of iodine in the treatment of wounds. Alcohol is the only remedy. It stimulates leucocytosis. I am not going to mention it in my paper tomorrow, but that is one of the reasons why I am enthusiastic about it. I believe that chlorine and nitrate of silver are among those remedies which stimulate leucocytosis.

Two men in America have done very much toward teaching how to treat infected wounds; one is Ochsner of Chicago who emphasizes the importance of rest in the treatment of infected wounds. In cases of infected hands—even infected fingers—the whole forearm is put upon a splint, and if we can get the patient to bed so much the better. Rest is much more important in an injured man than the choice of any particular antiseptic treatment of infected wounds.

SPECIFIC DIRECTIONS GIVEN.

DR. C. F. N. SCHRAM (Fairbanks-Morse Company): I would like to ask Dr. Lambert what directions he gives to the pharmacists when he puts up the Dakin solution? In the cases I have had under my charge only one was burned on the skin. I called on the pharmacist and he said he had a new method of making it up. I said, "The directions were given; please follow them." I would like to know what specific directions you give?

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MR. WILLS MACLACHLAN (Toronto): I would like to ask the doctor if he considers the Dakin solution as of great help in first-aid? Those first-aid cases that happen to be in the hands of laymen?

MISS G. PETTITT (Russell, Burdsall & Ward Bolt Company, Port Chester, N. Y.): How about acid burns?

DR. A. O. BUCK: I would like to ask the doctor if he uses the Dakin solution in first, second and third degree burns?

DR. J. A. DARROW (Erie Forge Company): I understand that a physician, in collaboration with four others, has evolved a solution called "chloramine"—bi-chloramine. It is used only once in twenty-four hours, and I want to find out if it is considered good?

DR. F. E. SCHUBMEHL (General Electric Company): I feel that Dr. Lambert has presented his subject rather modestly. We have been using the Dakin solution for some time at our plant and the results have been startling. We consider every wound an infected wound, and, consequently, treat it as such from the beginning. The excoriations of the skin, that have happened in some of our cases, are very easily treated by the methods devised by Dr. Carrel, and the results obtained with the solution, even taking into account the burning or excoriation of the skin, warrants using it everywhere and on every wound. We have now discarded benzine and gasoline for cleansing injured hands and feet and use the Dakin solution for washing and thoroughly cleansing the part. We bathe the injury—I think we are getting to a point where we may bathe the patient in it, entirely.

CHAIRMAN FARNUM: Are there any further suggestions on this remarkable paper?

DR. SHOUDY: I would like to ask in regard to the use of siphons in antiseptic solutions for wounds? I have read of the system as being very effective.

CHAIRMAN FARNUM: Is there any further question on this paper? If not, we will ask Dr. Lambert to answer this array of questions.

TREATMENT FOR BURNS.

DR. ADRIAN V. S. LAMBERT: It might be well if I took up the questions which have to do with the employment of the solution in the treatment of different kinds of burns. It is good for acid burns. It is good for all degrees of burns.

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In the treatment of burns, we have been in the habit of using Dakin's solution on account of two of its properties, and used it irrespective of whether it was a chemical or an acid or a burn caused by heat. The two properties which we desire are, first, its power of keeping down the growth of bacteria in wounds. A wound treated with the Dakin solution certainly has a less violent growth of bacteria. It takes a certain length of time to eliminate bacteria entirely, but at no time do they have ascendancy over the body tissue. The other property, which is a very important one, and which is often forgotten, is the property the Dakin solution has of dissolving dead tissue. The advantage of using it on burns is that you do not have to mechanically remove the burnt tissue, the slough, or the dead tissue caused by the burn and run the risk of leaving the wound a bleeding, exposed surface. You can depend on the Dakin solution to dissolve the dead tissue, soften it up, and allow it to be separated by the body beneath, without causing hemorrhage.

I have not spoken of a very interesting paper, and one which I think should be read in connection with his treatment of wounds, one written by Captain Gernwei and published, I think, in the 10th number of *Experimental Medicine*, on the cicatrization of wounds. He has demonstrated that a sterile wound, or one in which the bacterial count in the secretion is very low, will heal up much more rapidly than will one which is infected or which has a high bacterial count. We have found in the treatment of wounds, irrespective of their causation, that they will heal more rapidly when treated with Dakin's solution than when treated under other forms of antiseptics.

I feel sure that anyone who has used this solution will tell you that he has never seen better looking wounds; whether the bacterial count is high or low, whether you believe in antiseptics or not, it performs a function as the thing which heals, you will never see more beautiful looking wounds—if I can use that term, being a surgeon. The granulations of the wound itself are red, are healthy looking granulations although continuously bathed in a fluid, and my experience has been with other fluids that the granulations covering the wound after they have been bathed in a fluid for any length of time become soggy, pale, and liable to bleed on the least touch.

In regard to the question of ambulatory cases and their treatment with the solution, I think it is one of its limitations. The question of its use in the treatment of burns is also a question of its limitations.

wound every two hours and depend upon the energy and the intelligence of a not ordinary man, because that man will do it, but the ordinary man does not know enough to do it. I can see no way out of that. If a man does not know enough to do it intelligently, I see no way except to do it for him. This, I think, is a limitation of the treatment.

USE OF CHLORAMINE PASTE.

There is, however, a chloramine paste; that is, a paste or ointment made with chloramine, 1 per cent, and a watery mixture of sodium stearate—and such a paste will accomplish about as much in keeping the wound sterilized as will Dakin's solution. It is not as effective in sterilizing a badly infected wound, but having gotten the infection under control, it will maintain a low bacterial count.

A VOICE: Give the formulæ of the paste again.

DR. LAMBERT: It is 1 per cent of chloramine in a watery mixture of sodium stearate. The sodium stearate is set and the paste is made in an ice cream mixer. Make a solution of sodium stearate in water, 10 per cent, heat it, and 10 per cent solution will become solid when cold. We put it in the ice cream freezer and stir it around and churn it down, and as we churn it it becomes a lather. We keep on stirring it until it is cold; then it is broken up into minute particles, like an emulsion in water. Having done that, we add our 1 per cent of chloramine and stir again until it is mixed.

The question as to whether it is useful in first-aid and as a complement of a layman's kit, I should say it was not; that most laymen would not apply it correctly, and that it needs a considerable amount of attention for the first forty-eight hours. It is perfectly possible to take a solution of it along and get a piece of gauze and clap it onto the wound and keep the wound sterile, but you have to keep wetting it with the solution, because the solution loses its power, and if you keep wetting it it brings up the question as to the causation of burns from its use.

The property which it has, of dissolving dead tissue, is the property that causes the burns, because, as you all know, the surface of our body is covered with dead tissue, dead cells. They are the epithelial cells which are being destroyed. They receive no blood supply, they are dead. To prove that, one has simply to bandage his arm for a week or ten days, remove the bandage, and there is a cloud of dead, fluffy, slack skin which comes off. Dakin's solution will dissolve those dead cells and leave the raw papillæ of the

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skin exposed. In other words, it will result in a first degree burn.

To prevent that, the smearing of the skin with grease is necessary, but it is quite important to have the proper grease, and the proper kind of grease is that which has property—lanoline is the best. Unfortunately, lanoline is the most expensive grease just now, but it is the most useful. It will prevent burns better than any other grease. Yellow grease will do the same thing, but it has to be renewed much more frequently.

We have found in the first indication of burns that the patient complains of an itching and then, if not relieved, complains of a real burn, and our practice has been to let up on the Dakin solution for six hours or twelve hours as soon as the itching begins. We smear the whole part with vaseline or lanoline and then continue the treatment. So far, we have not had any very bad burns.

I do not believe I will go into the method of action of the solution. I think that is a question which is in a pretty way for discussion. If one wishes to read the French doctors' views on this, the very best, one has only to consult the bulletins of the Paris Academy of Medicine of about three months ago when this treatment was under discussion. If you do so you will appreciate the beauty of the French language as well as the heat of the discussion.

USE OF CHLORAZENE.

The subject of chloramine and chlorazene is one on which I do not feel very competent to speak. We have used chlorazene and had good results. It has maintained an antiseptic bacterial count at a low ebb. We have not been very successful in treating severe cases of infections that have come in. The treatment is always successful if the wound is in a suppurating state. It does not seem to act quite as well as did the Dakin solution in those florid and severe types of suppurated wounds. On wounds that have a low bacterial count it works very well and in those cases of suppuration which are more or less chronic it is excellent. The advantage of not being costly; it has the great advantage of being readily handled, and it is easily obtained.

The di-chloramine tea, which is used, is recommended by the committee in Philadelphia, together with Dakin, and is being tried out. It is an insoluble substance, and if it is used in a solution it is

has asked everyone to try its potency and it is being very widely used. Heretofore, or up to the present time, we have not found it as efficacious as Dakin's solution.

As to directions to the pharmacist: It is the great thing in order to get a proper Dakin solution. Of course, the Dakin solution is made with chloride of lime, sodium bicarbonate, and sodium carbonate; the carbonates and bicarbonates are pretty constant; it is the chloride of lime which varies. In order to get a proper Dakin solution one has got titrate in one's solution of lime, and one has to find out that strength in one's chloride of lime. Having determined this the instructions to the pharmacist consist in a mathematical estimation of how much of the three substances to add together, varying your quantity of chloride of lime, depending upon the result of the chlorine contents as determined by high pressure.

DR. A. C. BUCK: We dress the wound, and most of the men go back to work. Do you advise the chlorine paste put up by Abbott—could it be used as first aid?

CHLORINE PASTE AS A DRESSING.

DR. ADRIAN V. S. LAMBERT: I should think chlorine paste is a very good dressing and I think it would be very good as first aid. The Abbott people have put out a chloramine paste and it is a very good one, but it is not as good as the one—I do not want to advertise—as the one we make. (Laughter.) We are not selling, so don't mind. They have not quite learned the method of mixing, but I am sure they will. They have been over to Rockefeller and have been shown. It is just the method of mixing, under a little difficult conditions; the reason is that sodium stearate quickly becomes solid, and unless you churn with a good deal of vigor, you get a solid instead of a fleecy mass.

Their chloramine paste forms a hard scab-like crust; the paste we make, instead of doing that is soft at the end of twenty-four hours. We have obviated the trouble when using their paste by putting a layer of oil paper over the surface of the paste. We use paper like the railroad sandwiches are wrapped in—ordinary oiled paper—and that seems sufficient to prevent the surface evaporation from chloramine paste and to prevent it becoming a hard, scab-like substance. It is quite efficacious in keeping down the bacterial count and is very good for first aid dressing.

CHAIRMAN FARNUM: We are certainly very grateful to Dr. Lambert for his remarks on the Carrel-Dakin treatment.

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The next paper on the program is "Sanitary Standards in Industry" by Doctor J. A. Cousins, of Siegel, Cooper & Co.,

SANITARY STANDARDS IN INDUSTRY.

DR. J. A. COUSINS, SIEGEL, COOPER & CO., CHICAGO

Mr. Chairman and Members of the National Safety : Those who have given sanitation considerable thought realize that many factors must necessarily be considered in standardizing industry. Only within the last few years have hygiene and safety been given any consideration by the manufacturer. Heretofore little or no attention was paid to the health or physical condition of the employe by the employer or by the employes themselves. The effort to prevent accidents, too little attention is given to hygiene. Safety First appliances and mechanical precautions exist but they lack the human intelligence to adapt themselves to conditions and circumstances.

It has been realized that the conditions which surround the employe employed in carrying on the world's industries must be considered and those assigned to the work, such as representatives of health, factory inspectors, commissions of labor, etc., have attempted to do so by legislative activities. In a measure this has been successful, but we have come to realize that the problem is not one to be solved entirely by legislation but by educating the employer and employe in sanitary measures.

It is difficult to visualize for each employer the medical problems involved in the plant, but to educate him and his co-workers both from a financial and health standpoint, is, I believe, the first step in standardizing sanitation in industries. We find employers who have no desire to interest themselves in the welfare of the employe or to accept any individual responsibility. Such an attitude can be shown the advantage to be gained and made to see that the conservation of man-power is an economic problem of first importance and must receive careful consideration from the industrialists. If not, and laws that guard such negligence are brought to bear upon the employer, he will take advantage of the loophole in the law that fails to make definite statements pertaining to a particular business. Sooner or later he may find a pressure brought upon him from a source he scarcely anticipated, the demands for better environments by the employes who have

FREEING THE ESTABLISHMENT FROM HEALTH HAZARDS.

An industry may be established in a building where principles of sanitation have not entered into the design and structure. That concern may be very anxious to elevate the plant to the highest standard of sanitation and to overcome every defect if possible. But they are at a loss to know just what particular features of the building need correction, and when once determined they must learn of the measures which have been adapted for similar situations. Industries of like nature, wherever located, create an environment very similar in character, and methods used to render one such plant sanitary and free from health hazards may be applied in other similar plants with equal success. To do this would tax the resourcefulness, ingenuity and inventiveness of this employer to the utmost in order to bring about the required result. He could economically employ a safety engineer and place the work under the supervision of a medical director, who should be a man who has had considerable experience in industrial hygiene and has become thoroughly familiar with the needs of that particular industry—one who can go far below surface indications to locate causes of trouble. Then when the establishment has been made free from health hazards he should give the doctor sufficient authority and co-operation to maintain such conditions.

There are considerations springing from our situations and conditions which fervently invite us to take the lead in this great work. The institutions which have already taken the lead deserve full credit for the initiative and interest which they have displayed.

UNIVERSAL HEALTH TRAINING.

It has been thought that only in large and well-developed institutions, which have well laid plans, is it possible, economically, to carry out this work, but this has been proven incorrect. Workers go from small to large institutions and vice versa, therefore it is imperative that universal health training be carried on even in the most isolated communities. This, too, has come home to us by the conditions of our workers which have been revealed by medical examinations for our army—80 per cent of the men drafted have been found to be physically defective, largely due to industrial conditions.

The care of the sick and wounded easily holds the public mind, but, vital as this may seem, it is of small importance compared with

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the far greater task of keeping the men and women in the industrial army free from disease. The successful medical department of a factory should not point to its work and mention how many men and women were sick or injured, and were cured or cured but should be able to show how few were sick. It can be so accurate that the less heard of the medical department the more efficient it is. It is essential that the new employee be in touch with the necessity of co-operating in every way with the employer and the medical department in maintaining a high health standard. He must realize the character of the problem and the steps that are being taken to meet it. In order to do this a system of education is necessary.

In preparing a paper on the subject assigned to me I refrained from discussing in detail the specific factors which should be considered in standardizing sanitation in industry, such as ventilation, toilets, machine controls, lunchroom, etc. These will be discussed by others. I have attempted to treat the subject from my viewpoint, as a medical man, emphasizing the human and not the mechanical element.

BEYOND THE BEATEN PATH.

To standardize sanitation in industries, the environments that surround the families out of which the great mass of workers is drawn, the conditions under which those in the occupation should receive no small amount of consideration. The family should not be supplied with the necessities of life and its members be torn into moral and physical wrecks. The parents may be both workers thus breaking up the unity of home life, while, in some instances they live in places that compare unfavorably in appointments and cleanliness with a stable, thus reducing the resistance to disease. The responsibility of a local employer can extend much further than providing the administrative equipment for efficiency on the part of his employees. This is not only of industrial but of human significance. Our social and industrial problems are closely related; neither can be solved without close co-operation with the other.

The opportunity is present to give a demonstration of that unity of humanity which we know runs through the people. There was a time when concentrated effort and diligence were rewarded by a measure of success, and there never will be again unless whose philosophy and practice range from bodily and human health

through the great industries of the country realize sanitation and hygiene to be invaluable to all who prefer the ounce of prevention to the pound of regrets. I say this not to revel in the truth of my prophecy or to differ with big and good men, but as an appeal to them to instill in the minds and hearts of their followers that which stimulates the energy, enterprise and intellect which make for human happiness and for the defense necessary to keep our country free from harm. Then and then only is the industrial future of this great American country assured.

The various states and territories have efficient laws in hygiene and sanitation, but the diversified industries and varying proportions of the sexes employed demand a wide fluctuation in their applications.

FEDERAL HEALTH SERVICE.

The rapid growth of knowledge of industrial hygiene is manifesting itself, and, in view of the fact that the laws of various states have failed to arrive at a definite standard, it occurs to me that the Federal Public Health Service might operate in each state, take detailed information and collect data on industrial matters and make recommendations which will lead to Federal legislation. In addition to gathering facts along the line mentioned such a study would lead to new local and industrial improvements in sanitation. Such a force would have no powers except the right of unrestricted investigation. They would discover wrong situations, find and recommend the solution, and persuade the responsible executives of the necessity for action. Such a force might be subdivided and assigned to groups of industries. Their efficiency would be of value increasingly in proportion to the number of experiences through which they pass and the varying conditions which they face. This course will bring the valuable financial and industrial advantages into all sections in a manner which will not be disturbing. This will bring the assurance that uniform methods will be in effect throughout the nation. They would have a wide and intimate acquaintance with the methods in use through the states. And so the good work would go on. Buildings will disappear, some industries will perish, but our influence will remain. Gentlemen, I suggest that the Federal Public Health Service be asked by us to undertake, with our co-operation, this work of a national standardization of industrial hygiene. It is an era of federation; let us get in the line of evolution.

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Who can tell the new thoughts that have been awakened, ambitions fired, and the high achievements that will be through this Congress?

Let us remember that our interest is in concord, not in and that our real eminence rests in the victories we gain in against accidents and disease.

DISCUSSION.

CHAIRMAN FARNUM: You have heard this very excellent is there any question which you would like to ask Dr. Cousin

MR. W. L. CHANDLER: There is one suggestion, or criticism, handed to me this morning on the conduct of this. I think this is a good time to pass it along. It was that of the discussion is based upon the idea that the plant enough to merit the full time of the physician. He wanted thing he could apply to a smaller plant, where he could not a full-time physician; in fact, he was not sure whether he want a physician on part time, but he did want some information as to the services as rendered by a nurse, either on full or part. Possibly not a full, hospital-trained nurse, but a man or woman who had some knowledge of nursing. I would like to have body start something along that line.

CHAIRMAN FARNUM: Who will do it?

MR. DOHERTY: The doctor who trained some of the emergency to dress the wounds as they occurred can call at a convenient hour of the day, in the morning or afternoon.

ORGANIZING A NURSING SYSTEM.

DR. A. O. BUCK: We have a plant at the sewing machine company where the plan works very nicely. It is a large plant employs 8,000 or more people and yet I am not employed a time at that plant. When I was put in charge I had to employ of all, a graduate nurse. This nurse was very capable and there at all hours. Then I organized a system of first-aid nurses.

We have 1,500 girls in the factories. I took twenty-four girls and I made an attractive proposition to them. We furnished them the uniforms which they wear in the emergency hospital we entertain and keep them interested. My head nurse and I little talks once a month on first-aid work and our nurse

things. We have two nurses who attend in uniform when I am at my clinic and stay about an hour and a half each afternoon. These nurses are there for three days and then two more nurses are on for three days. We rotate in that way and it is very astonishing the proficiency our nurses reach; some of them would make a doctor ashamed of himself in dressing a wound. We find that plan has worked out very well—organizing what we call a first-aid corps of nurses for each department throughout the plant.

MR. F. W. CALVERT: We had a very interesting paper this morning from a lady and I heard her say something on the point of working a plant without a doctor.

PROBLEM OF THE SMALL PLANT.

MISS NESTA C. EDWARDS: In a small factory, say of 400 to 1,000, what are you going to do? In Cleveland we put on a doctor two days a week, from 11 to 1 o'clock, for consultation. He does not render medical service outside the plant unless he is paid, but directs people to places where they can secure medical attention. It was surprising the amount of cases that we cleaned up, not only for the employes, but for their families, through consultation with the doctor. That same factory had a nurse who was on full-time duty. Her mornings were spent in first-aid work and in general inspection of the factory. In making a report she included not only the regular points but many of the minor points. That woman devoted her afternoons to calling on employes and in solving and working out the special problems of our employes.

Ours is a small plant and her time was not at first fully occupied, later they called for an assistant. That system is being attempted in some plants in Wisconsin. They first take a trained nurse or a trained social-service worker, it makes little difference which as long as they have the capacity and the ability to take hold and get next to the individual. Whether it be a large or a small plant—and I am very keen about the small plant—the works calls for a type of woman bighearted enough and broad enough in her appeal to take the situation in fully—the viewpoint of the manufacturer as well as that of the employe. That type of woman is valuable in a small plant.

In another small plant the nurse was formerly a social-service worker, had done considerable along the line of settlement work and was keen and alert. She is in the Robert H. Jackson Company, of Milwaukee, and is now running, with an assistant, a first-aid

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room, under the direction of the company doctor, to which all accidents are sent. That is a plant that has few accidents.

There is another plant which has minor accidents, plus a great deal of health work—those are plants where two different types of accidents arise. The young woman not only looks after and supervises all health matters, but she is responsible for seeing all the employees who come into the firm and must keep in touch with them. The turn-over in that firm, because of that type of work, has been materially decreased. Does that answer the question? A woman who can handle first aid in the morning and who can do special work in the afternoon will soon be recognized.

MISS ELIZABETH M. BURNS: Did I understand the question to be whether a small plant would have a regular trained nurse in an accident room, or whether it would train, under supervision, a works doctor, a first aid employee? Was that the question?

MR. W. L. CHANDLER: There was no question, but I received a criticism handed to me, as I happened to be Vice-Chairman of the Section. The kick was put up to me and I am passing it along. It was not a question but a criticism that our discussion partook of much of the big unit—plants could afford to do things from the point of capital and with people enough to do it, too. It is a single question that is up, it is a desire for ideas of value to the audience—possibly others are interested beside the one who made the complaint—that they want to do some of these things and it is hopeless because the plant is too small. This is the idea: they can start it with a small plant?

REDUCING SKIN CRACKS.

MISS ELIZABETH M. BURNS: We have a trade nuisance which we have what are known as skin cracks and crown bites. The bites lead to loss of sleep and after a while to loss of flesh. With the help of the doctor we reduced our skin cracks from thirty to seven per month. We accomplished this by removing the sulphide of soda with which the employees used to clear off the dirt from their hands. With perfectly legitimate pride, for they have white hands on Sundays, they used the soda. By reducing our skin cracks and by the increase in our product in one month, we saved the nurse's salary at least. Another point, we are in an isolated district—quite a distance from the city hospital—and that makes it possible for us to render first aid to our neighbors. Again, courtesy extended to...

on their part in putting up shelters for workers, waiting for a car in the winter.

Our isolation brings up the question of men having to wait, say, twelve to fifteen minutes for a car. This again is a health problem. They pay for a lunchroom and for the help given them in the first-aid room. Being distant from a hospital, and having new industries cropping up all around you, due to the war rush orders, and not having taken proper precautions, your neighbors run their cases over to you, through your having properly equipped first-aid rooms.

Our national organization of Public Health Nurses, at its convention in Philadelphia, put itself on record last May, as a public nursing industry, as unwilling to look after anything but first dressings until the accident was seen by a physician. We consider that preventive medicine. If the nurse with her professional training considers that, how are you going to control the nurses that you make in twenty minutes? There are some correspondence schools that do, but how are you going to control the first-aid worker after she leaves your employ and goes somewhere else? I beg of you as medical men and as welfare workers to say that only trained workers are the highest economy in the end.

SUCCESS IN SERVICE WORK.

MISS MORRIS: If women are not occupying too much of the program, I would like to talk for five minutes. I started, four months ago, the work in a small plant of 500 people. I am not a trained nurse. I was for three years at the Curtis Publishing Company's plant as their welfare manager, and I left because I wanted to start service work as I thought it ought to be. There are 500 employees and they had never heard of service work or any work of that type, although they had had many applicants. They had more infected hands and fingers than you can think of. I had fifty out of 500 people the first month. I had some practical work in the South, where I lived, in treating negroes and horses and things around there, but outside of that I did not know very much of doctoring except from a common-sense point of view.

I do first aid, however, and know how to put on bandages. I had people coming to see me after the first week. At the end of four months I installed an assistant, not a trained nurse, but a college graduate who has done some first-aid work. My mill is a textile mill; she had done research work in textile mills. She has

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done first-aid work and puts on a very good bandage, if she also visits among the families of the employes. With children and I find, by not being a trained nurse, that I do a lot of things a trained nurse cannot do. I can give calomel where a trained nurse would not do it, because I cannot do that without a doctor's order. I have common sense and I know a man needs it and I give it to him without waiting for a doctor to order it. I thought of having a doctor over for two hours two days in the week. Three-quarters of our employes are Canadians and they like a French doctor. I tried it and it was not entirely successful because ours is a small village with 150 plants and 500 employes and the doctor is very busy. We are trying life extension, but we found it as expensive as having our own doctor. So we got a doctor and he works the time that is at our convenience. At least, they are only two hours. His work with the families is really the most help.

I think it depends more on the personality of the woman than whether she is a trained nurse or whether she is not a nurse. If you get the right woman you will do well, because the employes and their families very soon know whether you are a nurse. When they are sick they will come to you, because they know you and they will come to you with their trouble, whether it is for a wife or child or get married or divorced; they will come to you. A small plant is easier to work than a big one.

CHAIRMAN FARNUM: I will ask Dr. Cousins to answer the questions asked and complete the discussion.

FIRST AID AND THE PHYSICIAN.

DR. J. A. COUSINS: The most conspicuous part of the discussion has been the absence of the points I wanted to bring up. I have always contended, in conferences of this kind, that a man should not read a paper, but the real facts and the real information—that is, that you come here for—are gotten from your audience.

I know that many have been benefited by the little discussions that have been carried on. Now, as regards first aid. The lady will pardon me, but I will have to take just a little exception to that. Where are you going to draw the line? This: A wound that seems very trivial now may develop into a serious one before tomorrow night, especially if it is a laceration. Therefore, I find that it is very economical for the employe:

of them, the probable outcome, and also give the necessary treatment. After he has done all that he may let his welfare worker or his trained nurse look after the case, under his supervision. I believe it behooves the employer to have a physician to see all wounds first.

I have found in my reading and talks with other people that there is a wide divergence in state laws relative to hygiene and sanitation. One state will require 250 cubic feet of air space for each employe, and a neighboring state will specify 500, and the next state does not have any law at all, etc. These are the things I had in mind when I asked the co-operation of this Section and the Public Health Service, so that uniform standards might be adopted in each state. I saw Dr. Rucker in Washington on Monday and he was very enthusiastic about the idea. He said he hoped it would come about. There has been some action taken by Dr. Fox and Dr. Rucker told me that right now the work had been suspended, much to his regret. Work looking toward standardizing sanitation in industry is exceedingly important in the education of employes in small industries. A very large percentage of employes in large plants have troubles similar to those working in small plants, so I believe that if we can educate men and women in the small plant they will benefit by that education and apply it to their new work in the large factory.

As regards first aid, possibly it will help somewhat to outline what we have in Chicago, in my work, having to do with several small industries. It is not necessary, I think, to keep a physician at a plant, but I have advised employers to make pre-employment examination of all employes, for their own benefit as well as his. Out of 236 examinations I made in one plant I found 196 defectives—not serious, however; not sufficient to eliminate them, they were in an incipient state and by a little attention and a little information on the part of the employer, by the physician, they were remedied to a very marked degree. The teeth may be included in mentioning the physical defects. Seventy-five per cent of the employes of one factory have now had their teeth cleaned or filled, as best they could; all of them have had some little attention.

THE OLD FAMILY DOCTOR.

When an injury is received I do not think we should let the employer or the foreman think that he has any knowledge of medicine or surgery. I think we should impress on his mind that we should

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not make any application to the injury whatever, because found, and I think Dr. Farnum and others will bear me out. Nine-tenths of the treatments applied are more damaging than helpful. I think the fellow that gets hurt benefits very much from the inactivity on the part of his fellow workers. I think, too, that when a man or woman is injured they naturally turn to their old family doctor. Bless his old heart, he has a wound of that kind for ten years, yet he is very dear to the injured man. I believe that if a man spends one or two days of your time going to the doctor as soon as he receives the injury, it will save him many, many hours and possibly days if you send him early. I thank you.

DR. F. E. SCHUBMEHL (General Electric Company): In regard to first aid, we have 200 first-aid workers in our plant equipped with first-aid kits which have been adopted as standards in several states and a great many institutions. I cannot let the treatment go that has just been made. That the majority of first-aid treatments are more damaging than helpful. I want to say that the average individual that gets a slight scratch, no matter how much the interests of his employer or his own interests at heart, do not go to a doctor on his own time if he is a piece worker. We provide some simple first aid, conveniently located for you, and otherwise he will not report his simple injuries, and they are reported until they become infected. We have just gone through that, and we know that our first-aid people are all instructed that, because they have a first-aid kit, they are not allowed to practice medicine with that kit in the State of Massachusetts. The instructions are so simple and so explicit that there cannot be many mistakes made. I believe that we prevented 60 per cent of ordinary injuries.

I want to say a word about woman in industry. She has hands and we could not get along without her, but just because she is not a trained nurse does not fit her for a position in industry. There are many women who never were trained nurses and never had experience that have made most capable women in industry. They do not do the things a trained nurse never sees, because it requires the unusual viewpoint to be the best workers in industry. If they are trained nurses they are that much better, but that is the quality we need.

ARMY REJECTIONS FROM INDUSTRIAL CAUSES.

DR. C. A. LAUFFER (Westinghouse Electric Company)

printed in the transactions of this organization, and that is the statement to the effect that 80 per cent of army rejections are due largely to factory conditions.

DR. J. A. COUSINS: I said industrial.

DR. C. A. LAUFFER: That statement also can be disputed. If you will look up the army rejections, you will see that eyes, teeth, tonsils, hernia, defective heart and lungs, and venereal diseases disqualify applicants for the army. If you will investigate the factories, and study the health of employes, you will come to realize that scarcely 1 per cent of the people in the factories have defects disqualifying them from the army, due to causes arising within the industries.

The diseases of industry are very few. We use tons and tons of lead, but I have seen only two cases of lead poisoning in nine years, and one of those men had lead poisoning because he ate lead. Instead of wearing rubber gloves and a mask, as other people did, he would eat his lunch with unwashed hands. He necessarily developed lead poisoning.

More than 90 per cent of tuberculosis, when it is traced, is found to be due to home conditions. The source is true of other diseases. The industries merely reflect public health conditions in the communities where the industries are located.

CHAIRMAN FARNUM: I am sure that we can trust Dr. Cousins' resolution to our new officers together with the other things that must be given consideration during the coming year.

CITY LIFE A HANDICAP.

CAPT. W. P. WHITE: In regard to physical rejections of the army and navy: I happen to be a naval officer and am somewhat familiar with rejections in the navy, having acted as a recruiting officer. I think what the doctor had reference to—the rejection of men coming from cities and towns—is greatly due to the life in town. We have fewer rejections of men who come from the country, because they have lived a natural and normal life. Children who live in cities acquire certain habits detrimental to their future physical condition. I am continually running across small boys who think it very smart to smoke cigarets. I tell them to stop if they desire, eventually, to join the navy.

The matter of tonsils and teeth are constant sources of rejection, due to people not taking care of themselves. These conditions arise in the cities rather more than in the country, because in the city the parents are employed and do not have time to look after their

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children. The children are open to certain temptations which would not have in the country and the abnormal life of the city not conducive to good physical conditions; so when the doctor says these things are caused by the industry, I think he means, rather, they are due to industry—due to the conditions of life surrounding the industry.

CHAIRMAN FARNUM: We have exceeded the time for the reading of this very important paper by Dr. Cousins, but I shall allow me to take a couple of minutes in closing.

DEFECTS AMONG CHILDREN.

DR. J. A. COUSINS: Regarding the statement by the gentleman who did not get my meaning: What I said about first aid does not apply to a man who has received proper education in first aid. I found patients coming to the doctor with a cud of chewing tobacco—taken out of some man's mouth—bound to the wound. I am certain I got my meaning, I think.

I had in mind all the conditions that would contribute toward physical defects and classified them as industrial conditions. I am very sure of my statements, having edited them myself, and I took them up with other examining physicians in Chicago, I asked Dr. Rucker at Washington about it, and these were the figures I received. In 236 examinations I found 196 defects among children or young people just out of school and holding their first papers. These are the cases I included in my 80 per cent, not ones who had industrial diseases or workmen who had been incapacitated by accidents in factories.

CHAIRMAN FARNUM: The next paper is by Mr. C. Williams of the Equitable Life Assurance Society, of Cleveland, Ohio, upon the subject of "Human Relations in Industry with Special Reference to Corporate Employers and Employees."

HUMAN RELATIONS IN INDUSTRY, WITH PARTICULAR REFERENCE TO CORPORATE EMPLOYER AND EMPLOYEE.

C. WHITING WILLIAMS, DEPARTMENT OF GROUP INSURANCE,
EQUITABLE LIFE ASSURANCE SOCIETY, CLEVELAND, OHIO.

Mr. Chairman and Members of the National Safety Council:
The superintendent was talking:

"After long and weary hours of work, the superintendent was talking:

always to find from the men threatening to strike how it came about that their feelings were first hurt. When we have learned this and made amends—for it is usually the result of somebody's mistake or bad judgment—then we find that the settlement of wage demands or the other ostensible reasons for the flare-up is dead easy."

Such testimony, I believe, comes very near to the heart of the problem of human relations in present-day American industry—a problem which we must all agree is nothing less than vital to our industrial maintenance and our national existence.

Because this war is a war of factories as well as firing lines, a larger and larger industrial output is indispensable for the gaining of the victory. Machine and process are straining to their utmost. Personnel is admittedly capable of immensely greater effectiveness. How can this road be opened to the indispensable larger production? What is the "X" in the complex equation of personnel? Surely it will prove to be whatever is of most vital interest and significance to persons.

I submit that the factor of most vital interest and significance to persons is nothing other than *their relations with other persons*. If you doubt it, try to think of words which mean more to you than such as: Mother, wife, children, friends, honor, disgrace. Each is the name of a personal relation. What is it that gives these various relations their varieties of value to us? By what scales are they weighed that some are found so precious and others so trivial or hateful?

By the scales of our feelings. Experience, facts, scientific deductions, logic—these have very little to do with it. Without our feelings all values of things, persons and considerations within or outside ourselves would disappear. With them we have always within us the urge to find our place in the sunshine of relationships that satisfy our soul's desires.

"THE BOYS WERE SORE."

"Personality—it is the infinite capacity for feeling," said John Stuart Mill.

The labor leader bears out our superintendent: "Sure! Many a time the difference between us in dollars and cents would not have taken five minutes to fix, but the boys were sore and had to get even."

In the equation of industrial personnel the vital factor is right

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human relations between employer and employee. Of this chief factor is the proper regard for the *feelings* of all the entities concerned—those that comprise the management and the force.

The trouble started, of course, when the scale of industrial enterprise led to the use of such devices as the corporation and the telephone. With the resultant increase in number of personal units the maintenance of contacts grows in complexity almost as the square of the number—just as in a telephone exchange the cost of service is disproportionately to the number of subscribers.

As long, however, as human beings care more for relations with other human beings than for anything else, trouble is sure to arise unless every kind of organization makes possible some relation between its personal constituents and itself. To do so it must strive to give itself the attributes of a person. Those attributes that best equip the corporation to enter into and maintain relations with persons are easily named. In one word they are *feelings*.

Three chief fields of feelings distinguish all worthy of the name of persons. Of the three the first is my feeling of myself in relation to the world of present living things. The second, of course, is the bottom—also pretty much the top—of the feeling of instinct of self-preservation. This feeling is, in fact, such that it stretches beyond the present over into the future as a motive or instinct of reproduction.

Thirdly, I have the feeling of the value of myself in relation to my acquaintances and associates, my class, my community, my country, the world. I have my self-respect.

SENSE OF RELATIONAL VALUES.

Every real person—and every real corporation or human institution—*must* have these senses of its relation values—these: Survival otherwise is impossible. I am inclined to believe that the start of corporate or organization character is exactly the same as that of personal character. This start is well stated in the inscription carried over the doors of one of our oldest universities:

"Self-knowledge, self-reverence, self-control—these three lead life to sovereign power."

This is only a start, because, for all practical purposes, the test—whether of a person or an organization—is the label

feelings come into touch with those of other individuals or institutions. Character is the index of predictability as to the "come-back" likely to be obtained from this or that contact. Honesty, sincerity, considerateness, modesty, alertness, optimism, enthusiasm—these stand for good character because they stand for the kind of "come-back" which facilitates the most practical and useful kind of contacts and relationships in work and life. They indicate such equilibrium between the feelings of self and the feelings of others as Wolsey had in mind when he advised Cromwell: "To thine own self be true and it must follow as the night the day, thou canst not then be false to any man."

Whether conscious of it or not, every corporation *has* in actuality a going and manifest corporate self. But its self-knowledge may be inadequate, its self-reverence may be lacking; even more likely, its self-control may be halting and unorganized. Its character is, therefore, unsatisfactory; its conduct highly unpredictable. Dealings with it are unsatisfactory if not unsafe. Not being true to itself, it has difficulty in being true to others.

The first step, then, in supplying conditions of right human relations between the corporate employer and the employe is for the responsible head or heads to determine that the corporation's "curve of come-back" is to be a circle—consistent with itself at all points. The responsibility for this is perhaps the highest and most difficult placed upon the chief executive. An expert in "reverse-English" has well said: "A company is known by the management it keeps." If anywhere along the line a superintendent or foreman persistently misrepresents the corporation's personality there are only two things to do—either convert him or follow Scripture: "If thine eye offend thee, pluck it out—or thy hand, cut it off."

"CORPOR-PERSONALITY."

In a corporation involving thousands of persons connected together only by a few scores of company representatives scattered over miles of territory, this necessity of the expression and extension of the "corpor-personality" even throughout the veins and arteries of the management makes one of the most difficult and complex problems in the field of modern life. House organs, conventions, permanent, financially interested representatives, ubiquitous executives, numerous "glad-handers" and inspirers—all these are important and much-used methods. Two things are worth remem-

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bering in connection with the matter. One is that you can hear your friend talking from San Francisco more distinctly than you can hear your friend in Albany, because at the different relay stations the intensity of the sound is mechanically increased. The second feeling or, better, feeling-together—sympathy—is of all things in the world the strongest force for holding persons together. That combination somehow must be made of two elements, one of which too often are considered mutually exclusive—mechanical system and sympathy.

But the still bigger problem remains—to get the feeling incorporated over from the arteries of management into the fiber of the working force.

All of them, of course, as persons, have those same feelings of feeling. Successful relationship between them and their environment will depend upon the same thing as that between two persons—upon the *exchange* of respect for the other's feelings, sympathy, understanding and exchange of service. The accent is on *exchange*. No one ever orders a half-portion friendship—or a "dead" telephone.

The Germans have tried to find an easier way. They seek to gather superficial impressions of the other fellow's feelings and then apply logic to get the result. She is *losing the war* because she largely misguesses everybody. The collection of information regard to feelings is one of the most complex and difficult in the world—as every welfare manager knows who is puzzled by departing workers why they leave.

FEELINGS RATHER THAN FACTS.

There are good reasons why the corporate employer has before him the temptation to use the "German" method. There is the mechanical obstacle of size and usually, now, of language. There is a much more fundamental reason. Walter Dill Scott has said that, though we would all swear to the contrary, 75 per cent of our decisions—and by "our" he meant educated persons—are made on the basis of feelings rather than on the basis of facts or ideas. The educated and aggressive executive is apt to save time by using logic. He forgets, what the labor leader forgets, that the other fellow out in the foundry not only has a chief's knowledge of the facts, but also—most important—has been conditioned to an immensely greater extent than is the chief by his

Disappointment is certain, also, when a warm-hearted optimistic welfare or employment manager is instructed to supply an anecdote of human interest and wholesomeness while the management's usual policy of logic and indifference continues. Vain attempt! No subordinate can "demonstrate" company friendliness successfully unless he genuinely represents the company personality. With no corporation which does not possess sympathy can there be any exchange of sympathy—and there is no substitute for exchange.

This "easier way" the Germans have very plainly demonstrated. Like most "easier ways," it leads to hell. That is inevitable, if Sherman was right. *Failure to regard and sympathetically to respect the feelings of the other in any important field leads sooner or later to the severance of relations and then to war.*

It is not strange that war has become as common as it has between employer and employe. Besides the difficulty of creating a consistent and worthy corporate individuality and of "getting it over" to the men, was distorted and unbungled by subordinates, there is the complexity of those three fields of feelings.

"THERMAL UNITS."

If I, as an employe, am to be of any use to you or myself, I must believe in myself and must keep myself in shape to develop and deliver so many "British thermal units." If my economic margin of preservation is pretty slight you must not blame me if I am keen on high wages—and on any organization that will help me get them—and if I am not over enthusiastic about profit-sharing and bonuses unless it is made extremely plain to me that they are not at all at the cost of the larger daily income which I could use so well.

Of course, I am anxious to work in conditions not too dangerous to the delivery of those indispensable power units. But until I have actually suffered myself or had a friend suffer through his own or the company's failure to observe proper safeguards—especially if I had little schooling and know little about the brotherhood of cause and effect in hygiene, health, and safety—I am going to make little fuss about these matters in comparison with the fuss I make about the self-preservation in the pay envelope. For that reason, the Safety First movement deserves enormous credit that it has accomplished so much *without* the pressure of the average employe and has settled itself down so nobly to the job of educating him to the matter.

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But it's that future tense which makes my feelings more poignant. I am married. The present is no longer a single but, say, a cylinder affair now—if you don't believe it, come home tonight and let me introduce you to my wife and my five kids. They won't let me think simply about the present's bread and butter. You mustn't wonder if, in spite of exceptional wages, I would move back to the place where the money is less but the social and other chances for the kids better.

You see my family has begun to raise me from the level of a working animal. My feelings toward them are deeper and more intense than toward any other persons in the world. One of these is that I have shared—and hope always to share—with my own and their very deepest emotions and experiences. In the emergencies—through the “big moments” of sickness, accident, of death, or marriage—we always hope to go hand in hand. That's what families are for.

REAL FRIENDSHIP.

Inside the family and out, *real friendship depends not upon the number of contacts, not upon agreement in feelings, but upon the nature and intensity of the feelings and emotions shared.*

A soldier just back from France—permanently disabled—recently: “Why, the merest acquaintance or the strangest person becomes your ‘pal for life’ after two days in the same trench. It is the language of the ten-cent thriller: “She never knew she loved him until he stood beside her at her father's open grave!”

Now, remembering that as an employee I live, say, 90 per cent on feelings and that my deepest feelings are toward my employer, it will be plain that the thought of the future makes the subject of protecting my family against my disability by old age, sickness, accident, or death, a mighty interesting field—also one in which my employer can come closer to me than any other. But he can enter when he brings with him respect for me and my sensibilities and a sincere sympathy that is far removed from either sentimentality or pity.

The company picnic helps carry the management into this connection. The really successful company physician, too, is sure to find himself unconsciously establishing these family connections. He should be carefully chosen for that reason, as well as for his medical skill.

tion to bad work. The visiting nurse cannot do her job well unless she does just this—combining skilled service with sympathy and tact, and tact is only *regard* for *feeling*. The service-worker, of course, finds the visit to wife or daughter—or mother-in-law—the only way to get through to many a man's *real self*.

It is undoubtedly because of the intensity of these feelings of family in the supreme crisis, death, that group insurance has had so amazing a growth from its "invention" about six years ago by the company with which I have the honor to be connected. You are all doubtless more or less familiar with the mechanical details whereby a body of 100 or more workers is given two co-operative advantages: First, that of a constant average of normal health and of normal, medium age without the indelicacy or expense of individual physical examination; and, second, the economies of co-operative buying as the result of wholesale solicitation and collection.

For several years I was the secretary of Cleveland's Federation for Charity, whose fifty-seven constituent organizations required the solicitation of something like \$450,000 in yearly gifts. Of the money needed for the relief of families from destitution, nearly one-half was required for virtual widows and orphans, the father dead or permanently disabled. Even in the states where working-men's compensation is in effect, it is said that only 6 or 7 per cent of the deaths of workers are such as secure its awards. The families of the other 93, who die in ordinary ways, require, for the most part, the passing of the hat either by their sympathetic and generous but close-margined associated friends or by charity officials. A large automobile company found, by investigation, that in forty-nine out of their first fifty death awards the money was needed for the avoidance of actual destitution!

WHEN THE WIFE CO-OPERATES.

The third field of feeling, however—self-respect—is such that probably few workers would care for the insurance award even at the moment of dire need, if it represented merely the expression of the employer's philanthropic motives. The consumer might also object if its cost, from 45 to 90 cents a month per worker, were located on the industry and put into the selling price. But at the recent National Conference of Employment Managers it was agreed that an average of \$40.00 is extremely low as the cost to every business of replacing one employe with a new one. The lengthened

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service, as well as the increased interest in it, which is reported to follow the plan's installation, comes not simply sharing with the worker his *family*—his deepest—feelings, his increased freedom of mind and sense of value to his children. Even more, it is caused by the fact that these laborers have a special stake in that particular place of work. In factories, indeed, where group insurance is in force, the worker is called in a body to request the management never to fire them or even to let them fire themselves—without first consulting the group. Besides cutting the cost of the turn-over, such domestic cooperation has a great value in holding the men long enough for the management to get over to them some idea of its "corpor-personality." Demonstrating it to a procession is admittedly difficult.

It is strange that industry has been so slow in understanding the wife's importance in the home; surely, most industrial executives are themselves married!

Because the group plan of family protection touches the worker where he most completely lives, the occasion and the manner of its installation, the nature of the president's speech or letter accompanying it, the methods of its current maintenance and service call for the considerateness and the character required by the problem of human relations rather than the mere buying or selling of ordinary insurance protection. Neither as humanitarianism nor as "good business" alone is it at its best. It is a combination of the two.

SHARING OF DEEP FEELING.

The sharing of *deep feeling*, for instance, patriotism,—the reason of the value of factory war gardens, Liberty sales, etc.

The sentinels of self-respect are as watchful for the hand-worker as for the head-worker—possibly more so. By long social experience we have all developed a sort of "protective behavior," unconsciously test for insincerity in exact proportion as the worker tries to come into intimate relation with us. Welfare work is a therefore tested severely. Even the tone of the voice becomes important. Much of it has failed because it failed to carry conviction of real interest or neglected to regard the worker's desire for a chance to count among his associates in ways that "look like" him, which admit that he is "the equal of any other man. if not his

president never came around the factory clubhouse, no self-respecting worker was willing to show up around the place."

A chance to excel or carry responsibility, whether in the ball team, the Aid Society, the committee or the debate—these all give us enjoyable sensations of our value in our social worlds. If not supplied by the factory they are sure to be sought—and found—elsewhere. They are not bread, but bread alone never kept any social being alive. The worker—"even as you and I"—wants far more in life than the pay envelope, his statements to the contrary notwithstanding. His class feelings are almost as binding as his family feelings. Disregard here may spoil all.

Now I have tried to set up a framework of fundamental principles of human engineering into which various methods and devices for better human relations in industry may be fitted. I shall be repaid if it serves to lessen some of the confusion or explains some of the disappointments encountered in this field of executive attention—a field complex and trying, but *vital*.

It is not to be assumed that the establishment of these conditions through the *mutual appreciation of feelings* in its three fields is an end in itself. Many questions it will not solve; for instance, that of collective bargaining, *but it will greatly help to solve them*. It is worth remembering that the determination of the question of what is capital's and what is labor's fair share of the profits can never be accomplished as successfully by either side singly, however scientific its method, as it can by both sides putting friendly feet under the same table.

FRIENDLY DESIRE AND GOOD WILL.

Peaceful employer-employee relations—enlisting as they do the super-powers and resources of association and friendly co-operation—can certainly be viewed at this moment as absolutely indispensable toward that maximum production which the war's successful prosecution inexorably demands. It is not for either management or men to decide whether such relations are feasible or desirable. When our whole nation is fighting to drive the rule of autocratic force from the world, the right of both sides to an opinion on this matter must temporarily be waived! Otherwise the public will organize a league to enforce peace in industry! The greatest waste in industrial America today is the vast amount of unused physical, mental, and spiritual "gasoline"—unused because unexploded by the vital spark of friendly desire and good will. These are nothing but feelings,

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but they are the fundamental feelings and motives of the p is producing to his utmost because the spiritual equilibrium relations with his world spells his job as "joy."

There never was a time so favorable for the obtaining equilibrium between employer and employe as now. As ne in years we are all feeling together in the sense of commc and *we are feeling together deeply*. Industrial statesm needed at this hour. The essence of industrial statesmans essence of all statesmanship—opportunism, the quick recog grasping of the psychological moment.

Industrial democracy is undoubtedly headed this way. industrial democracy is *nothing to be feared*. When one sic the other's feelings as much as it wishes the other to regard it simply pays in advance for an advantage which it hope receive. *Sooner or later the advantage paid for arrives. buys respect. Sympathy buys sympathy*. The equilibrium o take is then established. Neither side has been altruistic. simply been true to itself—and hence to the other. Emp employe need only be true to themselves—selfish. But suc ness bears no stigma, because it gratifies its own desires fo highest good *through, and with the help of—not at the cos* gratified desires of its partners and associates in the heari nation's call and the doing of the nation's work.

DISCUSSION.

CHAIRMAN FARNUM: We will ask Dr. Eugene Lyman the Life Extension Institute to open the discussion.

DR. EUGENE LYMAN FISK: It is a great pleasure to today and listen to this profound and interesting paper by liams. The paper contains a wealth of suggestions reg neglected field in industrial hygiene. The essayist is in exa ment with Herbert Spencer, in that the majority of mer ments are dictated by feeling, rather than by logic.

Almost every phase of feeling and of emotion has its ship to health. For example, I do not believe that a th healthy—a completely healthy—man can cherish a grouch. the grouch is a pathological manifestation, and there are fe and concerns in which it does not ramify to some degree. Extension Institute recently issued a health letter and in every office they reach out for it and say "Let us have the

FUNDAMENTAL CONDITIONS FOR EMPLOYEE.

. This suggests another thought in regard to subjects that are so interesting and so vital to you—accident prevention and occupational disease. When the last word has been said in accident prevention, in shop hygiene, even in the welfare work of the home, there is still left a vast field uncovered, which has an immense influence upon all those conditions—that is, the handling of the fundamental condition for the employee. No matter what you try to do for him in the shop or the efforts made in the home by the average social worker, they are strictly limited by the physical condition of that employee; by the infections that are in his body, by the physical defects, by the structural troubles and the conventional troubles that arise out of his bad living habits. These can only be elicited by a thorough analysis of his condition from the standpoint of personal hygiene.

In the institute, our first and greatest commandment is that we shall ascertain the physical condition of the employee—all efficiency methods or welfare methods are built on that knowledge.

Something has been said about the small plant. The Life Extension Institute, as many of you know, is an organization extending all over the country, and it is to the small plant that we particularly appeal, to make available a system of medical examination, of hygienic consideration of disease prevention, and of education in the fundamentals of right living, which, in the ordinary small plant, would be very difficult to secure. The big plants can also be dealt with, but in the small plant they touch a button and secure this combined information, which represents the judgment of the men on our hygiene reference board.

ANNUAL EXAMINATIONS.

Some of you may not know about the institute. It has been in existence about three years. It is organized to arrange these periodic examinations and to assemble scientific information regarding right living, personal hygiene, and to convey this information to the people. The channels through which it reaches the people are the life insurance policy-holders, the individuals who take memberships in the institute, and industrial employees for whose benefit the employer takes the service of the institute.

I want to extend to the members of this organization a cordial invitation to visit the Life Extension Institute, to see what they are

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doing there, and if there is anything in the way of suggestion you can get from our service you are quite welcome.

I appreciate very deeply the privilege of appearing on and I heartily reciprocate the kind words said by Dr. Nothing that I can say will add to the work in which he is but I would like to say that we in the institute appreciate particularly the spirit in which the work is carried on, because of the ideal spirit.

CHAIRMAN FARNUM: This concludes the program for

FRIDAY AFTERNOON SESSION.

THE meeting was called to order at 2:15 o'clock by Dr. Farnum, chairman.

CHAIRMAN FARNUM: The meeting this afternoon is planned to be a round table discussion of the general topic, "How Can We Conserve Health in the Industries?" There are five subjects of which are printed. The other is the matter of "Resuscitation of Artificial Respiration," and the paper will be read by Dr. I of the Westinghouse Electric Company of Pittsburgh.

Unless there is objection I will now ask for the report of the Nominating Committee—the only item of business, I think must come before us. The chairman of the Nominating Committee is Dr. Cameron of the Republic Rubber Company, and he will report to you.

REPORT OF NOMINATING COMMITTEE.

DR. R. L. CAMERON (Chief Surgeon, Republic Rubber Company, Youngstown, Ohio): The Nominating Committee held a meeting and decided to suggest these three officers:

For Chairman, Dr. L. A. Shoudy of the Bethlehem Steel Company.

For Vice Chairman, Mr. W. L. Chandler of the Dodge Sales Engineering Company, Mishawaka, Ind.

For Secretary, Mr. Alexander Fleischer of the Metropolitan

CHAIRMAN FARNUM: You have heard the report of the Nominating Committee. What will you do with it?

DR. COUSINS: I move that the nominations be closed and that the Secretary be instructed to cast the unanimous ballot for Messrs. Shoudy, Chandler and Fleischer. (The motion was seconded.)

CHAIRMAN FARNUM: It is moved and seconded that the nominations be closed and that the Secretary be instructed to cast the unanimous ballot of the Section for Dr. Shoudy as Chairman for the coming year, Mr. Chandler as Vice Chairman and Mr. Fleischer as Secretary. All in favor of the motion will signify their assent by saying "Aye." Those opposed, if any? The motion is carried unanimously.

The program this afternoon is a unit. The question before us is "How Can We Best Conserve Health in the Industries?" We will have the first three papers, then the film, then the last three papers and then discussion of the unit.

Dr. Cranch of the General Electric and Dr. Whipple of the Bethlehem Steel will lead the discussion when we have finished the six papers, and I hope everyone will take part. The first paper is entitled "Industrial Hospitals and Dispensaries," by Dr. Thomas R. Crowder, Director of Sanitation and Safety, the Pullman Company, Chicago, Ill.

INDUSTRIAL HOSPITALS AND DISPENSARIES.

T. R. CROWDER, DIRECTOR, SANITATION AND SAFETY, THE PULLMAN COMPANY, CHICAGO, ILL.

Mr. Chairman and Members of the National Safety Council: I take it for granted that it needs no argument to establish with this body the opinion that industrial hospitals and dispensaries are a valuable part of our means of conserving the health of industrial workers. Experience to that effect has been practically universal where the measures have been tried, and the sum of our experience is now large. While the record of it is not as extensive or as readily available as might be desirable, such reports as those by Dr. Clark of the Norton Company and Dr. Mock of Sears-Roebuck have shown not only that good medical service is a real conserver of human material but that it is a sound economic procedure for the employer. Dr. Farnum and Dean Marquis have drawn bold and inspiring pictures of the great humanitarian heart that beats in the industrial

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doctor's work; they have shown its aim and purpose and lined the qualities of head and heart through which it reached. Most of you are familiar with these records others of a like nature.

There remains of the discussion, then, only a consideration of the best ways of accomplishing through the hospital and dispensary the results at which we aim.

SMALL INJURIES AND SERIOUS CONSEQUENCES.

The fully organized industrial hospital is needed only for the continuous care of the more serious injuries and illnesses of employees, but such cases are relatively few and this expensive equipment will be necessary only for the larger plants and factories. Even in these, if there is a good hospital within easy reach it will not be necessary, but only desirable. It should be emphasized, however, that we are constantly enlarging our view of what is formerly a hospital case. More and more the minor injuries are included. The hospital is really the only place where we can be sure that all our directions are carried out, and it is in this sense apparent that continuous observation for the first few days is the only efficient safeguard against small injuries developing serious consequences. Probably much more hospitalization than is now out would be profitable. And it is always advisable to have the hospital as near to the patient as possible.

The dispensary will nevertheless remain—and properly so—the chief seat of the industrial physician's activity. His presence there, as I see them, will be to determine men's fitness for various kinds of labor, to treat the sick and injured, to prevent the spread of infectious diseases among the workers, to guard against hazards of industrial poisoning, to gather statistics and make investigations for the furtherance of industrial medical knowledge, to carry on such a campaign of education in matters pertaining to hygiene and health as circumstances and his abilities warrant. On the other hand, I believe he should leave the mechanical campaign to those whose training fits them for it better.

The dispensary should deal with well men as well as with injured ones, and to the end that there may be less of the loss of time it should be one of the chief functions of the industrial physician to fit the employee to his work. We cannot standardize human beings as we do machinery. It is, therefore, wise and profitable to

powers before we assign them to their jobs. A leaky heart or a wooden leg may be excellent organs for some purposes, but not for all nor for many, and a misfit job will not make profit either for employer or employee.

DOCTOR AND PATIENT.

Whether a dispensary be housed in part of a workroom or in a building of its own, whether its working force be large or small, it should be so furnished and appointed as to attract the workingmen. If it is clean and attractive and accommodated to their comfort, they are better content to patronize it. Courtesy and helpfulness are its proper atmosphere—courtesy and kindness regardless of cloths or official position. All men are equal in a doctor's shop; all men in need of the doctor's help are equally deserving of his time and sympathy. When a workman finds that he is treated with the same consideration as his foreman or superintendent, both his self respect and his loyalty go up. When he feels that the company doctor is his physician first, and the company's employe only incidentally, that it is the doctor's purpose and endeavor to get him well as soon as possible, no one need fear that the proper professional relation between physician and patient will go astray. But it is highly essential that the proper professional relation should be established and maintained, and the doctor who does not have respect for the confidence of his patient will fail of his mission. It is a little more important even in dealing with the poor and neglected than with those who are used to getting what they want.

If wisely directed in sentiment, the dispensary rarely needs to look beyond the single purpose of service to the employe. When that end is accomplished benefits to the employer follow naturally and without effort, and the employe will not begrudge them when he sees how they are brought about, through service to himself. But he will not see it unless the doctor and his helpers see it first—the original vision must be theirs.

Industrial medicine is fast becoming a specialty of no mean proportions. Only the better grade of medical men make successful specialists, and for the proper development of this comparatively new specialty doctors should be selected—I say selected advisedly, for it is scarcely possible that a man become an industrial specialist on his own initiative and without specific employment to that end—who are well trained in general medicine and who are of such caliber as to be capable of becoming specially trained through their own

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experience. We need men of initiative and insight, men with the possibilities of bigness in them, but above all we need men of a high degree of human sympathy and prompted by desire to help those whom they tend. Such men are not the best nor the easiest to get, but they will be the most economical for the industries to employ.

WELL-EQUIPPED DISPENSARY NECESSARY.

It is as great a folly to hamper the physician with poor tools as to provide an expert workman with poor tools. We are not only to be a bit of an artist in dealing with unwilling patients in handling difficult personal situations, but to follow methods in the diagnosis and treatment of disease and instruments of precision are necessary for this and failure to use them is more than poor economy. Among the more elaborate of the modern industrial doctor's trade is the X-ray apparatus is expensive, but it is necessary if we would not leave the doctor guessing where it is incumbent that he should know.

I cannot emphasize too strongly the necessity for complete accurate records of all cases, and some system of filing which makes them readily available for future use. Where many men are employed no one can hope to remember all that he has seen. The doctor must sometime have a successor; medical records are stored knowledge for his use; they simplify his understanding of each recurring injury or illness. False claims must sometimes be combated; records help to do that. And from them grow the possibilities of tabulating one's experience for the benefit of other workers and other physicians, which, if efficiently and intelligently done, may give us information of great value.

After the physician the first expansion of the dispensary will profitably be a nurse, then clerical assistants, then more doctors and more nurses, perhaps including visiting nurses. In large plants a dentist for the direction of prophylactic work, for teeth are now known to be responsible for many obscure diseases. The value of the work of the assistants depends so largely on the ideals of the doctor in actual charge of operation that they need a separate discussion, and the division of their duties should be outlined in detail because they will differ for each industrial plant. It is essential only that they grasp the fine ideal of service to the employee and the community.

charity in carrying it out, and then that they have brains and training enough to fit them for their tasks.

A BROAD VISION AND A CO-OPERATIVE EFFORT.

There is need of closer union between men working in this infant specialty which we designate industrial medicine and surgery. A beginning has been made in your society and in the American Association of Industrial Physicians and Surgeons, which has held two enthusiastic and inspiring annual meetings. Interchange of ideas and observations on diagnosis and treatment, on prevention and protection, are the means by which the work will grow in value and importance. But we shall soon have passed the stage when mere interchange of opinions will be satisfactory; we shall want rather the facts on which opinions are based; we shall demand the evidence for our own consideration. Our industrial medical articles must take on the character of scientific research, then from them we may reasonably expect an eventual standardization of the treatment of most industrial injuries, of the prevention of industrial disease, and of the sanitation of plants, based on the collective experience of all men working in this field.

If I may point now, in closing, to some things that will aid our cause I would mention the need of a standardization of record forms and classifications, especially of injury cases; of experimentation and the carefully collection of data in methods of treating open wounds and other minor injuries, of preventing industrial poisoning, of rendering first aid, of using antiseptics; and investigation concerning the causes and conditions of lost time. Our knowledge concerning some of these is entirely too chaotic.

CHAIRMAN FARNUM: The second paper is "First Aid in the Industries. How Much?" by Dr. R. L. Cameron, Chief Surgeon of the Republic Rubber Company of Youngstown, Ohio.

FIRST AID IN THE INDUSTRIES. HOW MUCH?

DR. R. L. CAMERON, REPUBLIC RUBBER COMPANY,
YOUNGSTOWN, OHIO.

Mr. Chairman and Members of the National Safety Council: When first aid is mentioned one's idea is of a hospital, wrapping up injuries, relieving pain and suffering, as soon as possible. Should one have this idea, a few more subjects should be considered, namely:

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(1) Hygiene and ventilation; (2) physical examination and treatment; (3) emergency hospitals, and (4) social nurses. Two ideas of first aid, one being the narrow idea, the broad. To us in industry it is not only the caring for injuries that we should consider, but also the humanitarian side as well.

It is only in the past few years that industry has seemed to consider first aid for its employees. Industry has begun to consider the lack of securing the proper care for her workers, and whether or not industrial accident insurance or other means has caused changes no one seems to have solved. First aid, in its narrow sense, seems to be a small part of the real, broad, humanitarian idea. Industries have different ideas of how and by whom first aid should be given. It is a subject now under much discussion.

There are various sorts of industries, each having its own problems to solve. Some have the first-aid kit only; others have trained first-aid men rendering treatments; others have a nurse; then there is the part-time surgeon with the full-time doctor, and, finally, the full-time surgeon and his staff. Let us look at these and see what are some of the results. First, the first-aid kit. Here is an outfit, either elaborate or otherwise, in which there are most of the dressings, drugs, instruments, etc., that one would need in an operating-room. There may be instructions printed on the use of this kit, but are we safe in placing these in inexperienced hands?

WHEN AN EMPLOYEE IS INJURED.

If one of the employees is injured, and he uses this first-aid kit and recovers, nothing is said and we know nothing about his injury. Another employee may have a similar injury and a similar treatment, and we do not know that he has been injured until he becomes ill from himself with an infection and is unable to work. Again, with this untrained employee rendering first aid, and here you have the same condition as you do with the first-aid kit. How many times have we all had injuries come to our offices badly infected because of neglect?

EDUCATION IN FIRST-AID WORK.

Whose fault is it that these conditions arise? There should be sufficient teaching on the part of a competent person relative to the necessity of the proper care of minute injuries, as a pin prick, abrasion, etc., also how bacteria easily get into the tissues and cause infection. If sufficient education is given, it ought to help in preventing

reduce this hazard. Instruct your foremen to have their men report their smallest injuries; the larger ones will be taken care of themselves. The foreman may say that John Jones "just tore some hide off" and he did not think it necessary for him to leave his machine to report this accident and only have some iodine placed upon it; or he may tell you John received care in the dispensary by a first-aid man.

In my plant one of the employes severed a blood vessel. The foreman saw the accident and thought he could care for the injury without sending to the dispensary. Some peroxide was put in the wound and a strip of rubber was placed above the bleeding vessel, and over the wound was the employe's dirty handkerchief. In applying the tourniquet, more harm than good was done, and the result is obvious. No doubt this foreman thought he was doing the right thing; in fact, he told us so.

One of my experiments was a case in one of our steel mills, where the men in one of the departments work in gas fumes. The doctor sent some absorbent cotton and a solution to this department, with instructions as to its proper use—to wash the eyes. Gradually cases would come to the main dispensary with badly infected burns. Upon questioning the men it was learned that whenever one of the employes was burned he took some of this cotton, immersed it in engine oil, and in this manner cared for the wound. More infections came from this department than all the other departments put together. It would seem that if employers have to get along with first-aid crews and kits education should be more freely given. There should be instructions given to these first-aid men on what not to do, rather than what to do. They should be taught how to place a person on a stretcher, apply a tourniquet and not to try and reduce fractured bones. In other words, they should be capable of rendering first aid until a competent surgeon could arrive.

CARE OF MINOR INJURIES.

How about departments in which many minor injuries occur, where employes do not consider the injury sufficient to warrant them to go to dispensaries? Should this be the case, the dispensary should be taken to the employe. The officials will tell you that all this costs money, but show them where they have lost money, not only through compensation, but also through illness caused by men not reporting such minor injuries. In this dispensary should be a trained person

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—trained by the surgeon, not for a week or a month, but a person is capable of doing justice to the employee's injuries after this person is placed in a dispensary a surgeon should attend these injuries personally.

The whole solution to this question is to have proper attendants rendering the necessary first aid. Small industries they have not enough employees to require the services of a doctor and are satisfied with first aid given either by a trained or untrained man and a trained or untrained nurse. They would welcome any suggestion as to how a surgeon's services might be secured. At our last meeting, in Detroit, Dr. O. P. Geier read a paper in which he explained how these smaller industries could have the services of a doctor and still be under very modest expense.

It would seem that in order to teach first-aid men it is better to tell them what not to do than what to do. How many would want our injuries treated by inexperienced attendants? Should any one of the members of our families become injured would we want care given? Naturally, all of us would ask for competent treatment and would not consider the untrained attendant or the first-aid kit. I believe in first aid being rendered by a trained worker, and, as I have already stated, it should be attended by the surgeon. Even after an attendant has proceeded to care for his work, the patient should not be too far away from the eye of the surgeon.

HYGIENE AND ILLUMINATION.

We have considered first aid in its so-called narrow sense, let us go to the biggest and broadest term, which includes the humanitarian side of it. In order to start first aid properly there should be a plant in which ventilation, sanitation, hygiene and lighting are in the best of condition. Dust, gas, fumes and vapors should be reduced to a minimum. Washing facilities should be adequately supplied, and the workers should give their bodies proper care. Drinking fountains should be installed with good, fresh water. Lighting should be such as to give the proper illumination, not too strong and not too weak. Ventilation should be so regulated as to remove all foul air and keep the air in motion.

After we have our plant as near this condition as possible we begin to fill it with men who are willing to abide by the rules of hygiene and sanitation. The next step is the physical examination of all applicants for work. Right here is where experience of

aid will question whether an employer has the proper right to examine the applicants or not. We do not know whether any of us is perfect in health, but we do know that there are conditions which prevent us from doing certain sorts of work.

Let us assume that an applicant applies for work and the work is heavy. Upon examination it is found that both hernia rings are enlarged and heavy lifting will cause more damage. Again, an applicant has a heart lesion and is also willing to try hard work. Do any of you think it is fair to the man himself to allow him to try heavy work? Here is a foreigner applying for work and maybe he is just over from the old country. Upon physical examination he is found to have some contagious disease. Is it right to allow this man to work alongside of employees who are more cleanly about their person? I doubt if any of us would wish to be placed alongside such a man. How are we to find out these various conditions if not by a physical examination? It is not the idea of rejection that the examiner is after, but the idea of placing a man at the right job; in other words, fit the man for the job.

KEEP EMPLOYEES IN GOOD HEALTH.

Annual expenditures for services of employees is one of the employer's greatest expenses. Does not the employer keep up his buildings, ground and machinery so that the greatest of all machinery, human life, is able to make its investment possible? Is it not just that the employer should look after this human part of his machinery and keep this unit in the best possible condition? The question of proper care for the worker in our industrial concerns today is a vital one, especially on account of scarcity of labor and at this time of crisis in the country's affairs. How are we to keep our high standards if production diminishes? All of us in industry are wondering what is best to do for our workers. The poorest employee does not desire charity. All he wants is a sufficient amount of money with which to pay his bills and live as one should. Try to give charity to one of these workers and watch how long he will last with your concern.

Social nurses can be of immense value in helping solve some of the difficulties in wondering what to do for your employees. In the sense of a social nurse I would suggest a somewhat different attitude than that which is required by some concerns. We all know that the social nurse in the past has been looked upon by the employee as an industrial spy. Perhaps this is the right version when one

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considers what some industries have these nurses for. evade this question is to inform our employees that we social nurses for their benefit and that they are for their and that for whatever care or services that might be needed would have to do is to notify the industry.

Of course, if a report reaches us and we find that an employee is ill and not getting the proper care, it is up to us to be busy and see that all the attention needed is given him. A fair-minded employer is not prone to spy on his employees. He has the right to know if his men are living in a state of distress after they leave the factory gate, but if an employer has to be working all the time, watching his employees, there must be something wrong with the factory rules.

NURSES, NOT SPIES.

The employer does not, or, rather, ought not to want to be brought to him, except in rare cases by these social nurses. What he wants to know is that his employees are being well cared for. In corporations are there in which all the men report for work every day? And who is the employer who will try to stop a man from doing the various things he wishes? Here is where the nurse meets his prerogative and where labor will show resentment. What are the duties of the social nurse? The nurse goes to various places and finds many things at fault. She teaches hygiene and sanitation, prepares food for the ill, instructs how to care for the children, sometimes settles domestic disputes. She does many small things that are really of great moment. Suppose the nurse reports that John Smith has been up all night with one of his sick children. This reaches us in time to have a talk with John.

No man is capable of performing his regular duty who has not had his proper rest. This we tell to John and explain to him that the brain cells need their rest, because we know that when the cells become overworked fatigue sets in and a man is more likely to be injured. John considers all this and, remembering that he is the sole support of his family, he decides to not attempt his task. He goes home, the nurse accompanying him, with instructions how to care for his sick child. John gets his rest and he is able to assume his duties the following day. Knowing that his employer is interested in his family's welfare and knowing they will receive proper care, there is more impetus put into his work. This is not a new thing.

LISTEN TO YOUR FOREMAN.

Safety men around your industry can be of unbelievable help to accident prevention. They are busily engaged in safeguarding all machinery and teaching the men to be careful; they talk to the foreman and seek suggestions and are often surprised that the foreman can figure out a device for guarding the machine which most men thought could not be guarded. Listen to their remarks and show them you are eager to learn and explain to them why this or that guard cannot be applied, and you will find there will be more good ideas than bad; at least, it will boost safety.

You cannot show in dollars and cents where you have saved the company, but you will feel down in your own hearts that you have at least saved some unfortunate a serious accident. The day of "get all the work out of a man and then fire him" has passed. The employer has considered all this and now he is waiting with outstretched arms to welcome any safety and first aid ideas that will prove a betterment to his employees. Corporations are willing to do things, but first they must be shown. It is up to us to get busy and show them. Society at large seems to await the action of industries, but is not industry doing its part? How are we going to care for these invalids who are unable to care for themselves? These so-called by-products of industry must live; but who is to care for them? Is this up to industry alone? It would seem that our legislatures ought to be busy, formulating plans for the care of these by-products, whether it be health insurance or other means.

CHAIRMAN FARNUM: We are constantly told and I suspect we all believe that we are eminently capable of handling all the big things that come up to us but the little things are often the hardest. We are to hear about minor injuries and I can't tell you how happy I am that this particular subject is going to be handled by Dr. Colcord of the Carnegie Steel Company.

THE TREATMENT OF MINOR INJURIES.

DR. A. W. COLCORD, SECRETARY, RAILWAY SURGEONS ASSOCIATION,
CLAIRTON, PA.

Mr. Chairman and Members of the National Safety Council:
In this paper I assume that "Minor Injuries" are those not involving major surgery, and include all usually treated in the emergency hospitals of our mills and factories.

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It is obvious that all injuries should be treated at the possible moment. Yet I am convinced after a number spent in training first-aid classes that a wound, fracture should seldom be treated by anyone but a trained nurse or a doctor. In the Clairton group of mills there has not been a time in the last four years when there was any possible chance for a man to dress a wound. Our hospital can be reached from any of the works in ten minutes. We have gradually boiled down the teaching of first aid classes to four things:

1. Hemorrhage.
2. Asphyxia and shock.
3. Transportation of injured; how to get an injured man to a proper place for treatment with a maximum of speed and a minimum of pain and trauma.
4. What not to do: Not to dress a wound or burn, not to set a fracture with a splint, not to try to remove a cinder or foreign body from the cornea with a sharp pencil or a toothpick—to let a wound I am to treat should remain open rather than to have it dressed by a layman, even though well-trained in first aid work. I am aware that in many industries, such as small or widely scattered mills, first-aid work by laymen is sometimes necessary. It should then be of the best and each case should be hurried to a trained nurse or surgeon.

DIFFICULT TO OBTAIN CLEAN RESULTS.

While it must be admitted that better work can be accomplished in any well-regulated hospital, in my opinion good, clean surgery can be done outside of a hospital—in the home, office, even at the roadside. Yet it is much more difficult to obtain clean results. The fundamental principles of asepsis are the same in the hospitals as outside, but those who do the most of the work outside must perform it under entirely different surroundings, often without assistance, without trained nurses or the appliances of the hospital. Although the greater part of my work is now done in a well-equipped hospital, I shall speak of some of the more difficult problems met with in treating wounds outside of hospitals.

Let us suppose we are called to treat a severe wound. The patient has been carried to a private house in a small village. We see that we have the best and cleanest room available, with light, heat and ventilation. If the patient must lie down,

table—a kitchen table will do—and another small one for dressings. We clear the room of all unnecessary furniture and bystanders. When we first see the patient, we make a rapid preliminary examination, with a view to three things:

1. Stop hemorrhage.
2. Combat shock.
3. Relieve pain.

STOPPING HEMORRHAGE.

We may do the first with a tourniquet, pressure bandage or whatever means we have at hand. The pain and shock will be relieved with a hypodermic of one-fourth morphia, one grain atropin. If the shock is very severe we may of course use the customary measures. In my own hospital work, my nurses are instructed to treat hemorrhage, pain and shock at once, before surgeon arrives, when a severely injured man is brought in. Then after bleeding is controlled, the hypodermic dose of morphia and atropin is given, and patient is placed in comfortable position on well-padded operating table. External heat is applied with electric mattress and warming pads. His fears are calmed with reassuring words. We years ago stopped using strychnia, musk, camphor, whisky and all heart stimulants in shock. Cases requiring intravenous saline, transfusion of blood, bandaging of extremities, etc., belong to major injuries.

After a preliminary scrubbing of the hands we now remove such of the patient's clothing as is necessary, and without washing, examining or touching the wound, cover it with cotton or gauze wet with 1:2000 cyanide solution. We now get ready our dressings and arrange a clean place for them by wringing towels from cyanide solution and laying them on the table. On this we place our cotton, gauze, etc. The instruments are put into a tray of alcohol and the surgeon and his assistant proceed to thoroughly scrub hands and forearms for five minutes. If at hand, a rubber apron may be put on before scrubbing and a sterile gown and rubber gloves after it. The hands are now washed in whatever solution is preferred by the surgeon—we use only cyanide 1:2000, followed with alcohol.

USE OF ANESTHETICS.

If anesthesia is to be employed it may be begun long enough before, so that patient and surgeon will be ready at the same time. A Kelly pad, always clean and finally washed in cyanide, is placed

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under the injured part of the patient. If no Kelly pad use a sterile towel on heavy pad of cotton or hold limb basin or bucket. Never allow a dirty basin or bucket br the room. It is well to have one or two unscrubbed pers to assist, but do not allow them to touch dressings or th area of the patient. They can hand a chair, raise a wi Allow no one in the room except those really needed to allow no talking except by the surgeon, and he should do

DRESSING THE WOUND.

We now come to dressing of the wound itself. Scrui wide of the wound with sterile water and liquid soap, s hair several inches from the wound. Remove all forei and visible dirt, tie or twist bleeding vessels, trim off flesh that may die, irrigate with hot sterile water poure basin or pitcher. Now cover field well beyond wound w towels or towels wrung from cyanide. After this the hand should not go near the wound except to examine for in which case it should be again irrigated. We now p suture the wound, drain if necessary, cover with sterile g ton and bandage. If near a joint, a splint is applied.

We apply a dressing wet with Ochsner's fluid or Dak and keep it wet for several days or until all danger of in past. If Dakin's fluid is used and wound is deep or large, many Carrell tubes as are needed and arrange for more be injected every two hours. Protect skin two to four incl wound with sterile vaseline gauze. We have had sever severe burns of skin from Dakin's fluid. If sterile vaseli is not at hand, sterile vaseline or 5 per cent boric acid may be smeared over skin.

With a record of over 6,000 consecutive wounds trea Ochsner's fluid without an infection in my own service, to me that we have here an ideal antiseptic, non-poisonc irritating, easily carried and applied. It keeps its strengt nitely, does not burn the skin, and needs no complicated a for its application. I am now using Dakin's fluid almos sively in my Carnegie Steel Hospital work. Results a satisfactory. Some of our surgeons are already very astic. I have no doubt that in the horrible, infected shell

sults almost miraculous and has saved thousands of lives. I have begun a series of observations on wound discharges, using microscope, and shall be able later to report comparisons on a large number of cases treated by both methods. As Dr. Sherman aptly says: "The Carrell-Dakin treatment is 80 per cent technique and 20 per cent Dakin's fluid." The keeping away from the wound with fingers, the careful scrubbing with sponges held in forceps, the handling of all dressings with forceps only—in fact the introduction of the technique of major surgery into minor surgery—all this is splendid and if it impresses the profession as it should it will surely do much to drive out sepsis from our hospitals, big and little. Following up the work with the microscope and bacteriological chart is another feature that cannot be commended too highly.

TREATMENT OF LACERATIONS.

If finger is badly lacerated, apply wood spatula splint. If hand, wrist or forearm, apply woven wire or white pine splint and put whole forearm in a sling. If foot is badly lacerated, apply cotton splint; if ankle, apply cotton or wire splint, and elevate leg.

When fingers and hand are badly crushed and it is feared parts will die and require amputation, it is well to lay mangled parts carefully in position on a forearm and hand splint, do not suture—apply constant wet dressing—keep warm—use sling or better put patient to bed with arm on a pillow. Apply sutures in 24 to 48 hours, after circulation is established. Then amputate parts whose circulation is hopeless. I am sure that by this method we save many fingers in our work that would be lost by immediate suturing.

USES OF SUTURE MATERIALS.

1. Silkworm gut should be used where the skin is thick or where there will be much wound tension. Never use it for buried sutures on the face or where it is desirable to avoid scarring. .

2. Horsehair should be employed where the skin is thin, or on the face where we wish to avoid scarring. . Never use it where there is much tension, or for buried sutures.

3. Catgut, either cumolized or chromicized, may be used for buried sutures or for ligation of arteries.

4. Silk has little place in the suturing of wounds, except in wounds of intestine or eyelids.

In suturing, we must bring only like parts together, as skin to

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skin, nerve to nerve, tendon to tendon, fascia to fascia, and muscle to muscle.

Be careful in suturing skin not to roll it in. This is avoided by keeping close to the edge of the wound. Close accurately. Avoid wound tension and do not tie sutures too tight.

In inserting sutures use a needle holder and dissecting forceps. They are cleaner than fingers. We often employ the ordinary forceps for a needle holder.

In very deep wounds use buried sutures of catgut for skin and muscle to avoid dead spaces, and always drain. We use for drainage a few strands of silkworm gut, a strip of cigarette drain, rubber tubing, a glass drainage tube, or a Vansaw Tissue. Remove in one or two days. If very firm drainage is needed, we leave one suture untied till the drain is removed.

SOME HINTS ON BANDAGING.

After selecting the proper form of bandage for a part,

(a) *Permanent*—Put it on the *stay* and, if necessary, with adhesive plaster.

(b) *Comfortable*—You will not have the patient send you in the night because his bandage is too tight, or worse, it will get off and getting his wound infected.

(c) *Neat*—A well put on bandage is a work of art, and credit to the surgeon.

(d) *Economical*—Taking one turn too much in putting on a bandage is a waste of time and material.

In our work we do not use the reverse, but always the same side of eight. It is quicker, more permanent and more comfortable. Never under any circumstances allow the patient to take off his bandage, even in your presence. Get his co-operation by telling him of the danger of infection.

In applying wet dressings, the first one is put on in the morning and the patient is given one-half to 1 pint of the liquid told to pour it on the outside every two or three hours. Keep the thick cotton dressing effectually filters out any pus that may get on outside of bandage. This has been proven both mentally and clinically.

AFTER-TREATMENT OF WOUNDS.

If clean, redress in forty-eight hours and then leave for four days. Where wet dressings are employed we dress daily.

the greatest care in redressing to avoid infection. We wash a wound once, and only once, unless something gets into it later that must be removed, which we regard as a very unfortunate occurrence. Never touch the wound with fingers or anything else but a sterile instrument, and pick up gauze with sterile forceps or with fingers by the corner, never touching the part that is next to the wound. Open a new package of gauze for all important cases, and cover it at once as soon as the piece required is taken out. Avoid "soaking off" a dressing which "sticks"; never let the patient do it himself. Use a clean basin and pour on cyanide or hydrogen peroxide yourself.

Sutures are removed six to ten days from the time they are inserted, and on the face in three or four days. In removing sutures do not pull roughly or hurt the patient. Use clean, sharp scissors and forceps. Cut sutures "under the skin" by pulling up gently, and you will not force dried wound discharge through the path of the suture and cause stitch abscess.

Do not let the patient touch the wound or put his fingers *near it* while making a dressing. Do not leave the wound exposed too long, and should a long exposure become necessary, cover temporarily with wet gauze or cotton. Watch every wound for signs of infection—rise of temperature, redness, swelling, pain, pus oozing from the wound, red streak up the arm, swollen and painful axillary glands, etc.

If infected, remove sutures at once and treat as below for infected wounds.

In making redressing in a private house:

1. Insist on clean basins, scrub them clean and, if very important, sterilize by boiling.
2. Wring out clean towels from cyanide solution and lay them on the table to make clean place for dressings and instruments.
3. Sterilize instruments in alcohol or boil before using.

TREATMENT OF SPECIAL WOUNDS.

Scalp Wounds—Shave the hair at least two inches from the wound in all directions. Irrigate by pouring one or two quarts of hot sterile water from a pitcher or basin held two feet above the wound, holding its edges well apart. If from violence sufficient to cause fracture, examine the bone with the finger through the wound. Irrigate again. If the wound is over one and one-half inches long

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to the bone, if gaping too much, or if bleeding profusely, wash and drain.

In wounds of the eyelids we use a very small needle catgut; suturing the conjunctiva with a separate row of sutures on the under surface. Apply Lippincott's ointment or a washing of sterile boric acid solution.

In wounds of the lips or mouth use two rows of sutures for the mucous surface and one for the skin. Wash the wound frequently with Seiler's solution.

In wounds of tendons anywhere, be careful to bring the ends carefully together and sew with fine catgut. Put in a tensile splint of silkworm gut and always splint in a position to relax the muscle.

Be especially careful in wounds opening into a joint, employ rigid antisepsis; close the joint; use a splint, with perfect rest.

Poisoned Wounds—In treating such wounds as bites from other animals or human beings, do not cauterize with heat or apply pure carbolic acid and follow with alcohol. Provide drainage and use continuous wet dressings.

When the fingers have been "bitten" off by machinery or violence, if in the distal phalanx, do not reamputate; allow the wound to heal by granulation; it saves more of the finger and does not look much worse than the average amputation.

When the nail is injured, with blood under it, evacuate the blood, apply an antiseptic ointment or wet dressing, and remove the nail after several days.

When a portion of the flesh is completely torn away, dress daily with wet dressings until granulation is well started, then graft if necessary. When tissues are so injured that they will not keep on a wet dressing and trim them away as they are ready to fall, will thereby (a) avoid sepsis; (b) get a minimum of bad results; (c) have little or no pain; (d) promote rapid healing.

Punctured Wounds—In punctured wounds, scrub the wound thoroughly; do not probe; apply a wet dressing. In these cases insist on elevating the foot and on complete rest. If injured in a stable, or in a dirty yard or street, open fully the wound, apply a wet dressing and give antitetanic serum.

Bullet Wounds—Do not try to remove a bullet if it is not accessible and lodged where it will not do harm. Do not probe if avoidable. Better locate the bullet with the X-Ray and remove it.

cutting down on the most accessible point. Drain and treat as any lacerated or punctured wound.

In through and through bullet wounds, do not probe or use through and through drainage. Clean the surface thoroughly and use wet dressings. If necessary supply free drainage by larger openings.

The same may be said of needles or other metallic foreign bodies. Many a surgeon has done ten times the harm by cutting and hunting for a needle than the needle itself would have done if let alone.

Infected Wounds—Every surgeon dislikes, above all things, to have an infected case come to his office for dressing, on account of the great danger of his clean cases becoming contaminated, but for various reasons a certain number will present themselves already infected.

In case of an infected hand, open and resort to moderate drainage. Do not cut too much, as this opens new lymph channels and spreads the infection. Wrap the whole hand in a large cotton dressing; if red streaks run up the arm, include it in the dressing, which is to be kept constantly wet with Ochsner's or Dakin's fluid. Put the arm at rest, preferably on a splint, or by letting the patient lie in bed with the limb elevated on a pillow. Dress once or twice daily. Cases treated in this way get rapidly well with a minimum of pain and little general sepsis. The deforming and crippling of hands once so common is now seldom seen.

Condemn the use of flax-seed poultices in suppuration. It has done and is doing an immense amount of harm. Hot, moist antiseptic dressings will do all that a flax-seed poultice can do and without any of the dangers.

Infected wounds on other parts of the body are treated on the same general principles and yield quickly to the wet dressing and rest.

SEPTIC CASES.

After contact with a septic case, do not touch furniture, dressings, instruments, etc., if possible to avoid it, until you have scrubbed up. Scrub with gauze, not a brush.

Do not allow a septic case to stay in the office (operating room) a minute longer than is absolutely necessary. Do not let patient handle things about the office or use the stationary washbasin.

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Throw septic dressings at once into a germicidal solution on the floor or where flies can get at them.

When about to dress a septic case:

1. Have an assistant hand you gauze, instruments, etc.
2. Get out the quantity of gauze, cotton, etc., you will need before you have touched the patient. Throw away any excess portions.

If, with septic hands, you touch a package of sterile or other dressing, even on the outside, it is unclean. Do not use it on a clean case.

In making a number of surgical dressings during your hour, see the clean cases first, leaving the septic ones to see the waiting room until the last.

Don't operate or dress an important surgical case in the suit of clothes you have worn in visiting a patient with fever, diphtheria or erysipelas. Change your clothes and

When I see an assistant or fellow surgeon: (1) Drag him over clothing, hair or other unclean surface; (2) unclean touch a wound with his fingers; (3) handle gauze or smooth with his fingers, before putting it on a wound; (4) touch another unclean object and then go on dressing a wound with washing his hands; (5) go away and leave gauze open and to dust; (6) take scissors from case or pocket and without them remove sutures; (7) wipe blood, etc., from the skin the wound and then with the same pad wipe the wound; (8) go from a septic to a clean case without thoroughly scrubbing up, or (9) make after-dressings of wounds without scrubbing hands; when he does any of these things I know that he has no aseptic conscience."

Treat as open wounds without suture and with continuing dressing:

1. All punctured and penetrating wounds.
2. All lacerated wounds that cannot be sutured, as a piece of flesh is torn away.
3. All crushing injuries where some flesh must slough.
4. All wounds where there is great danger of infection from bites of animals or human being, gunshot wounds, stab wounds.
5. All infected wounds.

We can condense the treatment of wounds into two principles: *Cleanliness and Rest.*

BURNS.

During the past fifteen years I have treated over 5,000 burns with an ointment.* (See "Burns and Their Treatment," *Int. Journal Surgery*, May, 1911.) They heal rapidly without pus, and with little or no pain or odor.

I have been over the ground of all the popular remedies, picric acid, stearate of zinc, the dry method, and the various other ointments (in the early 90's was even guilty of using Carron oil, but hope I will be forgiven for it); but I have found my own ointment far superior to any of them.

Since March last I have been treating our burns with Ambrine, using electric dryer, atomizer, and brush, but so far have had no better results than with the ointment. In many of my cases it has caused so severe a dermatitis that I had to discontinue its use in those cases. It does not prevent pus and in an occasional burn one must stop it for a few days to clean it up with Dakin's or Ochsner's.

SPRAINS AND BRUISES.

Sprains and bruises are treated with an ointment of ichthyol 20 parts, iodine ointment 20 parts and belladonna ointment 60 parts; over this waxed paper, a cotton splint (plenty of cotton) and snug bandage; and when severe, position and rest of part. Sprained ankles are afterward strapped with adhesive plaster one week; and later, if needed, a Golden ankle brace is fitted. We insist on a high shoe snugly laced as soon as patient begins to walk.

* *Ointment for Burns.*

Carbolic acid.	Balsam of Peru, of each 10 gr.
Thymol.	Zinc oxide.
Menthol.	Starch, of each 1½ drams.
Camphor, of each 5 gr.	Petrolatum to make one ounce.
Ichthyol.	Mix well.

This is seldom used full strength; we usually use it diluted as follows:

Burn ointment	1 part
Boric acid ointment (5%)	5 parts
Mix.	

Spread on sterile gauze so as to extend well beyond the burned area.

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For fracture we use thin, clear, white pine splits or woven wire splint. Severe compound fractures and all of lower extremity are sent to a general hospital. All treated are carefully X-rayed, not only at first but at intervals as indicated. Massage and passive motion are begun early. If they tend to remain stiff they are baked daily in our electric apparatus. Compound fractures of fingers and toes or of hand do well with the necessary reduction and splinting. A large constant wet dressing of Ochsner's fluid. In our cases we have had no infection in such fractures for years.

Foreign bodies in the cornea are removed under cocaine with an applicator wet with 1/3000 cyanide solution or with a knife. Burns of conjunctiva or cornea are treated with bichloride of mercury ointment (sterile vaseline base) and eye pad changed twice daily.

"Gassed" cases are put to bed and if severe are given 1/100 grain of morphine and on to one-twentieth grain atropine. This prevents the after headache and gets them back to work quicker. If there is no pulse, they get oxygen. If they do not breathe, we use the Singer or artificial respiration, and here is where our first aid shines.

The treatment of heat prostration is the treatment of heat stroke. Heat stroke cases are tubbed in ice water till temperature is lowered to 102. Then rest in bed, with thorough and prompt attention. I have never seen a heat stroke case that did not survive. We had one live after a temperature of 111.

ELECTRIC SHOCK.

Electric shock cases may be divided into two groups:

1. Those who breathe. They will recover with various measures, such as we use in mild shock.

Those who do not breathe. We subdivide these into two:

(a) Those where a powerful current has passed through the heart. They are dead.

(b) Where a current has acted powerfully on the gastric or phrenic nerve. They are alive (if seen soon enough). All can be saved by prompt and efficient artificial respiration, lung motor or pulmotor and oxygen if at hand.

This is inhibitory shock. It is the "faint" type.

We can distinguish cases "a" and "b" only by using artificial respiration.

The Clairton Emergency Hospital has a waiting-room, a re-dressing-room, an operating-room, a ward, a nurses' room, bath-room, hall for supplies, an X-ray room and pathological laboratory, furnace-room, morgue, and janitor's room. There are terrazo floors, vitriolite walls, and the best of modern plumbing and surgical and hospital equipment. Three trained nurses are employed—not just ordinary graduates, but selected on account of peculiar fitness, specially trained for this work. They can suture a wound, dress a burn or apply a bandage or splint better than the average doctor and as well as most surgeons. They can be trained to use the microscope for blood counts, etc.—develop X-ray plates, make urine analyses, keep accurate case records, give anesthetics, treat shock, hemorrhage and asphyxia till the surgeon arrives and treat the large group of lesser injuries, having them report to the surgeon at the next daily dressing hour. Including welfare cases, 108 persons are given attention in this hospital every twenty-four hours.

FEW CASES OF INFECTION.

Each of the thirty-seven plants of the Carnegie Steel Company has a well-equipped emergency hospital, seven of them being of the type of the one at Clairton. At these various plants are 50,000 men and thirty-five surgeons. Dr. Sherman, chief surgeon, in October, 1915, reported for five years' service, 77,000 wounds treated with only ninety infections. This included 3,500 of my own with no infection. They did not include those who come for the first time, with wound already infected or those who removed their own dressings and so caused an infection. We are, however, gradually educating the men away from such things.

Such a record can only be made with the whole machinery of the company working as an efficient unit. It means a capable and tireless chief surgeon; loyal works surgeons; careful selection and training of the best nurses, and back of all the Carnegie Steel Company with an extremely liberal policy—anxious to do everything for the welfare of its employees.

With plants scattered from Columbus, Ohio, to Newark, N. J., the surgeons attend surgeons' meetings regularly and work for the success of the whole unit with the zeal of a football eleven. Three years ago a committee of surgeons, appointed by Dr. Sherman, prepared a standardized technique for all the mills. This is elastic enough to allow for individuality but the

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work is fairly uniform in all the mills. The men are furnished with dark glasses, crutches, wrist and ankle braces, artificial limbs, cots, and any surgical appliances deemed necessary by the doctors to treat any injury received by a man while at work.

PHYSICAL EXAMINATIONS.

When employed, each man is stripped and carefully examined, and of this an accurate record is kept.

All this care of injured employes may seem at first to be expensive, and it is. The first motive in doing all this for the men was a humane one, but the Carnegie Steel Company and other corporations who have been pioneers in this work have found that it pays.

Men are gotten back to work quicker, there is less compensation to pay, and, best of all, the men appreciate what is being done for them and pay it back in loyalty and good will.

CHAIRMAN FARNUM: We will now see the film of the teams of the Bethlehem Steel Company. (The film is shown.)

I am sure we have all enjoyed this film and we are very indebted to Dr. Shoudy and Mr. Fonda for the privilege of seeing it.

The next paper is "The Need for Visiting Nurses in Industry," by Miss Ella P. Crandall, Executive Secretary, National Association for Public Health Nursing, New York City.

THE NEED FOR VISITING NURSING IN INDUSTRY

ELLA P. CRANDALL, EXECUTIVE SECRETARY NATIONAL ASSOCIATION
FOR PUBLIC HEALTH NURSING, NEW YORK CITY.

Mr. Chairman and Members of the National Safety Council:

The claims of the workman of today for protection of his health and life itself can only, with full justice, be compared with the claims of the soldier in the military forces.

The President's recent rating of industrial workers in his 16th proclamation gives to the laboring man a new status in the world. Heretofore wars have been won or lost on the field of battle and by the soldiers. Theirs alone was the glory. In this new aspect of conflict has changed. Some one has said: "It is no longer a war between armies but a contest between nations." All the forces have been mobilized both here and in Europe, and 1

This nation has recently witnessed a fine expression of the loyalty of labor in the splendid triumph over the seditious efforts of pacifists to weaken the industrial forces of the United States. Such an expression has a double significance when we realize that the laborer generally gives his all when he is called to the service of his country. When the working man is conscripted, it means he gives up everything. He has no reserve, no savings, no insurance, nothing to leave to protect himself or his family, and when he comes back it is pretty apt to be to conditions worse than he left. This calls for courage greater than is usually recognized by those in more fortunate circumstances.

Moreover, his enlistment in war industries is often almost as exacting. Yet it lacks all the glory and stimulus of a soldier's life. And, further, the hazards of industry are as great, in some instances greater, than the hazards of war itself. The laboring man is often called on to leave his family and his home and to go where housing conditions are poor, sanitary provisions negligible or entirely lacking, and where the food is at best indifferent. Comfort and even cleanliness are often out of the question and recreation or decent diversion unthought of.

CARING FOR THE MODERN SOLDIER.

We see and hear a great deal about preparations for the care of the American army, preparations that are attracting the attention of the world. The preventive work of the medical service is well established and in full operation. Two medical examinations are given to every soldier before he is finally accepted into the army. He is required to submit to frequent and regular examinations throughout his service. He is being taught the laws of health and hygiene even before he arrives at camp. Whole states, in co-operation with their local authorities, are laying out sanitary zones surrounding the military camps and cantonments.

In addition to these, the social and moral life of the enlisted man is to be safeguarded as never before. Recreational facilities, libraries and many other means of protection and welfare are being provided. The government has already presented to Congress a bill for insurance and indemnity for the soldier's family.

The organization of the medical profession for his care when injured or ill has assumed wholly new proportions. The programme of reconstruction and re-education and rehabilitation that is already under way affords the greatest possible compensation for the sac-

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difficulties which the individual must make in the service of his country. This programme ranges from provision of false eyes and limbs to convalescent hospitals in which invalid occupations are taught and workshops for re-education in new vocational employment bureaus through which positions may be secured for the individual in his own part of the country.

RAVAGES OF DISEASE.

Of all this extraordinary care and protection, the worst is the lessening the double tragedy of the greatest carnage in history. At the same time disease playing a greater part in the mortality of nations than the actual casualties of war. For example, some figures recently tabulated in Canada, we face the startling facts: "Deaths from typhoid and tuberculosis at the outbreak of the war have been 17,350; deaths from all the Canadian expeditionary forces for the same period of war have been 15,766. Again, taking the following group of preventable diseases—typhoid fever, diphtheria, scarlet fever, whooping cough, tuberculosis, and measles, to say nothing of preventable infant mortality and the mortality from the preventable industrial diseases of middle life—the comparison is even more striking. The deaths from this group of preventable diseases in Canada since the outbreak of the war have been 22,560; the fatal casualties in the Canadian expeditionary forces in the same period 15,766."

In this country, as in Canada and all the warring nations, moreover, the war industries have naturally increased all the hazards which we are normally familiar with. Quoting Dr. Alice Hamilton's report on "Industrial Poisons in Munition Plants," we find

"Formerly we imported benzol and toluol from Germany. Now * * * we have learned to distil them. Carbolite, formerly imported, it is now made here in great quantities. Plants formerly equipped to make gun cotton may be used to make celluloid and nitrocellulose films. It is probable that some of these newer explosives will take the place of nitroglycerine for blasting and excavating. It is a permanent addition to American industrial life, and it is a careful scrutiny lest the dangers due to its hasty beginning and rapid growth become fastened upon it."

NEW INDUSTRIAL HAZARDS.

While Dr. Hamilton frankly admits that it is impossible to ascertain accurate figures as to the amount of sickness and death

work in these industries, since war was declared, she states quite definitely that many cases of industrial poisons were never recognized; while others were seen by company physicians or insurance physicians who were unwilling to give information concerning them. Some of the factories provide either inadequate or no medical care. In others there was evidence of general carelessness and indifference to the welfare of the men, although there were notable exceptions to this lamentable lack of protection. She gives various instances of frequent cases of mild poisoning, many of which receive no attention and were not even treated seriously by the workmen themselves. In addition to these new dangers, old ones are greatly increased, such as over-crowding of buildings, many of which have been hastily reconstructed to meet the new demands or are merely hurriedly built shacks, put together over night, in woods or on moors without drainage or sanitary provisions. The crudity of equipment is illustrated by frequent absence of exhausts to carry off fumes in metal works. Furthermore, the ignorance of the worker and even of the chemists and other experts in some of these new industries becomes still another factor in the risk taken by every individual worker.

The pressure of demand has made increased speeding-up inevitable. Granting that the industrial worker is as important to the successful issue of the war as is the soldier, it is obvious that both the nation and the individual industrial company are obligated to surround him with the protection of education, sanitation and recreational facilities equal to the soldier's in his camp.

PROBLEMS CALL FOR VAST UNDERSTANDING.

We say this fearlessly in full recognition of the unprecedented burden which this war has placed on employers of labor: Profits and income taxes, regulation of prices and many other exacting demands and conditions have created for them problems which only men of their vast understanding and ability could meet.

They, alone, cannot be expected to provide all that the Federal and state governments and an aroused and patriotic public are lavishing upon the soldier and sailor. But it is theirs to point and to lead the way to proper protection of labor and to secure necessary legislation to supplement what they, of their own accord, are doing.

WORK OF THE INDUSTRIAL NURSE.

Moreover, this protection of the worker is necessary, as much for economy and efficiency as in justice to the laborer and his family.

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In order to insure this economy and efficiency and justice, : sary in proportion to the increase of dangers to inquire dangers and to provide new or additional measures of p In the work of discovering and preventing, the industrial r her primary function. Her daily rounds in shop and fa mill discover to her the minor ills and the early signs of : ous physical conditions; long before the worker himself is of impending trouble. Hundreds of employes will visit aid-room when they would never think of consulting a ph reporting to the boss. In all these cases it is the nurse's fir secure medical attention for the patient. It is quite as mu her province to note the sanitary conditions in which the works, unless, as is often the case, special inspectors are . Even then, no nurse who is alert to her opportunities will fa her own observations of the relation between probable o causes and effects which present themselves to her in the conditions of her employe patients. Her records are pa designed to show comparisons between the occupational ac the percentage of accident or illness.

A valuable paper on this subject was presented at t convention of the National Organization for Public Health by Miss Florence Wright, industrial nurse for the Clark Company.

PRACTICAL VALUE OF REPORTS.

One example in illustration which she gives is as follo
"An industrial nurse found numerous cuts on the hand tain workers. Without records, these accidents would , been associated with their cause, as they happened in many ments (there was seldom more than one such worker in a ment). The records were tabulated as accidents happeni doing certain work. It was found that *every one* doing t had received at least one cut within a month. A guard was by a foreman, and there were no more injuries from this ca one foreman had realized the existence of the hazard as perhaps only one such worker in his room."

Miss Wright goes on to discuss the importance of the relations with the worker's family, and to show that her serve to divide responsibility for illnesses between condi home and at work. In fact, it should be said that too much e cannot be placed on the importance of the nurse's record-

with special application to the industry in question but also conforming in certain general features to those used in all plants in order that helpful comparisons may be made. It is not too much to say that the day's work of any industrial work, however valuable, is but a small factor of its potential value to the company when compared with a searching study of her records showing the experiences and findings of all the days of any given period of time.

DUTIES OF THE NURSE.

The duties of industrial nurses were stated as follows in a recent report prepared by the Committee on Home Nursing of the Committee of Labor of the Council of National Defense:

- (a) Regular conference hours during the working day.
- (b) Regular rounds of inspection (wherever practicable) for observation of the operatives.
- (c) Regular inspection of sanitary conditions of the plant. (If a nurse cannot perform this service a sanitary inspector should be employed, but it is frequently demonstrated that a nurse is the better agent because she combines the two services to the advantage of the company and to the comfort of the employe.)

In both of these rounds of inspection she should note all signs of physical defects, undertone and strain due to wrong posture, strong light, and other unfavorable conditions and influences.

- (d) Special attention to diet, including lunches provided by the company.

- (e) Charge of hospital and restrooms.

- (f) Regular group instruction in health and hygiene.

Recreation and other welfare activities rightly constitute a separate service of a general welfare department, but if the plant is small and but one worker is needed, the nurse frequently directs some so-called social service in connection with her health work.

It has been demonstrated that when this thorough-going care is given there are fewer accidents and less absence due to minor illnesses, as well as other advantages of a definite nature both to the company and the worker.

EXPERIENCE OF EMPLOYERS.

The appraisal of industrial nursing service, expressed in letters from companies of national and international reputation, is very interesting and may be summarized as follows:

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Employment of visiting nurse:

1. Avoids frequent changes.
2. Avoids serious infections.
3. Avoids long and frequent absences.
4. Avoids excessive 'physicians' bills.
5. Results in decreased number of deaths.
6. Results in decreased number of disabilities, both p and partial.
7. Results in decreased number of accidents.
8. Helps to solve the difficulty (in some instances) in sufficient operators.
9. Offers an avenue to employes for reaching the comp
10. Offers an avenue of friendly relationship and servic
11. Affords assistance in obtaining information regarding tent and causes of accidents.
12. Has a distinct value in determining liability.
13. Increases efficiency of employes.

A recent list of industrial nursing activities shows that now established in 205 cities and towns and in thirty-six. There are 460 firms employing 567 nurses, these firms inc very wide range of enterprises, from the building of ship building of typewriters, and from the manufacture of te: the making of matches.

A TRIBUTE BY DR. HARRINGTON.

At a recent symposium on industrial welfare a paper w sented by Dr. Thos. F. Harrington, in which he used as h ment and as an illustration the results already attained in t servation of infant and child life through infant welfare a and medical inspection and nursing of school children. Ever ment presented in behalf of these activities applies with equa and in many cases in greater measure, in behalf of the pro of the industrial worker. Dr. Harrington also stated: "Pre should be the keynote of all efforts to promote industrial There is an abundance of reliable experience and testimony 1 rant the belief that a great part of the industrial sickness and number of deaths among industrial workers can be presente

industry in this country, of white lead poisoning in the painting trades in Europe, and the reduction of occupational diseases, injuries and deaths, where preventive measures have been followed, show some of the possibilities of this form of education against industrial human losses.

"The value of good eyesight, unimpaired hearing, and a keen, active sense of co-ordination of nerve and muscles, was never greater than it is today."

NURSE IMPORTANT FACTOR.

In each case the nurse is but one factor, but avowedly a most important factor in the protection to life and limb and in the upbuilding of family and community standards of health, hygiene and sanitation. It is gratifying to note that the Federal bill in behalf of insurance for soldiers closely simulates some of the best laws of workmen's compensation, and it is to be hoped that each will react on the other with the result of improving the industrial worker's protection. It is also a matter of gratification that the Red Cross has already contracted with many cities to give visiting nursing care to the families of soldiers and sailors on a basis of cost, similar to that which the Metropolitan Life Insurance Company gives to its industrial policy holders. Particular emphasis will be placed on the fact that this is not a charity but a just claim. The Committee on Home Nursing of the Council of National Defense, whose report is quoted above, has as one of its purposes: "To make available the service of established home nursing and other public health nursing agencies in the United States to people needing such care, through direct communication with inquirers concerning these agencies, and also to stimulate employment of public health nursing services for industrial workers."

The nurse's work is so largely preventive that it obviously eliminates much of the curative service which is always more costly, and even in the latter her assistance is usually indispensable to a successful issue.

It seems not too much to say that along with every possible safety device, good housing conditions, recreational facilities, indemnity measures, and medical care, should go nursing service.

CHAIRMAN FARNUM: I am sure we are very grateful to Miss Crandall for this splendid paper. We will now hear the paper of Dr. Lauffer.

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RESUSCITATION FROM ELECTRIC SHOCK, TRAUMA,
SHOCK, DROWNING AND ASPHYXIATION FROM
EVERY CAUSE BY MEANS OF ARTIFICIAL
RESPIRATION.

CHARLES A. LAUFFER, M. D., MEDICAL DIRECTOR, RELIEF
DEPARTMENT, WESTINGHOUSE ELECTRIC AND MANUFACTURING
COMPANY.

Mr. Chairman and Members of the National Safety

Various methods of restoring life in persons apparently dead have been practiced from time immemorial. The Sylvester-method of artificial respiration was largely in vogue until supplanted by the Schaefer or prone pressure method. This method is easy to learn, and can be successfully employed by one man. The prone method utilizes the organs below the diaphragm to elevate the diaphragm, thus emptying the lungs; it cannot lacerate lung tissue and is the best substitute for natural breathing yet devised. By spirometric methods for the accurate determination of the volume of air moved, the old Sylvester-Laborde method is reported to have an efficiency of 175 c. c. of air volume expired, against 520 c. c. expelled by the Schaefer method. Making pressure twelve inches per minute by the prone pressure method gives us 6,240 c. c. of air expired, and a like amount inspired, affording more volume of air per minute than in normal breathing. Numerous successful resuscitations test its practicability; those who have had occasion to use the prone pressure method believe in it.

THE DIAPHRAGM.

The diaphragm is an arched muscular partition. Its convex face is the floor of the chest; the chest contains the heart and lungs. Its concave surface is the roof of the abdomen; the abdomen contains the stomach, spleen, liver, kidneys, intestines, pancreas, and bladder.

The diaphragm rises and falls like a piston rod in its cylinder. When the diaphragm rises, the air in the lungs is expired, and when the diaphragm descends, atmospheric air rushes in through the nose and mouth to inflate the lungs. Filling the lungs is inspiration; emptying them is expiration. The normal lungs are unattached to the chest walls; only their blood vessels and the bronchi give them support. When empty the lungs are partly collapsed, but when filled they are inflated.

The lungs are passive in respiration; using the lungs of a cat in the familiar bell-jar experiment and employing a sheet of rubber dam to represent the diaphragm, it is self-evident that the natural mode of inflating and emptying the lungs is by the activity of the diaphragm.

THE PARALYZED DIAPHRAGM.

The diaphragm begins its activity at birth, and its cessation means death. The diaphragm is as necessary to life as the heart; the continuous rhythmic contractions of both muscles are necessary to continued life.

A man can fast forty days or more if water is plentifully supplied him; but if his diaphragm is paralyzed for three minutes, thus depriving him of air, he may perish. A man requires oxygen, of which the air contains 20 per cent, and he must eliminate carbon dioxide gas, the retention of which itself will paralyze his diaphragm. From whatever cause his diaphragm is paralyzed, it is self-evident that if the man's life is to be saved, artificial respiration must be employed until his disturbed nerve-centers recover their normal functions; that is, until he is able to breathe himself.

WHAT PARALYZES THE DIAPHRAGM.

When the diaphragm is paralyzed, the man stops breathing, the heart action becomes feeble and irregular, and there is unconsciousness. This condition of suspended animation can arise from several causes:

1. *Electric Shock*—By its action on the nervous system, the passage of an electric current may arrest the action of the diaphragm.

2. *Asphyxiation*—There are forty or more non-respirable gases, which, upon entering the lungs, paralyze the respiratory center in the brain (medulla); exclusion of air as in a closed vault, or in drowning produces asphyxia, due to the lack of O_2 and the retention of CO_2 . Certain drugs, as opium in a similar manner arrest the action of the diaphragm. Chloroform and ether may act in this manner.

3. *Traumatic Shock*—A blow on the head, jaw, or neck, or over the solar plexus, will paralyze the diaphragm. A man who gets such a knock-out blow must be made to breathe until his disturbed nerve centers recover their normal functions.

FORETHOUGHT.

We live in an age of steam and electricity, chemical processes, machinery and rapid transit. Many accidents now fatal are so due to

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the failure to resuscitate the victim; suspended animation instant relief, and any man who fails to qualify himself, does not know how to give artificial respiration when the emergency arises, is morally considered, guilty of manslaughter.

The time to prepare for such calamities is just now; it is your business to know how as it is that of a physician; an actor, like the policeman, is never available when such emergency arises. Every second is an hour, when a man's diaphragm is paralyzed and unless he is immediately assisted by means of artificial respiration, later efforts may prove futile.

Please remember that the victim of electric shock is seldom outright by electricity; he needs artificial respiration. And the same may be said of the victim of gas, water, steam, ammonia, etc., requires assistance until normal breathing is restored.

RULES.

The prone pressure method may be conveniently reduced to a few rules, and described in brief under these headings:

The Position of the Patient.

The patient is laid on his stomach, face turned to one side, the mouth and nose do not touch the ground.

The patient's arms are drawn away from his body, or raised above his head.

The patient's mouth is cleansed of mucus, blood, serum, chewing gum, false teeth, by a stroke of the finger. This position causes the tongue to fall forward of its own weight as well as facilitates the removal of liquids from the mouth passages by gravity. It is this fact that makes it possible for a man, alone and unassisted, to save the life of a comrade in case of electric shock, or other condition, requiring artificial respiration.

The Posture of the Operator.

The operator kneels, straddling one or both of the thighs, or kneels by either side of the thighs, facing the head.

The operator's hands are placed on the outer ends of the lowest ribs; the fingers curl around the body, and are out of sight of the operator. Care is observed to keep the hands away from the face.

The Mode of Operation.

The operator's thumbs are rotated outwards, which assists him in holding his arms straight; he does not use his arm muscles, but his body weight is brought from his shoulders by bringing his body and shoulders forward.

This weight is gradually increased (there is no sudden thrust), until at the end of three seconds of vertical pressure upon the lowest ribs of the patient, the force exerted is felt to have compressed the parts, then the weight is suddenly removed.

When the pressure is thus exerted on the lowest ribs, the organs under the diaphragm (the liver, stomach, spleen, kidneys, etc.) drive up the diaphragm; when the hands are removed, or the pressure remitted, the displaced organs drop back to their normal relations.

When the diaphragm is thus forced to rise, the lungs are emptied. When it descends, a partial vacuum exists, and the lungs are filled by atmospheric pressure. The lungs are thus passive, like in normal breathing. Hence, by the prone pressure method, there is no possibility of lacerating lung tissue, such as is liable to occur when mechanical apparatus of the bellows type is employed.

Rate per Minute and Duration of Operation.

The rate of operation should be about twelve a minute.

The lungs should be thoroughly emptied by three seconds of vertical pressure, in the manner described; the hands are then removed, and the refilling of the lungs takes care of itself.

Pressure and release of pressure—one complete respiration—occupies about five seconds.

This rate can be approximated by the operator following his own deep, regular respiration, if he is alone, or by counting, or he can use his watch. If comrades are present, he can be guided by them.

Such efforts are usually successful within twenty-five minutes, but should be continued indefinitely, without interruption from any cause. One hour, even two hours or more, may be required to bring him to.

Supplemental Assistance.

While the artificial respiration is being carried on, a second party should clear the mouth of all foreign material, then hold continuously a cloth saturated with aromatic spirits of ammonia near the nose. The collar and neck band may be loosened.

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While this is being attended to, a third party summons No liquids dare be given by the mouth while the patient is unconscious. How would you like to have somebody give you water when you were asleep?

On the arrival of the doctor, he can stimulate the patient with such drugs as atropine and strychnine, and the infliction of such pain as is deemed requisite, such as pulling the patient's hair, pounding his feet with a board, slapping on his arms and legs, stretching the sphincter ani muscle, pulling the tongue.

Sprinkling cold water on the face in summer, and thick blankets and hot water bottles in winter, are desirable supplementary measures.

DISCUSSION.

DR. SHOUDY: I am willing to be the victim and have Dr. Lauffer demonstrate this method. Occasionally you find demonstrators prone pressure methods using faulty systems. If Dr. Lauffer demonstrates his method you will be in a position to instruct men in the proper way.

DR. F. E. SCHUBMEHL (West Lynn, Mass.): There is a necessity for demonstration. I recently talked to a group regarding the prone pressure method. I explained just as far as I could and then I called five subjects to the rostrum. I wanted to have the nurses exercise on those subjects. After my demonstration and going through the method with the class (it must have been my inability to appeal to everybody so that they would understand my mortification I found one of the nurses kneeling on the chest of the subject and working up and down. A demonstration is necessary even after such a clear description as Dr. Lauffer has given. (A demonstration was given by Drs. Lauffer and Shoudy.)

CHAIRMAN FARNUM: I am going to ask that Dr. Shoudy be the recent victim and Chairman of this Section for the coming year. He will take the chair.

DR. SHOUDY IN THE CHAIR.

DR. FARNUM: I am very sorry, but I shall be compelled to leave you at this time. Before I go I wish to thank you for the courtesies and hearty co-operation you have given the Health Service Section and I bespeak for Dr. Shoudy and the incoming officers.

has a uniting bond with all the other Sections; therefore, it is perfectly logical that we should be and are the very best Section of the Council. So I will, in again thanking you, say good-bye.

CHAIRMAN SHOUDY: When Dr. Farnum called the Section together he made a speech, but I am not expected to make a speech for one year. If I can have the co-operation and the help of the Council, as Dr. Farnum has had, I assure you that when we meet next year we will try and give as good a program as has ever been given.

We will continue the discussion of the papers. The discussion on "Industrial Hospitals and Dispensaries" and "First Aid in the Industries. How Much?" is to be led by Dr. A. G. Cranch, Works Physician of the General Electric Company at Erie, Pa.

PHYSICIAN AND PATIENT.

DR. A. G. CRANCH: A great many points were brought out in the papers and I will just touch on a few to help start the discussion. Dr. Crowder spoke of the need for full-time hospitals and the tendency toward hospitalization of what formerly had been considered minor cases. I think that the full-time hospital idea is growing in a good many plants, but as yet it has not reached many of them. The work that concerns most plants is that which is done in the works hospital or dispensary, not the full-time plant, and for that reason I think that phase should be more fully developed.

In developing the work there are a few things to consider. Take the average machinist and his attitude towards his machine. His machine is perfect and he can use it, the machine won't talk back, won't say anything to the other machines, won't interfere with any other man's operation with his machine, except that he may get into trouble with it himself. But it is quite different with the physician and he must bear in mind that his work is with the human factor.

I have seen some men that handle their dispensary patients as though they were inanimate, they didn't treat them as human factors at all and the man's personal feelings were not considered.

That should be entirely different in a works hospital. The doctor should remember that each man is an individual and that the success of that plant depends on how thoroughly he can get that man's co-operation—how much he can win his confidence. That man must feel, when he goes to the works dispensary that he is in the hands of a friend. He must not feel that the dispensary is run for

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the sake of avoiding legitimate responsibility on the works or anything of that sort. Some men will feel that there something is going to be done that the company responsible for—things which it might be responsible could go and see their own doctor. The doctor must feel on the part of the men—must remember the people the staff and the human element in the work there. The thing that will bear developing to a higher point than is now.

In regard to the tendency toward making hospital cases what have been considered minor injuries—you always reckon with the human element and a man wishes to get his job as quickly as possible. A great many injured men would be a great deal better off if we could make them stay in hospital three or four days, but the man has a family to support, must work, a day lost is a day's pay lost, and he does not see it; therefore, just as far as possible treatment should be so that a man can get back as soon as possible with safety. Make the cases ambulatory as far as surgical cases allow.

Another thing, many of the men will not go to the hospital because they think they will lose time, others will not go because they do not like the place, others will not go because they do not like the surgeon. You must make the place attractive.

HOSPITAL EQUIPMENT.

The equipment should be advanced. You should not let several cases have turned up for which you have no equipment; you should look ahead as far as possible and provide for cases that are apt to turn up. Get the equipment in, so that you can handle the case the best way possible—so that the man will not feel that he has got away with it as best you could. When he finds you have what is necessary to handle his case you will have made a good impression.

Another thing, that is record keeping. You should be able to make as accurate and full a record as possible in the shortest possible time. In our works we have an average of 85 to 100 cases a day. It is impossible for one man to remember who he has seen before, he has to stop and think twice. If he has an adequate record system he gets that man's number and he can place him in the right place and before there is any awkward pause, while the man is waiting for what you are waiting for. A record system is of value.

whenever you want to foot them up, to learn whether the injuries are running in one direction and where they come from. The record system ought to be developed to its utmost. There ought to be some standard form of record, especially a physician's examination of applicants. At present, two plants hardly ever have the same system. It would be of great value if we had some basis of comparison for other work.

SCOPE OF FIRST AID.

In connection with the important paper by Dr. Cameron on "First Aid" he touched on the scope of the work. A great many of us think first aid is merely concerned with injury. In reality it is a preventive measure which begins a long time before a man is hurt. First aid ought to be wholly preventive. It ought to begin with the sanitary and hygienic condition of the works, then in careful selection of men to see that they are fit for the job. Examinations are not made with the idea of rejecting men. We reject less than 5 per cent and then for very obvious causes. The men are getting so they know they won't pass unless qualified. In any other case the man is usually placed, but we know what is the matter with him. He is told to report at certain intervals and we keep track of him. If the work he is on is too heavy, he is transferred to a lighter job. He is able to support his family and we are able to use him to his full capacity. He is no loss to himself and no loss to the company; whereas, if we had taken him without an examination and he broke down in a month he might be permanently disabled. Examinations should be made as full as circumstances allow, the cases should be assorted accordingly and the man should get a job that does not hurt him.

A good many of the men injured have been in the plant only a short time. A large proportion of them have been in just over night and many others who are injured have been with us less than one month. Why were they injured? Simply because, as was brought out this morning in the Paper and Pulp Section, the man was either put on a job for which he was not fitted, he was not taught safe practices, or, being a foreigner, he did not understand what he was told, even though the foreman may have thought he did. If the men were carefully assorted, according to their qualifications, you would have a big reduction in your injuries.

There should be a nursing system attached to the hospital staff and the men should be taught that it is not a spying system nor a

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system by which we hope to get information to avoid responsibility. That service is there for the good of the company is not charity. It is in their interest and in ours. It is a profitable enterprise and we are not trying to save money so far as we can keep our employes with us. It is just a matter of give and take and the men should see it in that spirit. We have found the system worth while and have almost doubled within nine months.

NO INFECTION IN THREE YEARS.

Before I went with the General Chemical Company to a plant where every injury, no matter how slight, had to be reported to the doctor. For three years every injury, if it was only a minor one, if the foreman learned of it by hook or crook, that man went to the hospital. In that way we had practically no infections. We can teach the men what not to do it is more important than we should do. If you can teach them to prevent a bystander from putting tobacco in a wound, to simply let the injured man go to the hospital, give him a chance until the doctor can see him, you are going in a good way. The first-aid kits are remarkable. During the exhibition last night I saw many different first-aid kits. In fact, they were small operating kits. Our company has its first aid men just as small an equipment as possible—what would be needed in an emergency. No one can break the seal of these kits without our knowing that the box has been opened. If we do not get a report soon we find out why. In small plants where there is no regular staff, a layman should be available. He should be instructed in regard to the limits he should observe until the doctor arrives.

CHAIRMAN SHOUDY: Next is the discussion of Dr. E. R. Steelton's paper, "The Treatment of Minor Injuries," by Dr. E. R. Steelton of the Bethlehem Steel Company at Steelton.

USE OF TINCTURE OF IODINE.

DR. WHIPPLE: The paper we have just heard embodied just the sort of advice in regard to the treatment of minor injuries which we would expect from a man who has successfully treated a large number of cases over a number of years. It seems to me that the paper sets forth the principles of surgery as applied to industrial accidents.

results. I congratulate Dr. Colcord on the thoroughness in which he has treated his subject and doubt if the discussion will develop much criticism.

Certainly, industrial injuries do better if they receive early treatment at professional hands. Every plant of considerable size should have professional treatment constantly available and with that a well-equipped emergency hospital, where all minor cases may be properly treated and where the major ones may be given efficient, aseptic treatment, dressing and preparation for the trip to the general hospital. With such an equipment, first aid can be reduced to the minimum of, *first*, protection of the wound; *second*, checking of hemorrhage; *third*, resuscitation, and *fourth*, transportation of patient.

In our clinic we do not scrub wounds or the adjacent parts. At our first dressing, after a thorough cleansing with benzine and a dry shave, 3½ per cent tincture of iodine is applied liberally into and about the wound. Foreign particles are picked out, an alcohol dressing applied and the part put at rest. This treatment is general except in wounds about the eyes or where mucous membranes are involved. Where wounds are ragged, fingers crushed or complicated with contusions where the vitality of the soft parts is in doubt, or where a wound is noticeably dirty and we cannot be sure of having removed all foreign matter, a wet dressing is furnished the patient which is to be applied hot a couple of hours later and at regular intervals until his next visit at the dispensary. In this class of practice we have all learned the value of a wet dressing. It is indispensable.

Before the war I used chinosol entirely, it was non-toxic, and could be given to the most ignorant patient without fear of disaster if he chose to drink it, because it did not coagulate tissues and because it was non-viscous. Of late we have had to fall back on boric acid, salt solution and the hypochlorite solutions; with the latter I would say that I have found it particularly necessary to observe the precautions in protecting the adjacent skin surfaces that Dr. Colcord has mentioned.

In our community we have not been sure of our Dakin's solution and have more recently depended upon chlorazene. We have not given Dakin's solution a fair trial in our ambulatory cases, but have been more than satisfied with the result of this treatment in hospital cases. In a works dispensary, with a small force of helpers and a large number of cases, I believe that the chances of failure are

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very great as the absolute adherence to the Carrel technique for success. I do not wish to be understood as not believing in the Carrel-Dakin treatment of wounds. I believe in it fully but I do have the greatest respect for the performance of the technique as described by its originators, without any variations by individual operators.

TREATMENT OF BURNS.

In the treatment of burns a wide variety of methods is available. The use of the paraffine substances, so popular at the time, is not new. As someone has said, he knew of one mother who unconsciously used this treatment by melting mutton tallow and balm of gilead buds and her cases did not believe that the essential point in the treatment of any burn is dressing and cleansing, no matter what is used for a dressing. An electric hot air dryer is a great help. In our ambulatory cases we use a heavy dressing of 5 per cent boric ointment, spread over the burn. This dressing is impervious to air and is pliable and comfortable. If sloughing occurs wet dressings are resorted to until the slough separates.

After all, the success of this particular sort of work depends on (1) A competent, well-trained organization, capable of team work; (2) a simplified technique, boiled down to essentials, one readily taught and easily practiced; (3) co-operation on the part of the management which allows adequate help and adequate facilities.

CHAIRMAN SHOUDY: The next discussion is on the paper by Miss Crandall, which will be given by Miss Nesta C. Edwards of Wisconsin.

PERSONALITY OF THE NURSE.

MISS NESTA C. EDWARDS: I have not had Miss Crandall's paper beforehand, but it is a most admirable paper and full of valuable things.

I should like to speak on the personality of the nurse. The value of the nurse is indisputable, but men in industry have made a grave mistake. They have picked out the nurse by virtue of the fact that she is the nurse of the job, rather than taking advantage of her for the job and saying that because she is not a trained nurse she is, therefore, that much more valuable.

One of the great troubles that we have had in Wisconsin in employing nurses in the industries has been...

Whether the training or the doctor is responsible, I do not know, but nevertheless we have found it a fact. They have gone into private nursing and I have found some of the finest nurses for industrial work have come out of private nursing ranks rather than out of the public health ranks.

I do not, for one instant, want to limit or minimize the value of the trained nurse, but I do want to say this: If you are picking out the nurse, pick her out first and foremost because she is a woman of personality, of heart, one who can forget her training, so to speak, and put her arms around Mary's children and cheer them up. Remember, these people don't have to come to your first-aid room and some of them are very prejudiced to start with. Whether it be doctor or nurse, they must have "heart," they must have that human understanding, that sympathetic understanding that make men and women stand upright and bring them out of their discouragement.

I went into a home the other day with a trained nurse and she stood back of me, as though I was some sort of superintendent. When we got out I said to her: "For heaven's sake, talk. When you get into one of those places forget your hospital training."

I saw eighteen nurses last month, but I have not found the one I desire for certain work. I have placed nurses in a number of large factories in Wisconsin. I have had to train them for these positions. They didn't know the foreman's force and you can never work your first aid, you can never bring to the plant that healthy diffusion that you want, unless you are working with the foreman's force. These are the forces to be reckoned with, your superintendent and your general management.

I have seen some excellent results from women who are not trained nurses, simply because they are on fire with life, energy and vitality, and have been endowed by the Almighty with an unusual amount of good, common sense. When you have those things you get somewhere. Do not use your trained nurse because she is a trained nurse first, but because she is a woman who understands men and women, then you are going to get somewhere.

CHOOSE THE WOMAN FIRST.

MISS BURNS: I heartily agree with the last speaker, that we choose the woman first. Our superintendents of hospitals always do that and take it for granted that eventually it is the woman of grace, grit and gumption who gets into industrial nursing work. First,

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she is a woman, but with all of that, being alive, is she an asset by reason of her training? Mark Twain told us were the days of training, "that the cauliflower was simple with a college education," and our National Organization of Nursing has strained every effort to fit the socially inferior woman to the industrial plant. It is our experience that she is not the industrial nurse, that she is not the first but that she is the mother of the plant.

MISS EDWARDS: May I make one suggestion? I think times, that manufacturers are making one great mistake is the most burning need for health nurses in the community. Unfortunately, many manufacturers have been very persistent in my judgment, in taking over public work. There is no town or community that I have been in where we have the amount of nurses really necessary for community work. We begin to mix the interior work with the outside work we to get into serious trouble because you are going to do it right.

DR. BLUMENTHAL (Health Department of City of New York): I was very glad to hear Miss Edwards mention the fact that we should use initiative. That is one of the most important things and I think doctors ought to use a good deal more. We get the habit of repeating what others have done. Very few of us have the courage to start anything new or to advance our own ideas. This is the greatest demand for personality in the field of industrial hygiene.

The surface has hardly been scratched. Take any industry and compare it with what you see in the books and you will find they do not agree. Of course, where we come to an industry for the first time, why, it is a new field altogether when you compare it with the book. I think we ought to break away from books in industrial hygiene. There is so little there and the little that is there is often misleading.

DIVISION OF INDUSTRIAL HYGIENE.

Miss Crandall spoke about the creation of a division of industrial hygiene. We see that excellently illustrated in New York. It is connected with the division of child hygiene when there were a few inspectors and they had to do a lot of work.

is the largest division in the Health Department. The industrial division is a little bit of a thing, but it is going to be larger. Why in the world do we stop looking after our children when they leave school? If there is a reason to look out for them when they are in school there is need to look out for them when they are out of school. Our boys enter the factories without any instruction. In large plants you look out for them but in the medium-sized plants there is nothing done.

Of course, we are expected to treat injuries, inspect for health hazards and protect life and happiness generally, but there is one thing I have never heard mentioned—the habits of the workingman. They do lovely things. I was investigating the brush industry and I saw a lot of them putting hog strings in their mouths before binding up the brushes. That, you know, is the way they get anthrax. When you go to a place where there are a lot of men soldering you will see them putting sticks of solder in their mouths. A glazier will put putty in his mouth—there is white lead in it—another will put tacks in his mouth. They do not all do that; some of them are intelligent enough not to do it. At each bench there is a problem. It wouldn't do to give them general instruction at all. Each factory has its own problems. There may be fifty different processes in which they ought to receive individual instructions.

I think this is an excellent opportunity for the nurse. A man has more confidence in her clean ways than in doctors.

CHAIRMAN SHOUDY: Dr. Cameron made the statement that first aid should be handled by the plant physician only and not by the first-aid men. I wonder if he meant that literally. If that is true, then all the money we have put in the handling of men by first-aid standards would be lost.

DR. SCHUBMEHL: I talked with Dr. Cameron and I do not think that was his idea. He felt that first aid should be under the plant's direction.

PUBLIC UTILITY EMPLOYEES.

DR. MACKLIN (Chicago): I would like to ask Dr. Lauffer how he trains his men in resuscitation? I find you have to train them right straight through, even in how to turn the men over. We have to start in right from the first point. In Ontario the teams practice this work once every two weeks. Every employe of a public utility, whether privately or publicly owned, must take the course. This is not a law but a regulation enforced by public utility corporations.

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(Q)How would you handle first aid in small public utility sub-stations of large public utilities, scattered, possibly hundreds of miles? It is impossible to employ a surgeon at the whole utility. The local surgeons or doctors are all in training our men. The difficult problem is to find a system that will work out and organize a system to train our men.

MR. HAROLD MESTRE (San Francisco, Cal.): I think this plant has been very much neglected in the whole discussion. Speakers have talked almost exclusively of industries and of employing a physician. Of course, in some small plants a physician is very close at hand. In a case like that you have the same system of sending everybody to the physician. In about the small plant, especially in some of our less highly industrialized states, where you cannot do it. In some cases it is very acute. You can't get a physician, in a reasonable time, for serious injuries. In other cases it is merely a question of a physician being so far away that you cannot get the men to a physician with minor injuries.

I have seen a good many kinds of first-aid kits and I would like to say that many are not satisfactory. The kits were all made to sell the goods of the manufacturer and the instructions for use were very inadequate and in almost every case the kits have been grossly misused. We found, for instance, a large box of three-inch cotton bandages. Well, nobody uses them. We found antiseptics the men did not know how to use—antiseptics were to be diluted. We frequently found the bottle provided for antiseptic to be diluted in with its original mark; it had been used. We found that the small bottle of antiseptic had been completely used, although I have never been able to find out how it was used.

After running up against this condition repeatedly I have tried to devise a simple system of first aid which could be taught to men of ordinary intelligence. So far I have had very fair results. There are a lot of questions that I want to ask the physicians here and I may improve my work.

I have tried to cut down the size of the package. One of the great defects in all of the first-aid kits is that the packages are too large. I tried using a small envelope and I found that it worked very well. You see, by holding the gauze in the envelope and cutting it with a pair of scissors. You need never touch the

CUTTING GAUZE FOR DRESSINGS.

I have been using gasoline to clean around the wound. I do not have them cleanse toward the wound, but cleanse away from it. I usually take this envelope and cut it in half, lay down one-half of it, take the other half and fold by the end, and use that to swab the gasoline away from the wound. Then, taking the other piece of envelope, you can cut right through the envelope as much as you need of the gauze, take it by the forceps and lay it on the wound, using iodine. After putting on the iodine, take up the remaining gauze in the envelope and cut off as much as you need—still keeping hold of the envelope—then, by pulling the gauze out by the corner, you can lay it on the wound without touching the surface of it at all. I usually fasten it on with adhesive tape. We have a very low percentage of infections and I haven't had any trouble in teaching the men to do it in that way.

I have been using ammonia in trying to check fainting. I find it is very useful. A large proportion of men faint at sight of a very small cut on themselves.

I have been using boric acid and an eyedropper to flush out the eyes, that being the only eye treatment I permit. If the blunt end of the eyedropper is used there is little possibility of damaging the eyeball.

For burns, I have been trying to get away from the use of ointment. I found that practically all the kits contained carbolic ointment in jars and the current method of taking it out was to put the finger in and swab the ointment on liberally. I have completely done away with that.

I do not like picric acid in first-aid kits. The men are apt to use it on a burn on the face and get it into the eye. For that reason I have been using carron oil with 2 per cent carbolic acid in it, and find it very effective as a first-aid dressing. I know that is not the best drug there is, but I have looked at the whole thing from the point of view of getting something done in localities where, if you don't give them something simple, it would be something awful.

HELPING SMALL PLANTS.

DR. WINTHROP TALBOT (State Industrial Commission, New York): I would like to call your attention to the fact that in this state we have about 45,000 manufacturing plants. Of that number about 4 per cent employ more than 100 employees. Therefore, I was

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greatly interested and I believe we are on the right track. We should pay more attention to needs of the small plant. I would offer as a suggestion for the coming year that the meeting Section be largely devoted to the needs of the great number of industrial plants.

MR. F. E. SCHUBMEHL: Twenty-four or twenty-five members of the National Founders Association have been working for years trying to solve these problems for the small plant. We have devised a small kit, now put up by the National Founders Association. A closed jar contains just the things you mention: its gauze for each individual person in a paraffin envelope; all the little remedies you mention; it has a burn ointment and a 5 per cent bicarbonate of soda in a vessel that has been

They have standardized this as far as twenty-four physicians can standardize anything. It is the best thing we know of for the small plant and can do the least harm in the hands of first-aid men. It contains all the things that could be called for in an emergency: bandages, scissors, eyedropper and all. The directions are very simple, about seventy-five lines across the bottom. The information is also pasted on the inside cover of the jar, so that the first-aid man, if he is in doubt and wants to hide his ignorance, can turn that cover bottom side up and read the directions without looking for the remedies. I think you will find it interesting. The National Founders Association will send it to you.

I want to emphasize what Miss Edwards said about stenography. If the stenographer took it all down, we won't have to spend much more time discussing the nurse in industry. She has the last word on that subject.

MR. MESTRE: I am quite familiar with the National Safety Organization's kit. That kit is good, but has several deficiencies. There are several things in it that I would leave out. To be successful your men must be thoroughly trained, but you can't count on that in outlying plants. They are apt to put oil into a cut. Another thing that kit isn't provided with applicators.

DR. SCHUBMEHL: There is a little bunch of applicators stuck in a box of cotton.

MR. MESTRE: Is it better to have a portable kit or is it better to have it always in one place? I think that depends on the size of the plant. I have seen a man brought into the office for

nearly fifteen minutes to find it because someone had taken it to the other side of the plant.

CHAIRMAN SHOUDY: Make a rule that the kit should be kept at a certain place.

DR. BLUMENTHAL: I think they ought to have more than one first-aid kit if the plant takes up a block or a few blocks. A man with a little injury is not going to look very hard if he has to walk several blocks to get the kit.

CHAIRMAN SHOUDY: I take the suggestion, and it has been handed to us from a number of sources, not only in this Section but in other Sections, that the small industry must receive more attention on the programs of the National Safety Council. I assure you that we will bear that in mind in next year's program.

The Section then adjourned.

National Safety Co

Public Safety Division

New York City

Sept. 14, 1917

CHARLES M. TALBERT, Chairman
Board of Public Service, St. Louis, Mo.

THE meeting was called to order by Mr. Charles
Chairman, at 10 o'clock.

ADDRESS BY CHAIRMAN.

CHAIRMAN TALBERT: For several years the National Safety Council has delegated an important phase of safety to the Public Safety Section, and for a year or so Mr. Robell has served as Chairman of the Section. A great deal of thought has been given the program for the Annual Meeting but Mr. Campbell is very busy these strenuous days and is unable to devote as much time as he would like to the work of the Section. It is for this reason I have been requested to take his place at this Congress.

In taking up the work, it is well to explain a change in the membership schedule. Several years ago the Executive Committee worked out a schedule of membership dues which, at that time, might have been adequate to cover the expenses of the activities of our ever-growing and ambitious movement. In the business session of the members the dues were raised 50% and with this addition to our revenues we confidently expect to carry out a most effective and comprehensive working program.

represented in the safety movement. The Public Service Section will merge into the Public Safety Division, its field of usefulness amplified, its membership strengthened, and, with increased financial resources, we hope to make it the banner department of the Council.

WORKING ALWAYS FOR PRACTICAL RESULTS.

Our ambition is to outline a general scheme or program by which the work can be carried on during the coming year, and to develop a workable proposition with practicable results. With that thought in mind we are endeavoring to get together those who are interested in carrying on public safety work. In outlining the proposition to you I desire to ask for suggestions, not only from those who are particularly interested, but from those who are here by accident rather than from any preconceived theories as to the work and its effectiveness.

In my opinion the dominant feature to be kept in mind by this Division of Public Safety is to work always for practical results. I mean by that that such information as can be furnished by the Council should be of the type and in the form that it can be put into practice; for instance, do not merely suggest that white lines for pedestrians should be painted at street intersections, but include with it the kind of paint that should be used and the practical method of applying it, which after all is the most essential part of the suggestion.

We are working for active co-operation on the part of private and public interests and for an awakened public sentiment. I have suggested to Mr. Cameron that we establish, among other things, a bulletin system. Think of the excellent work we could do if we had a mailing list of those who, through inclination or through official positions, are interested in safety work. If we could keep them in touch with the work of the Council by a system of bulletins such as we are using in industrial safety, the battle for public safety would be more than half won. Let us ask all these people for their ideas on the subject, and if the idea is good put it in bulletin form and pass it on to others.

How shall we attempt this work? I would suggest that we consider this session an informal gathering of safety advocates and ask those present to give us their ideas. Let us proceed as though there was no existing system and no machinery. Let us create a new plan and outline a new program. I have told the Executive Committee that more results can be obtained by this Division, at a smaller

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expenditure of money, than from any other Section Council.

I did not know until the day before yesterday that I was asked to preside at this meeting. Since that time, however, I have given the matter some thought and my first suggestion was to put our ideas and our heads together and see what we could do at this meeting towards systematically carrying on the work of the coming year.

PRACTICAL TRAFFIC WORK.

As an example of what I call practical traffic work, I have with me some things I have heard of in other cities and some ideas we tried out in St. Louis. Our Director of Public Safety, Bailey, of Denver, found that he was not getting the cooperation he thought he should have from the police courts. The people had every conceivable case brought before him, and were particularly interested in traffic regulations or in public safety. The Director of Public Safety conceived the idea of establishing an informal traffic court of his own. Each morning he had before him such people as had been cited for traffic violations the day before. For instance, on the morning I happened to be there, he had some sixty people before him—some for speeding, some for glaring headlights, others for various violations. His object was for those apprehended for speeding. He talked to them for about ten minutes and explained the danger to pedestrian traffic, the reason why they should be careful, appealing to their reason and common sense and their civic pride, and asked them to co-operate with him to better conditions. He repeated his argument to the people who had been arrested for glaring headlights. He did not have the power either to summon them to his office or to fine them; but they had the option of appearing before him or going to the police court.

At the time I talked to him something like five or six people had appeared before him, and he told me that so far two had been cited to appear for a second offense. I think it is a practicable proposition. My idea would be to take his idea and give it to other communities as an example of what can be done in intelligent direction and co-operative work. This Director of Public Safety did not know that a Traffic Court along similar lines had been established in Chicago. If we can get action like that in our cities or thirty or fifty cities, it would be a great help.

In St. Louis we had difficulty with one particular street in the outlying district, where two heavy traffic lanes crossed at right angles. Policemen were injured at this crossing by being struck by automobiles because the center of the street was not lighted at night as well as the sides. The police department said that if we didn't find some way to protect its men they would be taken away. After considerable study and various experiments we hit upon a solution. We placed a thousand candle power headlight in the tenth story of a building on the block in question and focused it on the policeman. Accidents to policemen at this crossing were practically eliminated by the adoption of this method and traffic is handled promptly because the signals of the policemen are instantly seen.

There are a great many questions to be considered and a great many things to be done. I would really like to hear from others in attendance as to their ideas on how our work can be carried on in a practical way. Please bear in mind that our discussion is perfectly informal.

CO-OPERATING WITH THE GOVERNMENT.

MR. A. W. WHITNEY (National Workmen's Compensation Service Bureau, New York): I feel sure that the National Safety Council will back our movement just as soon as we show that it has real life. I am a member of the Executive Committee of the National Safety Council and I have had an opportunity to see something of its work. It has taken up and attempted to perfect one thing at a time. Of course, the first and most important problem was that of safeguarding in industry. That has been pretty well mapped out. I do not suppose there are many new features to be developed and our activities will be largely along lines already outlined. This year, although we hardly anticipated it a year ago, the principal new work of the National Safety Council has been co-operation with the government and a marked achievement was had in the introduction of organized safety methods in the Navy and War Departments, through careful surveys and the installation of safety engineers in all the arsenals and navy yards.

I think the National Safety Council is ready to focus its attention this coming year on some one new development, and unless I am very much mistaken, although I haven't had occasion to talk the matter over very intimately with anybody, public safety will be given a great deal of attention this year. At least that will be our aim if it can be shown that a real live movement has been started.

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I have been interested in public safety work not only in a personal way but also because I am associated with insurance companies in national work. Many insurance companies carry automobile liability insurance and a large proportion of drivers carry some forms of insurance. The insurance is usually had, or is thought necessary to be carried, is fire and although liability insurance is probably a great deal more than that is to say, insuring yourself against very heavy damages may come upon the owner of an automobile if he injures some pedestrian. Anyone who knows anything about insurance knows that the mere payment of damages, the assumption of the taking of the load off the person who is injured, is part of the function of insurance. As a matter of fact, all insurance carries with it a very large element of prevention. There are several reasons for that, and perhaps the most important is this: That whereas an individual is not in a position to take preventive work himself, when all risks are assumed by an insurance organization, they can appeal to those interested and carry out a very substantial part in the work of prevention. It is therefore obvious that by gathering all risks together that work can be undertaken of a preventive nature that could not possibly be taken by each risk separately, so that insurance always carries with it preventive work.

FAVORABLE RATINGS FOR SAFETY WORK.

In the case of workmen's compensation and in the case of fire insurance, that has come about by the use of schedules which take account of improved conditions. In the case of workmen's compensation, if a man wants to put guards on his machine and have safety organizations and do everything he can to make his working place what it should be, he can get a very large reduction on his rate, consequently insurance gives an actual financial incentive towards prevention.

As Mr. Talbert has said, very little has been done in the way of public safety. The insurance companies are tremendously interested in having this work done and it is thoroughly in their interests to further this work. I assume that the work largely will have to be dealt with by municipalities in trying to get intelligent regulations passed. Obviously that is work

acter, can hardly do effective work. The work must be carried on by an organization such as the National Safety Council and it seems to me desirable—I am speaking now from the point of view of the insurance companies—that the insurance companies should get into a movement of this kind. It is entirely in the natural line of their work, the natural development of the principle of insurance.

I think the most valuable thing to be done today would be to consider the field and see just what kind of a program can be developed; what are the things that need to be done and how they can best be attacked. The next problem after that would be to see how much actual life can be put into the movement if we are to further interest people in it.

COUNCIL WILL ASSIST IN WORK.

MR. J. H. HARVEY (Kansas City): As an officer of the Electric Street Railway Section of the National Safety Council I feel I am voicing the sentiment of all our members when I say that the formation of a Public Safety Division is something that we are all vitally interested in.

As the Chairman said in his remarks about railroad companies subscribing money to safety, I believe they have a selfish motive. That is all true enough, but we feel that this is a field in which a great deal of good can be accomplished by the Council going into it as an organization. If the Council, as a purely safety organization, gets into a matter of this kind we can go into a community and have a vastly greater influence on the general public in the prevention of accidents. I think that the formation of this Division will be a splendid thing and a great deal of good will be done. In our Kansas City Local Council we have just organized a Public Safety Committee, and next month we will probably get started. We hope to accomplish something very definite.

MR. GEORGE AURIEN (St. Louis): Is it the idea of the organization that each chairman of a local committee will become a part of a general committee in order to stimulate the work?

CHAIRMAN TALBERT: That is one of the problems to be worked out today. Each of us is here today from some personal standpoint. I know very few of you personally, and I want to be sure to get your names and addresses, and, if possible, the interest of every man in the room before he leaves, because we need you to start our work. If we get from each town represented the one man interested in our work we can do things effectively.

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I will ask our new President, Mr. David Van Sci, a few words regarding the Council's attitude towards the Public Safety Division. After that I want to continue the suggestions to our members, getting just as much as we can out of this meeting.

DEEP INTEREST IN PUBLIC SAFETY.

PRESIDENT VAN SCHEAACK: I am glad to have this opportunity on behalf of the Executive Committee, to tell you of its attitude in public safety. We have always felt that we would like to add our name to that of a National Safety Council unless we do something towards starting real public safety work. The time has now come when we can do our part in promoting public safety. Up to the present time we have not felt that we could take part, for several reasons. One was that we started as an industrial safety organization; secondly, there has been plenty of discussion on a particular line and we felt that if we could give some demonstration of the value of industrial safety it would be of great aid to us in promoting public safety in the localities where our membership lay.

I am glad to see so many here today and to hear, in a short stay in the room, of the real interest being taken in public safety. I have said so often that I almost say it in my sleep, that in public safety, just as in industrial safety, the keynote is co-operation. You can create an organization, but if you do not secure the cooperation of those who are interested, you will not go very far. I

PUBLIC SAFETY COMMISSION OF CHICAGO.

MR. WILLIAM BURGESS (Chicago): I have no doubt that there is a common understanding here that public safety is no new thing. Over the country there are organizations, legally created, doing more or less efficiently, and there has been a great deal of discussion as to when the National Safety Council would make public safety a part of the national movement. The Public Safety Commission of Chicago, of which I have been the executive secretary for two years, is a member of the Council; that is, by contributing the necessary dues to the National Safety Council we have become a part of it, and, therefore, I am here as a delegate from Chicago. I suppose a furtherance of our work—an extension of it—would in itself largely answer the problem we are now considering. How far we could improve it.

a public safety movement, to co-operate through the National Safety Council and give national expression to this great subject. We have had wide experience in various parts of the work in Chicago and are getting excellent results. A part of our activities are similar to the work Chairman Talbert outlined as being done in St. Louis.

Our work in Chicago, in connection with the general street traffic, is somewhat along the methods pursued in that city, although we do not go about it in precisely the same way. We have a card system and every member of our commission carries a supply of cards in his pocket and reports accidents which he sees, accidents or violations of the law of any kind. These cards are sent to our headquarters every day. If it is an automobile, for example, that is at fault, the number of the machine is taken and we correspond with the party who has committed the infraction of the law and bring him into our office, very much in the same way as you outlined, sir, that gathering every morning in your city. That method has been very effective in our city, but we recognize the fact that, just as in the industrial world, so in public safety work, there are two general departments of service that we must consider. The first, I think, is habit and custom, and the second is education—education, I think, being the greater, although law itself is a great educator if we realize the fact that law is an asset for educating the people. We must know its value, because nothing so impresses a man as the fact that the law is with him and that the police, after all, are representatives of law and order.

I am supposing, Mr. Chairman, that the record of this meeting is being taken for the Council's consideration, and, therefore, we understand that in a sense this informal meeting is also of an executive character because it will be reported as a part of what is being done.

CHAIRMAN TALBERT: This is a meeting of record.

MR. BURGESS: One of the things we ought to do is to ask the National Safety Council to conform to the idea of creating a form of membership so that everybody who is desirous of doing so may become a part of the Council by subscribing to its funds according to its terms. This will enable us to secure a fuller co-operation.

I hope a whole session will be given to public safety at the next annual meeting of the Council and that the various committees of the Public Safety Division will report their activities and a full discussion will be had.

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PROGRAM FOR COMING YEAR.

CHAIRMAN TALBERT: We should unquestionably have a program for next year which will give us more time than we are giving it today. We should provide for a meeting each day for the four days of the Congress. One might be devoted to public utilities; another to automobiles; a third to automobile headlights, and a fourth to general safety. Mr. Little has been conducting some very interesting work with headlights and he can demonstrate the results of his work. We can bring in people from different cities interested in this particular feature—bring in traffic men, government officials and men who can tell us what is best to educate school children in safety work. We can talk to the firemen from the street, as we did a sergeant in our town. We can talk to the men who attend the Engineers' Club one night and he talk for thirty minutes on his phase of the trouble. It was a very interesting meeting. The whole thing can be made extremely interesting.

In St. Louis we proceeded on the idea that to properly solve the problem we must get at the facts by careful investigation. We then base our action on the facts ascertained. The first thing we did was to tabulate the accidents. These we obtained from the independent records of the police department and the street car company. It took two men three months, as we tabulated the accidents as to locality and as to cause. Then we took a city map and marked the accidents. The size of the spots showed the number of accidents at the point in question and in the center of the spot was written the number of accidents. When the map was completed it was a great surprise for those who thought they were acquainted with the conditions in St. Louis. Points were found to be dangerous which had not been considered as specially hazardous. Places protected by a traffic policeman and a traffic lamp were found to have as heavy an accident list as some of those which did not have such safeguards with three times the traffic. It did not take long to get the information obtained from these spots. Some of the accidents were puzzling. There would be a good-sized one where it was known not to be very heavy. Investigation showed a rather unusual number of accidents at any point. At one spot we found the explanation in street-car sheds—cars were going in and out at that point.

LOCATION OF DANGER POINTS.

After we had completed these studies of the locality of accidents and their causes, we made district maps for each section of the city. One was supplied to each district police station so that at a glance a policeman could tell where the danger points were in his district. A set of district maps was also provided for the street car company. We are trying to work out something that will warn the public as to the location of these danger points.

Our standard traffic sign in St. Louis is circular, eighteen inches in diameter. We have thought of using these to display special warnings, as for instance, at the most hazardous places in the city: "The most dangerous crossing in town. Eighty accidents here last year. Be careful!" We also made a map showing the density of traffic according to width of lines drawn through streets. These are some of the activities that we have been carrying on in our town.

I would like to hear a word or two from Mr. Smith as to his idea of getting practical results.

DECIDE ON FIVE ACTIVITIES.

MR. G. O. SMITH (Doherty & Co.): I am not prepared to go into a long dissertation this morning, but I feel that all Chairman Talbert and the worthy President of the National Safety Council, Mr. Van Schaack, has said is true. I have usually discovered that public safety is regulated by the street car companies in the town in which the activity is started; that is, the street car company had to carry the burden. That is not fair, not only from a financial standpoint, but it isn't fair in the distribution of effort. Why should not a large taxicab or construction company get into the campaign? Why should the Automobile Club take only a half-hearted interest? I think it is probably because they never had a national institution back of the movement. Local safety committees have been formed in communities unaware of the work of the National Safety Council, but they knew what the railroad company was doing. As a matter of fact, we are getting a great deal of data from members of the National Safety Council, and, while we take advantage of this service to carry on the campaign, the Council is not getting credit for it. I feel that public safety is absolutely essential, but I feel that you must not center the burden on one industry.

In this Division, we should decide on five things to do this year

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and do them, not talk about them. Then I might suggest "on the dog." Theatrical shows open in small towns come to New York. Why not select a community in which we can secure a fair measure of co-operation and try a program, presenting concrete results of that activity at our meeting? Do not go into three or four cities this year; let one—do something, formulate a definite line of activity and put it across. Next year we can tell how we did it. °

You will get more co-operation from other communities if you can visualize the results accomplished in just one city than if a general effort is launched all over the country. The subject which you should take up, I think, should be limited—the hardest subject should be tackled first. That may be street vehicle accidents, or perhaps building construction safety. The last named subject you may find the head of a department in the city who is enthusiastic in inspection work; if you do, that will help you. You may or may not get co-operation from the local Automobile Club.

We in the Electric Street Railways Section have planned for next year which we hope will materialize in getting national interest in the safety movement. That is a suggestion from the Electric Street Railways Section. We would be very glad to place it on you, but I feel that we should not put the burden of it upon one industry of the community we may select to experiment. Take Brooklyn, Kansas City or Chicago. Where did publicity start? It started with the street railroad companies. The selfish motive, perhaps, but why not broaden the scope of it and interest every industry in the community in your program? I would like to see a city of four or five hundred thousand take hold and systematically comb for results and have the results presented here next year.

In the National Safety Council you have a variety of information. If you call for the services of your General Manager he will give you a list of all the members of the Council in that town and help you get after them. Use the Council's headquarters at Chicago to make some use of it, and, Mr. Chairman, I take the liberty of suggesting such a course of action. I haven't a really definite plan in my mind, I haven't gone into details sufficiently, but I would like if I may, at some future date, to communicate my ideas in the form of a letter.

WORK OF NATIONAL CLEAN-UP ASSOCIATION.

CHAIRMAN TALBERT: Mr. Smith's idea is very much along the line of the work carried on by the National Clean-up Association. This association interested the Cincinnati Chamber of Commerce in their system of inaugurating a clean-up of the town. The results of the campaign carried on in Cincinnati were embodied in a very complete report and used the next year as a publicity document. They printed hundreds of thousands of copies and sent them all over the country. We might select a town for our work next year and report as to what has been accomplished and how it has been accomplished. We might use that as an example of what has been done as distinguished from sending out suggestions as to what might be done.

MR. SMITH: I feel that to get the interest of the Council we must present a concrete situation. Shooting into the air doesn't get you very far.

MR. AURIEN (St. Louis): We had a great deal of difficulty about a year and a half ago in getting results or co-operation until the Public Safety Committee of which Mr. Talbert was Chairman became affiliated with the Chamber of Commerce. We put the matter before the Chamber of Commerce and they considered it thoroughly. It was the intention of the Chamber of Commerce to have each chairman of the various committees form an executive committee of the Local Safety Council, and it is only since that time that we have secured real results. There are about twenty-four on that committee, and nearly all are regular in their attendance. Our work is very interesting and goes into accident statistics and subjects of that nature.

After we started our work on public safety we began to incur a great many debts and the only way to pay them was through an appeal to the Chamber of Commerce and the various corporations which would naturally be interested in safety work. We finally secured about \$2,000 with which to carry on our work and are contemplating a number of things that will, I think, take practically all of that money. In a general way we were very successful in the eight or ten months in which we did this work.

CHAIRMAN TALBERT: If we had had more time we could probably work out something much more definite. It is going to be rather difficult to get the personal attitude and personal knowledge of those who are here; in other words, just what each of you can

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do when you go back home and how much you can assume of the Public Safety Division.

I think it would be a splendid thing to have Mr. Price, Secretary of the Council, do missionary work along Public Safety. In other words, every time Mr. Price comes to town, let him find out the situation as relating to public safety, look up some man who is interested and tell him what work can be done. This can be done if we put the proper material into the hands of Mr. Price.

It is my idea that, in order to get effective co-operation from the people we desire we must reach them once each month. We must establish a system of communication with your man so that he knows the work is alive and the organization is alive, and in connection I have suggested a bulletin service along the industrial safety bulletins.

MISSIONARY WORK BY FIELD SECRETARY.

MR. C. W. PRICE (Field Secretary): I have felt a little ill-prepared in my first year's work in the field along public safety lines as my whole training has been in industrial safety. At the Detroit Congress last year I took Mr. Bullock of the Brook Transit Company aside and talked with him for an hour. Here, Mr. Bullock," I said, "I know fifty things to do in fact, I can make a list of fifty things to teach children safety. I want to know is the first six things that I can recommend to principals—simple things. That is what I want to know are the first six things that you would recommend to a school principal?" He gave me six things. In my work, in practical city I have gone into, I have met school superintendents at times have spoken before school bodies. If you can give them a perfectly definite program—very simple, not too many things and tell them just what to do and how to do it, I have found them responsive in every case. It is by telling them of real need that you get action.

I asked Mr. Bullock what he would do in public safety apart from the school systems. He emphasized the point that the Chairman has just made: "Well, in the first place, I would make a study of accident experience; find out where the weak spots are and then, instead of trying to do fifty things or ten things, select one and relieve the situation on one street. See where there is a congestion of automobiles. Take just one situation and relieve

your feet on the ground and gain the confidence of the public in your work."

I think that is the wisest thing that has been said by all the men that have talked on public safety. In other words, get the facts in regard to where accidents are happening, why they are happening, and then do something perfectly definite. I think that if your Division did that I would welcome it because I am not prepared to talk on public safety; I am hazy about it. I am not competent to go into any city and say these are the first six things that you want to do.

CHAIRMAN TALBERT: Mr. Price, within the next six months how many cities will you visit in which you would have time to take up this phase of the work?

MR. PRICE: Within the next six months I will visit not less than eight and not more than twelve, possibly in the Middle West. I intend to go to Cleveland and Baltimore.

MR. BURGESS: Mr. Price, could you give us any suggestions as to the city that would be best adapted for the model proposition suggested by Mr. Smith?

MR. PRICE: I cannot; I am not competent to speak on that point. I would like to say, Mr. Chairman, that my government experience has been a revelation to me. Without any effort at all we were able to get the co-operation of the best engineers in this country that were able to give their services to the cause. I do not know of any city where, it seems to me, they have so nearly arrived as in the city of Rochester. I have been very much impressed by the way the people of Rochester are interested. It can be done, gentlemen, and it is a very encouraging experience.

PUBLIC SAFETY WORK IN AURORA, ILL.

MR. H. B. ADAMS (Aurora, Ill.): I came to the Congress last year expecting to get some help from the Public Safety Section to see along our lines in our home town. I went home with the same thing that it appears I am going home with now—a promise of something next year.

You know it doesn't take much yeast to make a loaf of bread, and sometimes small beginnings make large endings. During the last year, or previous to that, I interested our Chamber of Commerce to the extent that they appointed a Safety Committee of five. That was before the 1st of October last year. That committee, with some little help from our company, got up, I don't want to say a

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celebration, that isn't quite the word, but it was held on was known as Fire and Accident Prevention Day. On fire department and the city automobile trucks were decorated with banners indicating how to prevent some forms of accidents. We had thirty automobiles in our parades—one in the morning and one in the evening. We had posters put up in a number of places on the corners downtown. We tried to interest people in the safety habit. I believe that the safety habit, formed in the home of the child, develops the man wherever he is and who is always struggling for safety.

The education problem in relation to children has been a great deal of attention throughout the country. That education has only gone as far as the grade schools, although it sometimes goes to the high schools. I found that when I tried to interest our Chamber of Commerce in a public safety mission for the city of Aurora, the idea was to have nominal dues, so that we could have as many men, women and boys, but not the small children. I started a local campaign for safety, not so much for the work of the campaign as a campaign, but for the individual effect it would have upon its members. I believe that is one of the things that should be encouraged. I found that when we tried to accomplish that several men I had thought of as leaders were too busy with other things and I did not have the power to interest them sufficiently to neglect their other important matters to take leave in his particular line of public safety work.

I believe that the schools throughout the country—the elementary schools, colleges and universities—are now thinking of putting into their curriculum a course upon safety, with the idea of turning out engineers of construction, civil engineers and others so that all students cannot pass without having some degree of efficiency in public safety work. I think that is one of the things that should be encouraged by the delegates in attendance today.

Our City Council revised their ordinances last year. I found out what they proposed to do and got in touch with the Safety Committee of the Council, appointed in May, and provided them with a copy of the standard traffic rules for cities as prepared by Mr. [Name]. After four months' work with that committee that ordinance was passed, about two weeks ago. We believe that is something toward the standardization of traffic ordinances in cities all over the country. I thought to follow one particular line, so that a man who is drafted from Nebraska to New York knows the traffic rules.

through he has to obey the same rules of parking, of turning in the streets and all the things that he has to do at home. There are so many of these things that it is very hard to get down to one, two or three things to do in the coming year.

I want to know if it is the sense of the members here that local organizations, not members of the National Safety Council, would be a good thing? I think they can soon be brought in touch and controlled, to a certain extent, by the National Safety Council.

HOW THE SYSTEM WORKS IN ST. LOUIS.

CHAIRMAN TALBERT: Personally, Mr. Adams, I think it does not make so much difference as to the technique of the proposition as it does to get results, and, as you say, if you get them interested sooner or later you will get their co-operation. It is my idea to leave to each community the method of carrying on the work. In other words, furnish them with the information we have on hand, furnish them with a bulletin service and co-operation will naturally follow. In our system in St. Louis the work is divided in three classes. We have the general committee of the Chamber of Commerce, because the Chamber of Commerce is the one common meeting point of all business interests. It composes practically all of our civic activities and the fact that the Chamber of Commerce is at the head of the movement takes away any jealousy that might arise. Then we separate our activities into three subdivisions: Public safety work, industrial safety work and educational work—the industrial subdivision takes in the plant proposition, the public safety subdivision works along the lines we have already discussed, and the educational work is carried on through the schools. The Chamber of Commerce, as such, is not a member of this organization.

Men are on the committee of the Chamber of Commerce who are not members of the Chamber of Commerce. For instance, the Assistant Superintendent of Schools is a member of the Executive Committee, but is not a member of the Chamber of Commerce. In other words, we are not laying down certain rigid rules—that you must belong to this organization, you must pay dues, or you cannot participate in the activities. I do not know exactly what the attitude of the National Safety Council will be towards that, but the principal proposition is that we should get practical results in public safety work in the best practical way, irrespective of whether the man is to be a member or not.

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GETTING DOWN TO BRASS TACKS.

MR. PRICE: I am very fond of getting down to brass tacks and doing something. I am sick and tired of great, big schemes, meeting people everywhere that are interested in the betterment of mankind with great, big, universal schemes. I wonder if you can't get some practical, tentatively, just for the next year,—pending any action you may take—if a committee of three or five were appointed and I want your Chairman to be the chairman of that committee and get together within the next month and agree on something that I as the Field Secretary ought to recommend. Let us have a tentative working program. I will emphasize four things: the importance of investigating the causes of accidents and putting out the results. Doing one thing on street safety, and then, the necessity of public meetings and newspaper publicity. I am offering that as a suggestion, that you may give me a working program, even if it is not perfect. It would be a valuable thing and we will appreciate it very much.

MR. DICKERSON (Du Pont Works, Altoona, Pa.): I have been much pleased with our experience in the government safety program. Why wouldn't it be a logical solution in the public safety problem to get the National Safety Council members in big cities to make it a point to get out and do something for public safety one or two days a month. We have thousands of members who are practical safety men, working out industrial problems every day of their lives. Public safety is essentially a simple thing. There are no such propositions as we are up against in some manufacturing processes, such as explosives.

It is mainly a matter of education and getting the right people behind it, of getting the necessary publicity, which is a big part of it. If we can get the co-operation of all of these men, say, two days a month, along some uniform system laid down by the National Safety Council as to the best methods, as to what to cover first, as to what man to get in touch with, as to who to talk to, things should be taken up with, I believe that within the next year we can accomplish a tremendous amount of good along the line of public safety, entirely aside from the selfish standpoint of the education of the public, particularly of the coming generation. This has already been pointed out, is going to give us safer workmen in years to come. There is not a plant in the country that is not

two. I think that is universally conceded. We are taking a great many younger people, boys and girls, in, that heretofore have not been used. If we can start our safety propaganda now, amongst those people as they come in, they are going to fall in with their factory work and they are going to make a whole lot better workmen than the man who has had no preliminary outside education.

EDUCATE THE PUBLIC.

MR. ELBERDEE (Workmen's Compensation Bureau): I want to discuss the remarks of Mr. Price and Mr. Dickerson. I think we ought not to confine our work to some one such place as Rochester. I cannot do anything in Rochester and I want to do something. For the last four or five years I have wanted to do something along the lines of public safety. About four years ago my oldest boy was struck by an automobile. It was not his fault. It was a dark, misty evening and he was crossing a street. He was only 10 years old. He was struck by an automobile, dragged 120 feet, and the fellow that hit him never stopped. Naturally I feel that some education should be given to automobile owners, particularly chauffeurs. I feel that we should not wait months to do it, but that we ought to begin right now with a permanent organization and get down to brass tacks. When you get out your bulletins, send them to the taxicab companies, ask them to post them in their offices, and I will volunteer to address any meeting of taxicab drivers or any persons in my district.

In order to start our permanent organization I nominate Mr. C. M. Talbert as Chairman of the Public Safety Division of the National Safety Council.

(Mr. C. W. Price in the chair.)

CHAIRMAN PRICE: I would be very glad to receive a second to the nomination and to ask if there are further nominations.

MR. TALBERT: I was asked by Mr. R. W. Campbell, the Chairman of this Division, to take charge of the meeting this morning. I told him that I would and I believe I explained in the early part of the meeting that no definite program had been arranged. I do not know the plans of the Council in so far as this Division is concerned. Naturally, there will have to be a sectional organization, a Chairman, Vice-Chairman and Secretary and committees, and that part of the work should be done this morning.

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REPORT OF NOMINATING COMMITTEE.

MR. ADAMS: Ordinarily the Chairman of the Division is a Nominating Committee and that committee reports its suggestions to the Division.

GENERAL MANAGER CAMERON: We have had a Public Safety Section for several years. At our last meeting in Detroit the Nominating Committee was appointed by the Chairman. Mr. Campbell has been Chairman up to this time, and he has appointed a Nominating Committee. This committee nominates members for the offices of Chairman, Vice-Chairman and Secretary after which the election takes place.

MR. H. B. ADAMS: As Chairman of the Nominating Committee I suggest the following names for the several offices: Mr. Talbert, Director of Streets and Sewers, St. Louis, for Chairman; Mr. R. W. Campbell, Past President of the National Safety Council, Vice-Chairman; Mr. William Burgess, Executive Secretary of the Public Safety Commission of Chicago, Secretary.

(Mr. Cameron in the chair.)

CHAIRMAN CAMERON: Are there any further nominations? If not a motion will be in order to elect these gentlemen. (Upon motion, duly seconded, the nominees suggested by the committee were elected. The election was unanimous.)

(Mr. Talbert in the chair.)

PLAN AND SCOPE COMMITTEE.

CHAIRMAN TALBERT: I would suggest, in order to formulate a program for the coming year, that a committee to be known as the Committee on Plan and Scope be appointed, to be limited to five members; this committee to get together at once and formulate plans based on the general lines outlined in the debate of this morning's session. What we want is a few essential principles, so we will have something to work upon. (A motion to this effect was duly made and carried.)

CHAIRMAN TALBERT: I will appoint Messrs. Price, Smith and Adams on this committee. The gentlemen will retire at once to confer.

RECOMMENDATIONS BY COMMITTEE.

After an absence of fifteen minutes the committee returned.

As your committee understands it, what the Public Safety Division wants is this: A program of a few activities that each of us, and I, as Field Secretary of the National Council, during the next year can recommend as the first few things to start our activities along public safety lines, and that we have the authority of this Division back of these recommendations. Our first recommendation is in relation to school safety. In this connection it would be my duty and pleasure to go to the Superintendent of Schools of each city I visit and lay before him some of the facts outlined by this Division; show him how to take up the work and tell him that the National Safety Council will help him secure the material with which to carry on the campaign.

As a second proposition, we would recommend a thorough study and tabulation of the accident experience, so that the weak spots can be known.

Third, take one serious hazard, for instance, a congested street, and relieve that condition; thereby demonstrating to the public that we propose handling the work in a practical way. In that way we will get the confidence of the public.

Fourth, to at once ask the newspapers to give good publicity to the campaign. That is comparatively easy in all the towns I have visited. Many of them have been interested in publishing once each week a little section for children, running it in the Sunday issue. The committee will furnish the material.

Fifth, to organize and promote public meetings of two kinds: First, meetings with clubs and organizations; women's clubs, automobile clubs, luncheons of business men, etc., to place before them the subject of public safety, and to ask their co-operation; a second kind of meetings for all sorts of folks to awaken interest in public safety moving-pictures and all that sort of thing. (It was moved, seconded, and unanimously carried that the report of the committee be accepted as the work for the new year.)

WIDE PUBLICITY FOR PUBLIC SAFETY WORK.

CHAIRMAN TALBERT: What committee should be appointed to carry this out? Have you outlined any idea on that point?

MR. SMITH: Every man here is a committee of one to go back to his home town and go ahead and do this work.

CHAIRMAN TALBERT: We will furnish the information and forward it to each man here and to such others from time to time as we can learn they are interested in this proposition.

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MR. AURIEN: Would it not be a good idea to have the chair of each Local Council of each city a member of this organization? I think you can get a great deal of work done in that way.

MR. TALBERT: I think that should be arranged, by all means. I imagine they can be reached through Mr. Cameron's office.

GENERAL MANAGER CAMERON: Yes.

CHAIRMAN TALBERT: Could you, through your machinery, expedite the efforts of our Public Safety Division with the idea of getting the Presidents of the Local Councils interested in public safety work, could you find out who we could get as a representative in a particular town?

GENERAL MANAGER CAMERON: We had a meeting of our Local Councils on Monday afternoon, and one of the plans announced was the issuance of a handbook. By this means we can give plan wide publicity.

CHAIRMAN TALBERT: I want to say to the President and General Manager that we want to make this particular subject a feature of next year's Congress. My idea is that we set aside a room for a public safety display and ask each delegate to bring from his town a visualization of the feature he has been able to work up throughout the year. We would have many men in our room look at our display and studying the particular features. When the delegates to the Congress return home their thoughts will center on the Public Safety Division. We want to make it a big thing, make it stand out prominently and we can do it if each man interested will bring something that is worth showing.

MR. BURGESS: How about the suggestion that you create a Program Committee?

DEFINITE OUTLINE NECESSARY.

CHAIRMAN TALBERT: I think the Program Committee is a part of the work that will have to be taken up with the General Manager. We have taken down the names of the men who are here, as well as a large number who are interested but unable to be present at this meeting. Every man who has expressed a willingness to take an interest in the work will be put on some committee.

MR. H. B. HARMER (Philadelphia Electric Company): I am very much in favor of having a Committee on Standardization. You reach more people through public safety than you do through standardization.

child in the country. This is the only organization that can accomplish it, and a Committee on Standardization would be a good thing.

CHAIRMAN TALBERT: During the coming year I hope we shall be able to send to each of the men interested a definite outline of what we propose to do, so that six months before the next convention we will have a pretty definite program. This is one of the things that we can work out in conjunction with the committee.

A DELEGATE: It would be a very good thing to print on the inside cover of the program: "Suggestions are invited."

CHAIRMAN TALBERT: That is a very good idea.

GOOD RESULTS FROM "SURE POP" BOOK.

MR. W. S. PAINE (Aetna Life Insurance Company, Hartford, Conn.): Along the line of standardization of signs I would like to say that in my factory work among foreigners, in which I am deeply interested, I find most effective the little book "Sure Pop" that General Manager Cameron has distributed in the industries. Among the foreign men, Hungarians and Swedes, with whom I have worked intensely, I find this: They say "You have a sign in one department of industry that means one thing and you have a sign in the street meaning another thing. Then you wonder why we are injured."

When we standardize signs, so that foreigners coming to this country will realize that signs means one thing in every case and do not mix men up, then we will have accomplished something along safety lines. I speak in behalf of the little book, "Sure Pop." It is very effective. In our night work among foreigners I have handed that book around and let them read it. Sometimes I have had 200 Hungarians in a meeting and started them on the book. It does not end there. That Hungarian takes the book home to his children, and the child reads it to the father and mother; it is also read to many foreigners whom we may not reach. If you take up a paper tomorrow morning, just notice the accidents that occur and notice the names you will find. The names are mostly of foreigners and that is primarily because we have not thrown safeguards around our foreign-speaking people. They come from a country where they are safeguarded. The Hungarian is safeguarded in Austria and in Germany. They come here to hazardous conditions and they have to adjust themselves. When we standardize our methods we will accomplish something.

GENERAL MANAGER CAMERON: Four thousand copies of "Sure-

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"Pop" have been sold during the past two years. The total sale date is about 25,000 copies.

MR. N. C. GOODSPEED (General Electric Company, Erie, Pa.) : We put "Sure Pop" into the schools in Erie and the Superintendent arranged it as their morning reading lesson. The sale of the book shortly after increased considerably, so much so that two of the book stores told me they had to send in additional orders.

MISS LAURA M. ROADIFER (Philadelphia Rapid Transit Company) : We have been presenting the safety idea in schools through the medium of the story, and it has been successful.

PREPARATION OF BULLETINS.

CHAIRMAN TALBERT : Let me make a suggestion. It would be a good thing to formulate the work you are doing and send it to our central headquarters where it can be put in bulletin form and sent to every one. Let us gather your experience together and put it at the disposal of every one interested.

PRESIDENT VAN SCHAAK : I think it would be a very valuable plan to have a digest not only of what measures have been taken up and how they have worked out, but also of the measures that have been taken up and not worked out, giving the reasons why they either abandoned the idea of putting certain proposed measures into effect or why, when these were put into effect, they proved effective. I think it would be very interesting to have these in addition to the experience of what proves to be effective.

EACH MEMBER MUST ASSIST IN THE WORK.

CHAIRMAN TALBERT : I believe that is one point we have emphasized. It is just as essential to know the things that have been tried and have failed, as it is to know the things that have been tried and found to be successful.

I think we have worked out something we can do and which we can carry out just as quickly as we can put things in shape to tell every one in touch with the proposition. Each delegate will be called upon to do something and perhaps next year we can have a full day session set aside for this Division.

I thought this morning that perhaps we would have an opportunity to listen to Mr. Little on automobile headlights, as he has made some very interesting experiments in this line, but I find the time is very late. Next year we will take an hour or two hours to li

to the practical propositions of Mr. Little. I wish to apologize to Mr. Little, as I asked him to come here this morning and address the Division. I want him to know that we appreciate his work very much and his kindness in helping us with his personal services. On the part of the Division I offer him our thanks and best wishes.

The session then adjourned.

SPECIAL MEETING OF OFFICERS AND COMMITTEEMEN OF LOCAL COUNCIL

C. W. PRICE, Chairman

Field Secretary, National Safety Council.

THE special meeting of officers and committeemen of Local Councils, for the purpose of discussing experiences of the and for formulating plans for the promotion of Local Council was called to order by Chairman C. W. Price, Field Secretary of National Safety Council, at 2 o'clock, Monday, Sept. 10.

OPENING REMARKS OF CHAIRMAN.

Gentlemen of the National Safety Council: In view of the fact that our meeting today is to be an informal conference for the purpose of hearing reports from the different cities in regard to Local Council activities and for an exchange of experiences regarding most effective methods of organizing a live Local Council, your Chairman will not take much time in making preliminary remarks. However, my first year's experience as Field Secretary has emphasized in my mind the importance of local activities and the large field of opportunity which they offer to do a work which the other service of the Council cannot reach.

I find in every city which I have visited a large number of employers who are not acquainted with the National Safety Council and who know practically nothing of its work in the safety movement. As I see it, the great opportunity of Local Councils is to pioneer missionary work in arousing interest among employers, their foremen and workmen, and informing them in regard to wonderful results which are being achieved in accident prevention and the methods which have been found most efficient.

When I think of the experience of such cities as Pittsburgh, which in the first series of foremen's meetings in the sixteen districts

workmen they reached 100,000 persons, I realize what a valuable service can be rendered by local activities—a service which it would take many years to render through any printed matter which the Council may send out.

My observations during the last year have also confirmed my experience in Wisconsin and have convinced me that the only way to organize a live Local Council, which will win the support of the employers of labor, is to promote activities which will directly reach the foremen and workmen and arouse their interest in accident prevention.

In every city which I have visited we met the managers of many of the large plants and in every case where we outlined the plan for foremen and workmen's meetings we found that they were at once interested and ready to co-operate.

My experience has also convinced me that it is a comparatively simple and easy thing to so conduct foremen and workmen's meetings that they will be continuously interesting and proper.

SYNOPSIS OF DISCUSSION.

MR. MARCUS A. DOW (After describing the work done in New York City and districts): The intention, this fall, is to continue our district meetings. Each meeting will be confined to some particular phase of the subject—eye protection next, for example—suitable speakers being secured; we may have a lecture on machinery safeguarding. The idea is to make each meeting of particular interest to the men who are charged with the supervision of the work and deal with some specific subject. We intended, during the summer months, to have large outdoor meetings for the rank and file, but this did not result very well. We had one meeting at Long Island City and 2,000 men were present; some motion pictures were shown and much interest aroused.

CHAIRMAN PRICE: Nothing wrong with the idea?

MR. DOW: No. The question is one of convenience for the men. At Yonkers there will be a large meeting this fall.

CHAIRMAN PRICE: Ask questions of every speaker; interrupt him if you like.

MR. DOW: The only expense of the outdoor meeting was the printing of tickets. At the other meetings there was no expenses.

MR. WARD (Otis Elevator Company): We arranged for a Local Council at Yonkers and Mt. Vernon. We have had several meet-

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ings of foremen and the interest has been so good that the work has been continued through the summer.

MR. C. H. THOMPSON (Rochester Chamber Safety Council). Our foremen's meetings have worked out well. We secure names of foremen and their addresses, and personal invitations went out on Chamber of Commerce stationery. We had one case of a manager who replied that he did not think it was well to send out invitations to private addresses of foremen—he wanted to do the invitations himself. This winter we will have manage to send personal letters to each foreman urging him to attend meetings next year, beginning in September. There was a meeting every third Wednesday at the Chamber of Commerce—one meeting monthly from June to May. We should have fewer meetings this year—perhaps four meetings; October to March. These will be "red-hot" ones and we must endeavor to counteract other attractions and we will invite ladies. We will bring in some little item of entertainment—perhaps a comedy and get hold of a singer or two. We shall then get a man to talk. I believe in injecting the social factor into foremen's and foreladies' groups. Care must be taken to select suitable speakers. We had one speaker who intoned. He talked forty minutes and then the people went to sleep.

Another feature was the formation of an advisory committee of five of our most efficient safety workers for this committee gave each of them a separate subject. Every one specialized on some particular subject. Then, when members came in, they were told that this advisory committee was at their disposition. The committee took up their troubles and helped them. When demands for the services of this committee begin to fall off each member will write an article on his particular subject and copies will be given to the members.

It is a good idea to have officers of Local Councils visit other Locals for a day or two. I visited one or two and this worked well. A good idea in promoting the education of the public in safety matters in cities where there are public park band concerts is to rent a screen and throw on a safety motion picture film during the concert mission.

SAFETY WORK FOR SCHOOL CHILDREN.

MR. F. W. FISHER (Rochester Railway and Light Company). The work of the foremen's groups has touched the

lished much. We have gained much in our public work among the school children.

A DELEGATE: How do you carry the message of safety to children?

MR. FISHER: They have their own little meetings and write essays on Safety First and prizes are given. The services of speakers are donated. On one day speakers visited every school in the city. The other expenses are comparatively slight—practically none at all. Prizes were given by the school board.

MR. THOMPSON: The average attendance at the foremen's meeting is about 250. There is no practical limit to size of foremen's meetings. You must get all the foremen, sub-foremen and straw bosses.

MR. EARL B. MORGAN (New England Safety Council): We secure voluntary contributions from those who are going to participate. I do not believe in dues; everybody forgets about dues. (Mr. Morgan outlined the inception and prominent activities of the New England Safety Council and gave details of bulletins Nos. 1 and 2; No. 3 is now in course of preparation, and No. 4, "A Course of Studies in Safety Engineering." These will be given out at the night schools in Boston.)

NEWSPAPER PUBLICITY.

MR. T. T. TOOMEY (New England Safety Council): We have carried on a campaign of newspaper publicity and use a full sheet. This costs money, but we have had no difficulty in getting the money to pay for it. Our Council has been fortunate in being associated with the Associated Industries of Massachusetts.

CHAIRMAN PRICE: We have found it easy to affiliate Local Councils with Chambers of Commerce or other good bodies.

MR. H. H. ROBERTSON (Western Pennsylvania Safety Council): Pittsburgh probably offers a larger field for work than any other district. We have a special condition. There are a large number of small plants at diversified points, but they are hard to reach. We have divided the western part of Pennsylvania into fifteen districts. In each district there is a Chairman and Secretary and an active committee. We also have five Vice Presidents and each one has direct executive supervision of three districts. In getting started we had the co-operation of Dr. W. O'Neil Sherman of the Carnegie Steel Company. He came back from France with motion pictures, slides, etc., and has given lectures on the subject of "First-Aid and

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Hospital Experience." He first of all talks "First Aid in the story" and then adds something of interest about the war. They pulled very well. We have had fourteen meetings for the first time in this district and the total attendance has been 10,000. We have maintained one thing: The attendance of the foreman and his family. The women are very much interested.

We have had open-air meetings in eight of our various districts and have carried on a program of safety films. We have reached 85,000 to 90,000 workmen. Hot weather has not interfered with our meetings.

In dealing with open-air meetings it is desirable that workmen and their families have a place to sit down and be comfortable. We must secure a central place, as the men will not spend a nickel to go to a free show. There is a dearth of proper safety films. In some of our districts the theatres will put films on without any charge whatsoever.

FINANCING OF LOCAL COUNCILS.

A vital point is the financing of Local Council activities. We have found it easy to raise money but we have found it a little difficult to solicit memberships and then ask for more money. We might, in some way, consolidate the subscription and collect it locally, giving the man his subscription in the National Safety Council and there. We could raise \$10,000. We want to form a Central Finance Committee with a good Chairman and put at least five men on this, and in this way insure the more active co-operation of the Chamber of Commerce with which we are affiliated—go right to the manufacturer and assess him a proportion of the budget made by the Finance Committee.

(Messrs. J. A. Gould, E. B. Morgan and H. H. Robertson appointed as a special committee for purpose of discussing the subject of financial Local Councils.)

MORE SAFETY FILMS NEEDED.

CHAIRMAN PRICE: Mr. Robertson, have you any doubt as to the practicability of open-air meetings for workmen? Can the attendance be kept up?

MR. ROBERTSON: This is one of the most efficient ways of reaching the man. They may not attend for the entire program of four or five reels, but I think you can always get a crowd. We have had

number of films we can have real live audiences continually on this subject.

MR. WARD: Did you require tickets for admission?

MR. ROBERTSON: Only at foremen's meetings, not at massmeetings. We always had a better attendance in the smaller towns than in the larger ones.

MR. J. A. GOULD (Buffalo Safety Council): We have had a good attendance at meetings. We have had music, etc., and good speakers. We formed eight or ten classes under the auspices of the American Red Cross. We had a public rally, at which there was an attendance of over 15,000. We financed this by billing tickets to employers at about 3 cents each. We believe they attended so well because we charged something. In the fall campaign we will take up the subject of health. We are trying to bring about universal medical examinations.

You must secure advertising. We have secured good co-operation. The Safety Council is to be criticised for not getting its full share of this. We closed a contract for \$10,000.00 this fall. The Local Councils should get in on this. Newspaper representatives like to go out and get this advertising themselves. Checks should be made payable to Local Councils and if there is a surplus this will go to the Local Council and its funds.

ADVERTISING SAFETY WORK.

MR. ROBERTSON: How did it come that money for advertising was paid to the Local Council?

MR. GOULD: The Local Council was conducting the campaign. The newspapers seem to appreciate the fact that we can reach the big manufacturers.

MR. WILLIAM H. CAMERON (General Manager, National Safety Council): Many members are not in sympathy with advertising campaigns. There is, of course, a distinct value in having newspaper publicity, but we do not want to have newspaper publicity through the Councils. The matter should be referred to headquarters and the Local Council can help to get the advertisements right. Such advertisements must all be reviewed by safety men. The gentlemen in Washington who criticised the advertising in the *Ledger* said that the advertisement was gone over by a safety man.

MR. C. P. TOLMAN (National Lead Company): Why not have the National Safety Council prepare copy for advertisements and allow newspapers to use it? Standardize the copy, in other words.

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GENERAL MANAGER CAMERON: Where the newspapers have for copy we have provided it. I will take a note of your suggestion.

MR. GOULD: We have had one side of the same proposition in Buffalo. Some manufacturers have asked us point blank "does the Local Council stand in this matter?"

GENERAL MANAGER CAMERON: You must not let the Local Council finance and secure advertisements because of compliance.

MR. MORGAN: Why not let the Local Council supervise and control this method?

GENERAL MANAGER CAMERON: I believe the Buffalo Local Council should take leadership in getting safety on the map, but do not let the newspaper use the Local Council's name.

MR. HAROLD MESTRE (Northern California Safety Council): The proposition has been badly handled. Let us put the matter to the newspapers to give us a reduction on full rates—with space. I do not see how we can get into trouble.

GENERAL MANAGER CAMERON: We must not take part in the commercial aspects of newspaper advertising. This should be left upon by the Executive Committee.

MR. ROBERTSON: This matter should be given definite attention. We must get better by-laws for Local Councils.

GENERAL MANAGER CAMERON: You are at full liberty to do as you wish, but most Local Councils want simple ones.

MR. ROBERTSON: A book of rules for Local Councils would be advisable.

GENERAL MANAGER CAMERON: There is need for a handbook for Local Councils. (Mr. Cameron then explained the handbook in preparation, giving suggestions for addresses, etc., for use of Local Council officers.)

ADDITIONS TO FIELD FORCE.

MR. GEORGE AURIEN (St. Louis Local Council): One of the Chairmen of our round table meetings asked me what were the powers.

GENERAL MANAGER CAMERON: We need a new set of By-laws for the extended organizations. Your Local Council will supervise the activities of sub-organizations.

CHAIRMAN PRICE: Mr. Cameron will prepare the handbook. He will be pleased to receive suggestions. We shall continue the next letters.

the National Council than they are at present. Probably we shall have some three to four more men in the field. We have this in mind for public safety also.

MR. W. E. WORTH (Chicago Local Council) : Have you analyzed the pros and cons of the newspaper advertising campaign? In Chicago they wanted \$55,000—\$1,200 to \$1,300 weekly. The Local Council could spend \$55,000 to better advantage by putting into the field twelve to fifteen Field Secretaries. Let us give this careful consideration.

MR. F. M. ROSSELAND (Chicago Telephone Company) : We have held monthly meetings, but other attractions have interfered with our work. We have combined forces with the Safety Committee of the Illinois Manufacturers' Association and we are all working jointly. We are preparing to observe Fire and Accident Prevention day.

CHAIRMAN PRICE: Could you work out the district idea?

MR. ROSSELAND: We could. It appeals to me very much. We have not been able to do as much as we should have liked.

MR. ROBERTSON: I suggest that we make a formal application to Mr. Cameron for a visit from Mr. Price.

MR. ROSSELAND: We have started the *Safety Banner*. This, I think, is a good idea for Local Councils.

MR. F. W. CONGER: (Niagara Falls Local Council) : One thing in particular which we are doing is through the Pathoscope moving picture machine. Some companies have been using them and the machines have been brought into the plants.

MR. TOOMEY (William Filene Sons Company, Boston) : We have a Publicity Committee. Its Secretary was a newspaper man. The National Safety Council should have a Publicity Committee which can pass on advertisements—get big companies who do much newspaper advertising.

MR. ROBERTSON: How do you finance the Pathoscope proposition?

MR. CONGER: We assess each plant at the rate of 5 cents per employe.

MR. N. B. DAVIS (Western Pennsylvania Safety Council) : Let each Local Council send in their notes and let Mr. Cameron take extracts from them.

MR. C. B. AUDEL (Western Pennsylvania Safety Council) : Let us get after the children in the schools. We have found these a fertile field. You can reach both the children and the teachers. We have made our talk from fifteen minutes to three-quarters of an hour for

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highest classes, teaching elements of safety and sanitation. is a boil, for example? We have a Balopticon (\$20.00) and (\$5.00). We delegated one of our surgeons to take up the n

DONATIONS TO THE WORK.

MR. J. H. HARVEY (Kansas City Local Council): Our Council is just organizing along the line of public safety work. Our local traction company has done something along a great many different activities—showing of moving pictures, monthly banquets, etc. (Mr. Harvey gave a brief report of conditions bearing on the growth of the Local.) We went among the older members of the Council and asked for contributions. We have outlined them for the coming year, asking: "How much will you give?" We went to the older members and not to the men who had just paid their dues. They contributed something like \$500. We set aside \$100.00 allowance each month to the Secretary. Mr. Brown has done a great deal of work for us.

MEMBERS ARE GETTING TOGETHER.

To keep members interested we have had a noonday luncheon. Each member had to bring a prospect, if he could. Meetings were discontinued during the summer. We had several good talks with foremen's meetings. We have found these meetings were not enough. We announced for one meeting that it would be a "Question and Answer" meeting. The men wanted the meetings all summer. We have found this style of meeting is of great value. The Chamber of Commerce of Kansas City has helped us in every way possible.

GENERAL MANAGER CAMERON: The Erie School Board recently took twenty-two \$5.00 memberships in the Council. You should get some of your schools lined up. Has the Local tried, previously, an evening meeting, a conference meeting of safety inspectors at 4 p. m. I recommend this to you.

MR. HARVEY: We asked the board of education to place bulletins on boards in the mechanical department. We said we would send them with Safety Council bulletins. The School said they would be willing to do so and we selected the bulletins.

MR. W. R. RASMUSSEN (Omaha Local Council): We have had five meetings and have gone over the copies of advertisement in Omaha.

MR. CAMERON: I have a few more things to say.

ants have been brought into the schools to give instructions on proper ways of crossing the streets, etc. Under the auspices of the Chamber of Commerce we have nine committees. The Chairmen of each of these committees automatically become a member of the Executive Committee, who, in turn, form the safety committee of the Chamber of Commerce. Mr. C. M. Talbert, Director of the Department of Streets and Sewers, has done much work in curbing accidents. We have the co-operation of the big industrial and public service corporations. They give us notes of their accidents and the matter is taken up with Mr. Talbert who has the co-operation of the police and detective departments.

CHAIRMAN PRICE: Do you believe the district idea is good?

MR. AURIEN: Yes; but we lack the co-operation of the employer to contribute dollars and cents for their attendance. The principal thing is to bring the men of the different plants together—they then know what each other's plans are.

MR. MESTRE (Northern California Safety Council): Our Northern California Safety Council takes up two-thirds of the state. We wanted a strong Central Executive Committee, composed of Chairmen of the different Local Councils. In many instances we shall have four divisions and so on. We are endeavoring to get the industries to support the Local Councils. The Executive Committee will be entirely directive to stimulate work over the state. It will be simply a clearing-house of matters under National Safety Council control. There will be certain state-wide sections—a Health Section, for example, and a Public Safety Section. Probably one meeting only of the whole Council will be held during a year. There will probably be a Safety Congress. I hope, however, to have a strong public safety meeting when I get back. We are conducting a membership campaign at present.

MR. V. R. CURRIE (Texas Safety Council): We will hold a safety rally in Dallas in the near future. (Mr. Currie gave an outline of the origin and development of the Texas Safety Council and told of the state-wide rally.)

GENERAL MANAGER CAMERON gave an account of the publicity necessary to promote such rallies.

MR. TOOMEY (New England Safety Council): Let us get an advertising man.

MR. C. B. HAYWARD (New Haven Safety Council) gave an outline of the origin and development of his organization.

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THE WAR AND SAFETY WORK.

GENERAL MANAGER CAMERON: What about war and prevention activities?

MR. MESTRE: I think the war is the biggest lever to get memberships you can have.

MR. G. L. AVERY (Peoria Local Council): It strikes the same way.

MR. R. R. RAY (Detroit Local Council): One special thing that did to stimulate interest was the passing of a list of twenty subjects that should be taken up during the year's meetings. We asked the members to vote on the list and found that welfare work got the highest votes. (Mr. Ray gave an outline of results according to his Local's activities.)

MR. S. W. SHEPARD (Birmingham, Ala.): In Alabama we have a State Safety Association which meets the second Friday of each month. We have a great deal of enthusiasm in safety work and new methods. As to interesting school children in safety work we bought 500 copies of "Sure Pop." We secured the co-operation of the Boy Scouts and the Boy Scouts took up "Sure Pop" in their work with the children.

MR. G. T. FONDA (Lehigh Valley Local Council): Lehigh Valley Local Council No. 5 has been holding meetings regularly each month. Sometimes we have a cabaret entertainment. We have been making a further drive for memberships. It is simply a matter of work and working to schedule. We have been charging Council dues and have spent \$500 to \$700 annually—this has been mainly expended in financing our annual safety meeting.

MR. HOLGER JENSEN (Baltimore Safety Council): We are waiting for Mr. Price to pay us a visit to start us off.

After a thorough discussion of matters of interest to Council officials and committeemen the meeting adjourned.

LOCAL COUNCIL REPORTS

READING LOCAL COUNCIL.

JOS S. PENDLETON, Carpenter Steel Company, President.

LUTHER M. WALTON, Chamber of Commerce, Assistant Secretary.

READING, PA., Jan. 29, 1917.—Mr. William H. Cameron, General Manager, National Safety Council: Dear Sir—The Local Council, during the first half of the year, was quite active, but owing to the resignation of Secretary Ewing the work was somewhat disarranged. One of the active features was "Safety Week," which created a great deal of interest and was largely attended. Due to an unavoidable series of happenings the Local Council has not been active during the last few months. Several of the very active members have moved from the city and the pressure of work, due to the national crisis, has prevented us from pursuing the matter of safety work. We are very glad to say that the work which has been done by the Local Council has borne fruit. A great many of our industrial plants have adopted methods of preventing accidents and safeguarding their employees. Best wishes for the success of your splendid propaganda work.

LUTHER M. WALTON, Assistant Secretary.

EAST ST. LOUIS LOCAL COUNCIL.

D. E. PARSONS, East St. Louis & Suburban Railway Company,
President.

IRWIN RAUT, Industrial Secretary, Y. M. C. A., Secretary.

EAST ST. LOUIS, ILL., Aug. 31, 1917.—Mr. William H. Cameron, General Manager, National Safety Council: Dear Mr. Cameron—Our activities have been confined to foremen's meetings during the winter. I am sorry to advise that our President, Mr. W. C. Thrasher,

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All-Roofing Company, died last week. Meetings will be held shortly and plans outlined for the coming year.

The foremen's meetings were very successful and we thank you for your co-operation and suggestions in making them so.

Sincerely,

IRWIN RAUT, Sec

KANSAS CITY LOCAL COUNCIL.

JULIEN H. HARVEY, Kansas City Railways Company, President
B. S. BROWN, Kansas City News Service, Secretary

KANSAS CITY, Mo., June 30, 1917.—Mr. W. H. Cameron, General Manager, National Safety Council: My Dear Mr. Cameron: Here is the first annual report of Kansas City Local Council No. 11, of the National Safety Council. The Local Council is the result of activities begun by the Industrial Safety Department of the Chamber of Commerce.

The organization meeting was held Aug. 22, 1916, with 15 delegates present, representing twelve of the local members of the National Safety Council. E. G. Trimble acted as Temporary Chairman and B. S. Brown as Temporary Secretary. A full set of officers were elected. At a meeting Sept. 9 plans were made for increasing the membership. By-laws were adopted and committees provided for.

On Sept. 18 forty persons listened to Mr. W. H. Cameron, General Manager, and C. W. Price, Field Secretary of the National Safety Council. The following day fifteen members of the Membership Committee held an intensive business session with Mr. Cameron and Mr. Price and organized a membership campaign. Names were assigned to members of the committee for solicitation. The Membership Committee held frequent meetings and prosecuted its work systematically, reports of visits being noted on cards and put in a file.

Mr. Price returned Oct. 30 and spent a week in membership work with the local committee, also addressing civic bodies, audiences in high schools and special meetings. During his visit the progress of the Local Council's work was further crystallized.

The Executive Committee has met at least once a month, and a few days prior to the monthly meetings of the Local Council a special Executive Committee meeting is held.

MONTHLY COUNCIL MEETINGS. .

The monthly meetings of the Council at first had a definite program and one or two set speeches. Latterly, however, we have had question boxes and discussions of subjects decided upon beforehand by the Executive Committee or brought up in the meetings. At each session the members and visitors present have risen, in turn, giving their names and businesses, and each has also worn a badge on which is written his name and business. The meetings are held at noon, luncheon being served at 50 cents to 75 cents, in a banquet hall of hotel or restaurant.

Seven meetings have been held—from December to June, inclusive.

FOREMEN'S ROUND TABLES.

The Kansas City Local Council has paid particular attention to the monthly meetings for foremen, which have been held in rooms provided at the headquarters of the Chamber of Commerce. The first round table was held Nov. 3, 1916, during the visit of Mr. Price. Dr. Eugene Carbaugh talked convincingly and inspiringly on "First Aid." The foremen organized, with E. T. White, Superintendent of Safety of Smith & Sons Manufacturing Company, as Chairman, and John C. Grainger, factory inspector of the Board of Public Welfare, as Secretary—the Board of Public Welfare being an associate member of the National Safety Council.

Round tables have been held monthly; the first few had stated speakers, including H. L. Goodwin, who talked on "Eye Hazards and Protection"; L. Harris talked on "Telephone Line and Plant Hazards," illustrated with moving pictures and slides, and W. S. Woodland, on "Public Safety." By this time the foremen had become so interested and so obviously eager to tell their own experiences and to ask questions that set programs were abandoned. There were two meetings at which foremen from various plants spoke, having been assigned to subjects before the meeting. The present practice is to have no advance preparation, except a list of subjects to be discussed prepared by the Chairman, Mr. White. Attendance at the round tables is 50 to 100. The round table voted to continue meetings through the summer. Cigars are usually provided by the Local Council; June 4 a buffet lunch was served, and July 2, lemonade. Visitors from non-member plants are welcomed.

The Local Council had eighteen members in August, 1916, including firms with headquarters in Kansas City, and those which

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had branches here. June 30, 1917, there are fifty-four men the National Safety Council with headquarters in Kansas City affiliated with the Local Council, but with address in Kansas Kan., and ten with headquarters elsewhere—a total of seventy-one members, two are associations, the Board of Public Welfare and the Chamber of Commerce.

B. S. BROWN, Secretary

·BUFFALO LOCAL COUNCIL.

J. A. GOULD, Larkin Company, President.

G. A. MARKHAM, Larkin Company, Secretary.

BUFFALO, N. Y., July 12, 1917.—Mr. W. H. Cameron, General Manager, National Safety Council: Dear Sir—In accordance with the provisions of Section 4, Article IX, of the Constitution and By-Laws of the National Safety Council, I am pleased to report that the current year has been a most active one for Local Council No. 28.

Regular round table meetings were held monthly since our formation in December, 1916, up to May, 1917, with very good attendance. Executive meetings were also held each month. However, the most successful event throughout the year was our public safety meeting which was held on Feb. 24, in the Broadway Auditorium, both noon and evening. The afternoon program consisted of a demonstration by the Boy Scouts, an address on "First Aid at Home," by Mrs. A. L. Hansen, superintendent of the District Nurses Association, assisted by members of her staff, and moving pictures. The Hon. John F. Malon, Commissioner, City of Buffalo, gave an introductory address and Mrs. Henry Altman, president of the Buffalo City Federation of Women's Clubs, acted as Chairwoman for the evening. The Hon. Charles B. Hill, Commissioner of the City of Buffalo, acted as Chairman and gave an introductory address, which was followed by an address on "Home and Factory Sanitation" by Dr. Francis E. Fronczak, Health Commissioner, City of Buffalo. The Buffalo city police then gave a "First Aid Drill and Demonstration," illustrated by stereopticon slides. Mr. Marcus A. Dow of the New York Central Lines delivered his most interesting address "The Human Elements of Safety." He also showed his film

also shown. In the afternoon there were 6,000 present, consisting mostly of school children and mothers; 5,000 were present in the evening, most of whom were railroad men and shop employes.

Buffalo Safety Council Local No. 28 feels that considerable good has been accomplished during the past year and also feels that much is yet to be heard of us; that during the coming year we will be able to make our work reach a little further than it has during the past year.

NORRIS H. SCHEIB, Assistant Secretary.

NEW ENGLAND SAFETY COUNCIL.

H. G. SMITH, Vice President and General Manager, Fore River Shipbuilding Corporation, President.

E. B. SAUNDERS, Efficiency Director, Simonds Manufacturing Company, Secretary.

MR. WILLIAM H. CAMERON, General Manager, National Safety Council: Dear Sir—The New England Safety Council is the outcome of the reorganization and enlargement of the Boston Safety Society. Upon the visit of Field Secretary Price a luncheon meeting was called Feb. 7, 1917. It was then voted to adopt the more inclusive name and affiliate with the Associated Industries of Massachusetts. A full quota of officers was elected.

On Feb. 28, 1917, the Executive Committee conferred with General Manager Cameron in the Boston office. The activities of the New England Safety Council were outlined as follows:

1. Furnish speakers at preliminary meeting.
2. Show how to organize a Local Council.
3. Arrange a succession of big meetings in various sections of New England.
4. Help plan programs for season's work.
5. Activities listed in New England Bulletin No. 1, viz.:
 - Meetings for superintendents and foremen on subjects as—
 - "How to Organize for Safety."
 - "How to Interest the Workmen."
 - "First Aid to the Injured."
 - "Eye Protection."
 - "Dangerous Practices."
 - "Guard Building."
 - Moving Picture mass meetings for workmen.

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Luncheon meetings for executives.

Safety in schools.

6. Service of National Safety Council.

7. Co-operation with other organizations.

In pursuance of this program a general meeting was called at the Boston City Club March 15, 1917. The meeting was an enthusiastic one. In response to invitations extended to prominent manufacturers, 143 representatives of New England's largest industries, representing eighty-six separate manufacturing interests, from twenty-one cities and towns in Massachusetts, including five from outside the state and eight representatives of the Boston daily press were present. Addresses were made by President Smith, Field Secretary Price, New England Secretary Saunders and others.

A week of safety mass meetings for the working force of various cities was held, with the following results:

April 29—Worcester, Mass., 2,000 present.

April 30—Nashua, N. H., 1,100 present.

May 1—Lowell, Mass., 600 present.

May 2—Fitchburg, Mass., 1,200 present, Marcus A. Smith, speaker.

May 3—Chelsea, Mass., 500 present.

May 4—Springfield, Mass., 500 present.

Local Councils have been formed at Worcester, Mass. and Springfield, Mass.

Co-operative work has been planned with the Y. M. C. A., industrial secretaries will conduct safety drills in industrial plants and with the Boston Association for the Relief and Control of Tuberculosis whose Committee on Health in Industry is occupying industrial nurses.

Bulletin No. 2 is in preparation, dealing with insurance. This is being written by experts on workmen's compensation insurance.

Bulletin No. 3 is also in preparation by the industrial secretaries of the Boston Y. M. C. A., outlining the first aid and safety work which the association will undertake.

Safety material and figures are being gathered at the headquarters, room 1033 Kimball Building, Tremont street, Boston, Mass.

The Membership Committee has been enlarged by including safety inspectors of insurance companies. The membership

A course of study in safety engineering is contemplated which may be added to the subjects offered by the Department of University Extension of Massachusetts.

E. B. SAUNDERS, Secretary.

NEW HAVEN LOCAL COUNCIL.

C. B. HAYWARD, Safety Engineer, Winchester Repeating Arms Company, President.

L. T. CROSSMAN, Industrial Secretary, Y. M. C. A., Secretary.

MR. W. H. CAMERON, General Manager, National Safety Council: My Dear Mr. Cameron—The growth of New Haven Local Council No. 24 during the past twelve months has been rapid.

A little over a year ago we started with a nucleus of six industrial members in the National Safety Council and today have a total membership of thirty-one. The combined number represents a total of over 50,000 employees and there are seventy-four registered representatives. The average number of new memberships taken in during the past year has been two per month.

Publicity, purpose, persistence and persuasion constitute the Big Four P's of our success in safety work. There is not a factory owner, president or head official of any New Haven concern who has not been acquainted with the New Haven Local Council's plans and future ideals. Many are reticent on the matters, but it is simply a matter of time and the constant using of the four P's and they will be members. The newspapers have contributed on all occasions to keep the Safety Council activities before the eyes of the business man.

At the first annual meeting of Local No. 24, held Sept. 25, 1916, all of the officers and directors for the year preceding were re-elected with the exception of Vice President, Mr. E. E. Metzger, Superintendent Geometric Tool Company, being elected to the office of Vice President. The various committees reported development and progress. The Membership Committee, Mr. Ralph W. Langley, Chairman, reported three new members and a dozen or more prospects. The Publicity and Program Committee, Mr. C. H. Clements, Chairman, reported that work on publicity plans was showing up well and all newspapers would co-operate. After the regular routine business was dispensed with, several matters were discussed regarding the future activities. It was generally desired that a safety convention

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would be a positive way of creating more interest in the Council's organization. Plans were considered and a committee appointed by the President to study and work out the details to be reported on at a later date.

On Oct. 9, 1916—Safety and Fire Prevention Day—was held a luncheon at the Hotel Bishop and discussed both fire and accident prevention work. The meeting was well attended and a representative reported the observation of the day in some manner at the various plants.

Regular meetings have been held every month with one exception. The meeting night was changed in November, 1916, to the second Tuesday in each month instead of the second Monday each month. It was the consensus of opinion that Tuesday was free from other engagements for most business men and less crowded from work on Tuesday than on the first day of the week. The informal meetings have been beneficial and productive of valuable information.

Prof. C. E. A. Winslow of Yale University spoke on occasion on "Problems of Fatigue and Efficiency in Industries." The relative importance of carbon dioxide (CO_2) was explained as being little or no part in any workshop, provided the production did not give off quantities of the gas. The value of this was the change of attitude toward the theory of decrease in production in a crowded workroom being due to carbon dioxide exhaled from the lungs. The carbon dioxide theory was disproved and replaced by one proving the change to be due to excessive heat and humidity.

At the December meeting Mr. Philip Smith, Chief of the New Haven police department, spoke on "Traffic Problems." New Haven has narrow streets and the problem of improving these thoroughfares for traffic has kept many of the city's officials busy. Smith fully understands the conditions and the meeting was instructive and interesting. The Local Council has made several suggestions to the chief regarding traffic and thoroughfares; these have always been received with courtesy and appreciation. Some of the recommendations have been carried out—one was changing of the lights on the semaphores directing traffic from red to green.

During the fall of 1916 the Program and Arrangements Committee had been steadily working up plans for a state safety conference of industries in the state of Connecticut. A program was formulated

decided upon and the convention fixed for Jan. 30. All newspapers carried splendid accounts of the plans and gave the complete programs with parts of the addresses. The audiences were enthusiastic. Interest never lagged. The speakers were all on hand. In the evening there was a successful banquet at which ninety-five were present. The success of this first state safety convention has decided us to make it an annual event. The expense of the convention was taken over voluntarily by five of our largest industries.

The success of our first state safety gathering warrants its being an annual affair. It was an efficient manner of securing publicity throughout the state for the National Safety Council. Over 600 industries were reached and although not all of them sent representatives to the convention, they at least have the information concerning the safety movement and need for such work.

Fortunately the Local Council has made a place for itself in the heart of the Chamber of Commerce. The Secretary of the Chamber has accepted the Local Council for what it is worth—a useful organization. The Local Council presents safety information before the Chamber of Commerce at least twice each year, at the Saturday luncheons of this body; this means the providing of at least two excellent speakers on the subject of safety by the Local Safety Council.

On March 26, 1917, we held the first foremen's massmeeting. We sent out over 500 card invitations through the assistance of our representatives, to all the foremen in the shops of the members. These cards were printed forms leaving blank two lines, one for the foreman's name and one to be filled in with signature of some official of the company sending them out. The scheme worked out successfully and though there was a severe rainstorm over 100 foremen were in attendance. The subject of the evening was "First Aid" and well covered by our New Haven police surgeon, Dr. Seymour L. Spier. This forms the third important activity of the Local Council and a number of similar massmeetings are planned for the year.

There are two other activities that we plan to bring to a head at future date—massmeeting of employes at which time will be presented accident prevention through the medium of moving pictures and the Public Safety Committee, which will include as many of our active business men in this city as possible, to consider local public safety and help further safety instruction in the public schools.

New Haven Local is a success and will continue to be so.

C. B. HAYWARD, President.

shuis of this city ; one on the subject of "First Aid to Injured" and the other on "Medical Inspection of Employees." Aside from this the Local Council had no activities. Mr. Z. Clark Thwing of the Grand Rapids Veneer Works is sending out a number of letters to good, live prospects and we are in hopes that his efforts will bear fruit.

E. A. MEVES, Secretary.

CHICAGO LOCAL COUNCIL.

H. L. GANNETT, Commonwealth Edison Company, President.

F. M. ROSSELAND, Chicago Telephone Company, Secretary.

CHICAGO, ILL., Sept. 7, 1917.—Mr. W. H. Cameron, General Manager: Dear Sir—In connection with the activities of the Chicago Local Council during the present year, permit me to report that the following officers and Executive Committee members were elected at a meeting held at the Grand Pacific Hotel, Chicago, on Nov. 17, 1916:

H. L. Gannett, President.

F. M. Rosseland, Secretary.

J. J. Heelan, Vice President.

H. G. Ellerd, Treasurer.

Executive Committee—I. A. Berndt, J. T. Ryerson & Son, Chairman of Membership and Publicity Committee; W. E. Worth, Chicago Tunnel Company, Chairman of Program Committee; K. M. Burr, Illinois Steel Company (Gary), Chairman of Standardization Committee; Dr. W. B. Fiske, International Harvester Company; A. M. Ott, Chicago Malleable Castings Company; R. B. Hill, Portland Cement Association.

During the year the untimely death of Mr. A. M. Ott necessitated the selection of a successor. Mr. K. M. Burr and Dr. W. B. Fiske, because of the pressure of business, found it impossible to attend our meetings and presented their resignations, which were accepted with much regret. Messrs. W. E. Waters, National Malleable Castings Company; T. E. Barker, the Miehle Printing Press and Manufacturing Company, and E. L. Schnadig, the Barrett Company, were elected to fill the vacancies.

The Executive Committee has held regular meetings, at which the nature of the programs and the general policy of the Council were agreed upon.

ings during the latter part of September. The membership of the Local Council has been steadily growing, and the attendance at the Safety Dinners has been excellent.

Since the advent of the United States into the world war many of our members have been called to the colors, among whom were Major K. M. Burr of the Gary works of the Illinois Steel Company and Mr. Robert Brinton Hill of the Portland Cement Association, Chicago. At a meeting of the Executive Committee the following resolution was passed unanimously and copies transmitted to Mr. Cyrus H. McCormick, Jr., Secretary, Chicago War Board, and Mr. Samuel Insull, Chairman, State Council of Defense:

"Whereas, A state of war exists between the United States of America and the Imperial German Government; and

"Whereas, Chicago Local Council No. 3 of the National Safety Council is an organization which, for several years, has been devoting regular meetings and special sessions to the problems of safety and health conservation of the industrial workers; and

"Whereas, It is the aim of this organization to assist in the betterment of general industrial conditions; therefore, be it

"Resolved, That Chicago Local Council No. 3 of the National Safety Council hereby tenders its service collectively or individually in any manner that it may be called upon to assist in the application of safety and welfare in industry in any manner that will be for the best present and future welfare of our Country, State and City."

During the year, at the decision of the Executive Committee, the Secretary inaugurated a monthly publication, *The Safety Banner*. This publication was sent out each month up to the vacation season, and it is proposed to resume publication when the fall meetings are begun. *The Safety Banner* met with approval and it is the hope of the officers that it will become a permanent means of communication between the officers of the Local Council and the members. Respectfully submitted,

FRED M. ROSSELAND, Secretary.

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NEW YORK LOCAL COUNCIL.

MARCUS A. DOW, New York Central Lines, President
C. P. TOLMAN, National Lead Company, Secretary.

NEW YORK, Aug. 29, 1917.—Mr. William H. Cameron, General Manager, National Safety Council: Dear Sir—Early in the month of August the keynote of the work of the Council was clearly sounded at a complimentary dinner tendered by the New York Local Council. Mr. A. H. Young, the new director of the American Museum of Natural History, was the guest of honor. The museum was represented by a large number of directors and the Local Council was present in force to do honor to its guests. Addresses by Messrs. Dow, Wilson, Young, Wilson and Hoffman were most inspiring and were enthusiastically received. The scope of the National Safety Council and of the American Museum of Natural History was clearly defined and the importance to each of the work of the other was strongly emphasized.

Following this meeting the principal work of the year has been the membership campaign and preparation for the Annual Meeting of the National Council.

The Membership Committee, consisting of Messrs. J. R. de la Torre Bueno, Chairman, L. A. Larsen, R. W. Straus and A. H. Young, planned an extensive campaign in conjunction with Mr. Price, Field Secretary of the National Council. New York City and the outlying industrial centers were divided into districts placed under the direction of the following members of the Executive Committee: Messrs. A. C. Carruthers, Long Island City; J. R. de la Torre Bueno, Bayonne; C. T. E. Jersey City; C. L. Close and A. H. Young, South Brooklyn. District Chairmen were appointed and committees organized to take charge of the campaign in each district.

The general plan was to hold a preliminary meeting with the local Chamber of Commerce and other bodies interested in industrial and public safety at which Mr. Price would explain the purpose of the movement. Subsequently a meeting for factory superintendents and foremen would be held in some large local hall. This would be addressed by the leading physician of the place. Mr. Price would follow with a talk, and, if available, a safety moving picture was shown.

Meetings of the above nature were held which were largely

enthusiastically attended at Paterson, May 9; Newark, May 15; Bayonne, May 16; Long Island City, June 25, and Yonkers, June 28.

Very unfortunately for the continued success of the campaign Mr. Price was obliged to give up the work about the middle of June, being called into the service of the United States government. It is planned to resume this campaign shortly after the Annual Safety Congress when, it is felt, the publicity given to the council work shall have made its objects and constructive work better known to the local industries.

The New York Local Council has been very largely in charge of the arrangements for the Annual Congress, co-operating with Mr. W. H. Cameron, General Manager of the National Safety Council. The following committees have been in charge:

Mr. A. H. Young, Chairman, Ways and Means Committee.

Mr. G. O. Smith, Chairman, Publicity Committee.

Mr. J. R. de la Torre Bueno, Chairman, Membership Committee.

Mr. C. T. Banks, Chairman, Program Committee.

Mr. W. C. Wilson, Chairman, Reception and Entertainment Committee.

Twenty-seven new memberships have been secured by the Local Council.

C. P. TOLMAN, Secretary.

TACOMA LOCAL COUNCIL.

W. A. LEUENBERGER, Tacoma Gas Company, President.

W. W. LATHROP, St. Paul and Tacoma Lumber Company, Secretary.

TACOMA, WASH., July 11, 1917.—Mr. William H. Cameron, General Manager, National Safety Council: Dear Sir—Regular monthly meetings of the Local Council and Executive Committee have been held. Following the regular business addresses on the following subjects have been presented and discussed:

"Fire and Police Protection," the Hon. F. H. Pettit, Commissioner of Public Safety, Tacoma.

"Organization of First Aid Teams," Acting President W. A. Leuenberger, Superintendent, Tacoma Gas Company.

"Relation of Industrial Insurance to Accident Prevention," C. A. Pratt, President Pacific Box Company, Tacoma.

"Progress of Safety Scout Movement in Tacoma Public Schools," T. M. Henry, Tacoma Railway and Power Company, Tacoma.

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"Reduction of Fire Hazard in Tacoma Public Schools," Chantler, Fire Marshal, Tacoma.

"Causes of Fires," M. E. Cheney, Electrical Inspector, Ingham Surveying and Rating Bureau, Seattle.

"Proposed Traffic Ordinance," the Hon. F. H. Pettit, Commissioner of Public Safety, and H. M. Smith, Chief of Police, Tacoma.

"Safety First in Target Practice and First Aid," Capt. Palmer, Troop B, N. G. W., Tacoma.

"Interpretation of State Medical Aid Board Law," the Hon. M. Wilson, Chairman, State Industrial Insurance Commission, Olympia.

"Eye Injuries and Their Care," Dr. E. B. Wheeler, President, Commercial Club, Tacoma.

"Organization in Safety Work," R. C. Salisbury, Safety Supervisor, Tacoma Smelting Company, Tacoma.

"Operation State Medical Aid Board," the Hon. Dr. J. C. Mowell, Olympia, Chairman, State Medical Aid Board.

"Value of Democracy and Personal Words of Caution by Intendents and Foremen in Safety Work," G. M. Douglas, Chief Inspector, American Smelting and Refining Company.

"The Work of the National Safety Council," L. R. Ives, President, National Safety Council.

These meetings having been more or less semi-public, invitations to members that would be interested were sent out.

The second annual meeting was held at the Tacoma Hotel, 14, 1916, and the following officers were elected: President, Leuenberger; Vice President, H. G. Winsor; Secretary, W. W. Lathrop, and Treasurer, William Schlarb, Jr.

Executive Committee consisting of the above and Dr. J. R. Yocum, C. A. Pratt, Harry Pelletier.

Committees appointed by the President: Publicity Committee—Dr. J. R. Yocum, W. W. Lathrop and H. G. Winsor. Education Committee—C. C. Opie, C. A. Pratt and William Dayton. Membership Committee—Harry Pelletier, Clarence Parker and V. Schlarb, Jr.

Public activities: Aug. 19, 1916—Third Annual Mine Safety and First Aid Meet, held in the Stadium, under the auspices of the United States Bureau of Mines, Washington Mine Safety Association and Miners and Operators of Washington.

Nov. 9, 1916—Address on "Protection of Health in the Coal Mine," by Dr. J. R. Yocum.

ered in Commercial Club rooms. Address on "Approved Safety Devices in Elevator Operation," D. W. Perry, elevator inspector. Delivered in Commercial Club rooms.

March 1, 1917—A catalogue was published listing 346 books, pamphlets and articles on "Accident Prevention and Safety First" in the Tacoma public library; these catalogues being distributed to members, to the public schools, etc.

Tacoma Local also gave the capital prize, a silver loving cup, to the school represented by the Safety Scout winning the first prize, and appointed a committee to secure the remaining ten prizes given.

Local Council membership now numbers thirty-six. Yours truly,

W. W. LATHROP. Secretary.

ROCHESTER LOCAL COUNCIL.

FREDERICK W. FISHER, Rochester Railway and Light Company,
Secretary.

ROCHESTER, N. Y., July 14, 1917.—Mr. William H. Cameron, General Manager, National Safety Council: Dear Sir—It is more than a pleasure to present to you a report of the most active and thoroughly satisfactory season Local No. 9, of the National Safety Council, in co-operation with the Rochester Chamber of Commerce, has ever enjoyed. For the sake of space, a multitude of details must be ignored and the report given in concise narrative form:

Briefly, the Local Council has been conducting an intensive and extensive accident prevention campaign among the almost 50,000 factory workers who constitute almost five-sixths of Rochester's total of this class of employes. We have also conducted an active publicity campaign and safety work in the schools.

Four distinct features stand out from the rest of the year's activity:

1. The membership has been increased about 125 per cent.
2. In an effort to reduce the number of street accidents and to enlist the active co-operation of the public in progressive safety work, the Local Council has established a complaint bureau, which receives reports of observed traffic violations from the public and addresses a courteous warning to each of the negligent drivers thus reported.
3. The superintendents, foremen and safety inspectors in the

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employ of member plants have organized themselves into a group which, in itself, is expected greatly to increase the of Rochester's industrial accident prevention campaign and in the additional saving of lives and prevention of accidents

4. A most effective safety campaign was conducted Rochester's 40,000 public school children in conjunction Board of Education.

The wholesome co-operation and spirit of teamwork, the presence of which is responsible for our many successful achievements marked the membership work. At the beginning of the year covered by this report there were forty-four firms and six individuals on the membership roster. They represented an aggregate of 1,000 employees. Under the leadership of former President Sam Kearns, whose term of office closed Dec. 6, 1916, members of forty-three firms and one individual, representing a total of 1,200 employees, were added. As a result of a campaign in July directed by President Harry S. Moody, the present membership comprises 112 members, representing about 47,346 employees.

The Local Council considers the establishment of the co-operation bureau one of its most progressive steps. The need for a measure of accident prevention is attested to by the figures of the police department, which show that there were 954 public accidents in Rochester in 1916 and that forty-eight of them were fatal. More than 50 per cent of the total were automobile accidents, of which twenty-one were fatal.

The bureau opened April 2, 1917, with headquarters at the Chamber of Commerce. Its machinery operates as follows: The matter having been popularized and blank forms for complaints or cards distributed, the complaints began to arrive in gratifying numbers. In most cases only the license number of the offending motorist is given. The definite identity of the offender is then ascertained usually through the co-operation of the Secretary of State and motor license bureaus. Finally, a courteous letter is written to each offender, asking him to be more careful and consider the future. After the third complaint against the same offender the matter is placed in the hands of the police department.

The methods employed in popularizing the bureau consist in themselves a great function for the dissemination of propaganda. A whole week, April 2 to 7, was devoted to the campaign called "Public Safety Week." In skeleton form the week's program

1. Monday, April 2, 1917—People's Safety Show, at 8:15 p. m. at Convention Hall. Motion pictures, music and speakers. Invitations to the walking public and to chauffeurs of private pleasure cars and commercial trucks and teamsters.

2. Wednesday, April 4, 1917—Meeting of automobile owners at headquarters of Automobile Club of Rochester at 8 p. m. Smoker, motion pictures and speaking by John A. Robertson, representing the Automobile Club, and Roland B. Woodward, representing the Local Safety Council of the Chamber of Commerce.

3. Thursday, April 5, 1917—Afternoon and evening meetings at Exposition Park for 1,000 motormen and conductors employed by the New York State Railways, addressed by John A. Robertson.

General advertising was accomplished as follows: Two thousand signs on the outside and inside of street cars for two full weeks; referendum for expression of approval of bureau among memberships of Chamber of Commerce, Automobile Club, and labor unions; electric signs in advantageous locations; newspaper stories and illustrations; advertising cards on both sides of all commercial wagons and auto trucks; motion picture slides and lines for actors in theaters.

The success of the bureau has been made possible by the unstinted co-operation of the public and various agencies of assistance. Notable among the co-operators were: The Department of Safety, especially Commissioner R. A. Hamilton and Chief of Police Joseph M. Quigley; the Automobile Club of Rochester, through Secretary George A. Donahue; the labor organizations, the newspapers and the theaters.

Much is expected of the newly organized foremen's group. This group meets the third Wednesday night of each month in winter months, to investigate and discuss practical phases of the movement that are common to all member plants. "Eye Injuries and Eye Protection" was the subject of the first discussion, Nov. 15. More than 300 were present.

The following officers were elected: Chairman, C. H. Thompson, Eastman Kodak Company; Vice Chairman, E. M. Bentley, Buffalo, Rochester & Pittsburgh Railroad; Secretary, C. B. Carson, Taylor Instrument Companies.

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The winter program covered the following subjects:

"Fire Protection in Factories."

"Shop Lighting."

"Methods of Inspection and How to Maintain Interest in Safety."

"Dangerous Practices and Their Elimination."

"Shop Sanitation as Related to Tuberculosis and General Health and Safety."

"Pure Drinking Water."

"Instruction of Employees on Health."

The safety campaign in the public schools gives promise of the most valuable and constructive work ever undertaken by the Local Council. With an eye for the safety of future generations and through the co-operation of the Board of Education, Safety Week was popularized among 40,000 public school children. Encouraged by a spirit of self-help, the children organized themselves into a Grammar School Safety Council, adopted by-laws and held regular meetings. A total of 1,400 essays on "Accident Prevention" were written in competition for "merit award" pins. Upon the recommendation of the Junior Council one of its members was presented with a gold medal for an act of conspicuous bravery.

The vigorous activity among the school children wound up with two grammar school safety shows, which were attended by pupils of the upper grades and their parents. Motion picture parade of all the members of the Grammar School Safety Council taken through the courtesy of the Eastman Kodak Company was a feature of the program.

During the year these other activities were conducted to a large degree: Safety Week, Oct. 2 to 9; Rochester celebration of Fire Prevention Day, Oct. 9; work of Industrial Safety Committee and Statistical Committee; publicity, and round table discussions.

C. W. Price, Field Secretary of the National Safety Council, conducted Safety Week. He addressed hundreds of factory employees, foremen and superintendents at noonday meetings in the plants of Local Council members. It was gratifying to hear Price refer frequently to Rochester as a leading community in safety work.

Fire Protection Association, a story of it was printed in booklet form and more than 3,000 copies distributed to the members of this association throughout the United States and Canada. The day was observed in the churches, Oct. 8, in the public and parochial schools the next morning, and through a big fire and accident prevention show at Convention Hall in the evening. The attendance at the latter was over 3,000.

As a result of the activities of a special committee the foundation has been laid for valuable co-operation between the Chamber's Safety Council and the Central Trades and Labor Council of Rochester and vicinity.

The Industrial Safety Committee is composed of engineers qualified by training and experience to render the service of helping new members to inaugurate safety campaigns in their plants.

The Statistical Committee secured from Local Council members a summary of all accidents in their respective plants. These summaries showed a material reduction of industrial accidents.

As for publicity, the columns of news and editorial space given the Local Council at home and elsewhere could not have been bought. If popular favor is a suitable criterion the Local Council, unlike the prophet in the Bible, has honor in its home town, as well as throughout the country. More than 3,000 people attended the Local Council's public shows, saw the movies and heard the speakers.

The enthusiasm of the workers in the Local Council of Rochester continues, seemingly without bound, and the tentative program for the winter activity, which is already under way, gives promise of maintaining the present rate of accomplishment.

F. W. FISHER, Secretary.

PHILADELPHIA LOCAL COUNCIL.

M. M. SHEEDY, Pennsylvania Manufacturers Association Casualty Insurance Company, President.

J. P. MUDD, The Midvale Steel Company, Secretary-Treasurer.

PHILADELPHIA, PA., July 9, 1917.—Mr. William H. Cameron, General Manager, National Safety Council, Chicago: Dear Sir—I beg to make the following condensed report of the proceedings of the Philadelphia Safety Council for the year ending June 30, 1917:

Officers—Messrs. M. M. Sheedy, President; M. W. Rudderow, Vice President; J. P. Mudd, Secretary-Treasurer; F. D. Patterson,

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Chairman, Publicity Committee; J. F. Connor, Chairman, Committee, and Coleman Sellers, Jr., Chairman, Members mittee.

Meetings were held on Oct. 2, Oct. 9, Nov. 9, April 10 8. On Oct. 9 a very successful program was carried out, being set as Fire and Accident Prevention Day. Two of t ings were dinner meetings, the program of speakers and d being preceded by an informal dinner. The Local Cot found such arrangements very satisfactory.

The meeting of April 10 was held in the large auditc the Central Y. M. C. A., with President Sheedy in the cha meeting was preceded by an informal dinner. The subje discussion was "General Problems Relating to Accident Pre Especially the Stimulation of Interest in the Alien Workman Vincent Colleli, who is in charge of instruction to the foreig men on the Pennsylvania system, led the discussion with a talk on teaching the alien, outlining the methods obtaining Pennsylvania Railroad. His talk was followed by Messrs. (Sellers, Henry Morgan, Mrs. Joseph R. Wilson of the Hc School League, Mr. C. L. McAllister of the U. G. I., Mr. M the Chamber of Commerce, Mr. T. H. Carrow of the Penns Railroad, Mr. R. H. Bower of the American Pulley Wor Breen of David Lupton Sons & Co., Mr. R. B. Harlam of the and Mr. Andrew H. Kunsig of C. J. Matthews & Co. Sever of motion pictures were shown. Forty-nine persons were pre

On May 8, an effective meeting closed the yearly progr was held in the Y. M. C. A. auditorium and Mr. C. W. Price Secretary of the National Safety Council, gave a talk upon " and Efficiency." As usual, women were invited. A number larger firms in the city were represented by their complete zation of Safety Committees. An active discussion follo which the following participated: Mr. Coleman Sellers, William Sellers & Co., Mr. Oswald of Fels & Co., Mr. Cliff Wagner & Taylor and Mr. Moser of The Midvale Steel Cor

All of the members of the National Safety Council in delphia are affiliated with the Philadelphia Local Council. the National Safety Council does its work by printed matte tures, investigations and reports, the Local Council tries to different need by frequent meetings and discussions by its me: The value of discussion in the stimulation of interest among committee...

among those who are actively engaged in making the plant safe is bound to prove beneficial to all concerned.

The members of the Local Council show their appreciation of the Philadelphia branch by contributing financially to its support. The dues are \$2.00 per annum and in addition to the amounts paid into the National Safety Council. The membership is as follows: Members, June 30, 1916, 195; June 30, 1917, 231; net gain, thirty-six. Respectfully submitted.

JOHN P. MUDD, Secretary-Treasurer.

HARRISBURG LOCAL COUNCIL.

CARL W. DAVIS, Secretary.

HARRISBURG, PA., July 11, 1917.—Mr. William H. Cameron, General Manager, National Safety Council: Dear Sir—A reorganization meeting of the Harrisburg Local Council was held at the Engineers' Society of Pennsylvania on Thursday, June 18. The meeting was attended by twenty members. The following officers were elected: President, Robert H. Irons, Central Iron and Steel Company; Vice President, Walter E. Chick, Bethlehem Steel Company; Secretary, Carl W. Davis, J. Horace McFarland Company, and Treasurer, Edward Smith, Harrisburg Pipe and Pipe Bending Works.

Mr. Lew R. Palmer, President of the National Safety Council, gave a short outline of the work of the Local Council. Since this meeting the efforts of the committee have been devoted to building up the local membership. Yours truly,

CARL W. DAVIS, Secretary.

OMAHA LOCAL COUNCIL.

J. M. GUILD, Union Pacific Railroad Company, President.

H. A. JOHNSON, Omaha Gas Company, Secretary-Treasurer and Chairman Membership Committee.

OMAHA, NEB., July 9, 1917.—Mr. W. H. Cameron, General Manager, National Safety Council: Dear Sir—I submit herewith the annual report of the Omaha Local Council No. 27 for the year ending June 30, 1917. Our Local Council was organized on Nov. 24, 1916, at which time the following officers were elected: Presi-

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dent, Mr. J. M. Guild, Union Pacific Railroad Company; Vice president, Mr. W. R. Rasmussen, American Smelting and Refining Company, and Secretary and Treasurer, Mr. H. A. Johnson, Gas Company.

At this time there were only six members of the National Council in Omaha. At the present time I am glad to report membership has increased to forty-one, and I believe prospects very good for a larger increase during the coming year.

The activities of our Local Council have been devoted to holding of regular meetings for foremen and superintendents. We expect to hold a public mass meeting during October.

Regular meetings were held as follows: Dec. 15, 1916—Subject: "How to Organize a Plant for Safety." The principal speaker: Mr. Frank M. Coffey, formerly Chief Deputy Labor Commissioner of Nebraska. Jan. 19, 1917—Subject: "How to Educate the Workman Along the Lines of Accident Prevention." Talks were given by Mr. Ballard Dunn, Western Railway Association, and Dr. W. Taylor. Feb. 23, 1917—Subject: "The Benefits Which Accidents Bring Through Accident Prevention Work." March 23, 1917—Meeting devoted to general discussion of accident prevention pictures. May 25, 1917—Meeting devoted to general discussion of "Accident Prevention." Yours very truly,

H. A. JOHNSON, Secretary

EVERETT LOCAL COUNCIL.

E. A. POYNEER, Ferry-Baker Lumber Company, Secretary.

EVERETT, WASH., June 27, 1917.—Mr. W. H. Cameron, General Manager, National Safety Council: Dear Sir—At the request of Mr. Clarence Parker, a meeting was held at the Everett Commercial Club, Saturday, Jan. 27, 1917, which was attended by Messrs. W. J. Pilz of the Everett Pulp and Paper Company, P. Fland of the Everett Gas Company, K. K. Carrick of the Puget Sound International Railway and Power Company, and Dr. W. F. Watson, at which time it was voted to organize a local branch of the National Safety Council. The following men were elected temporary office President, E. M. Rogers of Weyerhaeuser Timber Company; Vice President, W. J. Pilz, and Secretary-Treasurer, K. K. Carrick. Mr. Carrick was instructed to apply to the National Safety Council for a charter.

The next meeting was held on June 11, 1917.

Carrick reported that the application to the National Safety Council for a charter had been favorably acted upon and the number assigned to the Everett Council was 32. It was voted to make the temporary officers the officers of the Council for the ensuing year. By-laws were read and adopted and Membership, Program and Publicity Committees named.

At this meeting Mr. Clarence Parker told of the splendid work done by Mr. T. N. Henry of the Tacoma Railway and Power Company of Tacoma in the schools of that city, reducing the accidents to children in the streets more than 50 per cent. It was voted to request the Tacoma Railway and Power Company to loan Mr. Henry to the Local Council in Everett to carry on the good work in this community. The Puget Sound International Railway and Power Company of Everett agreed to bear his expenses for a series of lectures here. These lectures will be continued during the coming school term and we hope to accomplish as much here as has been done in Tacoma.

The third meeting of the Everett Safety Council was held on Monday, June 4, at which time 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 the 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 Executive Committee selected Mr. Clarence Parker to act as safety engineer and established offices at 502-505 Commerce Building, Everett, from where all the work of accident prevention is directed among the lumber manufacturers of Everett.

At this meeting the resignation of Mr. Carrick as Secretary-Treasurer was reluctantly accepted and Mr. E. A. Poyneer of the Ferry-Baker Lumber Company was unanimously elected to fill the vacancy. Mr. Carrick's resignation was caused by ill health and press of business affairs.

The Everett Council is a very young organization, but we confidently hope to make it one of the liveliest Local Councils in the country. The results already obtained by Mr. Parker are highly appreciated and warrant his retention for an indefinite period. The manufacturers of this community are just waking up to the im-

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portance of the work we are doing and we hope in the near future to add considerably to our membership. Yours for Safety,
E. A. POYNEER, Secretary-Treasurer

ERIE LOCAL COUNCIL.

O. G. HITCHCOCK, Hays Manufacturing Company, President.
M. C. GOODSPEED, General Electric Company, Secretary-Treasurer.

ERIE, PA., June 27, 1917.—Mr. William H. Cameron, Manager, National Safety Council: Dear Sir—During the past few months meetings have been held each month, beginning the first in September and closing the first Tuesday in June. The attendance at these meetings has been very good and in some instances there have been as high as 150 persons present. Part of the meetings have been informal discussions of local conditions. Others have been held at the plants of various members, taking the members on tours through the plant, followed by a discussion of objects of interest noted during the trip.

Two public meetings were arranged during the winter, December, when Mr. H. A. Bullock, Safety Superintendent of the Brooklyn Rapid Transit Company, Brooklyn, N. Y., was the principal speaker for the evening. In April a meeting was held when Mr. J. B. Ayers, Safety Superintendent of the McKeesport Pipe Tube Company, as the speaker of the evening. Both the meetings were very well attended and the committee feels that additional meetings will be advisable next fall and winter.

The membership at the present time consists of eighteen companies and individuals. Yours very truly,

M. C. GOODSPEED, Secretary

DETROIT LOCAL COUNCIL.

R. R. RAY, Dodge Brothers, President.
FRED H. HADRICH, Solvay Process Company, Secretary-Treasurer

DETROIT, MICH., July 10, 1917.—Mr. William H. Cameron, General Manager, National Safety Council: Dear Sir—Following is the report of Detroit Safety Council, Local No. 8, Nov. 1, 1916, to Nov. 1, 1917.

Monthly Meetings: Dec. 12, 1916, Detroit Local Council met in conjunction with the Industrial Welfare Managers' Association at the Board of Commerce. Mr. Boyd Fisher, Vice President of the Executives' Club, presided; 144 men and women were present. Following the dinner, Mr. J. M. Eaton, President of the Detroit Safety Council, spoke briefly on the affairs of the Council. The annual election was held, in view of the fact that the Annual Congress of the National Safety Council was in session in Detroit.

The Chairman of the Nominating Committee, Mr. P. W. A. Fitzsimmons, presented the following report: President, R. R. Ray; Vice Presidents, J. M. Eaton, C. H. Gifford, F. S. Bigler, L. B. Robertson, John D. Green; Chairman, Program and Publicity Committee, W. Ernest Williams; Chairman, Membership Committee, L. R. Judson, and Secretary-Treasurer, Fred H. Hadrich.

On motion of Mr. Hadrich, the report was amended to add the names of P. W. A. Fitzsimmons of the Michigan Workmen's Compensation Mutual Insurance Company and Perry J. Ward, Secretary of the Michigan Federation of Labor, as Vice Presidents. The amendment was adopted and the election of all was duly declared.

Following the formal business, the principal speaker, Mr. W. A. Grievies of the Jeffrey Manufacturing Company, Columbus, Ohio, was introduced. He spoke at length on "The Relationship of Welfare Work to the Promotion of Safety," and talked particularly of the co-operative stores conducted for the benefit of the employees of his company. That the interests of safety are materially promoted through such co-operative efforts could not be denied. Following Mr. Grievies there was a general discussion.

The Hon. James W. Helme, Dairy and Food Commissioner of the State of Michigan, was introduced by Mr. Hadrich. Mr. Helme talked of the benefits to be derived from co-operative buying in general and told of the various co-operative arrangements then in practice among dairymen, fruit-growers, bean-growers and canneries. A brief discussion followed.

Jan. 17, 1917, a dinner meeting was held at the Board of Commerce. Through the enterprise of the newly elected Chairman of the Program Committee, Mr. W. Ernest Williams, music was furnished by the Packard Quartette. The President, Mr. R. R. Ray, set forth at some length the general purposes of the Safety Council and special attention was called to the lists of subjects for discussion at subsequent meetings to be filled out and turned in for the guidance of the program committee.

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The principal speaker was Mr. Charles B. Scott, Manager of Safety, Chicago. His subject was: "Whys and Hows of Accident Prevention." He made a deep impression upon the audience. His text was: "The Safety and Wellbeing of the Worker : Producer, Rather than Record Production of the Gross Material Commercial Activity."

Mr. W. P. Lovett of the Detroit Citizens' League gave explanations of the many ways in which the league and the Safety Council could be of mutual benefit to the public. The Hon. Ora E. DeWitt, Deputy Commissioner, Michigan Industrial Accident Board, spoke briefly.

Feb. 26, 1917, a dinner meeting was held at the Board of Commerce; about 140 were present. General subject, "Eye Protection and Eye Injuries." Principal speaker, Harry Guilbert, safety inspector, Haskell & Barker, Michigan City, Ind. Mr. Guilbert brought with him stereopticon slides and also had slides furnished by Julius King Optical Company and five large pictures, illustrated in colors, issued by the National Committee for the Prevention of Blindness on the prevention of eye injuries. Following this Dr. H. L. Begle discussed "Eye Injuries" and led the round-table talks.

The great importance of having goggles properly fitted was emphasized and it was stated among other things that the use of the glass in goggles had seldom or never caused any inconvenience. A very cosmopolitan gathering was present: Safety engineers, factory inspectors, superintendents, shopmen, foremen, eye specialists, opticians, etc.

The safety advantages of encouraging rifle practice as a means of promoting accuracy and precision in every-day work were set forth by Dr. S. A. Sanderson, President, Michigan State Rifle Association. Red Cross work was given encouragement by the distribution of leaflet folders.

March 27, 1917, a dinner meeting was held at the Board of Commerce; about 112 were present. The Employment Managers of the Executives' Club met with the Safety Council. The Chapter of the American Red Cross, represented by J. B. Gorman, Ward N. Choate, Byers H. Gitchell and Dr. Charles H. Gifford, set forth the Red Cross exigencies and made a deep impression upon the gathering.

The matter of organizing sanitary training detachments has previously been informally considered by the officers of the

Council and the subject was fully outlined at this meeting by the Red Cross officials.

A declaration to the President of the United States of unconditional loyalty, prepared by the Citizens' Committee of National Defense of the Detroit Board of Commerce, was signed by those present.

The general subject of the evening, "Welfare Work as Related to Accident Prevention," was set forth by Dr. Otto P. Geier, Director Employees' Service Department, The Cincinnati Milling Machine Company. Dr. Geier's talk was most instructive.

May 24, 1917, a dinner meeting was held at the Board of Commerce; 125 were present.

Subject, "Safety in the Use and Care of Grinding Wheels," by Mr. E. B. Morgan of The Norton Company, illustrated with stereopticon pictures, showing grinding wheels and grinding processes in all stages. Other safety pictures, including experiments with drying ovens of various kinds, were shown. The general round table discussion was one of the best and most interesting discussions during the season, and the general opinion was that this May meeting was the liveliest ever held by the Local Council.

In July an invitation was issued to all members of the Council to attend an "Illustrated Talk on Safety First" by Mr. C. B. Auel, in charge of Safety work for the Westinghouse interests, under the auspices of the Detroit Edison Power Club, Board of Commerce.

Meetings were held outside of Detroit at Midland, Mich., May, 1917, and Pontiac, Jan. 24, 1917.

There has been a steady growth of members in the Detroit Safety Council and every effort possible has been made to increase the members of the National Safety Council throughout surrounding territory in the State of Michigan.

By arrangement with the Secretary of the Detroit Board of Commerce a safety exhibit has been maintained in the lobby of the board during 1917 as a part of the industrial exhibit.

The sale and circulation of "*Surc Pop and The Safety Scouts*" has been encouraged whenever and wherever possible.

The Detroit Local Council was early alive to the great importance of encouraging the splendid work of the American Red Cross and prior to the general meeting of Feb. 23 volunteered (both by letters and by personal visits to the office of the Detroit Chapter) to do everything possible to assist the Red Cross in obtaining a larger membership in Detroit.

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In March a letter was received from the Detroit Chapter of the Red Cross requesting the officers of the Safety Council with the Red Cross officers relative to organizing Red Cross Training Detachments in Detroit.

March 20 a conference was held at the Board of Commerce with the Director, Bureau of Medical Service, set forth at length the purposes and advantages of sanitary training detachments.

Respectfully submitted.

FRED H. HADRICH, Secretary-Treasurer

NIAGARA FRONTIER LOCAL COUNCIL.

C. W. CONGER, The Carborundum Company, President
P. S. CASE, Union Carbide Company, Secretary and Treasurer

NIAGARA FALLS, N. Y., Aug. 17, 1917.—Mr. W. H. Cagney, General Manager, National Safety Council: Dear Sir—As this is our organization year and we are now but ten months old our record of achievement is perhaps less extensive than that of our more mature brother councils. However, our organization now has thirty industrial members and with our financial problem on the way to solution we will be in good condition for a still more active campaign at the end of the summer recess.

It has been our ideal to be if possible entirely self-supporting and to this end we assessed each member 5 cents per employee to cover the year's expenditures. Our Council was organized on November 1, 1916, with the active assistance of Mr. C. W. Conger, Field Secretary of the National Safety Council. Our first important meeting was held in the auditorium of the Shredded Veneer Company, which through their courtesy, has been at our disposal since our organization. Dr. Guillemont addressed the meeting on the subject of "First Aid." Mr. C. W. Price also gave us a splendid organization talk.

It has been our policy from the outset to invite the superintendents and foremen from the various members' plants and among their friends who cared to attend to all meetings. This resulted in a splendid turnout on all occasions.

A meeting was held in March, the subject being "Safety Organization in the Eastman Kodak Company." Mr. Thompson of the Kodak Company very kindly consented to make the address. "T"

greatly enhanced the interest in his talk. In the afternoon Mr. Thompson addressed a teacher's meeting at the Niagara Falls High School on "What Rochester Schools Are Doing for Safety."

The subject of our most recent meeting was "How to Maintain Interest in Safety Work." The evening was devoted to open discussion, the chair calling on the foremen from the members' plants to describe the methods employed in their individual organizations.

Arrangements are now in progress for a luncheon meeting of managers to be held in the near future. Several meetings of the Executive Committee have been held. At one of these we had the honor to have Mr. H. W. Forster present. Among other interesting information he gave us some valuable hints on financing our organization, suggesting the pro rata assessment we have since adopted.

The Council's officers are: C. W. Conger, The Carborundum Company, President; J. G. Marshall, Union Carbide Company, Vice President; C. H. Greenwood, The Carborundum Company, Vice President; C. H. Moritz, Aluminum Company of America, Vice President; P. S. Case, Union Carbide Company, Secretary and Treasurer; R. M. Onan, Carborundum Company, Chairman, Membership Committee; S. T. Kelly, Union Carbide Company, Chairman, Program Committee; H. C. Slade, Hooker Electro-Chemical Company, Chairman, Publicity Committee; A. K. Knapp, City Schools, Chairman, School Committee, and J. K. Curry, Chief of Police, Chairman, Public Safety Committee.

The Local Council now numbers upwards of thirty plants and we anticipate an active season for 1917 and 1918.

P. S. CASE, Secretary and Treasurer.

TEXAS SAFETY COUNCIL.

HOUSTON, TEX., July 11, 1917.—Mr. W. H. Cameron, General Manager, National Safety Council: Dear Sir—A meeting of members of the National Safety Council in the State of Texas was called by Mr. A. A. Krause, member of the Executive Committee of the Railroad Section, on Jan. 21, 1917, at Houston, at which time the following members and visitors were present: A. A. Krause, Committee of Safety, Missouri, Kansas & Texas Lines, St. Louis, Mo.; Isaiah Hale, Committee of Safety, Atchison, Topeka & Santa Fe Railway, Topeka, Kan.; R. P. Kyle, Safety Supervisor, El Paso & South Western Lines, El Paso; R. M. Glover, Supervisor of

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Wages, Southern Pacific Lines, Houston; J. S. O'Flynn, Claim Agent, International & Great Northern Railway, Houston; S. E. Burkhead, Assistant General Manager, International Northern Railway, Houston; L. J. Hennessey, Chamber of Commerce, Houston; A. L. Garrett, Deputy, Bureau of Labor Statistics, Austin; F. L. Clements, Gulf Companies, Houston; V. R. The Texas Company, Houston; W. J. Hickman, Producers Oil Company, Houston; J. E. Liggett, Producers Oil Company, Houston; James C. Kennedy, Brenham Compress Oil and Manufacturing Company, Brenham; C. A. Tatum, Texas Employers' Insurance Association, Dallas, and R. A. Kennedy, Texas Employers' Insurance Association, Houston.

At this meeting it was decided that a State Safety Council be formed under the auspices of the National Safety Council. An Organization Committee was appointed as follows: V. R. L. J. Hennessey, F. R. Bissell, S. E. Burkhead, James C. Kennedy, H. W. Withers, C. A. Tatum, F. L. Clements, James H. Moore.

The above committee was authorized to make such preparations as necessary, looking to the holding of a state safety rally in Houston during the month of May.

The total membership in Texas at the time the above rally was held consisted of thirty-five members. Since then thirty new members have been secured and an active campaign for new memberships is just being outlined, which should bring the total membership to at least 100 within the next few months.

The Organization Committee supervised the formation of Local Councils in Houston and Dallas, officially known as Nos. 30 and 31 respectively. Prospects are very good for the organization of additional locals at other points within the State and our Local Organization Committees are working actively to this end.

The First Annual Safety Congress was held at Houston on November 14 and 15, 1917, with an attendance of upward of ninety representatives. Two morning and two afternoon sessions, one business session, banquet and moving picture exhibition were held, the complete program being attached hereto.

At the business session, the following officers were elected for one year: President, V. R. Currie, the Texas Company, Houston; Vice President, James C. Kennedy, Brenham Compress Manufacturing Company, Brenham; Vice President, F. R. Bissell, Texas Portland Cement Company, Dallas; Secretary-Treasurer, C. V. Jarrell, Southwestern Telegraph and Telephone Company, Houston.

Houston; Chairman Membership Committee, C. A. Tatum, Texas Employers' Insurance Association, Dallas; Chairman Program and Publicity Committee, C. G. Elliott, Missouri, Kansas & Texas Lines, Dallas; Chairman Local Council Organization Committee, F. L. Clements, Gulf Companies, Houston; Chairman Finance Committee, A. L. Harris, Kirby Lumber Company, Beaumont.

The President was authorized to appoint a Committee on Trespassing and one on Text Books, these committees to consider the matter of co-operating with the railroads in reducing the trespassing evil and make an effort to have a chapter on safety included in the state text books.

It is proposed to hold a Semi-Annual Congress of the Texas Safety Council during the month of October and the Texas State Fair Association has agreed to designate one day, possibly Oct. 15, 1917, as Safety First Day.

C. V. JARRELL, Secretary.

V. R. CURRIE, President.

DALLAS LOCAL COUNCIL.

J. H. MOSELEY, Texas Power and Light Company, President.

A. F. ALLEN, Texas Employers' Insurance Association, Secretary-Treasurer.

DALLAS, TEX., July 26, 1917.—Mr. William H. Cameron, General Manager, National Safety Council: Dear Sir—Dallas Local Safety Council was formally organized on March 26, 1917, at a meeting held in the auditorium of the Chamber of Commerce and Manufacturers' Association building. At this meeting the following officers were elected for the ensuing year: Messrs. J. H. Moseley of the Texas Power and Light Company, President; R. C. McElree, of the Santa Fe Railway Company, Vice President; F. R. Bissel of the Texas Portland Cement Company, Chairman of the Membership Committee; A. B. Elias of the Southwestern Telegraph and Telephone Company, Chairman of the Program and Publicity Committee, and A. F. Allen of the Texas Employers' Insurance Association, Secretary and Treasurer.

The first monthly meeting of the Dallas Local Council was held in the auditorium of the Chamber of Commerce and Manufacturers' Association building on April 30, 1917.

The next regular meeting of the Dallas Local Council was held

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on the evening of June 15. The principal business before the meeting was to appoint a committee to arrange with the City Park Commission to have a special moving picture on "Safety Work" shown at various city parks the latter part of July.

Since the organization of the Dallas Local Council the following new members have been added from this territory: Magnolia Petroleum Company, Trinity Portland Cement Company and Southern Telegraph and Telephone Company.

A. F. ALLEN, Secretary-Treasurer

HOUSTON LOCAL COUNCIL.

H. W. WITHERS, Houston Electric Company, President
R. A. KENNEDY, Texas Employers' Insurance Association, Secretary and Treasurer.

HOUSTON, TEX., July 3, 1917.—Mr. W. H. Cameron, General Manager, National Safety Council: Dear Sir—The Houston Local Council was formally organized on March 15, 1917, at a meeting held in the committee room of the Texas Company Building. At this organization meeting Mr. H. W. Withers, general claim agent of the Houston Electric Company, was elected President of the Local Council; Mr. R. M. Glover of the Southern Pacific Company, Vice President, and Mr. R. A. Kennedy, district manager of the Texas Employers' Insurance Association, Secretary and Treasurer. At this same meeting Mr. H. W. Withers, the newly elected President, appointed Mr. A. L. Harris of the Kirby Lumber Company as Chairman of the Program and Publicity Committee and James C. Kennedy of the Brenham Compress, Oil and Manufacturing Company as Chairman of the Membership Committee. At the same organization meeting proper by-laws were adopted.

The first monthly meeting of the Houston Safety Council was held on April 16, 1917. At this meeting Mr. C. V. Jarrell of the Southwestern Telegraph and Telephone Company was appointed as Chairman of the Membership Committee in place of Mr. R. A. Kennedy, who found it impossible to serve in this capacity. Likewise, Mr. V. R. Currie of the Texas Company was appointed Chairman of the Program and Publicity Committee to take the place of Mr. A. L. Harris, who could not serve, in view of the fact that the headquarters were elsewhere than in Houston.

The next regular meeting of the Local Council was held on the evening of May 9. The principal business before this meeting was to make formal arrangements for the first annual gathering of the Texas Safety Council.

The following new members of the National Safety Council have been added from this territory: Galveston Gas Company, Galveston; Corpus Christi Railway and Light Company, Corpus Christi; Houston Lighting and Power Company, Houston; Peden Iron and Steel Company, Houston and San Antonio; Port Arthur Traction Company, Port Arthur, and Horton & Horton, Texas Gas and Electric Company, Southwestern Telegraph and Telephone Company, Farmers and Merchants Lumber Company, South Texas Cotton Mills, H. T. Hohlf Company, Waugemann-Reichardt Company, Theo. Schirmacher, Brenham Banner Press Publishing Company, Rice Hotel, Houston Gas and Fuel Company, Texas Bag and Fibre Company, all of Houston, and San Antonio Gas and Electric Company of San Antonio.

Since organization of the Local Council, the following out-of-state members of the National Council have appointed local representatives to affiliate with the Houston organization: Petroleum Iron Works Company, Sharon, Pa.; Otis Elevator Company, New York; Ford Motor Company, Detroit, and Freeport Sulphur Company, New York.

Most of the activities of the Local Council have been confined to the securing of new members and the above list will show our success.

R. A. KENNEDY, Secretary-Treasurer.

WESTERN PENNSYLVANIA SAFETY COUNCIL.

H. H. ROBERTSON, President Asbestos Protected Metal Company,
President.

N. B. DAVIS, Northwestern Mutual Life Insurance Company,
Secretary-Treasurer.

PITTSBURGH, PA., Aug. 30, 1917.—Mr. W. H. Cameron, General Manager, National Safety Council: Dear Sir—Following the general plan of the Executive Board of the National Safety Council, and anticipating greater local activity, Mr. C. W. Price, the very able Field Secretary, came to Pittsburgh and assisted us in reorgan-

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izing the Local Council along lines producing greater efficient effort for safety. For facility of handling, the Western Pennsylvania territory was divided into seventeen districts.

On March 13 a meeting was held at which were present representatives from the entire territory. The following officers elected:

President, H. H. Robertson, President, Asbestos Protected Company.

Vice-Presidents, C. B. Auel, Director Standards, Processes Materials, Westinghouse Electric and Manufacturing Company Pittsburgh, Pa.; Prof. G. W. Case, University of Pittsburgh; Schultz, Chief Safety Inspector, American Steel and Wire Company; W. S. Tallman, Superintendent, Central Tube Company, bridge, Pa.; W. C. Titus, Safety Engineer, Jones & Laughlin Company.

Secretary-Treasurer, Nelson B. Davis, Northwestern M Life Insurance Company.

The territory was divided into fourteen districts, and a Chairman and Secretary of each district was elected:

District No. 1, Monongahela City—E. E. Bach, Sociological Director, Ellsworth Collieries Company, Ellsworth, Chairman; J. McGregor, Safety Inspector, American Steel and Wire Company, Donora, Secretary.

District No. 2, McKeesport—H. M. Bailey, Safety Engineer, Carnegie Steel Company, Duquesne, Chairman; H. M. Dunn, Sales Department, National Tube Company, Secretary.

District No. 3, Greensburg—T. B. Dilts, Chairman.

District No. 4, Braddock—C. B. Auel, Director of Standards, Westinghouse Electric and Manufacturing Company, East Pittsburgh, Chairman; John A. Oartel, Edgar Thompson Works, Carnegie Steel Company, Secretary.

District No. 5, Homestead—J. W. Benner, Homestead Steel Company, Chairman; E. F. Harris, Safety Director, Mesta Machine Company, Secretary.

Districts Nos. 6 and 7, Second Avenue and South Side—R. Dickson, Carnegie Steel Company, Chairman; A. N. Dunsmon, Safety Inspector, A. M. Byers Company, Secretary.

Districts Nos. 8 and 9, North Side and Etna—David Pryde, Superintendent, Carnegie Steel Company, Lower Union Mills, Chairman; F. La Barrer, Safety Director, Carbon Steel Company, Secretary.

District No. 10, North Side—C. V. McCurdy, Auditor, Locomotive Stokers Company, Chairman; C. E. Wise, Crucible Steel Company of America, Secretary.

District No. 11, McKees Rocks—George F. Laurent, Finishing Foreman, Fort Pitt Malleable Iron Company, Chairman; John Lucas, Safety and Efficiency Engineer, Duquesne Foundry Company, Coraopolis, Pa., Secretary.

District No. 12, Ambridge—W. S. Tallman, Superintendent, Central Tube Company, Chairman; J. J. Griffith, National Metal Molding Company, Secretary.

District No. 13, Beaver Valley—J. W. Sloan, M. M. Armstrong Cork Company, Chairman; Chas. Taylor, Factory Inspector, Department of Labor and Industry, Rochester, Secretary.

District No. 14, New Kensington—Lee L. Chandler, Safety Engineer, Pittsburgh Plate Glass Company, Chairman; L. M. Keefe, Safety Inspector, West Penn Steel Company, Brackenridge, Secretary.

District No. 16, Washington—A. B. Dunn, Secretary, Y. M. C. A., Chairman; Warren R. Jackson, Secretary Board of Trade, Secretary.

District No. 17, Carnegie—Mr. Smith, Superintendent, finishing mills, Superior Steel Company, Chairman; J. J. Komora, Chief Engineer, Columbia Steel Shafting Company, Secretary.

The following chairmen of committees were also appointed:

Program—Lauson Stone, Superintendent, United States Bureau of Mines.

Schools and Colleges—C. B. Connelley, Dean, Carnegie Institute of Technology.

Standards and Plant Organization—J. B. Ayres, Superintendent of Safety, National Tube Company.

Boy Scout Activities—George W. Ehler, Scout Executive, Boy Scouts of America.

Mr. Lew R. Palmer, President, National Safety Council, presided as temporary Chairman at the meeting.

SUPERINTENDENTS' AND FOREMEN'S SAFETY MEETINGS.

Beginning immediately after the meeting, the Council secured the services of Dr. William O'Neil Sherman, Chief Surgeon of the Carnegie Steel Company, for a series of superintendents' and foremen's safety meetings in each of the districts.

Dr. Sherman gave a most interesting lecture on the "Carrel Treat-

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ment of Wounds" and the Ambrine treatment of burns, s means of colored slides the actual wound and burn in m of treatment. Prevailing conditions in the war zone i vividly presented in the moving pictures and slides shown

The lecture was given to a capacity audience and the to ance at these meetings was over 10,000 foremen and superi having under their supervision more than 100,000 workmen

The total expense of these meetings was approxima divided prorata among the districts.

WORKMEN'S OPEN AIR MEETINGS.

During July and August thirty-one open air meetings i with a total attendance of 57,900. Eight more meetings ar The cost of the meetings was \$1,155, exclusive of street c tising, etc., which was donated.

AFFILIATION WITH PITTSBURGH CHAMBER OF COMMERCE

The Council is affiliated with the Chamber of Com Pittsburgh and has the aid of its name and influence. The resolution shows the interest in safety work of the Ch Commerce:

"Resolved, That the Chamber of Commerce of Pittsbi sympathy with and desires to lend the aid of its name and to the Western Pennsylvania Safety Council of the Nation Council in connection with the proposed campaign to be ca in this district, having as its object the bringing to the att employers, foremen and workmen the necessity of safety in the conduct of our businesses."

NEWSPAPER CAMPAIGN.

Two of our leading newspapers have conducted a cam safety, printing twenty full pages devoted to carrying safe office and home. About 100 representative firms subscri \$10,000 to this campaign.

AFFILIATION WITH BOY SCOUTS.

Mr. George W. Ehler, scout executive of the Boy S America, was appointed chairman of the Boy Scout Commi is, therefore, a member of our Executive Committee. M being vice director of the Allegheny County Division of t

Labor, suggested our affiliation with the Commission, and the President appointed Mr. E. E. Bach, Chairman of District No. 1, as our representative on the commission.

GOVERNMENT SAFETY WORK.

Our activities have been extended to the United States government in the person of Mr. H. A. Schultz, Vice President of the Council, who is devoting a large portion of his time organizing the safety departments of several large navy yards.

SAFETY IN THE PUBLIC SCHOOLS.

Through the Chairman of our School Committee, the safety idea has been presented to the school children of Pittsburgh.

In a few more weeks we will have reached 90,000 men with the Safety First idea in many of its most important phases. This has cost \$2,055, exclusive of service and material donated.

The Western Pennsylvania Safety Council desires to make acknowledgment of the valuable help rendered by the officers of the National Safety Council by attendance at our meetings, by frequent visits to the Pittsburgh district and by prompt and businesslike co-operation, particularly through the personal efforts of Mr. Lew R. Palmer, President, Mr. W. H. Cameron, General Manager, and Mr. C. W. Price, Field Secretary. Respectfully,

NELSON B. DAVIS,
Secretary-Treasurer.

National Safety Cou

Paper and Pulp Sectional Meeting

New York City

Sept. 13-14, 1917

G. E. WILLIAMSON, Acting Chairman
Strathmore Paper Company

G. W. PHILLIPS, Acting Secretary
Champion Fibre Company

THURSDAY MORNING SESSION

THE meeting was called to order at 9:50 o'clock by J. Williamson, Strathmore Paper Company, Mittineau, who presided at the request of the Vice Chairman, Mr. Garrett. Mr. G. W. Phillips, Champion Fibre Company, was Secretary pro tem.

The address of welcome was given by the Chairman of the Program Committee, Mr. F. W. Calvert.

The report of the Chairman, Mr. S. F. Shattuck, who was to be present, was read by Mr. Williamson, duly accepted and on file.

The Secretary's report was then read and accepted. A. G. Pounsford, Port Arthur Pulp and Paper Company, was to be present.

REPORT OF THE SECRETARY.

Mr. Chairman and Members of the National Safety
At the close of the meeting of this Section last year, it was
that inst...

year, that the Section meet in conjunction with the annual meeting of the American Paper and Pulp Association, to be held in New York City, Feb. 6, 7 and 8, 1917.

On the above dates a meeting was called and programs presented by the Program Committee. The following papers were delivered at this meeting, but due to the very small attendance, some of the papers were shortened considerably.

"Paper Mill Lighting," Mr. C. W. Price, Field Secretary, National Safety Council, Chicago.

"The Trained Nurse in Small Plants," Miss Florence S. Wright, Clark Thread Company, Newark, N. J.

"Plant or Company Periodicals," H. A. Bullock, Chairman, Central Safety Committee, Brooklyn Rapid Transit Company, Brooklyn, N. Y.

"Paper Mill Ventilation," E. A. Briner, Carrier Engineering Corporation, New York City.

It is the opinion of the Secretary that, due to the great number of activities in conjunction with the Pulp and Paper Association, that it is not advisable to hold this mid-year meeting, as the attendance was entirely too small for the great amount of work and excellent papers which were delivered.

During the past year the Section has increased its membership by forty-two, which shows very good progress along safety lines in the pulp and paper industry. The Section has a total membership of 162.

Respectfully submitted,

A. G. POUNSFORD, Secretary.

Verbal reports were made by the Chairmen of the several committees as follows: Membership Committee, Mr. Garrett Schenck, Jr.; Bulletin Committee, Mr. G. E. Williamson; Program Committee, Mr. F. W. Calvert; Human Relations Committee, Mr. G. W. Phillips; Safe Practices Committee, A. G. Pounsford.

REPORT OF SAFE PRACTICE COMMITTEE.

Mr. Chairman and Members of the National Safety Council:
It has been rather difficult during the past year to do any extensive work in connection with this subject, owing to the great pressure under which all of the mills have been working. Some preliminary work has been done in an effort to determine causes of accidents and

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the means of preventing same in connection with the v. running rolls on numerous paper mill machinery; also an to eliminate the hazard, and develop a satisfactory type of

The manufacturers of paper mill machinery were written reference to in-running rolls and replies were received from them, but in a great majority of cases they asked for information rather than being able to give it.

Numerous types of doctors have been developed for the stack and also some devices for re-winders. These are all market products, which the most of you are acquainted with; however, your committee did not feel that these solved the problem of eliminating hazards from this cause and the work should be continued by the next committee, when appointed.

The members of the committee lived at such great distances that it was practically impossible to obtain a meeting with the entire committee in attendance.

A meeting of this committee was held in conjunction with the Technical Section of the American Pulp and Paper Association at this meeting the Chairman and one member made up the committee in attendance.

It is the feeling of the Chairman that the best possible way to proceed with this phase of the work would be to appoint one or two members to make a special study of each problem, he to then forward his findings to as many members of the Section as he deems advisable and obtain their comments on same. This would put the work on a basis of definite research, and with one individual working on each item probably more would be accomplished.

It would be advisable for the Chairman to appoint all members of the Safe Practices Committee from one locality so that numerous meetings could be held to discuss the subjects taken.

Respectfully submitted,

A. G. POUNSFORD, Secretary

APPOINTMENT OF NOMINATING COMMITTEE.

A Nominating Committee was appointed by the Chairman consisted of Messrs. Harper, B. D. Rising Paper Company; National Secretary of the American Paper and Pulp Association, and F. Riordon Pulp and Paper Company.

SYNOPSIS OF DISCUSSIONS.

The regular program was then taken up. The addresses were followed by discussions.

A letter from Mr. John Ludrigan, Safety Supervisor, International Paper Company, expressing regrets at inability to be present and give an address on "Safety Work and Results," as scheduled, was read by the Chairman.

A paper entitled "The Reward of Thought for Others," by William Howarth, President, Everett Paper Company, Everett, Wash., was read by the Secretary.

Miss Nesta C. Edwards, Kimberly-Clark Company, gave a most interesting talk on "Service Work, Its Value in Industry." At the close of this talk many questions were asked Miss Edwards concerning different phases of her work.

The Nominating Committee reported and presented the following nominations: For Chairman, Mr. G. E. Williamson, Strathmore Paper Company; Vice Chairman, Mr. Garrett Schenck, Jr., Superintendent, Bureau of Economy, Great Northern Paper Company; Secretary, Mr. A. G. Pounsford, Port Arthur Pulp and Paper Company.

The Secretary then took the chair and the officers recommended by the Nominating Committee were unanimously elected.

Meeting adjourned at 12:10 o'clock.

FRIDAY MORNING SESSION

THE second meeting of the Paper and Pulp Section was called to order at 9:40 a. m. by the Chairman.

The first paper, entitled "Standardizing Statistics," was read by C. A. Gilkerson of the Spanish River Pulp and Paper Company. Mr. Gilkerson's paper presented in a most interesting and concise way a problem of great interest to all who attempt to keep systematic records of safety work, and his use of charts was of much assistance in making clear the details. The paper was discussed by Mr. Beall and Mr. J. R. de la Torre Bueno, General Chemical Company, and others.

The second paper, on the subject, "Company Periodicals," was read by Mr. A. D. Wood, Champion Fibre Company. A discussion

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followed in which Mr. Bonsib, United States Metal Refining Company; Mr. Bueno, General Chemical Company; Mr. Schott, & Wright Rubber Company; Miss Edwards, Mr. Ballou Cofrin took part.

Mr. A. P. Costigane, Secretary and Safety Engineer, Pulp and Pulp Makers' Safety Association, read a paper on "Over of Labor in Relation to Accidents." Owing to lack of discussion of this paper was deferred.

Mr. E. Briner, paper specialist, Carrier Engineering Corporation, New York City, was to have given an address on "Paper Ventilation," but was unavoidably detained and promised to have one of his assistants speak in his place. This gentleman, however, did not arrive in time to be heard.

During the few minutes remaining the round table conference were started, and a short discussion took place on "Locker Washrooms," in which Mr. Calvert, Miss Edwards and Mr. Cofrin took part.

When the time for adjournment arrived it was suggested there had been insufficient time for discussion of papers, whereupon the Chairman suggested a short session in the afternoon. The matter was put to vote with a result that an extra session of the Section was called for 2 o'clock.

FRIDAY AFTERNOON SESSION

CHAIRMAN WILLIAMSON called the meeting to order at 2 o'clock. The first call for discussion was Mr. Cofrin's paper. This paper was discussed at length by Messrs. Calvert, Costigane, Cushing, Wood, Gilchrist, Schott and others.

The conference on "Locker and Washrooms" was then continued, followed by a round table conference on "Company Clubhouses" in which Miss Edwards and the Chairman gave the experience of their respective companies.

The subject of "In-running Rolls" was not discussed, but the Chairman suggested to Mr. Calvert that next year's program include one or more papers on this vital subject.

Before closing the meeting the Chairman urged upon the members present the necessity of action after returning home from a Conference in order that the greatest possible results might be accomplished.

THE REWARD OF THOUGHT FOR OTHERS

WILLIAM HOWARTH, PRESIDENT, EVERETT PAPER COMPANY,
EVERETT, WASH.

Mr. Chairman and Members of the National Safety Council:
It is with regret that the distance from the Pacific to the Atlantic side of this, our country, makes it impossible for the writer on this subject to be with you to deliver the same in person. He realizes that a message from one who for several years has been interested in Safety First, and warm from his heart, means much more when presented in person than when read. He hopes a statement of what has been done in a small paper mill, located in the extreme northwest corner of this country, will be of interest and benefit, and will help to create greater enthusiasm in the work which results in the saving of life, limb and health of our good citizens, thus adding to the nation's welfare by a process of elimination of waste of our best material, a service which this country has now the greatest need: "The patriotic service of every eligible man and woman in our country's hour of need in helping our allies in the war for liberty and democracy."

REVISION OF COMPENSATION PAYMENTS.

During the fall of 1910 a movement was started in the State of Washington to induce the State Legislature to enact a Workmen's Compensation Law—a measure designed to compensate employes when injured without regard to cause, or whether or not the accident was due to contributory negligence or to fault of fellow workmen. Considerable opposition was raised by employers of labor on the grounds that it was unfair to tax industries—particularly in a young state—when competitive industries in the older communities did not have similar laws; further, that it was experimental, and any additional expense meant placing industries in this state at a further competitive disadvantage. How short-sighted they were—an exemplification of the old saying: "We worry most about the things which never happen."

The proof of the pudding is not in the making, but in the eating. After six years' practical experience with the workings of the Workmen's Compensation Act of the State of Washington, comparative payments made by the commission to the workmen of each employer in each subdivision, in juxtaposition with the amount paid into the fund by the same employers, showed in many instances that

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employers who had had the welfare and safety of their work at heart were made to contribute the same rate per unit of work as others who were indifferent to the welfare and safety of their work people. Last fall this injustice was remedied by amendment to the present act, by which the commission is empowered to reward those employers whose records show by their investment in Safety First and by the payments received from them the amounts actually paid to their employees during the past year that an individual plant in any one subdivision shall be as in the future at a reduced rate, so that eventually such employers have only paid into said fund practically the same amount as their own workmen had received.

The administrative cost of this act is paid out of the general taxation, so only the actual money received from employers and paid to workmen is involved, thus making it an easy matter to find and check up each individual account.

PAPER-MAKERS IN ONE CLASS.

Fortunately, the paper-makers of this state, prior to the enactment of the law, agreed to be placed in one class; in that way they were working harmoniously together in matters of mutual interest. This has resulted in mutual benefit and better understanding.

Our company, from Oct. 1, 1911, to date, has paid into the fund as provided by law, the sum of \$14,765.79, as compared with \$661.65 paid to our workmen; the balance, \$9,104.14, being used to meet the increased cost of workmen's accidents and for the benefit of the other paper industries of this class.

Systematic efforts and interest in the Safety First movement have been carried on through

1. *Suggestion Boxes*—Offering three monthly prizes for the three best suggestions from our employees for the welfare, health and safety of our work people. In six years there has been no decrease of interest.

2. *Executive Council of Safety*, composed of our most experienced operative foremen.

3. *Posting on the bulletin board of the printed circulars of the National Safety Council*, thus constantly bringing before our employees the object lessons of actual accidents due to neglect, carelessness and lack of thought on the part of fellow workmen. The Safety appliances recommended by the Council also exerted

There has been a wonderful decrease in the number of accidents, a corresponding decrease in loss of time, and consequently, in the amount of compensation paid to our employes.

COST, \$1.73 PER EMPLOYEE.

The fiscal years ending Sept. 30 show the following facts:

YEAR	DAYS LOST	AMOUNT
1912.....	532 $\frac{1}{4}$	*\$1,866.00
1913.....	617 $\frac{1}{4}$	2,232.95
1914.....	269	353.20
1915.....	187	333.65
1916.....	260	759.50
1917.....	103	116.35
Total.....		\$5,661.65

Taking the record of the past four years would mean a total of \$1,562.70, or an average of \$390.67 per year, with an average number of employes of 225—just \$1.73 per employe per year.

If fortunate enough to keep the cost of the accidents to the average of the past four years (and the same interest should mean even a better result) we ought not, under the amendment of the Workmen's Compensation Act, to be called upon to pay anything more for twenty-three years (\$9,104.14 overpaid divided by \$390.67).

Effective July 1, 1917, is another law by which the cost of medical, surgical, hospital and ambulance service is to be paid equally by employers and employes, and which is merely an extension to finally get the cost of accidents, measured by loss of time, decreased earning compensation, and worth of man at time of death by accident, into the selling price of the commodity produced; for ultimately, when the same justly enters into the universal cost of manufacture, the final expense will be in the consumer's cost.

REWARD FOR SAFETY WORK.

Now, what is the reward for the thought of others, as determined by this brief statement of facts?

Not the money saved in decreased compensation received by the

*Amount paid, including compensation offset by decreased earning capacity.

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work people, for whatever they get is only poor compensation; best; not the money saved by comparing recent years with previous periods; but the knowledge that you have, with the co-operation of your employees in Safety First work, saved without question serious accidents, as shown by reversing the facts, by which your good work people who today are well and in the enjoyment of life and limb, might otherwise be maimed, injured, or even killed, to the great beyond, leaving a dear mother, or a dear wife, or children dependent upon what the Workmen's Compensation Law provides—a mercenary amount established by the Legislature after every pressure was brought to bear to make it as little as possible. This must have created a thought in the mind of one of our Eastern leading manufacturers, which caused him to ask the following question: "When you have reduced the loss in your own plant to its lowest figure, are you satisfied that that amount is equitable compensation to the injured employee?"

Our aim should not be to get off as cheaply as possible, but to eliminate, as soon as suggested or recommended, every cause of accident, getting the best advice possible, and supporting the work of the National Safety Council. It is said: "A wise man employs a specialist, but an uncommonly wise man employs two specialists." Our knowledge is limited by our environment and we know of things except by comparison. When we seek knowledge and advice from the National Safety Council a warm-hearted response never comes, for we all love the kind of food which our heart desires.

As you give to others, so you receive in kind, with interest. The greatest reward is that satisfaction which, at the close of a rounded business career, comes to your own loved ones by an inheritance in the community in which you have lived, that you have left behind "Thoughtful of Others."

SERVICE WORK AND ITS VALUE IN INDUSTRY

MISS NESTA C. EDWARDS, KIMBERLY-CLARK COMPANY, NEW BRUNSWICK, N. J.

Mr. Chairman and Members of the National Safety Council:
What is service work? What is it not?

It is not philanthropy, neither is it a panacea for the evils which have befallen both capital and labor, nor is it a substitute for long hours and short pay.

Well, what is it? Some say capital and labor working together for mutual good, but I prefer to put it in its simplest form, to call it a part of a good business organization.

The old type of welfare, its origin and development many of you know, but for those who have been too absorbed in the actual business of production to give any time or consideration to the well being of your fellows, it might be well to note that it started many years ago in France, England and Germany, in the better housing of employes, accident and sick benefit associations, lunchrooms and recreation grounds.

In the early days it had a smack of paternalism, rather than fraternalism. The paternalistic attitude of the employer toward the employe is sure to bring him to grief. Self-respecting men and women, who are doing their share of the world's work, who are really the world's producers, do not like to be "fathered." They rightly resent that type of service work.

Alas, too many manufacturers went into the old line of welfare work with enthusiasm. They reconstructed their factories so fast as to make your head swim. The firm introduced dances, parties, athletics and all kinds of fandango things, but peace, joy and happiness in the shop did not come. What was wrong? Added to a hard day's work was a lot of social life among the same people with whom they had worked for the past eight to ten hours. They had not planned their own amusement—it had been arranged for them by some good-intentioned but short-sighted person who had swept them into this new social life with such a whirl that they found themselves gasping for breath.

HEAVY EXPENDITURE, POOR RETURNS.

The company was spending money fast and ought to see a return. One foreman after another thought it was his duty to prod up the employes to have a good time. John's department had a good turn out of the last party, so Jim thought he ought to get busy and push his people into the next social function.

English classes were formed. A vigorous campaign was started to whirl the foreigner into signing up. At the close of the day the group was assigned to the attic, or basement or often crowded into the president's or board of directors' office. We had completely forgotten our public night school, the Y. M. C. A. and Y. W. C. A. associations, the national organization whose function it is to foster and develop a speaking knowledge of English and a maximum

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amount of Americanism in our foreign friends. Their institution in America that can Americanize our foreign public school. I hope the day will come when every foreigner has to spend eight years in the public school. The fact finally dwindled down and petered out. Why?

You will ask: How are we going to safeguard our employees who do not understand or speak English?

First. To every man who acquires a speaking amount of English give an increase in pay.

Second. No man will be promoted until he has the required amount of English.

Third. Make it plain at the time of hiring men and when they are employed only on the ground that they will attend school for a required time. This lies within the province of the Safety First measure. See that your employment service worker keeps a check on those who should attend school.

Like all other new movements this one had faults. When they were applied that did not exactly fit conditions and but they became discouraged and put a black circle around the welfare work, but because of its inherent benefits service departments in factories was bound to survive. Its life has been maintained by the development of service departments in individual factories in order to have an effective service department there must be a worker specializing in the development of the work in his field to cover the conditions arising therein.

What can service work do for the paper mill industry? The theory on which the need for service work is based is that moral and physical disturbances impair one's ability to perform at a bench or machine or in the office. If a man or woman is afflicted with any physical ailment, real or imaginary, or is worried by any personal or family trouble, a day's work cannot be produced.

SCOPE OF SERVICE DEPARTMENT.

What does such a department embrace?

First. Have you adequate *lunch rooms*? How about the eating time? Are the men found eating anywhere in or out of the factory, possibly from little boxes which have allowed sandwiches to become dry and unappetizing during the past five hours, giving an excuse for the men to move with the listlessness of the day down two flights of stairs and...

for a pail of beer to supplement the lunch carried from home? Or have you found some corner in your factory which a few coats of good yellow paint has made into a room of sunshine in both bad weather and fair, where your employes can bring their lunches and sit down comfortably and peacefully at noon to eat like self-respecting men and women? True, they may still carry their lunches; they have paid their board, which includes a lunch, but added to that lunch can be the very best cup of coffee you can get. Soup, not consomme or strained or shadow soup, but soups which are the outcome of plenty of good meat, vegetables, barley, etc. Milk soup with plenty of good butter added. One day I passed one of our best girls who looked up at me smilingly and said: "Me feel no so light now, me feel nice and heavy; me feel full. Soup good." Are you making excuses for your men who are filling the saloon across the road at the noon period? Forethought, time, and a little money could well be put into a traveling soup kettle to be sent through the factory. If you question whether your employes—"the men"—are willing to give up their beer for hot soup, try the experiment and see. Mark you, this cannot be "shadow soup." You will have to furnish the equipment, space for kitchen, light, heat and water. The cost of actual produce and help to prepare food should be covered in the actual selling price of the prepared food. If your men are working shifts, make a traveling soup kitchen. These are simple and inexpensive. Have them equipped with a soup kettle, cup (miner's), sandwiches, fruit, and some pint bottles of milk.

A SLOVENLY FACTORY IS A DANGEROUS FACTORY.

Second. Who looks after the sanitation of the mill? Show me a dirty factory, and nine out of ten I can show where moral conditions are below par. Clean windows admit light. Scrupulously clean conditions uplift. Is it Jim? He has given twenty to thirty years of service and you don't want to throw him out. Let Jim do the cleaning; he is worn out, rheumatic and stiff. No good at the bench or on the roustabout gang. The only man who knows how to scrub is a deckhand, and they are few and far between. In some factories keen discouragement has overtaken the manager despite the installation of new toilet-rooms and new lunchrooms with all their new and attractive equipment. Nothing keeps clean of itself; even the unused room accumulates dust. Much more, then, will dust and dirt accumulate in a lunchroom where crumbs drop to the floor and

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are trampled under foot. In the washroom, scrubbing scrubbing—is necessary, but under old methods this is practice. When asked, "When was that floor scrubbed earnest, serious look passes over the face of the one and the reply comes, "Really I don't know, but I think th ago." In order to keep the lunchroom floors, the factory toilets and locker-rooms clean there should be *hot water plenty of good, honest right arms with sufficient elbows each*. Why not hold the service department responsible cleaning staff and sanitation?

Who is responsible for ventilation? Everybody in g no one in particular. Had windows been thrown open minutes and lungs been allowed to fill with fresh air, you would take a new lease of life on their work and continue the rest of the day with much more productive power than can be gained by trotting to locker or toilet-room.

DRINKING WATER AND ILLUMINATION.

Drinking Water. This is a serious question. The drinking water fountain which needs replacing. "Why, this in ten years ago, the best thing of its kind at the time, but it has gotten out of whack and the water supply is not what be." The sink is dirty, and, instead of drinking two or three of water a day, the men turn up their noses and pass. Another cause of physical trouble later on.

Lights. You want an expert. Lack of light spells accumulation of dirt has a demoralizing effect on the condition. Dirt and darkness generally have the devil along pretty close at hand. Poor eyesight is bad for work as morals.

First Aid Room. Here is where you get to know your people. This is where they bring smashed fingers, hurt and often hearts. Here is where you read your own pulp stories. This is where your employees feel at perfect freedom to relax and get rid of a lot of their troubles. Make first aid room attractive—get away from the hospital atmosphere. Don't let your service worker, if a nurse, dress like a ramrod. Are you putting in the room for appearance or purpose of getting next to the hearts of your people?

WHEN THE DOCTOR IS A FRIEND.

The company doctor is one of the greatest assets a company can have if he is the right type of man. One of the most damaging if the wrong kind. No matter how wonderfully skilled a physician is, if he does not know and love men he cannot handle them. He must have a sympathetic understanding of human nature if he is to lead your men. He must know how to gain their confidence. A large Cleveland firm had a wonderfully skilled surgeon but his tongue was as sharp as his instruments. The employes would devise ways and means to keep away from him. A competent younger man was chosen, one who was most painstaking in his explanation of the individual's troubles. They grew fond of the young physician and it was wonderful how explicitly they carried out his instruction for themselves and family.

Mutual Benefit Associations. This is one of the most valuable things for both employer and employe but one of the most difficult things to install. Benefits and protection are not seen for a long time. We are not the most provident people and although the employe often knows the value he takes chances and comes out pretty good and finds it hard to pay for the relief of trouble in advance.

Lunch rooms, ventilation, sanitation, first aid and health work all come under the supervision of the service department. In some of the smaller factories the service department has been responsible for the hiring and firing of employes. By that I mean the foreman requisitions the service department for labor. The service worker interviews applicants and places them in the department she thinks they are fitted for. Of course, the foremen have the power of rejection. When a man quits or is discharged he is sent to the service worker. She ascertains the reason in either case and makes a thorough investigation. This relieves the foreman of a lot of unnecessary labor and leaves him free to plan and develop the work of his department.

A large Milwaukee factory even sent men and women down to service workers who were to be warned for poor work. It was amazing the number of things which developed showing that the cause of the decrease in production and efficiency was due ofttime to physical disability, a misunderstanding and sometimes trouble at home.

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BRINGING FAMILY TROUBLES TO THE SERVICE WORK

To the service department many employees are glad to bring only their physical troubles and mental disturbances but not the troubles of the families. They want advice and guidance. It may be a wee baby that has been suffering for months and is in need of a specialist. Even though you pay that man or woman the highest wage possible the aid of a specialist is out of the question. In such a case they may be directed to a clinic where they can have confidence in the medical attention which they will receive. Their service activities and usefulness may be extended to other employees. Immediate physical conditions within the walls of the factory.

The service worker is a natural go-between for employees and themselves and the employer or his representative. Often there is a misunderstanding between the foreman—the most maligned man in the factory—and the employee is adjusted with little difficulty. The service worker, who analyzes, fits the facts and easily brings justice to each concerned.

Service work will never make your factory an Eden but it will go a long way towards making it run more smoothly. It is a physically better, happier group of people. When relieved both mental and physical strain you are bound to have a decrease in half-days off and an increase of production.

The service worker should know how and when to use force and not be afraid to use a little muscular Christianity if necessary. The service worker should have the patience of Job, the strength of Hercules, the wisdom of Solomon, and a heart as big as the outdoors. A sympathetic understanding of human nature through her the clearing-house for all trouble and enables her to set the employee to his work an employee with head up rather than heels down and no self-pity on account of the employer's own disability.

After a good many years of seeing both sides of life in the industrial world if I should be asked: "What are three of the most pernicious evils in the industrial world?" I think I should say lack of breakfast on the part of the workman, lack of explanation on the part of those who can and should explain and keeping the man on the wrong job."

DOES IT PAY?

I have never known an employer or a set of employees who were willing to have the service department withdrawn if it was run along practical lines.

One larger employer said to me when asked: "Does it pay?": "Ask my foreman, and especially those who bucked it at the start. It is in to stay. Our absentee list has decreased and our hours off are surprisingly less."

This is where we see an actual saving in dollars and cents, to say nothing of the good will gained.

STANDARDIZING STATISTICS.

C. A. GILKERSON, SPANISH RIVER PULP AND PAPER COMPANY, LTD.,
SAULT STE. MARIE, CANADA.

Mr. Chairman and Members of the National Safety Council:
When an accident occurs and is reported to the safety engineer or superintendent of the mill, there are four questions which naturally arise in his mind in the following logical order: Where, who, how, and why—and upon the basis of these questions we analyze our accidents. Under the first question, if there is more than one mill in the same organization, the first natural division is according to mill, the next according to department, and then the definite location in the department. Under the second question we wish to know who is injured, which, for statistical record, is the occupation. Under the third question we wish to learn the cause of the accident. This question involves the greatest amount of detail, which will be considered below. The fourth question might be considered as a part of the third, as its answer is a result of the investigation to determine the answer to the third question, but, owing to its importance as a factor in accident prevention, it should be considered separately, and not secondary to "how."

LISTING THE MILL BY DEPARTMENTS.

Under each question the various items of detail should be listed as nearly as possible in the logical order of the operations of the mill. Thus we have under the first the departments, which may be listed in the following order:

Slasher mill.	Machine-room.
Wood yard.	Finishing-room.
Woodroom.	Boiler-house.
Sulphite mill.	Engine or generating room.
Groundwood mill.	Repair shop.
Beater-room.	

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The above are the general departments and may be into as many sections as are required. After the analysis completed the departments may be rearranged according to reason. One department stops and another begins must be by the local conditions and should be charged to the authority according to the authority of the foreman. This applies particularly to the sluices, conveyors and other means of transport of material. For instance, if the sluice or conveyor to the woodroom is under the authority of the woodyard foreman, even if it extends into the woodroom, all accidents occurring to work on this conveyor should be charged against the woodyard. In other words, charge the accident against the department of which the injured's foreman is in charge.

MILLWRIGHTS AND ELECTRICIANS.

In the case of millwrights, electricians and any other men who may have work in all departments about the mill, they should be charged to the mechanical or electrical department, as the case may be, and not against the department in which they are working at that particular time. There is an exception to be made to this: If in the investigation it is found that a millwright or electrician is injured through the fault of one of his men within the department in which he was injured, he may then be charged against that department, and, conversely, if a workman in any department is injured through the neglect of a millwright or electrician, the accident should be charged against the specific department.

Under the second classification all accidents should be charged to the occupation at which the man was working when injured. It should as definitely as possible tell the exact work which the man was doing. To say that a man is a laborer does not give a definite idea of the nature of his work. Several occupations are included under the head of laborers, and these should be divided into certain definite classes. If a man is unloading wood from a truck or placing it onto the wood conveyor he may be classified as a handler, but if he is working at the boom or along the corridor or sluice-way, his definite occupation should be designated—boom man, conveyor man, sluice man.

All men working at machinery can be classified as to occupation according to the machine on which they are working.

ical and electrical work the occupation of helper is sometimes given without classifying as to the nature of his work. All workmen in the electrical department may be classed as electricians and when a workman is considered an apprentice in the department, the term electrician's apprentice may be used. The same is true of millwrights. However, in the case of millwrights they should be divided into occupations, such as carpenter, machinist, etc. In work such as about the boiler-house use as few detailed terms as possible, but enough to designate the particular occupation, as water-tender, stoker, ashman, coalhandler, etc. Without going into further detail on this subject all occupations should show as closely as possible just where the injured man worked.

CLASSIFYING ACCIDENTS.

As to the causes of accidents, unless some definite plan or course is followed it will be found difficult to properly define the classes and some classes may overlap. There are five general classes as follows: Hand work, power tools, operating equipment (including transmission of power), handling material, and falls. Analyses of these classes should be separated as to operation and construction, as the latter should not be charged against the industry.

Under the class of hand work should come all work such as the use of portable ladders as well as the actual use of tools. Then there are other subclasses, such as falling material (from overhead places), steam, water and acid burns, electricity, etc. Some have classified these as separate general classes, but they should be subheads to each general class. If falling material is the result of a workman leaving his tools or material in overhead places, it should come under hand work. If a counter-weight works loose and, not being properly guarded, falls, it should be charged to operating equipment. The same is true with burns. If a man is burned with a blow torch or spills acid or hot water, or shorts the electrical conductors with his screwdriver, it is hand work. If a leak causes a steam, water or acid burn, or a breakdown of insulation causes a short or ground on the line and a flash at the switch or circuit breaker, it is operating equipment. Therefore, these are subheads in each class.

HAND-TOOL ACCIDENTS.

In the analysis of hand-tool accidents, which are secondary to hand work, they should be separated according to the class of tool, in order that we may learn with what tools the greatest number of

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accidents occur. Thus we have learned that the most hand tool is the wrench, unless it is properly hand adjusted and a proper type and size of wrench used. the tools which cause injuries we may find what tool greatest care in their use. It is true that some tools are frequently than others, and, for this reason, a greater accidents will occur with these tools; but, regardless if the greatest number of accidents occur by the use the greatest care must be exercised in selecting and using

POWER TOOLS.

Under power tools charge all accidents which occur machine and in setting the job and taking it down. which occur on the drive-belts, pulleys and gears in the to distinguish from operating equipment.

In the classification of the accidents under operation we have all those which occur on the equipment used for and power transmission. First, there are the conveyers can be followed with the specific machine in use, such as splitters, chippers, grinders, etc. On the paper machine there should be other subclassifications, such as calendar in-running rolls (exclusive of calendars), etc. These divided to meet the requirements of the purpose for analysis is being made.

Handling material should include moving by hand trucks or hoists) raw material, finished stock, stores, supplies, etc. Many subdivisions under this general heading which time will not permit to enumerate.

Falls may be subdivided into falls from elevations, or excavations, and falling by slipping and tripping. first-named subhead include falls from ladders and such primary cause of the fall.

It is well in all analyses to keep the classifications as number as possible and at the same time to give all the required, so that a comprehensive and satisfactory analysis causes may be made and in every case traced and classified primary cause.

PHYSICAL CONDITIONS AND THE HUMAN FACT

In the analysis under the fourth question all accidents classified under two heads, those caused by physical conditions

the properties and equipment and those caused by the human factor. Under the first include all accidents caused by defective equipment, absence of mechanical safeguards, unsafe condition of yards, floors, walks and runways, etc. In analyzing these conditions the safety engineer must exercise his best judgment, because at times it is necessary to draw a very fine line of distinction. The illustration of the falling unguarded counterweight and the loose overhead material will apply here, the former being a physical condition and the latter due to the human factor.

Another instance: If in the yard a workman stumbles over the walls of a manhole extending above the grade, and which it would be practicable to make flush with the grade, this should be charged as a physical condition. But if the workman falls into an unprotected manhole, if the protection, be it a cover or a rail guard, were available and not in place at that particular time, it should be charged to the human factor. Under those charged to the human factor should be included all accidents caused by the thoughtlessness, carelessness, indifference, ignorance or lack of experience or skill of the injured person or his fellow employe or foreman.

"TRADE RISKS"

Some investigators add a third class under this head which are called "trade risks." With the development of mechanical guards and appliances which work for both safety and efficiency this class is continually growing smaller. When accidents were first analyzed it was discovered that a large number of them were not due to mechanical conditions but to the human factor, but for many of the mechanical conditions it was considered impracticable to provide guards. In recent years, since the work has been given the best thought of the best engineers, safeguarding has been so developed that nearly all of the mechanical conditions can be corrected. Therefore, it is only reasonable to believe that with the further development of the mechanical work and by the education of the human factor that the so-called trade risks will eventually be eliminated by mechanical means or prevented by the thoughtful, careful, skilled workman. Of course, this is ideal, and until such a Utopia is reached we will admit a few trade risks, but if the accident could have been prevented by any *known* guard or device, or if a thoughtful, careful, skilled workman could do the work without injury to himself, charge it to its respective class.

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MAN-HOUR THE BEST BASIS.

One of the principal reasons for standardizing statistics to form a basis for comparison of the departments of a company or the various companies within an industry is the man-hour. For this purpose the man-hour is the best basis. This is obtained from the time department and the exact number of man-hours worked for a month, or any given period can be used. If in some companies or organizations it is considered impractical to obtain the number of man-hours, the man-day may be used as a fairly accurate basis. There is an objection to this basis as some of the men are probably working twelve hours, others ten, nine or eight hours. To arrive at the total man-hours do not make the mistake of using the total number of men on the pay roll during the month multiplied by the number of days, but use the total of the number of man-hours in the month.

As a standard for what accidents to include, I believe it is the lost-time accident, counting time from the beginning of the next tour after the one on which the man was injured. If a man were injured at 10 o'clock or 3 o'clock today and return to work at the usual time tomorrow, this accident should not be included in the number of comparable statistics. There are two reasons for not including these accidents: First, to allow the man time to go to the first-aid room, receive treatment, and, if the accident is serious enough, to have a night's rest before he returns to work, without charging it against the department; second, if minor injuries are included there will be a tendency on the part of some foremen to fail to report the minor injuries in order to keep their department records down. This may also apply to the workmen and they may not go to the first-aid room for treatment. On the other hand, all accidents resulting in a loss of one day or more will show on the time records and there is no reason for not reporting the accident.

INCLUDES ALL ACCIDENTS.

For the general analysis of causes, all accidents should be included. Some investigators make a difference between an accident which causes a short loss of time, say, less than seven days, and an accident which causes considerably greater loss of time. For standardizing statistics and for making any comparison of causes for accidents, all accidents should be included.

parable records is to develop a spirit of accident prevention by providing a graphical means of promoting the interest of the workmen, the foreman or even the employer. An accident is an accident regardless of its result and the same conditions which cause an accident resulting in the loss of one day, through a fraction of a second or a fraction of an inch, might have caused a much more serious injury, resulting either in a considerably greater loss of time or even fatally. Therefore, we want to remove the condition regardless of the probable result; as we cannot tell beforehand what the possible result will be; and, were it not human nature to try to "slip one over," all accidents should be included and count on an equal basis.

Having the man-hours and the number of accidents we can figure the number of accidents per thousand man-hours worked and have a comparable result. If it is desired to take into consideration the lost time, this can be figured on the basis of tours worked and tours lost which will result in showing the certain number of tours lost through accident to each thousand tours worked in each department or mill. For this purpose allow ten hours per tour, or, better still, where possible use the exact mill average. Of course, one really serious accident in any department or mill will run this record very high.

TIME CHARGED FOR FATAL ACCIDENT.

There is another feature to be taken into consideration on this basis and that is the amount of time to be charged for a fatal accident. Some have suggested that the full life expectancy of the injured man be charged. Another and perhaps more reasonable basis is to charge the length of time for which compensation is allowed on account of the fatal accident. This would work out in comparing all mills which are working under the same law, but would not be practical for those working under the various laws which we now have. This is a question which I think should be decided upon, and, among other things, as an outgrowth of this meeting, I believe that the best way to standardize statistics will be to appoint a committee for this purpose and bring together the various classifications of accidents and the bases of comparison, and decide upon and adopt the standard which is the most practicable for our industry.

It was not proposed in preparing this paper to lay down any hard and fast rules which should be adopted as a standard for the

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industry, but to set forth, if possible, a few of the features of statistical work and to form a basis for a discussion of the subject pro and con. On statistics we base all our conclusions and it was not until we began analyzing and compiling statistics that any appreciable reduction in the accidents was made; therefore, in direct proportion to the care and study which we put into analysis of primary causes, the compiling of statistics for comparable results will we reduce industrial accidents and the accompanying evil purpose be accomplished, even though it seems a far cry from statistics to the keynote of this Congress, "Our patriotic duty is the conservation of mankind," the time devoted to this its discussion, will not have been in vain.

COMPANY PERIODICALS.

A. D. WOOD SULPHITE SUPERINTENDENT, CHAMPION PAPER COMPANY, CANTON, N. C.

Mr. Chairman and Members of the National Safety Council:
The first letter received by our company, requesting the reading of a paper to be read at this gathering upon the subject of "Company Periodicals," puzzled me. I wondered at first why the committee went so far for a man, but upon second thought I realized for I was brought face to face with the fact that the National Safety Council of Safety First knows no North, South, East or West, no matter where we live, if we are helping this great cause, we should let the National Council think of us as neighbors and fellows.

I looked upon this invitation very much as I would if my fellow workers working in the mill down home had leaned over and said: "Wish you-all would come over and gimme a few minutes." In consequence of this attitude my method was a set of rules or a compilation of tables in textbook form instead of a little heart-to-heart, neighborly chat.

The National Safety Council has issued several bulletins endeavoring to promote the publication of company papers. Arthur T. Morey, editor of the *Commonwealth*, publisher of the Commonwealth Steel Company, is the author of an article entitled "How to Edit and Make a Shop Magazine Attractive." This art

who contemplates establishing a magazine. The *Dodge Idea*, published at Mishawaka, Ind., also printed valuable articles. An excellent paper could be prepared on this subject by reference, but we have thought it would be of more interest if we told of our own experience.

EXPERIENCE OF YE EDITOR.

It was something less than four years ago that our general manager first discussed a shop paper at a noonday conference of superintendents. No one objected to the idea, for, as you know, the average pulp and paper maker is as well qualified to edit a paper as he is to preach a sermon. But my journalistic experience had been greater than any of the others, for, many years before, I had been assistant editor of a daily paper which ran a whole week. It was published by the volunteer firemen, in Mechanicsville, N. Y. Its name was *The Daily Nozzle* and its motto was "When You Look In, Look Out." I assure you that this warning was a timely one, for the prime purpose of the *Nozzle* was to soak everybody and make them mad. Everyone enjoyed the soaking until his turn arrived. Although this experience taught me nothing of the duties of an editor, it taught me many things which an editor should avoid, and so I volunteered to edit the first three issues of our proposed shop paper, with the understanding that each of the other superintendents should be required to edit a like number—saying nothing to any of them concerning my own valuable experience, but hoping quietly for the worst.

A few days later a letter from the general manager authorized me to go ahead. He also appointed two associate editors. We were without a name for our paper, though several had been suggested, and at our first conference we decided to christen our publication *The Log* and prepared the following editorial announcement:

"Our name was selected from many others on account of its peculiar significance. On board a ship the 'Log' is the record of longitude and latitude, or, as they say up at the Champion Coated Paper Company, 'Where You Are At.' Its record indicates the knots made—ours will report the knots unified (or problems solved). It also tells the vessel's course, in what direction you are sailing, and any unusual sights, especially one that might indicate that some brother mariner is in distress. It further records what steps are taken for his relief and the result of assistance rendered. It is a history of the crew, passengers and freight during the voyage.

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"The name was also suggested by the fact that the important factor in the manufacture of pulp, the four industry resting upon it. Anyone will recognize this material."

SPIRIT OF "THE LOG."

We had things easy. Our men welcomed *The Log* ed out in this spirit, but the editors of *The Log* do not cla that. It was not *The Log*, it was the spirit behind *TL* made the paper welcome. It was the spirit of the Cha Company, a spirit of co-operation with all its employ already made itself felt in every department. None that we could have had a successful reception if that s existed. We could have done nothing to inspire co-op company had been unwilling to do its part. You can ployes into good feeling toward their employers unless t have some good feeling to invest. A good advertiseme investment in itself, but if you haven't the goods to l will not pay, eventually, to advertise.

We had the goods. In our initial issue we announce of the winners of \$500 which had been offered in prizes in the boiler-house drawing the first prize of \$100 for a had been written on "The Champion Spirit."

But while we had things easy, I do not mean that we our problems. We had plenty of good material, but we the theory that a paper needs something besides good r needs readers. If that simple fact is overlooked th cellent shop paper will fail. Our problem was plainly could we fill *The Log* with things the men ought to k the same time make it a paper which they would go c way to read?

One time, after the paper had been going a couple more, we wanted to know exactly how much our men for *The Log*, and this is the way we found out. Half c was distributed at 6 o'clock one night and the other hal the following day. We were much gratified to learn th the first served *had their copies stolen*.

A PAPER WORTH STEALING.

This was not because our paper was good, but beca bad. There were lots of good things in it but that . . .

stole it for. The average man may read good advice but he won't steal it; he'll be perfectly willing to wait until it comes to him in the regular course. What we wanted to have was something he would steal.

That is the only apology for some of the matter which appears in *The Log*. I am speaking of the occasional yarn we spin which might not be classed as educational. Some of our readers, in fact, have criticized us for stories we have reprinted from the *Ladies' Home Journal*, but we can't blame the *Ladies' Home Journal* for them all.

We believe in the uplift, but we go on the theory that you can't lift a man up until you get down to his level first. We didn't have to get down—we were already there.

If you were to go home with me, bringing with you one of the most learned college professors you could find, and advertise among the Champion employes that your man would give a free lecture at the Methodist church on "The Ideals of Culture, and I should whisper it around at the same time that Benny Leonard and Freddie Welch would have a twenty-round bout at the ball park, just which way do you think the crowd would go? Well, so would I.

Suppose I wanted to get a message to all the men in our employ whom I could possibly reach that minute, should I have it printed on the program of the classic lecture or on that of the classy bout?

The personal column which we run under the heading, "Chips and Splinters," is a summary of the wit, humor and pathos of the mill. No one can realize until he gets into the game just how much material can be picked up in the various departments, the reading of which gets the fellows acquainted with each other.

THE HUMAN INTEREST STORY.

We try not to hurt the feelings of any workman. If we have a good joke on him, but think there is a possibility of his resenting a story about it, we submit it to him and publish it only after he consents. Needless to say, when this practice is followed, no one objects to being guyed and they tell us the sky is the limit. Our officers and executives have come in for their share and have taken their medicine in the broad-minded manner becoming to their positions. People as a rule like to be joshed by their equals but if you haven't a spirit of equality and democracy in your plant—if your shop is not your men's paper—don't get gay.

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Never fail to tell a story of special achievement on the part of any workman. If your engineer has designed and completed a building of which you are proud, say so. If an oiler or mechanic made a material saving, tell about it. If a laborer in a mill room discovers an iron wedge in a log and saves the chip from being wrecked, write him up.

One class of stories should never be omitted, the kind that every man read will win a place for the men in the heart of a boss or a boss will warm up toward the men over them. When I was twenty years old, acting as a foreman in a mill, we were, one day, about to start a new pulp washer—the last thing done being the removal of the couch roll. Just then the general manager happened in and gave the roll the once over and asked: "What d—n fool would have thought of that?"

This inquiry caused considerable amusement—for ever since that time—for two of the men had warned me that I was winding up my career. But while the men were chuckling the general manager was studying the machine. Presently he started away at a trot but after going about fifty feet he made a military about-face and marched back.

"I just came back to tell you," he said, "that I was wrong and you were right and I want them all to hear it. D—n fools! That's what that time!" After he left, one of the men turned to me and said: "Gee, but that was rich. I'd give anything if I had the general manager's thing like that."

EDITOR MUST HAVE LOTS OF HEART.

Now, that's what I call a story. If such a thing were published in any mill where I was employed today I would want to see it up with display headlines. The head would probably read "When He Was Wrong and Had the Sand to Say So." But use the original word instead of "Sand." I am sure it would be literature but I am sure it would be read.

The Log is a decided failure from a literary standpoint, but from our standpoint it is a huge success. I don't think it takes much of a paper man to run such a sheet. It doesn't take experience and it doesn't take much brains. In the average organization you find some men with more brains than heart and others with more heart than brains. If you contemplate publishing a text book, the former type to edit it: but if, on the other hand, you want a publication to be the medium through which the employe is to

gentleman with a lot of intellect and pick out some roughneck with lots of heart.

The mill is not simply a big pile of bricks with a whistle on it. It is a living thing—a human thing—the very embodiment of human labor and thought. The manager is not a soulless symbol, representing so many property rights; he is a workman—a fellow workman—a true comrade of every other worker. And the workers, too, they are not merely “hands,” they are life-sized men with men’s feelings, men’s aspirations and men’s capabilities. Industry is human and every industrial problem is a human problem. The work of the National Safety Council has always been to emphasize this human element in industry, and the company periodical, by just being human, can be made a valuable instrument in furthering this great work.

TURNOVER OF LABOR IN RELATION TO ACCIDENTS.

A. P. COSTIGANE, SECRETARY AND SAFETY ENGINEER, ONTARIO PULP

AND PAPER MAKERS’ SAFETY ASSOCIATION, TORONTO, ONT.

Mr. Chairman and Members of the National Safety Council: The important factor of the turnover of labor in industry is rapidly coming to the front and being studied by some of the large concerns, with the object in view of stopping a leakage which in recent years, with the great influx of alien labor, has attained far greater proportions than ever before.

In order to study this problem intelligently, let us go back to an earlier period in the history of industrial development and endeavor to trace the causes that have brought about the ever-increasing instability of labor.

Not so many years ago the industries of most countries were largely in the hands of the commercial or middle classes, who operated in a comparatively small way as private concerns. The employer, or master, as he was then called, was in close touch with every one of his employes, knew them by name, knew their wives and all the members of their families. When a lad was ready to leave school he followed his father to the shop and was enrolled to serve the usual period of apprenticeship in the trade of his choice. During this apprenticeship his employer followed the progress of the learner and encouraged him to master the intricacies of the

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business from the practical aspect, so that when his time he would be an all-round journeyman tradesman. Unless he was of an adventurous disposition the chances were that when his apprenticeship was over, get married and settle as a journeyman in the shop in which he learned his trade—working side by side with his father and other relatives. In those days were men of broad sympathies and real responsibilities as teachers of the rising generation, and it was a pride to turn out apprentices who were fully equipped to work on an equal level in excellence of workmanship with the tradesmen of other countries. So great an interest did some of the employers have in their apprentices that they devoted one or two nights each week to teaching them the theoretical side of the business. It was a common thing for the master of an engineering and millwright shop to instruct his apprentices in the evening in the rudiments of mechanical drawing, geometry, steam engineering and other subjects connected with the industries, and the time so devoted was given gladly for the benefit of his boys. Such conditions ruling, one can understand the *esprit de corps* which then existed and which the writer has often heard voiced by men well up in years, talking in a kindly and respectful way of the old masters and the old shops under whom they had served their apprenticeship. Tradesmen grew up in those old shops and under such favorable conditions became themselves worthy of the training they had received. They were not one-operation men, but men qualified to perform any work connected with the trade and to do it well.

BIRTH OF FACTORY SYSTEM.

As time went on, competition became keener and the desire of reducing production costs gave rise to the growth of large corporations or limited liability companies. The United States was the first to see the advantage in the establishment of huge industrial concerns run on scientific principles. This method of production spread to other countries, until now it is almost universal in the leading industrial countries. With the advent of large "combinations" the personal relationship between the employer or company and the employees gradually came strained and ultimately the bond of union disappeared. The present condition of things was brought about through various causes, the two most important being the absence of personal touch between capital and labor and the growth of socialism.

between the two classes, until each looked on the other as natural enemies—the employer looking on the employe as more or less of a machine from which the largest production had to be obtained at the minimum expenditure and the employes looking on the employers, collectively, as a class from whom as much had to be forced as possible in exchange for as little labor as they could get away with.

Following this attitude of capital, which I am glad to say is becoming more and more a thing of the past—and somewhat forced by the employes—officials, superintendents and foremen became a buffer class between capital and labor, and gradually assumed a coercive attitude towards the people under their control. The growth of this feeling on the part of officials is not hard to understand, badgered as they were on one side by a balance-sheet management and constantly urged to increase production and decrease costs, and on the other hand opposed by the veiled hostility of the employes, who aimed at decreased production. The old system of apprenticeship was more or less departed from and no system introduced to take its place—the result is now being felt in the dearth of skilled men. The mills and foundries are full of men who only know their own little bit, without appreciating the inter-relationship between all operations to make a satisfactory product.

WASTE OF MATERIAL.

This lack of all-roundness on the part of employes is responsible for much unnecessary waste of material. Responsibility for this states of affairs does not lie with employes, but with the system or rather the absence of system of training. If a man has not served an apprenticeship to his trade, passing through all departments—and there is no outside means of learning—how can he be expected to have even the most rudimentary knowledge of other operations and what bearing these other operations have on his own? The fact is, no scientific method of training has been adopted and employers and employes suffer alike from this want—the employers constantly deploring the fact that good men are so hard to get, and employes, who have been years in the mill, deplore their inability to fill executive positions when these become vacant. Hence there is considerable dissatisfaction on the part of employes with existing conditions, tending to increase the labor turnover. This dissatisfaction would be greatly relieved if men were better qualified for their work and competent to hold advanced positions.

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GREEN MEN INJURED.

As an accident hazard the turnover of labor and lay is very serious and merits the most careful consideration of the mill manager. Looking over a batch of sixty-five accidents that came to my hand recently, I was astonished to find the percentage of accidents to persons less than three months of the company worked out at 56 per cent, and in the cases as high as 75 per cent—proving conclusively that green men are a menace to the whole industry. Granted that labor is a serious factor, how can the conditions be remedied?

1. By the careful examination and selection of an employee.
2. By rudimentary education for non-English-speakers.
3. By the abolition of indiscriminate firing.
4. By vocational training.
5. Promotion policy.

CAREFUL EXAMINATION AND SELECTION OF EMPLOYEES

The careful examination and selection of employees to reduce the turnover of labor. Looked at from the fact that there are so many positions in the plant to be filled, the position requires certain qualities in the employee, the person in charge of the selection department must have an intimate knowledge of the requirements of the positions to be filled so as to enable him to make a quick and intelligent selection of a man to fill any position becoming vacant. When applicants come to the office it is desirable, if they cannot be interviewed immediately, that they should be shown into a room where they can be comfortably seated. Each individual should be interviewed in a private enclosure, away from the sight and hearing of other applicants. When interviewed privately, an applicant will talk more freely and give a better outline of his experience and what he would do if speaking at a wicket and overheard. Courteous treatment of applicants should be considered as a fundamental qualification of all connected with the personnel department, as the creation of a good impression on the applicant when he becomes an employee, will be the seed from which should spring a strong feeling of loyalty to the company.

Careful selection will also relieve superintendents

whose only means of securing labor is to rush down to the time office and grab the first applicant he sees, guided in his selection more by eyesight than anything else. The foreman has not the time nor the training to make an examination, and trusts entirely to that most expensive of methods, "the trying-out process."

RUDIMENTARY EDUCATION AMONGST NON-ENGLISH-SPEAKING
EMPLOYEES.

Inability on the part of employes to speak or understand English constitutes one of the most prolific causes of labor unrest, as well as one of the gravest accident hazards. No matter how painstaking and conscientious a foreman may be, he cannot devote the time to explain in detail all the duties of a new employe's position, especially when the new man has only a limited understanding of English and nods his head or answers "Yes" emphatically to all that is said to him, whether he understands or not. Difficulty with the language is often the cause of senseless practical jokes being played on the new man by older employes, even those of his own country who have advanced in acquirement of the language. Foreigners seeking employment, unacquainted with the language, are under a grave disadvantage. They are sensitive as to their deficiency, and out of this feeling arise the deceptions they practice in professing to understand instructions the nature of which they have not grasped. One can readily understand the grave danger such men are in any factory, not only to themselves but also to others. A study of accident returns shows a large proportion of industrial accidents are due to foreigners not understanding the instructions of the foreman. This is a serious accident hazard that must be eliminated.

Wherever foreigners are employed, provision should be made to teach them the language. An elementary school should be available, no matter how crude; a suitable person selected to give instruction, and notices posted intimating that promotion may only be looked for if proficiency in the language is attained. Most foreigners are sensitive and anxious to get on, and I am sure where schools or instruction classes were formed they will be well attended. Employers are beginning to realize the necessity of teaching their foreign employes the English language and at the same time teaching them to understand something of the standard requirements of citizenship. Great progress has already been made along similar lines in some of the large industries of the United States, but so far little organized effort has been made to tackle this problem in Canada.

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It only requires that this problem be placed fairly before the leaders of industrial progress in Canada for the far-reaching possibilities in the amelioration of dangerous conditions attached to the employment of speaking labor. Judging from conversations I have had of the leading employers, I am sure that the next twelve show rapid progress in elementary education, making efficiency and greatly reducing the present accident hazard.

ABOLITION OF INDISCRIMINATE FIRING.

The question of indiscriminate firing is a most important involving as it does injustices of all kinds, and is the true much unrest amongst relatives, fellow countrymen and the unjustly discharged employe remaining in the fact after the employe has departed. Of course, it is an easy blame the foreman, but are the foremen really to blame men are required to perform a multiplication of duties, general supervision of their department down to the minutest looking after stock, adjusting wages, keeping up discipline by any means the least irritating, of answering complaints in office without being given proper time to investigate such. Is it surprising that a man subject to all this should, come out of mere weariness of spirit and irritation, unnecessarily charge the first employe who gives him the opportunity?

If the duties of hiring and discharging are to be vested in the foreman, then foremen should be trained to perform them in a sympathetic and intelligent manner. It is the custom in our industries to make the best operator foreman, irrespective of other qualities necessary for the position. It is a debatable question if a good operator will make a good foreman. Being a thing so well himself is apt to make him impatient with those who have not reached his proficiency mark.

Another prolific cause of petty injustice is the religious intolerance. Many a good man has been hounded out of his job by the intolerance of his fellow employes, whose persecutions are the more virulent because of the knowledge that their fellows are as narrow-minded as themselves. Any foreman guilty of religious intolerance towards religious persecution should be dispensed with immediately. The fact of his stooping to such petty bullying brands him as broad-gauge or enlightened enough to be trusted with any kind

Indifferent selection is also responsible for much injustice. A new man is brought into the factory and placed on a job for which he is not at all suited. Naturally he turns out unsatisfactory and is discharged after having cost the firm a considerable sum of money. No thought is given to the fact that there may be numerous positions in other departments in which the unsatisfactory man may become an expert and be a real asset to the company.

The establishment of a selection department, under the control of an experienced and generous minded student of human nature, is the only cure I know for the unnecessary sacrificing of human beings on the altar of intolerance and inefficiency. Under no circumstances should a discharged employe be permitted to leave the factory without being interviewed by an unbiased official. By so doing many abuses come to light that would otherwise be hidden from the knowledge of the management.

VOCATIONAL TRAINING.

This is a question that is of vital interest to Canada, as on the development of vocational training the whole industrial future of the country hinges. As I said previously, the old form of apprenticeship has, to a great extent, been abolished and no system introduced to take its place. Is it fair to the rising and future generations that they should be made the victims of the present haphazard methods of education? Is it fair that children, after attending school for seven or eight years, should at the end of that period be thrown on the industrial labor market without any idea whatever as to the industry which would best develop their latent talents and give them the best opportunities for advancement. Ask any child, who has just left or is preparing to leave school, what they are going to do and in nine cases out of ten the answer will be "Get a job." Our educational system requires reconstruction and reconstruction should include study of the children by the teachers. Progress should be noted, also the peculiar talents of each child; a periodical report should be issued by the schools to the parents, so that when the time comes to leave school the parents, guided by the accumulated information obtained from the school reports, will be in a position to advise as to what industry their children should follow.

If such a system was adopted a choice of vocation could be made with some degree of intelligence and the last two school years could be devoted to special industrial training in a technical school. Following this a modified form of apprenticeship could be adopted in

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the factories which would give the learners the opportunity through all departments. In cases where special observed, further instruction could be given in the high through the medium of technical schools or universities. would always be a proportion of young people coming from of whose ranks suitable material could always be found to tive positions.

This principle is intensely democratic, being based on individual worth and ability, and would give every one in industry the same opportunity, by perseverance and applying to rising to higher positions.

NEEDS OF THE TIMES.

The pulp and paper industries of Ontario are rapidly the needs of the times, and industrial training will soon be the attention it merits. Last winter, at Thorold, industries were begun, and, in spite of inadequate equipment and disadvantages, considerable progress was made in the following subjects: English, mechanical drawing, chemistry and electricity. An educational committee of the technical section of the Canadian Paper Association, realizing that technical education is given very little attention outside of Toronto and some of the other towns, are earnestly working for the furtherance of industrial education in rural industrial towns. At Thorold enlargement of curriculum has been provided for and cooking and dressmaking classes will now be included. Arrangement has also been made for additional equipment, and great improvements are to be made in conditions in general, making the classes much more attractive and efficient. Various methods of training are under consideration such as:

EDUCATIONAL COURSES.

1. Part-time service in the mills and part-time technical instruction, with provision for service in each department.
2. Encouraging the employment in the mills of technical students during vacation months.
3. Introducing a policy of promotion in the mills, whereby efficiency attained at industrial night classes will be recognized and rewarded.

Speaking generally --

with the operations of each department. One of the greatest marvels of the present war was the ability of Great Britain to double and treble the output of munitions in a year's time. What made this possible? The apprenticeship system, under which nearly every man is trained to be competent to take a higher position. When the crisis arrived and the metal industries were inundated with a flood of green labor, both men and women, a proportion of journeymen were distributed among new factories and converted factories. These men acted as instructors and in a very short time the green labor was so well organized and taught that output increased by leaps and bounds. To my mind the apprenticeship system of the old country has more than justified its existence, and I am sure a system somewhat similar, amended to suit conditions, could be introduced with great advantage into the industries of Canada.

PROMOTION POLICY.

In talking of promotion, I include not only a step up to a higher position but also promotion by increase of wages as a reward for increased efficiency in the same job. The policy of never increasing an employee's wages until forced to do so is one of the most short-sighted methods that can be perpetrated by the management of any factory. Take, for example, the case of a bright, intelligent young man, starting in a strange factory at a low wage. After getting accustomed to the surroundings his value to the company increases rapidly in the first month or two. He is conscious of his increased efficiency and works hard for promotion. The company, not having taken the initiative, he approaches his foreman for an increase and more often than not is put off with some indefinite promise for the future. What is the result? He either becomes indifferent or, if of stronger fibre, looks around for a position elsewhere in which better remuneration is to be had. Thus the firm, who paid the initial cost of breaking him in, lose what they have expended and at the same time lose an employee who would rapidly become expert. How much better would it be to reward merit by an unsolicited increase in wages, thereby encouraging employees to continue to do their best and binding them to the factory by the sure knowledge that they will be treated justly by the management. Any student of human nature must be aware that an unsolicited increase causes a warm feeling of satisfaction in the recipient and the knowledge that progress is being observed and appreciated will act as a stimulant to further efforts.

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PROMOTION FOR EMPLOYEES.

Where this feeling of loyalty is fostered, the problem of turnover is well on the way to solution. The bringing of men to fill vacancies as foremen, etc., should never be resorted to except in exceptional circumstances. During a ten years' experience of factory management, and having tried both methods, the conclusion is that it pays better to promote an employee than to bring in an outsider. In the former case the new foreman receives the congratulations of his co-workers, is loyally backed up, and there is a feeling of satisfaction amongst the other employees, that one of their own has been selected as foreman, goes far to make things run smoothly. In the latter case an outside man, although he may be efficient, invariably creates a feeling of coldness and distrust among the employees, who consciously or unconsciously do many things detrimental to his interests and authority. To make good these circumstances, an outside man must have special abilities, and tact, by the exercise of which he will gradually win the confidence and respect of those under him. Invariably, however, the first few months lead to wholesale dismissals by the new foreman, who feels he has a grip on his department.

WORKMEN'S COMPENSATION ACT.

An important development in the administration of the Workmen's Compensation Act of Ontario may help to focus the attention of employers on the labor turnover as an accident hazard. At present time the system of assessment is based on the classification of industries into classes, each class being assessed separately on the basis of so much per \$100 of pay roll. The moneys so collected form a separate pool for each class, out of which all accident compensation is paid. It was felt that an element of injustice existed in that firms who were active in accident prevention received no better treatment than other firms who were non-progressive or indifferent. The Commission proposed to adopt a merit-rating scheme under which the conditions of environment of each plant will be taken into consideration. Factors such as accident record, organization for accident prevention, labor turnover of labor, proportion of non-English-speaking employees, etc., will receive careful consideration when fixing the assessment.

BUILDING UP AN INDUSTRY.

The conditions in the pulp and paper industries in Canada could be greatly improved, this state of affairs having been brought about by various causes, some of which I will enumerate:

1. Lack of systematic industrial training.
2. Scarcity of qualified teachers.
3. The ability to draw skilled men from other countries.

After the present war is over indications point to the advent of one of the greatest trade booms the world has ever experienced, and woe betide the country that lags behind in industrial training and all that it implies. Canada, up to the present, has been fortunate in being able to draw skilled labor from other countries, such as the United States, Great Britain and France, but these countries now and probably for some years will require all their own skilled men, so Canada will require to face the problem of training her own skilled labor. The educational system of the country requires careful reconstruction, particular attention being paid to securing an adequate supply of competent instructors by offering salaries large enough to attract a higher grade of intelligence and with opportunities of promotion which will make it worth the while for bright students to adopt teaching as a career.

REORGANIZE THE SCHOOL BOARDS.

Too many members of school boards, as at present constituted, are men whose families are beyond school age and they themselves beyond the age of usefulness, and have no direct personal interest in education. It would make for efficiency if such men were removed from the boards and their places taken by men whose families were attending public schools. These latter men would be interested in securing the best education possible, as the prospects of their own children would be involved.

Greater proportion of representatives on the school boards should be women—not the variety seeking after notoriety, but mothers who are keen and ambitious for their children. Who is it that thinks most of the future of the family and has the least to say in the matter? Why, the mother! Who is it that is most ambitious for the family and works year after year unselfishly to promote their interests and prospects? Why, the mother! Then the mothers should be well represented on the school boards.

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WHEN THE SOLDIERS RETURN.

The excellence of organized effort, the triumph of influence, and the unwinding of red tape so evident in and France at the present time is going to have great influence after the war. The men who are in the heart of they return to their places of industry, will not be inefficient methods but will introduce scientific principles they have used with such great effect on the battlefield. In the efforts and influence of such men lies the industry of Canada. This will not be the last war; other wars with the battles will be fought between armies equipped, not artillery, machine guns and poisonous gas, but with the scientific tools of industry. The battleground will be the world and the nations most highly organized, educated and win many victories, thereby leading the other nations accordingly. Now is the time for the industries of Canada to get their houses in order, that they may be ready to take the the wonderful natural resources of the country entitle the world's march of industrial progress.

HELP THE OTHER FELLOW

That's the Spirit of Safety, and in the end it spells success. It brings out the best there is in every man, and it strikes at the very source of poverty and misery, of oppression and gloom. It's the spirit that draws all men together by a common bond. It is a spirit of accomplishment, worthy of the most sincere thought of the best minds and of the best thought and consideration of lesser minds, and is only attained by united and purposeful effort of persevering men. It is reflected in the daily work and the home life of every man who is endeavoring to be guided by this Spirit of Safety; in more efficient work and better working conditions; in happier faces and more cheerful surroundings; in brighter homes and in more contented wives and mothers, because of the assurance of Safety to husbands and sons; in better fed, better clad and better educated children.

National Safety Co

Textile Sectional Meeting

New York City

Sept. 14, 1917

MALCOLM CURRY, Chairman

General Engineer, American Thread Company

E. D. LAMB, Secretary

American Thread Company, Holyoke, Mass.

SYNOPSIS OF MEETING

THE meeting was called to order by Mr. W. H. Carr, General Manager, Secretary and Treasurer of the National Safety Council, Chicago. In the absence of Chairman Fogler, Mr. Curry, General Engineer of the American Thread Company, was selected as temporary Chairman. Owing to the absence of Secretary, Mr. E. D. Lamb of the American Thread Company, Holyoke, Mass., was elected acting Secretary.

About forty representatives were present and the meeting began with the reading of a paper on the "Problems of Ventilation and Sanitation in Textile Mills" by Mr. W. Fred Dolke, Jr., of Wood, Greene & Co., Boston, Mass. This was followed by a discussion.

A paper was read by Mr. Marcus Cole, master mechanic at Saco-Lowell Shops, Lowell, Mass., on the "Application of Locking Guards on Textile Machinery." This was also followed by an open discussion.

A third paper by Mr. J. C. ...

ments, Pacific Mills, Lawrence, Mass., was on "Hazards in Wool Carding, Combing and Drawing."

The annual election of officers followed and the following were unanimously elected:

Chairman, David S. Beyer, Liberty Mutual Insurance Company, Boston, Mass.

Vice Chairman, Earl S. Jenckes, Jos. Bancroft & Sons Company, Reading, Pa.

Secretary, S. Harold Greene, International Cotton Mills, Boston, Massachusetts.

The last paper was presented by Mr. D. S. Beyer of the Liberty Mutual Insurance Company, Boston, Mass., Manager of the Accident Prevention Department, who pointed out the advisability of the manufacturers coming to a common understanding as to what kind of safety devices should be called for.

After a discussion, it was voted that the Chairman for the ensuing year should appoint a committee of three members to act with the American Association of Mechanical Engineers and the Insurance representatives to formulate standards for safety guards for textile machinery.

The Section then adjourned.

PROBLEMS IN THE SANITATION AND VENTILATION OF TEXTILE MILLS.

W. FRED DOLKE, JR., LOCKWOOD, GREENE AND COMPANY, ENGINEERS, BOSTON, MASS.

Mr. Chairman and Members of the National Safety Council: The problems of sanitation and ventilation in industrial plants have only recently received the thorough attention which is properly due them through their close connection with the health and efficiency of the country's workers.

The reason for this fact lies, paradoxically, in a peculiar factor in the development of American industries—namely, the high cost of man power. The differences in this country between the costs of man power and of mechanical physical force is tremendous, and up to the present time the chief problem and interest of managers naturally has been to replace high-priced human labor by cheaper natural forces.

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Nowadays all plants are approaching similar lines of comp in equipment, machinery methods, purchasing skill and prices of materials, and in the near future the varying grades of comp success will be decided by labor efficiency. Managers must now find the best ways to develop human power and to conserve its energy, and, consequently, they are making serious studies of all the factors governing efficiency of their employees.

HEALTH OF EMPLOYEE.

Of these factors, two stand out prominently: Education in the best ways of doing the work, and health. It is with the factory conditions that affect the employee's health that the interest of this division is concerned.

Evidence is constantly present to every one who profits by his own experience and observation that the efficiency of the human mind and body is intimately dependent upon physical environment. Untidy surroundings and shiftless conditions tend to create untidiness and shiftlessness in those subject to such an environment. We all know that health depends very largely upon an abundance of fresh air, free from contamination or irritating substances, and the cleanliness of person has an immeasurably great influence upon the morale of a working force.

It is generally thought that working people are not over particular in respect to their personal cleanliness and that it is a sufficient satisfaction to their self-respect if they can mingle with the homebound crowd in a moderate degree of cleanliness. Moreover, observation would seem to lead one to believe that the average worker is entirely lacking in any notion of common decency.

These conditions, when they exist, are partly the results of lack of education and partly of environment—the results of filthy working conditions; of dark, noisome, dirty toilet facilities; the result of complete disregard for the convenience and comfort as well as the health of employees. They are the results of a neglect on the part of managers to recognize the economic value of self-respect and personal pride and to make provision for their cultivation. Give workers clean, light, airy toilet-rooms, with modern equipment, efficient janitor service to keep them in proper order, and it will be observed that even in shops employing people least moved by conditions.

In any installation of toilet facilities in a mill the main considerations to be studied will be the location and housing of the toilet-rooms and the amount and kind of equipment.

LOCATION OF TOILETS.

With regard to the location of the toilet facilities there are two prominent features to be considered. In the first place, facilities should be so placed that there will be no undue loss of time because of their remoteness from any worker. This is a matter which must be studied out for the individual plant, but practice and law have established definite limits. Massachusetts, for example, has set 300 feet as the maximum distance, except in those cases where service elevators are provided for employes. New York states that no water-closet shall be more than one floor above or below the regular place of work of a person using the same, and recommends that toilet-rooms be placed on the same floor with the workers, even at the expense of installing a larger number of rooms.

The second consideration in the location of the toilet-room is one which, under the enlightenment of modern thought, is so obviously desirable as hardly to need mention. It is that toilet fixtures should be located in rooms entirely separated from the workshops. The advantages from the point of view of health and decency are self-evident, but it is a sad commentary on the shortsightedness of employers that the states find it necessary to make a separate housing of toilet facilities a legal requirement.

Of course, it is sometimes desirable to place washing facilities in the workshops, but it would seem preferable generally to install them in the toilet-room. When locker rooms are provided it is decidedly advantageous to locate the lavatories with the lockers, with the other toilet fixtures in an adjoining room. In this case there should be direct access from the workroom to the toilet-room, so as to prevent employes from lingering at their lockers, and also at least one lavatory to be located with the water closets. It is generally more economical and convenient to place men's and women's toilet-rooms adjacent to one another, but it is certainly advisable to separate the entrance doors as much as possible. There is a distinct advantage also in screening the entrances from direct view of the work-room, if only for the purpose of cultivating the employes' self-respect and so toning up the morale of the force.

The size of the toilet-rooms will naturally depend upon the number of fixtures to be housed, but even in this case the minimum re-

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quirements have been set forth in some states by legislation, and requirements constitute a good working basis. In New York it is necessary to provide at least ninety cubic feet for each v closet or urinal while Massachusetts stipulates ten square feet eighty cubic feet as the minimum spaces allowable.

WALLS AND FLOORS.

The ideal toilet-room will, of course, have an abundance of and fresh air, as these are prime requisites in the maintenance of clean wholesome rooms. The walls and floors should properly be constructed of materials impervious to moisture, not only to prevent absorption of moisture with the accompanying decay and odor but also to allow of the room being thoroughly flushed out periodically.

The floors should not only be waterproof, but the top coating of the floor, whether concrete, asphalt, or tile, should be turned up at least six inches against the walls to form a sanitary base and prevent leakage around the walls. Waterproof methods of construction are now required in some communities, and wood compartment partitions are allowed only on condition that they be protected by a heavy waterproof enamel paint. It is desirable that all surfaces of the room, perhaps even the floor, be enameled white, as the whiteness, by the very fact of its intrinsic cleanness, tends to discourage filthiness and vulgarity.

Particular pains should be taken to secure good ventilation in toilet-rooms. With a large amount of window space in a room, frequent changes of air can ordinarily be obtained by opening the windows, but owing to the fact that so many people imagine that they object to drafts in winter and that in hot, sultry weather no natural ventilation can be secured, it is much better to provide forced ventilation. This can be done easily by pulling the air from the room through exhaust ducts by natural draft in the colder weather and fans in the summer. The best method is to carry exhaust ducts from each water closet and urinal on what is named the "local-vent" system, by means of which the air from the room is pulled out through the fixture itself. Some communities (notably Hartford, Conn.) make this local-venting a requirement for any factory toilet-room.

In every plant, no matter how large or how small, some one person should be made absolutely responsible for the cleanliness of the toilet-rooms and every effort should be made **not only to keep them clean, but to apprehend and punish any employees who are consistently indecent.**

AMOUNT OF EQUIPMENT.

The amount of equipment to be installed will depend somewhat on local conditions, but general practice and state laws have established definite rules for guidance. One water closet to fifteen workers is ordinarily amply sufficient. Massachusetts requires only one to twenty-five, while New York has a sliding scale of one to fifteen for a small number of employes up to one to thirty for 200 or more persons. In either state one-third of the number of water closets required for men may be replaced by urinals.

Washing facilities must be provided in accordance with the dirtiness of the work. For ordinary textile conditions one lavatory to twenty employes will usually be sufficient. It is interesting to note that a big textile state like Massachusetts requires only one lavatory to thirty workers. However, nothing will discourage cleanliness so much as to be compelled to wait around for a chance to wash up.

Drinking facilities should be abundant. Plenty of pure, cool water is a recognized requisite of health, and the money spent in equipping mills with modern drinking fountains supplying cold and clean water will be more than recovered by the increased efficiency of the workers. Some factories go so far as to send ice water carts circulating through the work rooms.

All fixtures should be of types and materials making for easy care and perfect sanitation. For closets and urinals earthenware is more substantial and sanitary than enameled cast iron; some states make vitreous ware a requirement. Closets and urinals should be simple in form, smooth surfaced, and capable of thorough and convenient flushing and disinfection. The old open-trough type of latrine and the old hopper style of closet should be obviously avoided.

SELF-RESPECT AND CLEANLINESS.

For washing facilities sinks have long been preferred because of their economy in first cost. But sinks are obviously objectionable in that they are used in common, one person's filth being passed on to another. Basins overcome this objection somewhat, but it is evident that individual wash bowls, each with its own water supply and waste are much to be preferred. Their use is more conducive to self-respect and cleanliness than is a common sink. Hot water is essential to proper cleansing and without doubt should always be supplied. Some mills are so progressive as to provide liquid soap containers and paper towels. Elegant appointments are not

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necessary in factory toilet rooms; simplicity and ruggedness a main requisites. Also, maintenance cost is a more important than first cost and in the long run the heavier and more expensive units with substantial, well-built valves and appliances are usually the cheaper.

A master mechanic's principal troubles with a plumbing system will lie in the piping, and, so far as the drain pipes are concerned this condition will arise from three causes: pipes too small for work to be done, poor materials and workmanship in the original installation and abuse of the system. Pipe sizes should be determined by the number of fixtures to be served, with a tendency toward liberality. Any mechanic who has had to dig bobbins out of a drain will appreciate the necessity of large pipes. Poor materials and workmanship in the original installation will produce endless trouble and not only should every mill superintendent see to it that the piping system is properly designed, but he must insist on paying for first-class materials and workmanship, and provide rigid inspection to see that he gets what he wants.

PROBLEM OF VENTILATION.

When we turn to a consideration of some of the problems of ventilation in textile mills, we take up a subject which not only tends to be complex, but one which has a more direct and obvious effect on health.

It is frankly acknowledged by all enlightened persons that human health depends very largely upon an abundance of clean, fresh air. The problem of ventilation arises from the fact that this air enters the lungs as one thing and comes out as another. The amount of oxygen content in the air has dropped from approximately 20 per cent to about 16 per cent, while the carbon dioxide has increased from 4-100 of per cent to about 4 per cent, an increase of 100 times.

Diffusion of the exhaled gases takes place at once and the carbon dioxide is soon distributed quite uniformly throughout the air of the room, thereby increasing the carbon dioxide content of the room above the normal four parts in 10,000 found in fresh air. When the carbon dioxide content due to respiration exceeds seven parts in 10,000 the effect of poor ventilation is easily apparent, and at ten parts in 10,000 actual discomfort and headache are experienced. It is therefore, customary to limit the proper carbon dioxide content of air in a room to a maximum of seven parts in 10,000.

presence, as the result of human respiration, is an indication of the organic impurities which are exhaled at the same time with other gases which may prove a serious menace to health.

Because we know the amount of air which is taken in by an average adult at each respiration and also the results in air change at each respiration, we are able to compute that we must supply to each individual in a room 2,000 cubic feet per hour of fresh air, containing four parts of carbon dioxide in 10,000, in order to maintain a carbon dioxide content in the room of not over seven parts.

LEGAL REQUIREMENTS.

It is evident that where there is a space of 2,000 cubic feet for each persons in a room with all doors and windows tightly closed, it will take an hour to raise the carbon dioxide content to the danger point, and also that if any positive movement of air in through the windows takes place, the length of time required to raise the carbon dioxide content to the danger point will vary according to the amount of incoming air. With less than 2,000 cubic feet of space per person in the room means of ventilation will evidently become necessary. This matter is rapidly becoming the subject of state legislation and a statement of the requirements of the Illinois ventilation law for factories and mills will interest us as giving some basis for determining when ventilation becomes necessary.

This law requires at least 500 cubic feet of space for each person in rooms using lights that consume oxygen and at least 250 cubic feet for rooms using electric light. In addition it is stated that all rooms having at least 2,000 cubic feet of space per person and having an outside door and window area of at least one-eighth of the floor space shall not be required to have artificial means of ventilation. All rooms having less than 2,000 cubic feet of space per person and with an outside door and window area as before specified must be provided with an artificial means of ventilation at the rate of 1,500 cubic feet of fresh air per person per hour during such weather when windows can not be left open for ventilation. When the outside window and door area is less than one-eighth of the floor space then artificial ventilation must be supplied at the rate of 1,800 cubic feet per person per hour. This law does not seem logical or consistent, but that is not a point to be argued here. Other states, notably Ohio, New York, and Massachusetts, have laws for ventilation which are not so specific.

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TEXTILE WORKERS WELL PROTECTED.

Now, what are the conditions in textile mills? In spinning employes occupy from 500 to 1,000 square feet of floor space, and for usual story heights, from 5,000 up to as much as 12,000 cubic feet of space per employe. The window openings will vary from as little as one-fifteenth to as high as one-sixth in unusual cases. The height will probably be about one-tenth. Weave-shed workers occupy about the same amount of floor space in general as that for spinning employes, whereas the cubic space will be even greater. Not all weave sheds are well supplied with windows, but the ventilators usually placed in the peak of the saw-tooth skylights will in the place of windows.

It must be evident that so far as the amount of space per employe and the available openings to outside air are concerned, textile mills seem to be well ventilated, and general experience would seem to bear out this conclusion. In some individual mills, poor conditions undoubtedly obtain, due to local influences which it is impossible to consider in this paper. Actual conditions must be studied over a long period of time in order to determine whether the ventilation in any particular mill is sufficient.

TEMPERATURE AND HUMIDITY.

However, ventilation is a subject that cannot be considered absolutely alone, for proper ventilation is affected seriously by air, and in turn itself affects two other factors, temperature and humidity, of which in their inter-relations have serious effects on health. A complication arises from the fact that as the temperature of air increases its capacity to absorb and hold water vapor increases rapidly. Outside air at 40 degrees, when taken into a building and heated to 70 degrees becomes relatively very dry; drier, in fact, than the atmosphere of the driest desert on earth. Consequently it absorbs moisture from anything that will yield it.

The human body is constantly giving off moisture and the dry air takes it up. But in this act of vaporizing heat is required which in part, taken up from the surface of the body and gives rise to a sensation of cooling. Consequently under such conditions we actually feel several degrees cooler than the real temperature of the room. While this state might seem highly desirable during hot weather it really is not, and it is also manifestly undesirable in cold weather. Dry atmosphere gives rise to a number of physical irritations and

ments which may easily become chronic. Furthermore, in dry atmosphere dust particles and especially fibrous particles readily remain in suspension and this is evidently a serious condition.

On the other hand, too much humidity interferes with the natural evaporation of moisture from the body and there results the uncomfortable feeling which we experience on a hot, sultry day in summer. The humidity most agreeable to the body ranges from 55 to 70, probably because nature has adapted us to that amount. A temperature of 65 degrees with a relative humidity of 70 per cent is more comfortable than a temperature of 70 or 75 degrees with air too dry. It is estimated from experiments along this line that from 15 to 25 per cent of heating cost may be saved by holding the temperature at 50 to 65 degrees and raising the humidity to 70 per cent, with more comfort to employes, better health, and so better and more work done.

This brief discussion shows that the prevailing practice of depending upon the thermometer as the sole guide to the proper heating of buildings is not only inadequate, but misleading. The same temperatures produce varying sensations of warmth or chilliness, depending upon the relative humidity existing at the time. Evidently it is impossible to discuss proper ventilation in relation to health without at once also considering temperature and humidity.

HUMIDITY AND EFFICIENCY.

In most modern textile plants the relative humidity is kept at or near a constant point by artificial apparatus for manufacturing reasons, and it thus becomes necessary to maintain the temperature of the workrooms at that point in relation to the humidity which will result in the greatest comfort to the employes; in other words, to provide only so much external heat as is necessary to prevent the body radiating more heat than it produces under the given conditions.

Under normal conditions ventilation for textile mills could be secured through the windows, but in view of the fact that an influx of air from the outside will upset the existing atmospheric conditions inside, thoughtful room overseers are tempted to keep the windows and doors closed as much as they can. Natural ventilation, moreover, can be satisfactorily obtained only when there is a breeze blowing outdoors. In cold weather, drafts become objectionable, and again the windows will be shut. In hot, sultry weather, when a movement of air is most desirable, nature perversely keeps the air still. An alert overseer can do much to make natural ventilation a success, but it is evident that only under the most favorable conditions will

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natural ventilation fulfill all the requirements of proper ventilation and proper atmospheric state for manufacturing.

The hardest problem to solve in ventilation is the removal of the cold floor stratum of air and of the closely enveloping blanket of moist, and vitiated air which forms about the body not exposed to direct draft.

FORCED VENTILATION.

Unquestionably the only certain and efficient method of securing proper renewal, proper circulation, and proper conditioning under all circumstances is to force fresh air that has been warmed, heated, and humidified into the room under pressure. It is not an intention to say that natural ventilation is always a failure, but to bring out the self-evident fact that to maintain a standard atmospheric condition in a room that room must be considered a box and air of a definite condition admitted.

A blower system of heating and ventilation has many advantages briefly outlined as follows: Positive ventilation is obtained independent of changing climatic conditions. The air can be warmed free of all dust, and the humidifying which is necessary in textile operations can be done at the heating and blowing apparatus. A much smaller amount of radiating surface will be required in a workroom to perform an equal heating duty with a consequent reduction in the number of steam-tight joints, unions, and valves to keep in repair. The air leakage being mostly outward the building will be freer from drafts and more uniformly heated. The system is easily regulated to respond readily to changing outside temperatures. In summer the air may be cooled by the circulation of water through the heater, while simply running the fan will in a great measure greatly relieve the oppressiveness of hot, sultry weather.

This system naturally has some disadvantages. Its work can, of course, be somewhat upset by too many open windows on a windy day, but that disadvantage is true also of any other system. The biggest objection raised against a blower system is its much greater initial cost and the amount of power consumed in running the fan and in heating outside air. This objection can be offset, in part, by a lower maintenance cost, and largely by the great advantages that accrue both to the employees by reason of better working conditions and to the employer from greater efficiency of the workers and better quality of product.

It is evident that within the limits of a

securing proper sanitation and ventilation in a textile plant, and to suggest some thing of the nature of general solutions. Every plant is an individual problem in itself, to be studied from many different points, but the main considerations will be along the lines which I have attempted to bring out.

THE APPLICATION OF INTERLOCKING GUARDS ON TEXTILE MACHINERY.

MARCUS J. COLE, MASTER MECHANIC, SACO-LOWELL SHOPS,
LOWELL, MASSACHUSETTS.

Mr. Chairman and Members of the National Safety Council:
The problem of universal safety has become of vital interest to every one of the present day and in the last few years has gone ahead by leaps and bounds. When we stop to consider to what business may the principles of safety first be applied, we realize right away that their applications are unlimited. In the manufacture of textile machinery we find a very large field in which to devote our time, attention and energy in designing machinery so that it will protect the operative from injury, loss of limb and even life. To illustrate this I will take a few concrete examples of textile machinery, such as are manufactured by the Saco-Lowell shops.

SILK-FILLING ENGINE.

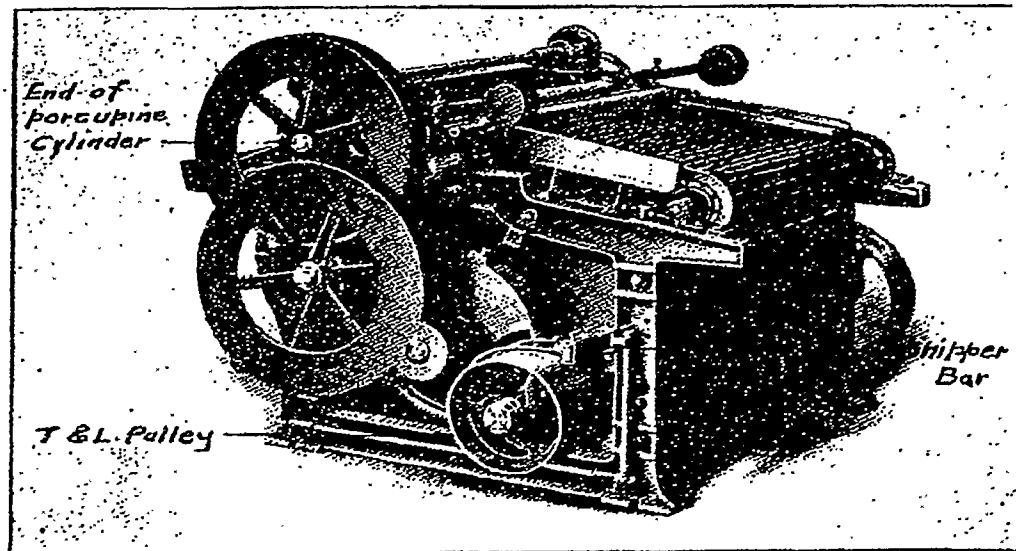
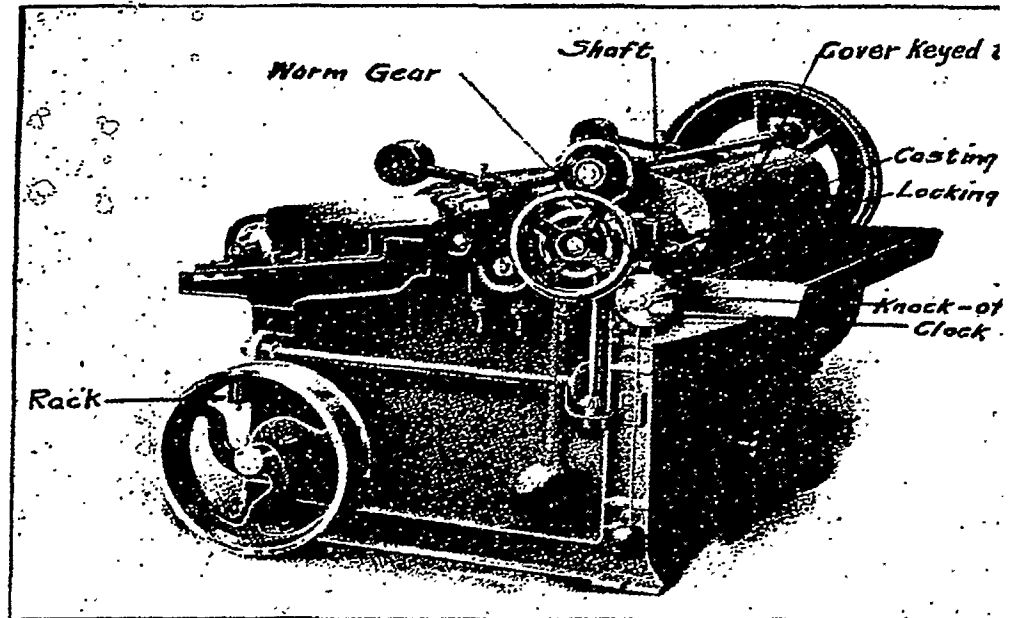
First of all we will consider the silk-filling engine. This, perhaps may be more clearly understood with reference to Plates 1 and 2, which show the front and back views of this machine. Near the delivery end we have a cylinder (called a comb) which is covered with longitudinal segments of pins—these pins being about one inch and a half long—all of which is protected by a cover.

The comb makes about 300 revolutions per minute and is the most dangerous part of the machine. Its duty is very similar to a carding cylinder. Positively connected to the comb is a clock (so called) which registers the number of revolutions which the comb makes. A knock-off finger is attached to this clock and when the desired number of revolutions have been made, this finger strikes a locking pin which allows the cover to fly open exposing the comb. Simultaneously the machine is brought to a stop.

In order to accomplish the latter, the cover is keyed to a shaft

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which in turn is connected by means of bevel gears to the fork bar, so that the raising or lowering of the cover directly transfers the belt from the tight to the loose pulley or vice versa

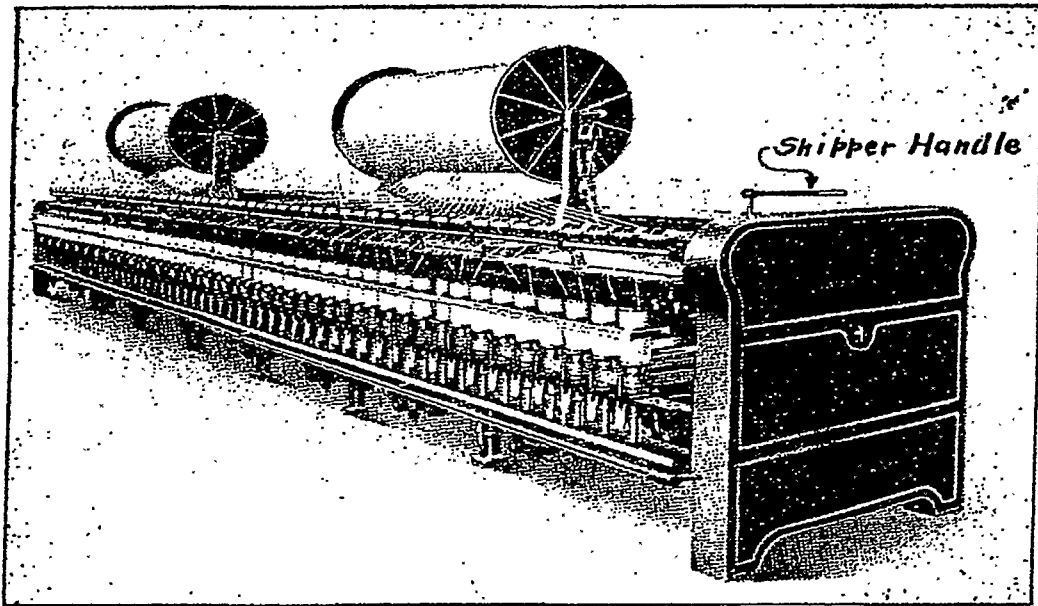


This machine is started or stopped solely by the cover, depending on whether it is shut or open, and, with the exposed gears guarded, makes it a very safe machine for the operative to run

COTTON TWISTER.

Plate 3 shows the type of machine called the cotton twister. This is not so complicated as the silk filling engine and a much more simple arrangement is used to protect the operative.

One of the dangers in the past has been that while a fixer or operative was changing or working on the gears at the gear end some one carelessly started up the machine at the other end. The workman was frequently taken unawares and this often resulted



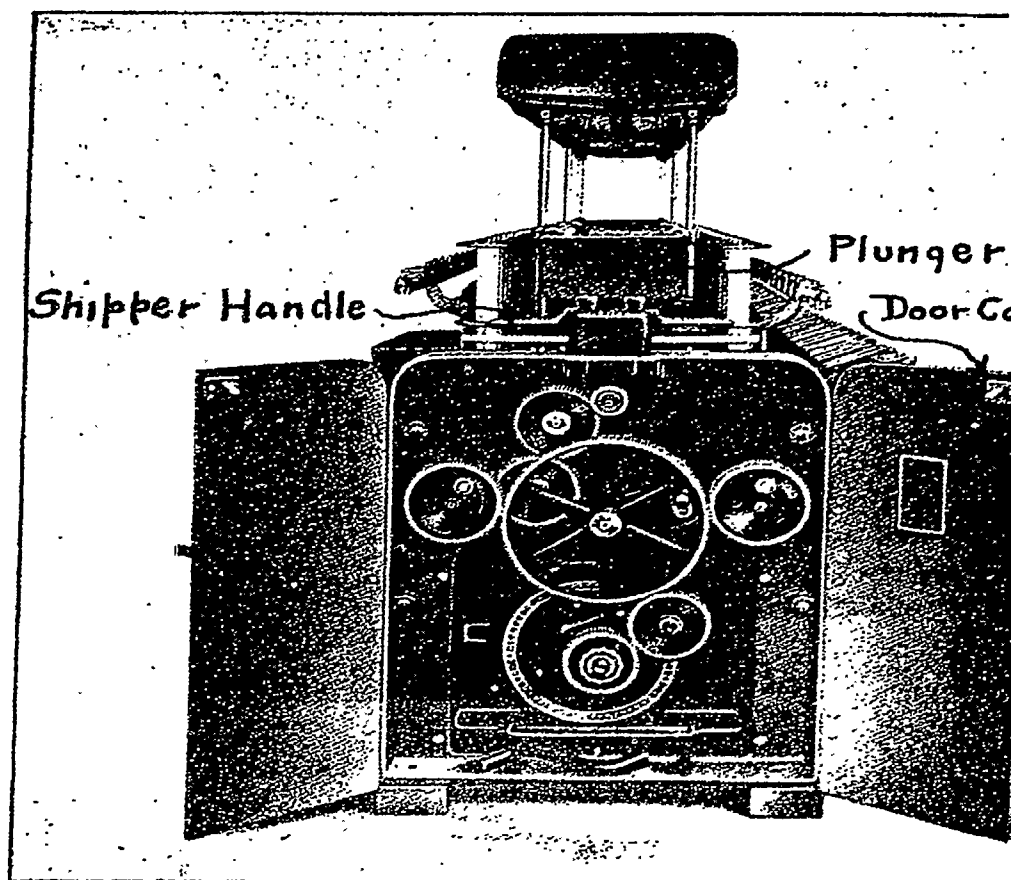
in the loss of one or more fingers and sometimes more serious consequences.

As a result, the shipping device was so arranged that the machine could only be started from one end of the frame—that is, the gear end—yet could be stopped from either end. The cotton twister has a shipper handle at each end of the frame moving in a horizontal plane. These handles are connected to vertical rods at the bottom of which are shipping toggles connected together by a long horizontal rod. An offset coupling from this latter rod connects to the shipper bar, thus moving the belt from either the tight or the loose pulley. When the frame is stopped, the shipper handle on the gear end, due to its own weight, drops into a slot, locking it. Consequently, in order to start the machine, the operative must come

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to the gear end, where, of necessity, he will readily see if is working on the gears; then, by raising the handle on slot, he is able to shift the belt, thus starting up the frame.

The cotton spooler and cotton spinning frame have interguards which are similar in principle. They have a ship arrangement similar to the cotton twister, yet their interlockin is quite different.



On the gear end of the frame, the gears are tightly enc by steel doors. These doors are arranged so that the frames not be started while either is open, nor can the doors be opened the frame is in operation. This is accomplished by means simple arrangement at the gear end of the frame and is cl shown by Plate 4. The interlocking device is at the end of shipper rod and is contained in a small compact metal box.

on the doors. When the doors are shut, the shipper rod extension may be moved through these slots allowing the shipping of the belt on the tight pulley at the same time locking the doors, as the plungers are now in a locked position.

In like manner, when the doors are open, the frame cannot be started because the slots in the plungers are not opposite the shipper rod extension and will not be until the doors are closed. Thus the dangerous part of this machine has been overcome and makes it absolutely safe for the workman to work upon the gears at any time.

PICKER MACHINE.

The picker machine has, in the past, been one of the most dangerous of textile machines and some very serious accidents have resulted from it. The two main points on a picker to safeguard are the gearing and the beater.

Every gear is now covered with a properly constructed gear shield, so that it is impossible for a man to get his hand caught in the gearing.

BEATER BONNET.

The speed of the beater varies, according to conditions, from 900 to 1,400 revolutions per minute, and this is where most accidents have occurred. Many instances are known in which an operative has attempted to free the beater while the machine was running, by opening the beater bonnet or the glass door in front of the beater. As a result, the man was very apt to have his hand or his arm caught or torn from his body and if not killed was maimed for life.

This led to the recent design of a beater lock which renders it impossible to start the machine when either the beater bonnet or glass door is open, and also renders it impossible to open either the beater bonnet or the glass door when the beater is revolving. This lock is a simple arrangement, entirely automatic, and is now furnished as a standard equipment of their picking machinery. The beater lock is shown on Plate 5 and the illustrations give three different patterns attached to different types of machines.

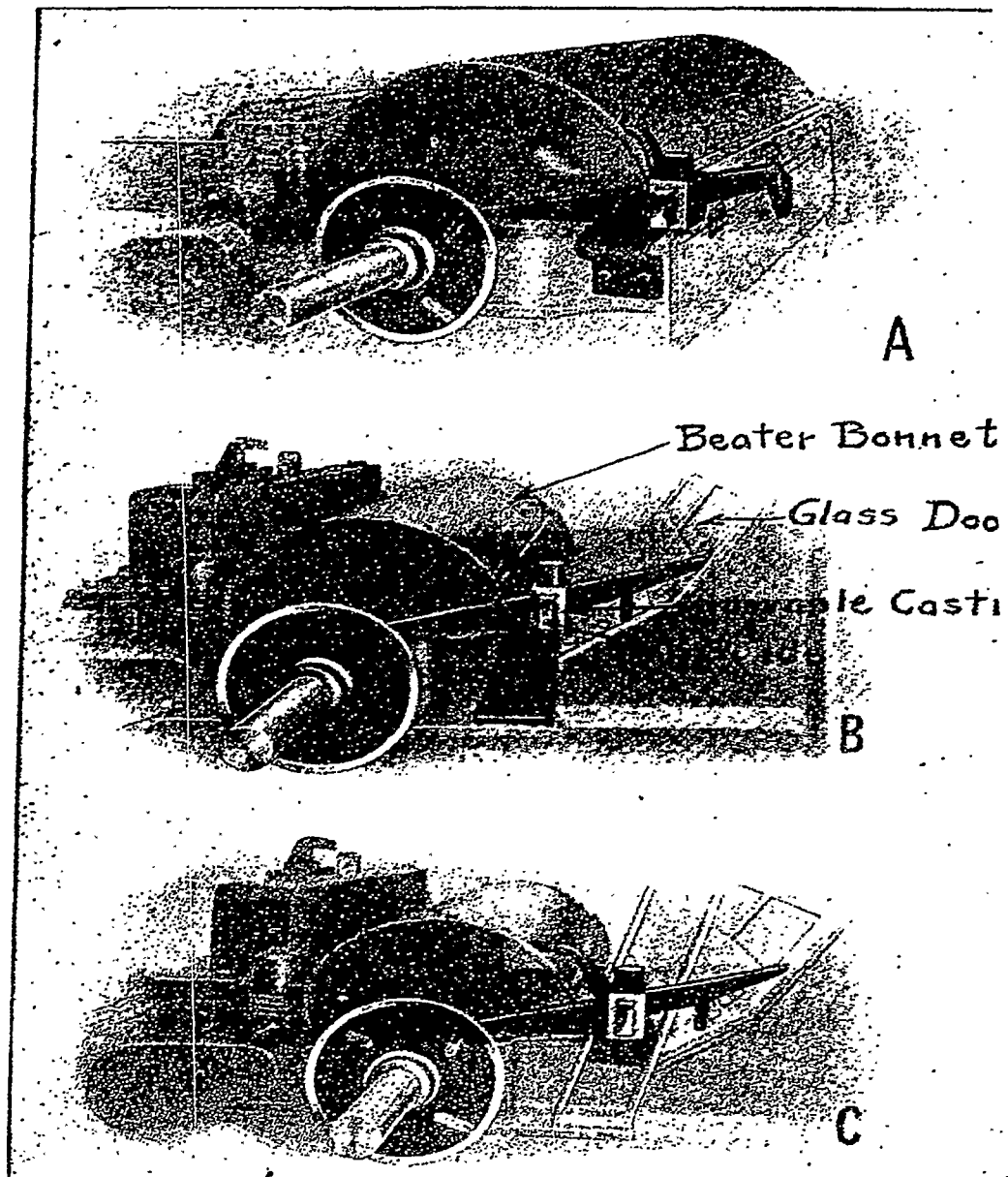
The lock consists of three castings:

1. The bracket which is fastened on the machine and carries a guide.
2. The casting which moves along this guide and which comprises the locking arms for the beater bonnet, glass door and beater shaft.

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3. The disc which is fast on the beater shaft.

In order to open the beater bonnet or glass door the r has to be stopped. Then, by raising a plunger, the movable



may be moved outward allowing a finger on one of the locking a to engage with one of four slots in the disc on the beater

volve even if the power is started up. To start the machine it is just the opposite. Disengaging the locking finger from the disc moves the casting inward at the same time locking the beater bonnet and glass door.

SUMMARY.

Hence we arrive at the conclusion: That an interlocking guard is an essential part of certain machines. That it should be simple, durable, always operative, and, in effect, automatic. That there is a demand for a lock that will adequately protect the operative. That such safety devices must comply with the rules or requirements of the insurance companies, as such rules are no doubt the result of their experience; and, similarly, these devices should comply with legislation.

HAZARDS IN WOOL CARDING, COMBING AND
DRAWING.

JOHN T. LORD, SUPERINTENDENT, PACIFIC MILLS, WORSTED
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Mr. Chairman and Members of the National Safety Council: Wool carding, combing and drawing are processes in the manufacture of worsted yarns and are not attended by any unusual hazard. A survey of the accidents in these three departments of a large worsted plant for a period of two years discloses the fact that less than 10 per cent of the injuries resulted from hazardous conditions.

A modern worsted card for medium and fine wools usually consists of two main cylinders about fifty-four inches in diameter, each with three or four pairs of workers and strippers; one breast cylinder, with two pairs workers and strippers; two doffers, two fancies, two angle strippers, one licker-in, one top divider, one burr cylinder, four or five burr rolls, and two feeder rolls. The carding face of these cylinders and rolls is fifty-four or sixty inches wide, and their surface speed per minute ranges from fourteen inches of the slow-moving feed rolls to 1,800 feet of the fast-revolving swifts. Over thirty million points of wire are brought into engagement when the card is in operation. In every well-regulated cardroom there is an unwritten law that under no circumstances must the human hand ever touch the carding surface of any roller or cylinder while the machine is in motion. If something goes wrong the card must first be brought to rest and the trouble corrected afterwards.

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TENDENCY TOWARD OVERCROWDING.

In recent years there has been a manifest tendency to increase the size of worsted cards. Width of carding surface has increased six to twelve inches, and diameter of swifts has enlarged to the same extent, with dimensions of the other rolls and cylinders in the series to correspond. This increase in the length, height and weight of the modern card has not always coincided with suitable mill construction. The most common width of bay in a worsted mill is ten feet and in this space a forty-inch card can be nicely accommodated. A fifty-four-inch card is a little too crowded in a ten-foot bay for either convenience or safety, and in all new construction eleven-foot bays should be provided for cards of this width. Card-tenders, in passing between cards which are set too closely together, are in near proximity to belts and pulleys on both sides and they need to restrain their movements in advance upon the machines.

This enlargement in size of carding machines has rendered difficult the preparation for grinding. Workers and strippers removed from their positions against the swift and transferred to a separate grinding frame away from the cards. These rolls are so heavy, as compared with those on earlier cards, and their location is so high that their removal is attended with some hazard to man and machine unless proper means of transfer are adopted. The use of a platform of suitable height and length on each side of the card will enable the attendants to remove the rolls with ease and safety; or an overhead track and trolley with hoisting device will accomplish the same end.

BELT HAZARDS.

Most of the rolls and cylinders are belt driven, and the network of belts along the sides of the cards affords opportunity and temptation to thrust the hand through open belts in picking off fly waste. The danger consists not only in having a hand or arm drawn between some belt and pulley, but in the belt being thrown off and becoming entangled in other belts and dragging the caught member into same and around other pulleys. By the use of compressed air for removing the waste lint from side frames, pulleys and the ends and bearings of rolls and cylinders, cleaning is more thorough and the hazard from belts greatly diminished. The airblast will always blow off, from around the gudgeons, the rings or ropes

with the rotary motion of the gudgeon, and this form of waste should be picked off only when the card is at rest. To attempt to remove it while the machine is in motion incurs the risk of the fingers becoming enmeshed in the condensed mass of fibres and drawn around the revolving journal.

Lint and waste quickly accumulate in matted form on the inside surfaces of belts and around slow-running pulleys and must be periodically removed. If this is done by a hand-stripping card and at a point just after belt has left the pulley there is but little hazard, but if attempted near where belt is going on to pulley the hand is liable to be drawn in.

The putting on of belts is of frequent recurrence and the hazard is at its minimum when belts are drawn onto the advancing right side of the pulley.

Stripping is accomplished by the use of hand cards and while the machine is at rest. The attendants climb up on the side frame of the card to reach some of the rolls and cylinders, and they need to make sure that their footing is secure. Pricks and scratches are incident to this operation and if neglected may readily lead to a septic condition of the parts affected.

Every modern card is equipped with a belt shipper for tight and loose pulleys. Some older cards did not have this device and shipping was accomplished by the pressure of a stick or board in the hands of the operator against the edge of the belt. If such practice is in vogue today in any mill it is inexcusable.

Getting a hand caught between an arm of the doffer gear and the top of the side frame is of easy occurrence. This gear is so large and is placed so closely to the side frame that a shearing relation is established between the two. The slow motion of the gear hides the hazardous character of the relationship. An effectual remedy is the placing of a solid disc of sheet metal the full diameter of the gear against its outer side and thus preventing a hand from being thrust through the gear.

FALLERS AND FEED ROLLERS.

Gilling consists in passing a series of wool slivers through feed rollers on to the pinned area of a row of fallers which advance slightly faster than the wool. By means of the front rollers the sheet of wool is drawn through the pins of the fallers very much faster than the fallers travel, resulting in a combing process which lays all the fibres within the sheet parallel with each other.

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The distance between the fallers and feed rollers is varied to suit the requirements of different loads and staples. When slivers are passed through the nip of the feed rolls their free ends may drop and fail of engagement with the fallers. To prevent this it is not unusual for the machine tender to support and guide with his hand the loose ends on their passage to the fallers. This, however, is attended by great hazard, for the slightest miscalculation may result in the workman's fingers being caught by the pins of the ascending faller, and before the machine can be stopped three or four of five or six other fallers may become embedded in the back of the hand. There have been instances where a hand so injured has been laid over the open jaws of a vise and the fallers disengaged by striking with a hammer, leaving plenty of broken pins behind to be extracted by the surgeon. An absolute safeguard against this hazard is the insertion of a rectangular boxlike filling-in piece made of metal to occupy the space between back rolls and pressure bar. This cuts off all access to the ascending faller and provides a surface which serves as a conductor to guide the loose sliver on to the feed rolls. To make this scheme effective at all times filling-in pieces of various widths must be on hand to correspond with the open space of different machine settings.

In stripping waste from between the faller pins care must be taken that the stripping knife in the hand of the operator follows its true course between the two rows of pins. Where the set is open it is easy for the knife to be deflected in its passage, and, slipping under the faller, cause the hand to come in violent contact with the points of the pins.

When a lap is formed on either roll or apron the only safe method is to stop the machine, loosen apron and roll, remove the lap and readjust the parts. Any deviation from this incurs the risk of the hand being drawn in between the heavily weighted rolls.

Too long a sweep of the balling head on a gill box may at the end of each traverse bring the base of the upright stand so close to the side bearing as to prove a hazard. Such adjustment should be made that the maximum sweep will never reach, by an inch or more, the side bearing and in this way avoid pinching or bruising the operator's fingers.

PUNCH BOXES.

After gilling, four slivers are built up side by side into a ball in readiness to be placed in a

mechanism by which this ball-winding is accomplished is known as a punch box. In the earlier types of machine a careless operator was liable to have his fingers caught between the forward end of the advancing plunger and the side plate whose center it entered. In the latest design of punch box this hazard has been overcome by an automatic arrangement which stops the plunger before it reaches the plate and requires a second release of the shipper handle to complete the inward passage.

To secure maximum compression of the ball, the pressure plate is heavily weighted, and, to avoid being drawn in, the hand must be kept away from the rounded edge of the plate over which the slivers pass on to the ball.

COMBING MACHINES.

The type of combing machine in most general use is the Noble comb, whose essential parts are a large horizontal comb circle inside of which are two small circles. The outside row of pins of the small circle touch the inside row of pins of the large circle, and at their point of contact the wool is pressed down into the pins by a dabbing brush. Vertical drawing-off rollers remove the fringe of wool from the inner edge of the large circle and from the outside of the small circles, and the combed fibres are passed along to the coiler.

Two dabbing brushes are located on opposite sides of the comb and on fine wools they will each make 700 to 800 strokes per minute. In drawing the ends through the feed boxes and laying them over the brush plate the operator must be careful to keep his hand clear of the dabbing zone. Puncture wounds and lacerations are the penalty if the hand should intrude in the forbidden area.

Combing is effected by the drawing apart of the large and small circles as they revolve. As the angle between them increases the fibres are gradually drawn out between the pins of the two circles and extend as a fringe along the inner edge of the large comb and the outer edge of the small comb. That these outstanding fibres may be presented in proper shape to their respective drawing-off rollers beyond, they are engaged by the stroker, whose action is to "stroke" them forward—point first—toward the nip. The sharp teeth or points of this stroker, in combination with its high speed, constitute a hazard which so far has been difficult to overcome. On certain fine wools "stroking" has been successfully accomplished by air currents, but on medium and low wools the results have not been so satisfactory.

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DRAWING-OFF ROLLERS.

Vertical drawing-off rollers, set in close contact with the edge of the large circle and the outer edge of the small circles, catch the projecting fibres which have already been combed and draw them out of the circle. The rollers are fluted and have a leather cover between them to act as a cushion to prevent the wool from being cut. In attendance upon the comb the operator needs to avoid contact with these rollers, as they are capable of inflicting serious injury to finger or hand that may come within their grip.

Picking off waste from the small circle between the plough and the brush plate is attended by some hazard. It is easy for the finger to be carried forward by the circle pins and wedged tightly against the plate. When this occurs the advancing rows of pins and knives and seriously lacerate the caught members.

Drawing has reference to a series of processes by means of which the combed sliver is extenuated to such a degree as to produce a soft, loose thread, from which yarns can be spun. The proper number of ends is put up against each machine, fed through successive revolving back rollers, and passed between a pair of front rollers which, revolving at a higher speed, attenuate or draw out the sliver.

English drawing for fine wool consists of nine or ten operations. On some of the intermediate processes the shipper handle is in close proximity to the twist belt, near where it passes on to the pulley, as to prove a menace. Extending the stud guard below the shipper handle removes the hazard.

The trains of gears at the ends of the machine are usually guarded. On the finishing boxes the pinion gears which drive the sections of middle and top back rollers along the length of the frame should be enclosed in sheet metal.

At the back of reducing and roving frames the hinged cover guarding the cylinder shaft should extend well below the band and pulleys. Despite instructions to the contrary some women operators will take down their hair and comb it at the back of their machine and instances have been of too frequent occurrence where the operator has been caught and drawn in between spindle band and pulley and the scalp more or less torn.

On speeder frames the compound drive and cone gears should be enclosed, and cleaning and oiling the same done only when the machine is stopped. A careless operator will sometimes stand on the spindle gear cover to reach a roving; this brings the lower part of her apron

against the revolving flyers and not infrequently draws it in. As the shipper rod is right at hand, injury to the person does not always result, but the rule should be enforced against reaching for distant rovings from the front of the machine.

FRENCH DRAWING FRAMES.

The essential difference between the product of English and French drawing is that roving from the latter system contains no twist. Porcupines and rub aprons are features peculiar to the French system. French drawing frames have their moving parts better protected than any other class of machinery in a worsted mill, and in many respects serve as a model in the art of safeguarding. If the rule were uniformly observed, never to clean or pick waste from these machines while in motion, rare indeed would be the instances of the operator receiving injuries in the course of her employment.

The porcupine is a roller studded with fine pins and is inaccessible when its guard cover is in position. Cleaning of this roller should be undertaken only when it is stopped, but too often instructions are disobeyed, guards are removed, and, either with bare fingers or wiping cloths, picking or cleaning is attempted while the machine is in operation. If the hand is drawn in, it becomes wedged between front rolls and porcupine, the pins of which are capable of inflicting such injury as to render necessary amputation of the affected member.

DISOBEDIENCE OF RULES

Waste fibers accumulate on the inside surface of the rub aprons and should be cleaned off only when the machine is at rest. If removal is attempted while the aprons are in action the fingers are liable to be caught and squeezed between the apron and rolls, with contusions or fractures as the outcome.

In well-managed worsted mills with machinery of modern make and with reasonable regard for safety devices and regulations, the number of serious accidents in the regular course of the carding, combing and drawing operations is relatively small, and of those that do occur most are due to the carelessness or disobedience of the injured persons. If the safety rules and regulations in force were faithfully observed by all the employees in these departments serious accidents would seldom occur and the number of minor accidents would be very greatly reduced.

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RECENT APPLICATION OF SAFETY DEVICES TO
TEXTILE MACHINERY AS SEEN FROM THE
MACHINE BUILDERS' VIEWPOINT.

DAVID S. BEYER, VICE PRESIDENT AND CHIEF ENGINEER, LIB
MUTUAL INSURANCE COMPANY, BOSTON, MASS.

Mr. Chairman and Members of the National Safety Council:
While we are not directly connected with the machine building industry, we have been co-operating with the builders of textile machinery for several years in the development of safeguards at a number of the large textile plants which we insure so we have a pretty good opportunity to learn the machine builders' viewpoint.

As a rule, the builders of textile machinery believe in safety devices and are ready to provide them whenever there is a demand for them. One manufacturer of spinning machinery recently said: "I consider automatic interlocking guards absolutely necessary on this equipment." He went on to say that the grade of help furnished in the mills nowadays is not what it used to be and in order to bring the accidents down the safety standards must go up.

At the factory of another large concern manufacturing textile machinery the designers told me that they had standing orders to make the machinery just as safe as possible. The fact that they were carrying out these orders was evident from the nature of their product, which is among the best safe-guarded machinery ever manufactured in any industry today.

Another manufacturer has a specific blank in his order form in which the purchaser is requested to fill out, asking whether certain guards should be included or not. I was told, however, that in most cases the purchaser neither asked for the guards nor stated specifically that they were to be omitted.

The builder of textile machinery is doing the same as every other machine builder, namely, trying to furnish what his customers want. He can do something in the way of exploiting new safety devices but after all the demand must come chiefly from the man who is running the plant. Unless the mill operator realizes the need for safety devices and really wants them on his machinery, the devices will not accomplish their purpose, even though they are provided by the builder.

Sometime ago one of our engineers wanted to look up a new safety device that one of the textile manufacturers had placed on the market and visited a plant where he had been told there was

a half a dozen of these devices in use. He asked to see the machines with the safety equipment, but no one in the plant seemed to know anything about them. After considerable searching the machines were finally located, but the safety devices had been put out of commission. On account of lack of realization of their value the plant lost the high degree of safety which these guards would have furnished to the machine operators if they had been kept in service.

While some textile plants have done considerable mechanical safeguarding it is probably true that there is a bigger mechanical exposure in the textile industry today than in any other industry in the country.

This is due partly to the fact that there are so many machines in textile plants. In the majority of manufacturing industries the number of employes exceeds the number of machines. In textile plants the reverse is true and there may be three or even five or six times as many machines as there are employes. Many of these machines have several unprotected or partially protected gears, and if it is attempted to thoroughly guard all the gears alone in a good-sized textile plant it may necessitate the installation of several thousand guards. The labor and expense involved are naturally rather appalling to the employer.

INSURANCE RATES VERY LOW.

Another thing that has tended to retard the adoption of safeguards in the textile industry is the low rate for insurance against accidents in this industry which prevailed for a time. For example, it was possible two years ago to secure insurance on cotton mills in Massachusetts for 45 cents per hundred dollars of pay roll, or less than one-half per cent of the annual pay roll. This made the accidents seem relatively unimportant from the standpoint of cost to the employer.

This condition has now changed materially and the rate at the present time is practically double the above figure. As the tendency seems to be for the compensation benefits to be extended in one form or another, by each Legislature, the cost of this insurance is likely to keep on increasing from year to year. Every increase in the insurance rate makes the accident problem loom up in importance from the standpoint of the employer and furnishes an additional incentive on his part for the prevention of accidents.

The insurance rates for each industry are determined by the cost of the accidents in that industry and, in the long run, each

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industry must pay its own way. Thus the only effective method by which the textile manufacturer can reduce his insurance cost to eliminate, so far as possible, all preventable accidents. There is a big field for this work is shown by the following statistics for Massachusetts, which is one of the leading textile States.

In 1914 there were 113,000 persons employed in cotton goods manufacture out of 607,000 for all industries, or a little less than 19 per cent of the total. The proportion of accidents contributed by gears in the textile industry, however, was 36.7 per cent. Accidents from belting, hook and fasteners were 31 per cent; broken belts, 30 per cent; shafting, setscrews, couplings, etc., 29.8 per cent; caught between belt and pulley, 27.1 per cent.

A study of thirteen principal industries of Massachusetts, showing lost time per thousand employees due to the mechanical hazards of belting, shafting and gearing, gave the following results:

DAYS LOST TIME FROM INJURY PER 1,000 EMPLOYEES.

<i>Cause—</i>	<i>Thirteen Industries.</i>	<i>Cotton Mills.</i>	<i>Ratio.</i>
Belting	21.7	43.6	2
Shafting	12.4	30.2	2.4
Gearing	21.1	98.2	4.6
Totals	55.2	171.9	3.1

In other words, the mechanical hazard in the textile industry contributed about twice as many accidents, numerically, as the average industry of the State, and caused three times as much lost time as the average of the thirteen principal industries of the State.

One thing that could and should be done is to have all new machinery thoroughly guarded at the time it is installed. It seems too bad to be putting machinery into our plants today in an unguarded condition, when satisfactory guards have been developed and the builders are ready to supply them at no increased cost except only a slight advance.

Gear guards and even belt guards for some machines will be furnished for new equipment without additional charge. One of the best forms of interlocking gear guards for spinning frames, which makes it impossible to open the guard while the machine is running or to start the machine with the guard open, costs only \$10.00 additional on a machine, the total value of which is about \$1,000.00, or only 1 per cent increase. Yet many of these frames are now being installed without this device.

One thing that would help a great deal in furthering the adoption of safeguards for the textile industry is the preparation of definite

safety standards. Such standards would be of assistance to the factory manager, the safety engineer and the machine builder.

At present safety requirements vary for the different States, and different employers in the same State have different ideas as to what should be done. As a result the manufacturer of the machines does not know quite "where he is at" when it comes to the question of providing safeguards.

If there were uniform safety standards so that each manufacturer knew just what was required and would have to bid on the same type of equipment they would all be placed on a fair competitive basis and there would be no opportunity to cut the price by omitting the safeguards.

Uniform safety standards would also be of assistance to the factory manager, who would be able to get the benefit of the experience not alone of his own plant but of other plants in the same industry, and would know that he was securing the best possible equipment based on wide experience and judgement.

WHAT STANDARDS SHOULD COVER.

Briefly summarized it would seem that the standards for new machinery should cover points such as the following:

Complete guarding of all exposed gearing; guards for head end of roving, twisting, spinning, spooling and similar machines to be provided with automatic interlocking guards so arranged that the guard cannot be opened while the machine is running and the machine cannot be started unless the guard is in place.

All machinery to be provided with belt shifters, roving, twisting, spinning, spooling and similar machines to be provided with a belt guard which will protect the point of contact between belt and pulley.

Pickers to be equipped with automatic interlocking guards for beater covers and doors over dirt grids.

Cards to be provided with automatic interlocking device for cylinder doors.

Lap machines to be provided with interlocking guards, which will prevent the operator from coming in contact with inrunning rolls while they are in motion.

Probably the point that stands out most strongly in this entire matter is the fact that real progress depends on the proprietor of the textile plant. When he realizes the need for a complete system of safeguarding, and wants to put it into effect, the machine builders can be depended on to furnish it.

National Safety Council

Public Utilities Sectional Meeting

New York City

Sept. 13, 1917

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The United Gas Improvement Company, Philadelphia, Pa.

H. A. HOLDREGE, Vice Chairman

Omaha Electric Light and Power Company, Omaha, Neb.

F. M. ROSSELAND, Secretary

Chicago Telephone Company, Chicago, Ill.

THE meeting was called to order by Chairman J. B. Douglas at 9:45 o'clock, with approximately eighty delegates in attendance.

ADDRESS BY CHAIRMAN.

Gentlemen: It is a pleasure to be with you this morning and to call to order the third annual meeting of the Public Utilities Section of the National Safety Council, now holding its Sixth Annual Congress.

As many of you know, there was some doubt for a time as to the advisability of holding a Congress this year because of the unprecedented demand occasioned by the war for extra service from every one. I believe our experience here this week and the benefit to be derived will cause all to recognize the wisdom shown by the Executive Committee in deciding to carry on the Congress as usual. The tremendous increase in the general activities of our members

certainly calls for a corresponding increase rather than a lessening of attention to accident prevention.

Since the closing of the 1916 Congress at Detroit ninety new memberships have come to our Section, which is now composed of 215 members from gas, electric, telephone and water works interests. This increase speaks for itself and for the good work of Mr. Paige as Chairman of the Membership Committee.

SECTIONAL BULLETINS.

During the year we have compiled material for fifty-two bulletins and forwarded it to the home office of the Council for publication. Most of the bulletins have been issued. Effort has been made to have each bulletin touch on a technical interest of our members and little if any effort has been made to describe general hazards; these have been largely taken care of by the other Sections.

In addition, our Section has had distributed monthly for the information of its members copies of the leading utilities safety and welfare organs, for which we are indebted to the donors who have been very liberal in their response.

Your Chairman has not had the help from the membership that he had reason to expect in the getting up of bulletins, and as a consequence the material has not come from widely scattered sources. A few members, however, have been generous in providing material. It is hoped that during the coming year each member will send some material, if not more than a photograph, of a hazard and the remedy, with description, to the incoming Chairman. From my experience I can well say that it will be appreciated. What is wanted is general co-operation in this phase of our work, and the Section should not have to depend upon the efforts of several of the members who are always willing to do more than their share for the cause.

I am sure that most of us now feel that the mechanical and electrical hazards incident to the work of our companies, generally speaking, are well taken care of, and that the greatest good will now result from the time devoted to making safety "devices" of the workmen themselves by showing them how to do their work with the least likelihood of accident and instilling in them practical thoughts on safety.

THE AMERICANIZATION MOVEMENT.

The Americanization movement, designed to teach foreigners English and to acquaint them with our ways and customs, when

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taken up generally as it should be by those employing illiterate foreign labor, doubtless will be a big factor in helping to reduce accident experience to the minimum. In some cities the Y. M. C. are already conducting classes in practical English, with results that command the attention of employers.

In this connection I would mention a ruling made by the Pennsylvania Department of Labor and Industry (to become effective next January) requiring that foremen engaged in hazardous work shall be able to speak and understand the language of those with whom they come in contact. While this ruling may be termed progressive I am inclined to doubt as to how it will work out in practice. It does point, however, to the importance of employees being able to speak English and I firmly believe that just as soon as labor conditions will permit progressive employers will give the "Americanization" of their employees the attention it undoubtedly deserves.

The widely scattered territory in which our Sectional offices are located has interfered with holding Sectional meetings during the year. I have, however, been in close touch with our officers through correspondence.

The Sectional Chairmen of the Council being ex-officio members of its Executive Committee, I have attended a number of the meetings during the year and taken part in the deliberations.

Our work throughout the year has appealed particularly to those of our members engaged in the gas and electric industries, and I trust that during the coming year more success will be met in endeavoring to add to our membership list those from the telephone and waterworks fields.

The committee has arranged a promising program and I am sure that we are very fortunate in having Messrs. Naylor, Davidson, Burton and Pearce as our speakers this morning.

I will now call for reports from our Secretary and the Chairmen of our three standing committees.

REPORT OF PROGRAM AND PUBLICITY COMMITTEE

The Secretary thereupon presented the report of the Chairman of the Program and Publicity Committee, Mr. L. C. Smith, Fulton County Gas and Electric Company, Gloversville, N. Y., as follows:

Mr. Chairman and Members of the Public Utilities Section of the National Safety Council: Various attempts have been made by me to secure the co-operation of the publishers of various

and periodicals, especially those pertaining to the gas and electric industry. I am sorry to state that although these publishers expressed themselves as willing to co-operate with the committee in the publishing of various articles pertaining to safety, I was not able to secure material assistance in getting very many of the articles published. The chief reason for this, as they stated, was that the data furnished was duplicate material, that is, it had appeared before in other magazines or bulletins, and the editors prefer to obtain original material. Owing to the press of work I have been unable to get together any original copy.

The only other matter on which I have to report is the preparation of our program. As you are aware, the majority of persons I asked to prepare papers for the convention were kind enough to accept my invitation. The topics were so selected as to evenly distribute the time between gas, electric and telephone subjects. The papers have been submitted to me and appear to be very interesting. They should call forth a lot of valuable discussion.

REPORT OF SAFE PRACTICES COMMITTEE.

The Secretary then presented the report of the Chairman of the Safe Practices Committee, Mr. B. E. Morrow, Consumers Power Company, Jackson, Mich., as follows:

Mr. Chairman and Members of the Public Utilities Section of the National Safety Council: At the request of the Chairman of this Section we have reviewed the National Safety Code, issued by the Bureau of Standards, and, generally speaking, we approve of it. We think that part four of the circular, which pertains to safe practices in the operation of electric equipment and lines, should be adopted as far as is practicable. The circular is very complete and contains rules for the employer as well as for the employee.

Your committee has examined and approved the material used to compile the publication entitled *Safe Practices* issued by the Council. This bulletin has been very favorably received, and, judging from the comments and the number of extra copies that have been ordered by members of the Council, is being used very extensively.

A number of inquiries have been received by your committee from the National Safety Council headquarters at Chicago and from other sources pertaining to the safe handling of electrical equipment and lines. In answering these questions the National Safety Code

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of the Bureau of Standards and the standard operating practice and experience of member companies have been used as a criterion. Among the questions passed upon were "The Use of Rubber Gloves," "The Opening and Tagging of Lines and Circuits," and "The Use of Iron Pins vs. Wooden Ones." Copies of the answers were forwarded to the National Safety Council's headquarters.

PRIMARY HAZARD IN ELECTRICAL INDUSTRY.

A well-known fact, although not always appreciated, is that electric current itself is the primary hazard in the electrical industry and as workers toward greater safety we should concentrate efforts on accidents from this source. We have learned that a large number of serious and sometimes fatal accidents are due to the fact that new employees do not realize that the insulation on voltage conductors must not be touched. I refer particularly to insulated terminals of transformers, oil switches, entrance bushings and, in some cases, high-tension bus work.

The public, and especially children, should be instructed through the newspapers and school authorities not to interfere with electrical equipment and lines. Boys have been killed by climbing poles and birds' nests and children flying kites with wires attached have been injured by the wire coming in contact with the electric lines. These are facts that have been called to the attention of your committee and I feel that they are important and should be mentioned in this report.

REPORT OF MEMBERSHIP COMMITTEE.

Chairman Douglas thereupon called for the report of the Membership Committee, which was presented by the Chairman, Mr. C. Paige, Malden & Melrose Gas Light Company, Malden, Mass., as follows:

Mr. Chairman and Members of the Public Utilities Section of the National Safety Council: Since the last Congress the Public Utilities Section of the National Safety Council shows an increase in membership of 72 per cent. So much interest has been awakened in safety work all over the country that there should be little trouble in carrying on this work with even greater success.

The results of the work of committees in previous years 1

mittee for this Section secured names of Public Utilities from the directory of gas company officials (Gas Publishing Company, Chicago) and from the "McGraw Central Station List." The companies on these lists received from us a circular letter, a letter-folder and a sample set of bulletins. During this year we have followed up with gratifying results the prospects thus secured. This has been done by general letters, special letters and pictorial bulletins.

MEMBERSHIP CAMPAIGN.

One method which worked very well was that tried at the convention of the New England Association of Gas Engineers at Boston, last February. Permission was secured from the President of the Association to address the convention. A brief talk was given on the scope and purpose of the National Safety Council and particularly of the Public Utilities Section, and our bulletins were displayed. As a result some memberships were secured and all of the companies represented had brought home to them the value and possibilities of our service.

We mounted sample bulletins on heavy green cardboard and posted them in lobbies of hotels where conventions were being held. It is noteworthy that the "horrible" pictures seemed to draw the most attention. The statistical bulletins have value and illustrations of prevention possibilities attract attention but real impressions were made by the bulletins which show the *results* of accidents.

The committee wishes to express its appreciation of the co-operation and assistance furnished us by the Chicago office of the Council. Without this nothing like the results we are pleased to report could have been possible.

APPOINTMENT OF NOMINATING COMMITTEE.

CHAIRMAN DOUGLAS: Before proceeding further with the program I wish to appoint as a Nominating Committee Messrs. H. J. Burton, Wills MacLachlan and H. C. Lucas. I would request that the committee report their selections as soon as their duty is completed.

The first paper on our program is "Safety Practices in Telephone Work" by Mr. John F. Naylor of the New York Telephone Company.

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SAFETY PRACTICES IN TELEPHONE WORK.

JOHN F. NAYLON, DIVISION EQUIPMENT SUPERINTENDENT,
YORK TELEPHONE COMPANY, NEW YORK CITY.

Mr. Chairman and Members of the National Safety Council:
The prevention of accidents in the telephone field, as in other fields, can be brought about only by the closest co-operation between the company and the employees. Both the company and the employees have a definite part to perform and if either fails to do that the best results cannot be obtained.

In general, it is the company's part in the problem to provide a safe plant, good working conditions, proper tools, material and equipment and to educate employees to be thoughtful and careful in the conduct of their work. It is the part of the employees to perform their work in a thoughtful, careful manner, to take no chances and to observe the company's rules.

Long before the operating companies undertook any Safety Campaign, they realized that there was room for improvement outside plant conditions. The first real step in that direction was taken about twelve years ago, when it was decided that proper climbing space must be provided between pole pins on crossarm poles jointly occupied by the telephone and electric light companies. It was soon found that this was only a step in the right direction and a short time later the present practice of having electric light companies occupy the top position on all jointly used poles started.

The work of reversing construction is practically complete. The danger of telephone employees coming in contact with electric light wires has been reduced to a minimum, with a consequent reduction in the number of accidents.

The design of material, tools and equipment has been given a great deal of consideration, so that the number of accidents resulting from defective material and tools is negligible.

EDUCATING EMPLOYEES.

The problem, therefore, is largely one of educating employees to be thoughtful and careful of their safety. This is particularly true of employees engaged in line work, which branch of the work naturally carries with it a greater element of danger. It is true to a lesser degree of employees engaged in installation and maintenance work.

The educational work to which reference has been made, is being conducted in accordance with the following general plan:

(1) The organization of accident prevention committees, whose duties are to investigate all serious accidents, pass upon safety suggestions, make recommendations to improve conditions that might cause accidents, provide the subject matter for illustrated and other bulletins and such other duties as may be pertinent to the subject of accident prevention.

(2) The distribution of bulletins, some illustrated, describing serious accidents that have occurred, the circumstances that led up to them and how they could have been avoided. It is the practice to place bulletin boards in conspicuous places where men congregate in more or less large numbers, such as storerooms and terminal rooms.

There are, however, a great many men employed in telephone work who seldom or never have occasion to visit a storeroom or terminal room where they would have an opportunity to see and read bulletins.

For instance, the employes of some construction gangs, with the exception of the foreman, may not have occasion to visit a storeroom or terminal room for several months. It is of particular importance that these men have an opportunity to see accident prevention bulletins. Provision is made, therefore, so that each foreman receives a copy of the bulletins as they are published and he is required upon the receipt of a new bulletin or bulletins to gather his men around him at some proper time, preferably during the noon hour; read the bulletin, discuss it, and, if it happens to be a bulletin which has to do with his particular branch of the work, he is expected to go into it with his men in a great deal of detail and plan how to avoid a similar accident in his force.

PLACING OF BULLETIN BOARDS.

There is one point in connection with bulletin boards that should be borne in mind and that is to see that they are placed in as conspicuous a place as possible and that they are properly lighted.

I recently had occasion to visit a plant where I noticed several bulletin boards that were very poorly located. In one case a board had been placed in a position where it was hidden by an open door a greater part of the time. Unless the bulletin boards are so placed that the men can read the bulletins without stepping up closely to them a great deal of the good effect of the bulletin is lost.

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(3) A rigid periodical inspection of tools and the weeding tools that have become defective. In companies where all tools are furnished by the company, it is a comparatively simple matter to keep defective tools out of the plant. It is, of course, more difficult in companies where the men furnish their own tools. In this case there is often a considerable difference in opinion between the company and the men as to when a tool is defective.

(4) The periodical inspection of poles unquestionably results in preventing a great many serious accidents. While no figures are available at this moment it is probable that, if figures were available, that they would show that the number of accidents resulting from broken poles is very much larger among companies that do not make a periodical inspection than among companies that make regular inspections.

(5) Periodical illustrated talks have been found to be a very effective means of reaching the men most subject to injury. It is possible, specialized talks should be given at frequent intervals to men employed in the various branches of the work. Employees are usually more interested in something that applies to their particular branch of work than they are in something that is general in character. Talks of a general nature, however, have their advantages.

In building up illustrated accident-prevention talks there are several things that should be kept in mind, if the greatest benefit is to be derived from them.

Care should be used not to have the pictures overdrawn or too fetched. Pictures may be reproductions of accidents that have actually happened in the plant, reproductions of conditions that have nearly caused accidents, or of dangerous conditions that have been caught on the job during the regular progress of the work. The pictures should never be given by a person who is not thoroughly familiar with telephone work or who is unable to talk the language of the men he is addressing. This is particularly important, because in giving talks over the heads of the employees much of the effect is lost.

(6) A very effective means of reaching men in the field is to have informal talks, given at regular intervals by a Supervisor or department head, and so conducted that every man present will feel himself at home and loosen up and talk.

(7) We depend a great deal in our accident-prevention work on suggestions and recommendations made by the men in the field covering conditions that might cause an accident. If this phase

the work is properly conducted it will help a great deal toward the solution of our problem.

(8) Properly equipped safety first aid kits should be furnished so that they will be available for use by all the employes. In order to make certain that the contents of the kits are properly used all employes should be trained in their use.

WHAT IS CARELESSNESS?

I wish to bring before you at this time a matter that in my opinion should be considered and discussed, not only in the telephone field, but in other fields of work. I believe we are treading on more or less dangerous ground when we attribute nearly all preventable accidents to carelessness. Employes are very likely to resent being called careless, especially if there is any doubt about it. When resentment is aroused there will undoubtedly be difficulty in restoring employes to a receptive frame of mind.

It is the thought that all so-called avoidable accidents are due to one of the following three causes, namely: thoughtlessness, carelessness or recklessness. If then, thoughtlessness, carelessness and recklessness are such prominent factors in causing accidents we should know the meaning of these terms. Since thoughtlessness, carelessness and recklessness mean, without thought, without care and without reck, we shall first determine the meaning of these three terms. In the following are authentic definitions.

Thought—The act, process or power of thinking and the word think means to review in mind, examine mentally, consider.

Care—The state of being mentally oppressed as by anxiety or concern for some matter of interest or importance, often implying concern for safety. Care signifies watchful attention in view of possible harm.

Reck—To have a care or thought for; taking into consideration; heed.

Working upon these definitions as a basis, we define *thoughtless* as being without the act, process or power of thinking, without reviewing in mind, without examining mentally, and without considering.

Careless—As without the state of being mentally oppressed as by anxiety or concern for some matter of interest or importance; often implying concern for safety, without watchful attention in view of possible harm.

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Reckless—As destitute of heed or concern for consequence; foolishly heedless of danger; headlong, rash, desperate.

From the standpoint of our problem and for the purpose of brevity we may select the following definitions:

Thoughtless—Manifesting lack of thought, without indulgence in the process of thinking.

Careless—Without watchful attention in view of possible consequences; lighthearted.

Reckless—Foolishly heedless of danger.

From these definitions it would seem that the reckless man is one who without exercising watchful attention in view of possible harm and without any mental action; that is, without any thought or care on his part, is fully aware of danger, and, being thus aware of it, acts in a manner which indicates that he is foolishly heedless thereof.

The careless man on the other hand, occupies a position in which he has a view of possible harm, but the harm or danger is only possible and is by no means certain. Being placed in this position the careless man does not exercise watchful attention to the end that the harm or danger may be avoided, but he acts indifferently. Now this indifference is a failure to exercise the watchful attention which we would have him exercise signifies something quite different from what we mean by thoughtfulness; it signifies that we would have him place himself in the state of being more or less oppressed by concern for the safety of himself and his co-workers. This man, therefore, would be doing nothing more than exercising watchful attention for the safety of himself and others and would be exercising the power of thinking.

WHAT IS THOUGHTFULNESS.

This distinction can be made more clear by the description of what we mean by thoughtfulness. A thoughtful man is he who exercises the power of thinking. A man may be heedful of danger and may be careful to a degree, and yet be absolutely thoughtless. To think, a man must have the power of perception and conception and must exercise that power. By perception we mean the power of following lines of thought which are presented to the mind, and by conception the power of holding in mind the finished mental picture or idea resulting from perception.

To emphasize the distinction between the meanings of these terms we will cite a concrete illustration of extreme cases of carelessness, carelessness and thoughtlessness.

Imagine a freight car of the platform type standing on a siding, loaded high with telephone poles which are retained in position by strong stakes inserted along both sides of the car and fastened across the top by strong wire stays to prevent them from spreading. Now imagine that the stakes along one side have been removed, but, that by chance the poles have become wedged together so that none of them roll off on the side where the stakes were removed. Apparently the poles lie there motionless, yet there may be going on an imperceptible slipping between the poles which at any instant may result in the poles starting to roll and crashing to the ground. Now, under these circumstances, picture a fellow worker, who is fully aware of the conditions, walking on the ground along the side of the car from which the stakes have been removed and thus exposing himself to danger for an unimportant purpose and you have the picture of a reckless act.

A gang of linemen are erecting a fifty-foot pole along a street in a densely populated tenement section. As the operation of hoisting the pole is in progress a large number of small children are attracted to the scene and occupy various positions which would prove fatal to a number of them if any part of the hoisting tackle were to break. Now picture to yourself that the foreman and gang in charge of this operation proceed with the work without compelling the children to remove to positions of safety; that they go on with the work light-heartedly and with indifference to the possible harm which may befall the children, and you have the picture of a careless set.

Again, let us assume that this same operation is in progress, with this distinction, the foreman and his men have exercised the greatest care by compelling all persons in the immediate location to occupy positions of safety and are themselves occupying safe positions as far as it is possible to do so and continue with the work. They are all deeply oppressed with the concern lest possible harm should befall them. It so happens, however, that in the harness of the team that furnished the hoisting power there is a somewhat concealed, but very serious defect. A mental inventory of the elements of danger in connection with the operation would lead to the inspection of the harness, but to make a mental inventory would be to think. In this case, however, the gang while being extremely careful does not make a mental review of the elements of danger, and, therefore, does not become aware of the fact that danger is lurking treacherously near. Picture this condition and you have the picture of a thoughtless act.

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CO-OPERATION OF EMPLOYER AND EMPLOYEE.

From the foregoing it would appear that it is wrong to jump to the conclusion that the majority of avoidable accidents are caused by carelessness. It would also appear that in the progress of educational work we should keep in mind the fact that we have factors of thoughtlessness, carelessness and recklessness to consider.

The question of penalizing the thoughtless, careless or reckless man who is not injured as a result of thoughtlessness, carelessness or recklessness is one that should be given serious consideration.

Care should be used, however, in the event of any action taken, to make the punishment fit the crime.

After all is said and done, the prevention of accidents in the telephone field as in other fields can be brought about only by closest co-operation between the company and the employees.

DISCUSSION.

A general discussion of Mr. Naylor's paper was opened by F. M. Rosseland of the Chicago Telephone Company, who, after commenting on the completeness with which Mr. Naylor covered his subject, concurred in his conclusion as to the use of the word "carelessness" in accident-prevention work. He asked the question as to whether or not bulletins and other publications alone are valuable in reducing accidents as occasional workmen's meetings supplemented by bulletins.

Mr. G. K. Selden, Chairman Safety First Committee South Bell Telephone & Telegraph Company, Atlanta, Ga., discussed the percentage of accidents directly caused by thoughtlessness and asked for information as to the best way to reach the men, stating that he personally felt it was largely a local matter. He also asked for a greater degree of co-operation in safety work between the electric light companies and the telephone companies.

Mr. Dobbin, Empire Gas and Electric Company, Geneva, N. Y., heartily approved dropping the word "carelessness" when talking to men and suggested that when a public utilities company holds safety meetings for its employees that employees of other public utilities companies in the locality should be invited.

Mr. H. J. Burton of Jackson, Mich., inquired whether poles are stepped to the ground.

Mr. G. K. Selden of Atlanta, Ga., stated that in general where

or no trouble in regard to the stepping of poles. He believed, however, that the stepping of telephone poles to the ground did not make any difference.

Mr. John Bailey, Superintendent of Safety, Bell Telephone Company of Pennsylvania, of Philadelphia, also inquired about the stepping of poles, stating that if the poles were not so stepped telephone men were considerably inconvenienced.

Mr. H. C. Lucas of the Philadelphia Electric Company, Philadelphia, Pa., asked whether removable pole steps and sockets were not used.

Mr. Bailey of Philadelphia said they were not generally used as boys filled the sockets so they are not usable, and also because men would use anything that might be handy for steps in place of the removable pole steps provided.

Mr. Lucas of Philadelphia observed that stepping poles to the ground provided an "attractive hazard."

Mr. Preston of Long Branch, N. Y., suggested placing the pole steps so far apart that children could not use them.

Mr. Lucas of Philadelphia suggested that the danger be eliminated by not using pole steps near the ground and by furnishing the men a short light ladder in place of the pole steps. In some classes of work the Philadelphia Electric Company uses adjustable platform wagons and in every case have instructed their lamp trimmers to use ladders if the lamp can be lowered to the ground. The men are instructed to place the ladder flat on the ground and stand on it and in this manner avoiding shocks.

Mr. Harmer of the Philadelphia Electric Company, Philadelphia, Pa., at the suggestion of Chairman Douglas, told of a bag which they had designed for use in raising and lowering tools and material. With this company it is against the rules to raise or lower tools tied to a rope. The bag must be used.

Mr. Fisher of the Rochester Railway and Light Company, Rochester, N. Y., advocated the use of advertising space in the newspapers to warn boys and others of the danger of climbing poles and steel towers carrying high-tension lines.

Mr. Wills Maclachlan of Toronto stated that he had observed that the men were afraid to talk in joint meetings of the utility companies and that discussion was very much reduced.

Mr. Dobbin, of Geneva, N. Y., stated that such had not been the experience of his company; that they had a Knockers' Club which brought out points in a friendly way.

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Mr. C. E. Paige of Malden, Mass., in referring to Mr. N. paper, said that the distribution of safety bulletins by the fore the men was a new and attractive suggestion. He further be that each company should get out safety bulletins to suppleme National Safety Council bulletins. He said further that grea should be taken not to issue bulletins direct to the men that only go to managers and superintendents. He also referred practice of furnishing tools to men. "Men are only as good as tools," he said, but that often the men do not appreciate the va the tools if they are furnished without charge. Tool kits sho inspected by special men to insure that tools were in first-class dition. His company provided first aid kits but found it wa sufficient to provide kits; they must also be inspected at re intervals by special men.

Referring to the report of the Chairman of the Program Publicity Committee, he suggested that the publication of ar on safety in the various journals might be secured if they offered for publication simultaneously and in this way the obje to publishing articles which have already appeared in other jou would be overcome.

REPORT OF NOMINATING COMMITTEE.

CHAIRMAN DOUGLAS: Gentlemen, I regret to state that we now close our discussion on this subject and pass to the next pa I see that the Nominating Committee has completed its work and will now hear their report.

MR. H. C. LUCAS (Chairman, Nominating Committee): In half of the Nominating Committee, permit me to present the foli ing names as officers for the coming year:

Chairman, C. B. Scott, Bureau of Safety, Chicago, Ill.

Vice Chairman, C. E. Paige, Malden and Melrose Gas L Company, Malden, Mass.

Secretary, H. B. Harmer, Philadelphia Electric Company, F adelphia, Pa.

Chairman of the Membership Committee, E. L. Davies, Quee borough Gas and Electric Company, Far Rockaway, N. Y.

Chairman of the Safe Practices Committee, F. W. Fisher, Ro ester Railway and Light Company, Rochester, N. Y.

Chairman of the Program and Publicity Committee John

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out and properly run safety organization as much, if not more than the careful guarding of machines and the installation of safety devices at the works and in the field.

Previous papers on my subject have carefully tabulated causes of accidents in the gas industry from a large amount of widely secured data. I simply wish to add a word to these figures.

My investigation shows that in a company sending out 400,000 feet of gas a year, of the forty-two accidents occurring from Jan. 1, 1915, to Aug. 1, 1917, thirty-four, or 81 per cent, were directly due to the employees' gross carelessness—which tends to show the value of education to the employees. This can only be carried on by the constant watchfulness of the foreman or superintendent, aided by a well-organized safety organization.

ORGANIZING FOR SAFETY.

I shall, therefore, say a few words on safety organization before bringing up the most dangerous points found in gas plants and under working conditions in the street and shop, although I fully realize that this side of the subject has been quite fully described and discussed in previous meetings.

The safety organization of the company with which I am connected, and which we can highly recommend, is, with a few exceptions, of the familiar type approved by the National Safety Council, and I believe it is applicable to almost any size gas company. It consists of a Central Safety Committee, made up of the operating officials of the company. The committee has a chairman and secretary and careful minutes are kept of its proceedings at meetings.

To this committee report a Committee of Safety and Sanitation consisting of three employees, which is active for three months—new one being appointed at the end of that time—generally with its chairman appointed from the previous committee. These members when appointed, are given a handsome safety button with the company's name inscribed as a reward of their appointment.

The company does not employ a safety inspector, as is done by many companies—this changing committee taking an inspector's place. I consider this a better plan, as in this way a total of twelve men inspect the properties every year, and many good safety measures are available in every company if they are selected for their carefulness and common sense. We do, however, appoint a fire inspector, as fire apparatus, such as extinguishers, etc., needs more constant attention.

COMMITTEES REPORT IN WRITING.

It is the duty of this committee to make an inspection of all the company's properties during its term, and to make a written report. This report is gone over carefully by the Central Committee, and a joint meeting of the two is then held and the various suggestions discussed and passed on and a list of the approved items sent to the various department heads to be executed. The succeeding committee is provided with a copy of this report so that they will not list again suggestions already made.

Another very important duty of this committee is to investigate all important accidents occurring in the company, and to make a report, in writing, with a recommendation for preventing a recurrence. Such reports are posted. These investigations are ordered by the Central Committee. We have found this particularly valuable, as the employes know that if they are the cause of an accident attention is directed toward them. We have also been surprised to find that the employe takes the committee's criticism in better spirit than he does that coming from an official.

A good example of a report is an accident which occurred a few years ago, when a derrick, which was lowering a sixteen-inch cast iron pipe into a street trench, slipped, dropping the pipe a few inches and badly crushing an employe's foot. Immediate investigation by the Safety Committee showed that there were no spikes on the feet of the derrick, which caused its slipping. Recommendation that same be installed was made, approved and complied with, the result being that we have not had a similar accident since. This accident was due to lack of safeguard on company's part.

A CARELESS MAN.

A report of an accident of another type follows, the bulletin being quoted: "On Aug. 18, 1915, at 1 p. m., William Smith, gas-fitter, answered a complaint of 'no gas' at No. 7 Boulevard, Rock-away Beach.

"The meter was located under the first floor, which is about four feet above the ground. This space was piled high with lumber and odd materials. Smith crawled in the enclosure and with difficulty finally reached the meter. As it was dark, *he lighted a candle, which he carried with him, as his electric torch was broken. He had not reported this to the office, but had, instead, purchased the candle.*

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"He placed the lighted candle about eight feet from the r on some lumber, within a few inches of the under side of the : and then proceeded to remove the plug and clear the service.

"Before he could put the plug back the gas had completely the enclosure (particularly the upper part of it), was ignited the lighted candle, and the explosion which followed badly burned Smith and set the lumber on fire, which, in turn, set the entire building in flames.

"It is hardly believable that a man in our employ should so forget his rules as to use a lighted candle or other open flame in the presence of live gas.

"The employe, Smith, was discharged.

"*'We do not want careless men in our employ.'*"

BULLETIN BOARDS.

These committee accident reports are posted on bulletin boards provided for this purpose and for the posting of other company bulletins and the National Safety Council Bulletins. Where an accident is caused by such gross carelessness as to warrant dismissal of the employe, this is noted, followed by the slogan "*We do not want careless men in our employ.*" The bulletin boards are located conspicuously at all the properties, including our show rooms, the latter being headed with the following placard: "It is the company's constant endeavor to protect and safeguard our employes from accidents and sickness. We respectfully ask the interest and co-operation of our customers."

It is surprising to see the interest manifested by the public in our safety campaign, which is largely attained by these public bulletin boards. Announcements of safety meetings are posted on the boards, and at most of these meetings fully 25 per cent of the audience are persons in no way connected with the company, thus showing the public interest.

The Safety Committee also has charge of the monthly meetings of employes and their families, which are held in the company auditorium in the evening, at which time motion pictures are shown. A few comedy films are given between the safety and education films. During the evening a talk of about ten minutes is given on "Safety," bringing out in particular descriptions of any accidents occurring since the previous meeting, and a discussion of the lessons to be learned from them is held. The evening's program closes with

SAFETY MEETINGS.

These meetings serve the double purpose of keeping the employees interested in safety work, and of getting their families to think and talk safety in their homes, which we consider most important.

During the short talk, pictures with placards, such as the following, are thrown on the screen. A picture of woman and child, with placard:

"IF YOU ARE INJURED, WE ARE THE ONES
WHO SUFFER."

We also hold other safety meetings once a month in the afternoon, on the company's time, at the gas works or storerooms, which all employees other than office men attend. They consist of demonstrations by employees, picked at random, of first aid to those overcome by gas, demonstrations of mechanical respirators, and the use of the "first aid jar." Such meetings are usually attended by the company's physician, who, by the way, examines all men before they are employed.

This covers the duties of the Safety Committee, and describes, in a general way, our safety campaign and organization, but I wish to mention a prize offered by the Central Committee every month, which we believe has greatly stimulated interest in safety work. A \$10 goldpiece is awarded the employee who, in the opinion of the Central Committee, composes the best essay on "Safety Work," a different phase being selected as the topic each month. At the end of the year the winners of the monthly prizes compete for a prize of \$25. We believe that this tends to keep the safety idea constantly before the employees, and also interests the families, as they discuss their essays at home.

I do not think a great number of signs posted conspicuously around a company's properties do much good, except when first put up or when the employee first sees them. I would have only a few, but have these very carefully selected. Examples of ones we consider particularly valuable are:

NOTICE TO MEN SEEKING EMPLOYMENT.

Unless you are willing to be careful to avoid injury to yourself and fellow workmen, do not ask for employment. We do not want careless men in our employ.

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and another—

OUR EMPLOYEES.

Are forbidden to cross the tracks or trespass on the property of the Long Island Railroad Company. Use regular crossings.

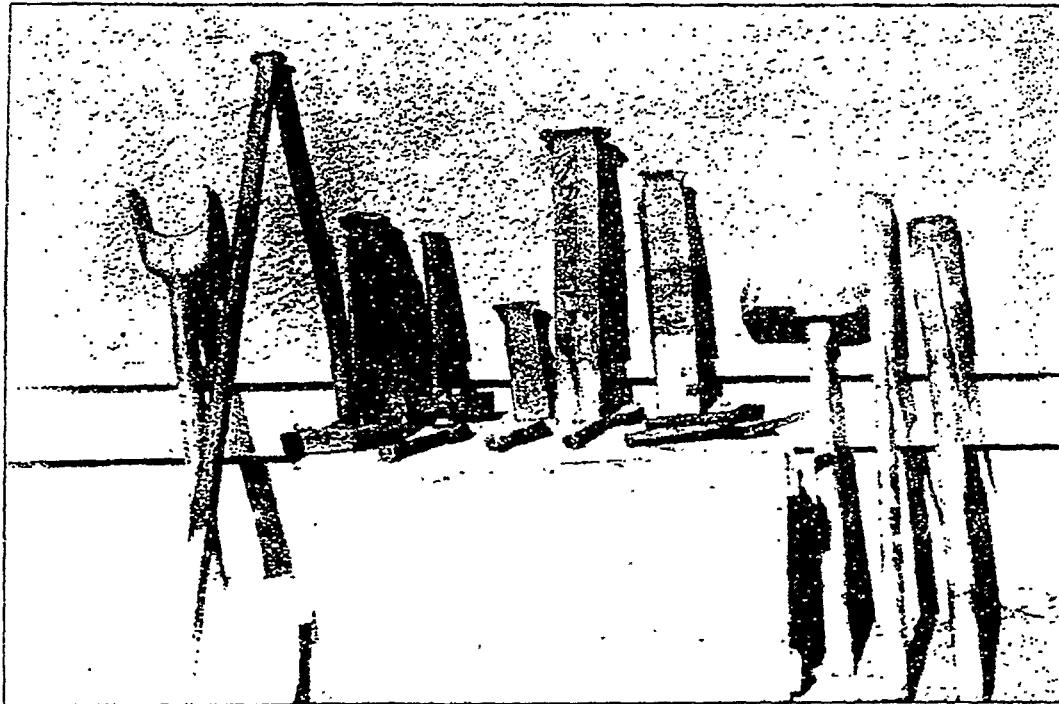
Any violations of this rule will be deemed a wilful intention on the part of an employe to bring about injury or death to himself, under the Workmen's Compensation Act. Any employe who violates this rule will be discharged.



DEEP BURN INFLICTED BY IMPROPER AND TOO FREE USE OF IODINE
UNDER A TIGHT BANDAGE.

These signs, which are very large and conspicuously placed at our gates and crossings, are, with two or three others, the only ones we use.

I wish to emphasize the importance of instructing a man in safety when he is employed. We consider it time and money well spent to have the new employe go over the bulletins of the previous year, which are kept on file for that purpose, and also to study



EXAMPLES OF DANGEROUS TOOLS.

carefully the company's rules. These are in printed form, each employe receiving one, and he is required to sign a slip, stating he is thoroughly familiar with them. Gross carelessness and repeated violation of these rules should always be followed by dismissal.

Every employe, except common laborers, should have simple instructions in the use of the "first aid jar," which should be placed at all properties and on all company's wagons and trucks. Improper use of this jar may result seriously. It is of the utmost importance that these jars be properly maintained and kept clean at all times,

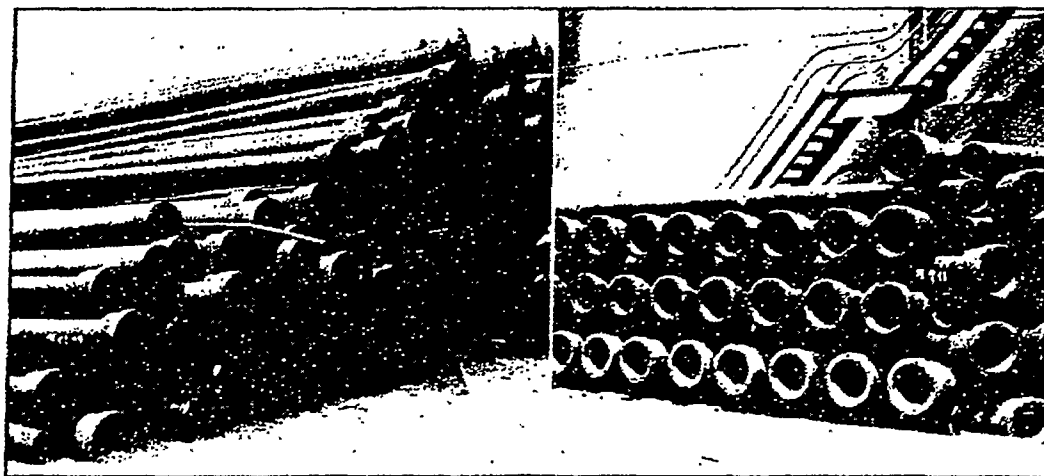
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which can only be done through the constant inspection of foreman.

Most workmen, when employed, have a fair idea of the proper use of tools, but difficulty is found in having dangerous



THE NAIL SHOWN RAN ITS FULL LENGTH INTO EMPLOYEE'S FOOT



INCORRECT WAY

CORRECT WAY

reported. This item, and the use of goggles, are constantly being called to our attention by the Council bulletins.

Proper lighting is a matter to be closely followed, both in the works and shop, and also on consumers' premises. Instruct your men that under no conditions are they to work where the light is poor.

Poor housekeeping on company's properties and in consumers

construction work is being carried on. A large percentage of our accidents have been of men stepping on nails in boards left carelessly around.

Many accidents result from the careless piling of material, particularly pipe, in the works and street departments. It costs slightly more, but we think it pays, to pile it in tiers, alternate layers being at right angles, and alternate pipe lengths having bells and spigots at opposite ends. Piles should never be higher than five feet.

GAS WORKS HAZARDS.

Most of the dangers and points to be watched carefully in gas works have been noted in previous papers, so I am referring again to the more important of these and am listing, in addition, the more unnoticed hazards which, nevertheless, may be the causes of serious accidents.

LEFT-HANDED VALVES.

Left-handed gas valves (valves opening clockwise) should not be purchased or installed in a work's yard connections, and where they do exist they should be removed. If this is not practical they should be tagged and a notation made on the yard connection plans. They are particularly undesirable in purifier connections, mixed up with right-handed valves. The writer knows of a case of a man being killed with gas in a purifier box because a left-handed valve, which was in the connections with right-handed valves, was thought to be closed, but in reality was open. When the exhauster was started the men in the box were overcome. I also saw one installed with a water gas set in the last six months. The company is having it removed and a right-handed valve put in.

COAL BUGGIES.

In many water gas generator houses the buggies for coaling the generator are run up to it on rails. After a "coal-up" they are generally filled again, pushed from under the hopper and stand on the rails, waiting to be used. A "dog," or derailler, should be provided on the rail between the charging door and the buggy, which should be removed only when the generator lid is off. Or the rails should decline sharply away from the lid. Both of these methods are to prevent the coal buggy from running down and striking the T-bar on the coaling lid and knocking the lid off. The writer knows of a case of this kind happening during a "run," but fortunately no

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one was burned, the gasmaker being able to reach the steam manifolds and turn them off. Where rails are not used, coal manipulation of the coal buggy results in it often striking the catch which locks the cutter bar on the coaling lid. This weakens the catch and may finally break it and the lid may come off.

In taking the lid off the generator, first crack it and see that the lights are lighted, and I would call attention to the proper method of opening fire and ash doors on a generator. Unscrew the T-bar, leaving the cutter bar in place. This will allow the door to crack an inch or so, and should any explosion take place, the door would not be blown around on its hinges and strike someone—a thing which the writer saw a number of years ago.

On some designs of water gas generators the cutter bar is horizontal and the catch, if accidentally struck by a tool or bar, in the hands of a man passing, can be easily knocked off and the door opened. A small hole drilled through the catch and bar, and a small bolt on a chain, dropped in it, will prevent such an accident occurring.

Before starting up a water gas set that has been shut down some time, the "down steam" should be turned on and the line drained. If this is not done, and the "reverse" connections are turned on, closing the top hot valve, and then this water of condensation is thrown on the fire, considerable pressure is suddenly developed, this has been known to crack the generator head, although I have never heard of any personal injury resulting.

CLEANING FIRES.

The greatest hazard in the generator house is in cleaning the fire, especially in barring it down from the operating floor. This work, which is usually done by the common laborers around the work, should be carefully superintended and watched by the gasmaker. The writer once saw a man pulled down with the bar after it had slipped through the fire, and fall across the coaling branch. He was very badly burned. When sledging bar, have it held with tongs.

Gauges on sets should be watched carefully for stoppages, as it is dangerous to operate set with these out of use.

Glasses should always be kept in sight cocks and should not be cracked. Put this down as an item in your inspection when starting up a machine and see that in horizontal sight cocks the rim holds.

the sight of an eye by looking through a sight cock which had a piece of broken glass in it.

TRIPPING HAZARDS.

Tripping over tools in the generator and boiler-rooms has been mentioned very often, but is of such importance that I wish to call attention to it again. Racks should be provided for these tools and they should be kept in them when not in use. A good laborer in the cleaning gang can be made responsible for this and the gasmaker can see that he attends to it. We also refer to a portable tool rack, mentioned in the 1916 meeting, which we think might be used to advantage in many plants.

Never allow open-flame lamps of any kind to be brought or kept in the works, and provide a generous supply of electric flash lights and keep a supply of batteries at all times. A works should be thoroughly piped for gas lighting, but it should not be used unless the electric service is interrupted. In the exhauster and purifier rooms vapor proof bulbs should be used, and the switch for turning them on should be outside of building.

In both coal and water gas works there are generally quite a number of galleries or balconies, from which tools, coal or other material may drop. The use of toe boards and the covering up of any holes will largely prevent this, but the men should be taught *to pick up their tools after completing a job.*

The writer once found an empty milk bottle, apparently used for drinking water, laying on its side on the outside sheet of the crown of a 2,000-M. holder, and in a short time it would undoubtedly have rolled off to the ground.

With the installation of every water gas machine should go a set of directions. These should be framed and hung on the operating floor and carefully followed, especially the directions for emptying the wash box when cleaning is necessary.

Blast-main explosions are usually the result of carelessness in operating the "set," as leaking blast valves are easily detected if the vent from the main is kept clear and is properly located for the gasmaker's view. Many explosion heads in a main are desirable, and these should be guarded to catch flying pieces.

PURIFIER BOXES.

Purifier boxes should be opened as long as possible before changing oxide or other purifier material, and great care should be given

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to valves. I would never allow any one but the foreman to intend the turning on or off of a box. In two-layer boxes, are on the ground level, remove the upper layer of oxide by opening the lower doors, to prevent it from catching on fire. does not apply where boxes are elevated and have dumps from bottom. Make it a rule that men are to leave all smoking articles in their lockers before going to work in or around an open box.



FROZEN GENERATOR FUEL.

Frozen coal is another source of danger, as men unconsciously undermine large quantities, only to have it suddenly give way and fall on them. This is particularly true of broken anthracite coal used in generators.

Additional hazards in the coal gas plant are generally found in the retort house, where tiers of balconies and many floor or bench openings increase the danger.

Many accidents have occurred by the charging and discharging machinery catching men unawares. A complete and thoroughly understood signal system should prevent accidents of this type.

The liability of the

high in the retort house, as are also the chances of men being burned from hot coke and from steam and when wetting coke down.

DANGERS FROM FIRE.

Most gas works are on or near railroad tracks, or at least have railroad sidings, and for this reason the chance of gas oil tanks catching fire from locomotives is very high unless proper precautions are taken. See that all openings in tanks are securely covered and from the top of each tank have an inverted vent with fine gauze over the opening.

These same railroad sidings often result in improper trespassing by company's employees, resulting in accidents, and besides warning all works men and having rules on the subject, large "*No trespassing*" signs should be conspicuously posted. Signs should state that violation will result in dismissal.

As the hazards found in boiler and engine rooms are those found in almost every plant generating steam and having machinery, and are, therefore, not characteristic of the gas business, I shall not take the time to go into them.

SHOP AND STREET HAZARDS.

In this department we have the combined liability of accidents to our employees and to the public.

Accidents to one are often caused by the carelessness or lack of safeguards on the part of the other. Improperly operated automobiles, standing horses not tied, resulting in runaways, and work improperly done or guarded, may result in injury to the public, and can be charged to the employee's carelessness. Poor housekeeping and lighting on the premises of our customers may cause injury to our men, while gross carelessness and often curiosity regarding our work, by the public, cause accidents to themselves.

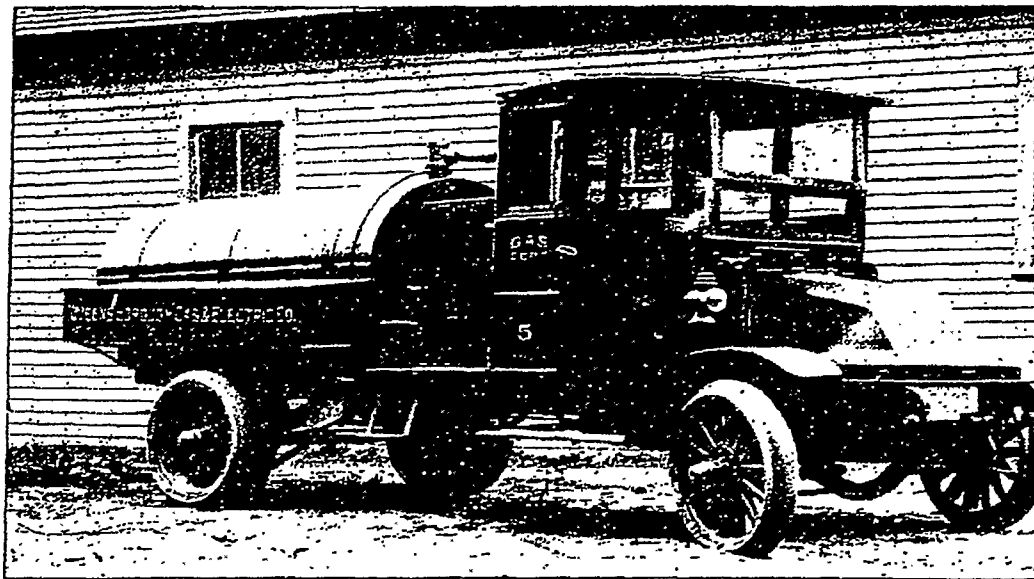
MOTORS AND TRUCKS.

In a company operating motor cars and wagons, as most companies do, the liability is very high, and it is of the greatest importance that this work be carefully followed. See that the rolling stock leaves the garage or stable in proper shape, the wagons being provided with horns, tie weights for the horses, etc.; the cars having tire chains, good brakes and horns and being in good mechanical order. The rules of the road and company's rules on

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driving should be drawn up in pamphlet form and given to driver and he should be occasionally quizzed on them.

In the shops, storerooms and holder stations accident prevention is largely up to the man in charge of the property, be of the importance of good housekeeping. Safeguarding with ladders and toe boards and proper care given tools, is not enough to prevent accidents, and they are bound to occur, particularly



MOTOR DRIP TRUCK.

outlying properties, if the man in charge is not an enthusiastic safety booster and if he does not pay particular attention to good housekeeping.

EVEN PRESSURE IN MAINS.

Great care should be given the maintenance of even pressure in mains, and it should never be allowed to drop below a minimum. This is especially true where a company has district governors feeding from the high-pressure system into the low pressure, and where the irregularity of one governor may cause a drop in pressure in several districts. This drop in pressure will often extinguish the pilot lights on automatic appliances, and when this is not known, and the appliance is turned on, gas will escape. For this reason it is important to install flues with all automatic appliances. A drop in pressure may also be caused by the careless

removing of a bag or stopper in a main or the lack of a necessary temporary by-pass. Such items are simply matters of good engineering practice and with proper supervision should not occur.

The pumping of drips and the handling of drippage should be carefully watched from a safety standpoint and also because of its nuisance to the public. It is desirable to store it all at one location, preferably the gas works, and it is bad practice to leave it standing in the wagon or truck over night. In large territories a motor drip truck can be used to advantage, as it can cover more ground and get the drippage to the proper storage location each day. We have found that with the use of a power pump, driven by the truck motor, the drippage is economically and safely handled. A careful man should be selected for this work, and he should be impressed with the importance of keeping the public at a safe distance when pumping drips, especially the high-pressure ones.

Curb boxes and valve and drip boxes in the street are the cause of many accidents, and employes should be instructed to watch out for and to report any found in a dangerous condition. They are often had tripping hazards if improperly installed. In selecting a type to be used pay particular attention to the chance of the cover coming off. If this occurs in the larger sizes used in the street an accident may result from a person or a horse stepping in the opening. Such an accident occurred in our district a few years ago, the horse breaking his leg and the occupants of the carriage being thrown out and injured.

GENERAL.

I would recommend the question of standards for gas work be more carefully gone into, and I think this could best be carried on by the National Safety Council. A few examples of what I refer to are: Railings, their proper heights and weights. You find them being installed now from thirty inches to forty-two inches high and from three-quarter inches to two inches in size, with the uprights various distances apart. Toe boards, their proper use and size. The proper safeguarding of new machinery, which we now find shipped, and, in most cases, installed, without any regard to guarding moving parts or caring for tripping hazards.

I should think the best way to accomplish this would be to enlist the co-operation of the manufacturers of all apparatus used in the gas works, starting with the water gas set or coal gas bench, and

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including exhausters, purifiers, station meters, tar extractors, and so on, right through to the gas holders.

I am sure we would all be willing to pay a little more for installation properly guarded if we knew we were putting in a rat guard guarded with an approved standard, and I sincerely hope Council can find a method of following this suggestion.

Accidents of even the smallest type are certainly to be deplored and everything done to prevent them, but, when you are unfortunate enough to have one occur, *learn your lesson from it* and that your entire organization profits by it, by carefully investigating its cause. You have at least gained something if every one keeps it in mind and works against its recurrence.

When the question of the cost of installing safeguards comes up, and, in fact, the cost of any branch of safety work, please remember that the installation of the most common, and, in many cases, rather expensive guards, for a hazard you might consider remote; the rather tiresome and necessary constant warning of foremen and men, and the time and care of operating a Safety Organization, has been proven, many times, without the shadow of a doubt, to be good business from a financial standpoint, aside from the humane view, which gives you the satisfaction of knowing your men are working under better conditions and you are having fewer accidents, which is all resulting in less unnecessary suffering.

DISCUSSION.

Mr. J. F. Conner, Philadelphia, Pa., in hearty accord with the statements made by Mr. Davies in his excellent paper. At employee meetings the speaker too often talks over the heads of the men present. The speakers should be men among men and talk with them, not at them.

Mr. E. L. Davies: We have tried to reach the men through their families. We invite the families to attend the safety meeting and try to get them to discuss safety in their own homes.

Mr. F. W. Fisher, of Rochester, N. Y.: Discipline should be applied with great care or minor injuries will not be reported.

Mr. Wills MacLachlan, Toronto, observed that discipline was not fully carried out because of labor conditions. He seriously questioned the advisability of giving prizes and asked Mr. Davies how his company knew their men really understood the rules even though they sign a statement to that effect.

that we should not depend upon the manufacturers to guard machines, that an inspection should be made and if additional guards were necessary they should be promptly installed.

Mr. E. L. Davies, in reply to a question raised by Mr. White of New Haven in regard to goggles, stated that goggles are provided, but that they could not be used in some parts of the work because of the great heat, as a result of which perspiration rolled down over the lenses.

Mr. Almberg, Consolidated Gas Company, New York City, stated that because of the difficulty of getting labor many companies do not examine new employes and for the same reason do not discharge men for violations of safety rules.

Mr. Naylor of Newark, N. J., speaking on the subject of educating employes in the English language, stated that because of the relatively small number of non-English-speaking people his company did not carry on instructions in English.

Mr. Lucas of Philadelphia asked how such instructions could be carried on at this time.

Chairman Douglas observed that probably little could be done at this time, but that after the war was over it would be possible to carry on instruction in English, to examine all employes physically and to administer discipline for violation of safety rules.

Mr. Fisher of Rochester, N. Y., stated that every employee should be examined where the job was at all permanent.

CHAIRMAN DOUGLAS: We will now have presented the paper by Mr. H. J. Burton. In regard to the fourth paper on the program I regret to state that I am advised that Mr. Pearce, who was to have been with us today, is seriously ill and will be unable to address us, although his paper will appear in the proceedings. I take pleasure in introducing Mr. Burton.

SAFETY WORK AS IT APPLIES TO THE OPERATION OF ELECTRIC GENERATING AND SUB STATIONS.

H. J. BURTON, OPERATING ENGINEER, IN CHARGE OF THE EDUCATIONAL AND WELFARE WORK OF THE CONSUMERS POWER COMPANY,
JACKSON, MICH.

Mr. Chairman and Members of the National Safety Council: It has been said that the causes of accidents are common to all industries and that falls, defective tools and handling material head the

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list. It is true that a man may be injured by falling or by defective tools in almost any industry, but this does not mean that accident prevention work will be identical in all cases. Figures taken

TEN LEADING CAUSES OF ACCIDENTS IN THE ELECTRICAL INDUSTRY.

685 DISABILITY ACCIDENTS ANALYZED AS TO CAUSE,

Showing per cent of total time lost charged to each cause.
(Counting each fatal accident as 25 years lost time)

Acid, solder, compounds	.1%	1
Foreign body in eye	.1%	1
Explosion, gas, gasoline, steam	.2%	1
Struck by falling body	.4%	1
Machinery in motion	.4%	1
Handling tools	.7%	1
Wagon, auto, motorcycle	.7%	1
Handling material	.8%	1
Slipping, tripping, falling	20.7%	
Electric current	75.4%	

This chart was prepared by the Accident Prevention Committee of the National Electric Light Association, and shows that electric current is by far the most serious cause of accidents in this industry.

INSTRUCTION DEPT. CONSUMERS POWER COMPANY.

685 DISABILITY ACCIDENTS ANALYZED AS TO CAUSE,

Showing average number of days lost per accident.
(Counting each fatal accident as 25 years lost time).

Lamp breaking	1.9	1
Overcome by gas or heat	2.0	1
Foreign body in eye	3.5	1
Nail injuries	4.0	1
Allegation	4.5	1
Doors and windows	6.0	1
Handling tools	6.3	1
Struck by falling body	6.4	1
Colliding with obstruction	6.8	1
Injured by animal	6.9	1
Acid, solder, compounds	7.2	1
Handling material	8.7	1
Miscellaneous	10.0	1
Wagon, auto, motorcycle	12.9	1
Explosion, gas, gasoline, steam	15.6	1
Machinery in motion	17.4	1
Slipping, tripping, falling	103.0	
Electric current	563.0	

NOTE: Electric current caused by far the highest average number of days lost per disability accident reported. This chart was prepared by the Accident Prevention Committee of the N.E.L.A.

INSTRUCTION DEPT. CONSUMERS POWER COMPANY.

the records of several public utilities show that 55 per cent of the accidents to employees are caused by falls. handling tools at 1--"

current, but the accidents recorded, due to electric current, are the serious ones and in most cases are fatal. Statistics show that the electric current is by far the most serious cause of accidents in this industry, both as regards fatal accidents and time lost due to accidents. It is estimated that the number of fatal accidents to electrical workers in the United States each year is, at least, 2.25 per thousand.

In accident prevention work it is not *always* the number but the nature of the injuries that should receive most attention. Slight electric shocks are often received by employes working on or around electrical apparatus; but such accidents, if they may be called such, are seldom recorded unless some evidence is left on the injured, such as a burn or scar of some kind. Reports from some electric light and power companies show that, whereas they have hundreds of records of injuries to employes, such as slight cuts, burns, bruises and other minor accidents involving the loss of at least one full working day, the only serious accidents recorded are those listed as instantaneous death due to electric shock.

SERIOUS ACCIDENTS DUE TO ELECTRIC CURRENT.

It is not the purpose of this paper to disregard the importance of looking after and trying to prevent the minor accidents, as it is realized that in the aggregate they are important, and slight injuries neglected are liable to be serious; and, further, slight injuries should be reported, as they sometimes indicate that something is radically wrong and needs attention before a serious accident does occur. But we should not lose sight of the fact that the serious accidents incident to the operation of electric generating and substations are due to the electric current and not to causes that are common to all industries.

In some industries, with mechanical protection properly designed and placed, it is possible to so safeguard some machines as to practically eliminate the serious accidents incident to the operation of the machines. In the electrical industry it is not always possible to mechanically safeguard and protect the equipment used to generate transmit and utilize electricity. A wire that is energized does not look any different from one that is not energized, and the electrical worker must learn what is safe to touch and what should be given a wide berth.

In the operation of electric generating and substations, it is necessary at times for switchboard operators, linemen and other em-

and then switch," is a good slogan for switchboard operators. Goggles should be worn when there is any danger of the eyes being flashed by an electric arc. It has been demonstrated that a pair of plain glass goggles will protect the eyes from the injurious effects of a momentary electric arc and they are more suitable than colored glass goggles, as they can be worn with more comfort to the eye and around tight places where colored glasses might obstruct the vision and introduce a stumbling hazard.

Employees should be taught how to replace fuses. The safe way depends upon the voltage of the circuit and the location and kind of fuses. After replacing a low-voltage fuse, care should be exercised when closing switch, as there is always danger of the fuse exploding and causing injury to the operator's face or hands. Circuits on which drop cord are used and handled should always be lightly fused, so that should trouble occur on a cord that was being handled the fuse would blow readily and possibly prevent a serious burn or shock. Great care should always be exercised when replacing high-tension fuses, such as those used on instrument transformers. Fuses of this kind are generally installed in out-of-the-way places, but can be replaced safely while the circuit is alive, with insulating tongs of proper length. On extra-high-voltage circuits, insulated stools or ladders should be used in addition to the tongs.

"WORK FROM BELOW."

Employees should be instructed not to work immediately above live lines or equipment, as a tool, rope or branch of a tree dropped across a high-tension line might result in a flash, with serious consequences. An electric arc generally flares upward, and a man's life would not be worth much if an arc between high-tension conductors was established immediately below him. The rule, "*Work from below,"* is a good one.

The use of steel measuring tapes should be forbidden around power stations, and employees should be instructed to use due care when carrying or using metal rods, tools or articles of any kind around live conductors. Accidents have occurred when articles carried over the shoulder have come in contact with live or moving parts.

Station employees should be provided with protective devices for handling live parts, so that they will not resort to makeshifts that are inadequate for their own protection, and they should also be

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ployes to handle live equipment and lines, and in order to safely they must be properly qualified for the work they perform. Instructions to employes as well as mechanical safety to apparatus are essential if accidents are to be avoided.

Employes should be taught that high potential current is dangerous to life and they should know the voltage carried by the conductor in their station or under their supervision. They should be instructed that not only the bare conductor, but the insulation on high-voltage conductors should not be touched or dangerously approached. A wire insulated for, and carrying, a potential of 100 volts might be, and is, reasonably safe to handle; but the same similar wire, carrying a potential of 1,000 volts, although to appearances perfectly insulated and harmless, would be extremely dangerous to handle, and the higher the voltage the greater the danger to life. It cannot be too often repeated or too strongly impressed on all employes that insulated as well as bare cables or wires carrying high potentials are dangerous to handle or approach, unless they are enclosed with a grounded metal sheath. Insulation on high tension conductors gives a sense of false security to the uninstructed man; many a serious accident to employes has occurred because a conductor was thought to be safe because it was insulated. It is the story of "Didn't know it was loaded!" Electric current as high as 10,000 volts will jump from a conductor through some insulation; and it is not necessary to make actual contact with a high-voltage conductor in order to receive a fatal shock. This matter of not placing much dependence as far as personal safety is concerned on the insulating covering of wires is often neglected in the instruction of men, and it is something that should be thoroughly explained and understood by all operators and linemen.

PROPER SEQUENCE OF SWITCHING.

Employes are often injured, sometimes seriously, in opening or closing circuits. Accidents of this kind are generally due to haste, forgetfulness, or lack of instruction. Employes must know the proper sequence of switching necessary to safely start and stop machines and to connect or disconnect apparatus from its source of energy. Opening or closing a switch or circuit in a power station may be extremely dangerous if not properly performed, and many an employe has had his hands, face and even injured.

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Employees should be instructed not to work immediately above live lines or equipment, as a tool, rope or branch of a tree dropped across a high-tension line might result in a flash, with serious consequences. An electric arc generally flares upward, and a man's life would not be worth much if an arc between high-tension conductors was established immediately below him. The rule, *"Work from below,"* is a good one.

The use of steel measuring tapes should be forbidden around power stations, and employees should be instructed to use due care when carrying or using metal rods, tools or articles of any kind around live conductors. Accidents have occurred when articles carried over the shoulder have come in contact with live or moving parts.

Station employees should be provided with protective devices for handling live parts, so that they will not resort to makeshifts that are inadequate for their own protection, and they should also be

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instructed how to use the devices provided. For instance, if a handled switch hook is provided for some high-tension disconnecting switches, the operator should be instructed to get the length of the insulating rod between him and the live parts and not to hold of the rod in the middle. He should be instructed to keep the rod, when not in use, in a convenient and dry place, and it should be used only for the purpose for which it is provided. Instances are on record where high-tension switch hooks have been painted with metallic paint and defective or broken rods have been replaced with ordinary broom handles, rendering their use dangerous.

The practice of using the bare fingers or hands to determine whether or not a low-voltage circuit is alive is dangerous and should be discontinued. The very fact that a test is to be made proves that the circuit is in trouble and it may be crossed with a high-tension wire.

INSTRUCT NEW EMPLOYEES.

New employees should be instructed not to replace fuses, change brushes, clean commutators, or do any work on or around high-tension parts unless they have received special permission to do so from their superior officers. Serious accidents have occurred to new men because they have attempted to do something they have seen someone else do safely. For example, it looks easy and it is reasonably safe for an experienced man to change a brush on some low-voltage D. C. generator, but a new man, unless properly instructed, might easily receive a serious injury doing so.

Great care should always be exercised when using private telephone lines that parallel high-tension lines. Insulating transformers, fuses and insulated platforms should always be used, as when there is transmission line trouble the telephone is liable to be high-tension energized and dangerous.

Electrolytic lightning arresters are now used almost universally on high-tension installations. Arresters of this type need attention at least once daily, and they are reasonably safe to take care of if correctly installed and the operators are properly instructed. Numerous instances are on record where arresters of this type have not received proper attention because an uninstructed employee was afraid to perform his duties in connection with them and they have been left uncharged for long periods, the arresters being rendered practically useless as a protection against lightning and dangerous

DESIGNATE SWITCHES AND LINES.

All circuits, lines and switches should be given a distinguishing name or number and should be plainly and conspicuously marked, and employes must learn the names and location of the switches, so as to be prepared to do emergency switching when life or property is in danger. It is a good plan to designate switches and lines with a letter and a number, such as the *A-1* or the *B-2* line or switch, instead of the north or south line, as the case may be. Serious accidents have occurred when employes have operated the wrong switch because of misunderstanding about directions.

The public, and especially children, should be instructed through the newspapers and schools not to interfere with electrical equipment or lines. Quite often young "would-be" electricians are allowed to attempt repairs on defective equipment that should be handled only by experienced employes, and boys have been killed while climbing poles for birds' nests. Children flying kites with wire attached have been injured by the wire coming in contact with electric lines.

TEACH RESUSCITATION METHOD.

The prone-pressure method of resuscitation from electric shock should be taught all employes. In addition to being prepared for emergencies, the teaching of this method seems to emphasize the presence of danger and makes employes more careful and keeps them from getting shocked. The fact that a man can be resuscitated does not prove that electricity will not kill, as some people seem to think. Death depends to a great extent upon the voltage and the contact. If the voltage is high enough and the contact good, death will be sure. Resuscitation should be tried in all cases, as accidental contact is nearly always imperfect and the voltage received doubtful.

INSPECTION.

This paper is based on reported accidents and since the length of it will not allow more time for electrical cases, the question of safety in the boiler-room will be briefly taken up. Regular, frequent and careful inspections of boilers, externally and internally, for defects and weaknesses of material, also the inspection for defects in operating conditions of all auxiliaries, is one of the best ways to insure safety around a boiler-room.

Gauge glasses should be properly protected, so that flying par-

DISCUSSION.

CHAIRMAN DOUGLAS: Before discussing Mr. Burton's splendid paper I desire to introduce the Chairman-elect, Mr. C. B. Scott. Most of us know him and of his successful work.

Mr. Scott then acknowledged the introduction and briefly discussed Mr. Burton's paper, suggesting that in the paper the word "instructed" should be replaced by "required." He emphasized the necessity for executive approval of accident prevention work, observing that without it success was impossible, and further, that safety must be considered a part of the work done by employees.

Mr. Wills Maclachlan of Toronto asked what would happen if we left all wire over 750 volts uninsulated. He also advocated teaching only the prone-pressure method of resuscitation, stating that in his companies they will not teach the use of any apparatus for resuscitation, but that they teach the prone-pressure method and enforce bi-weekly practice.

Discussion of the prone-pressure method followed, which was taken part in by Messrs. Rockershaw of the New England Power Company, Lucas of Philadelphia, Conner of Philadelphia, and Van Brunt of the Public Service Corporation of New Jersey. In general, it was approved in preference to the use of apparatus.

Mr. Lucas of Philadelphia also stated that he heartily concurred in Mr. Scott's statement of the necessary approval of the work, also stating that to be successful, accident prevention work must never be allowed to lag. We must keep constantly at it.

Mr. Fisher of the Rochester Railway and Light Company, Rochester, N. Y., referring to Mr. Burton's paper, observed that more than one exit must be provided in power stations.

Mr. Conner also spoke on the subject of exits, urging the necessity for more than one exit for every working place or gallery in a power station.

Mr. Van Dorn of the Utilities Mutual Insurance Company urged the advisability of equipping switch hooks with ground wires, recommending the use of uninsulated wire.

Mr. Day of Philadelphia, referring to the criticism of the pulmotor and lungmotor, asked whether or not such devices were successful in gas cases.

Mr. Fisher of the Rochester Railway and Light Company, stated that his company maintains pulmotor service for gas cases because of the oxygen equipment included with the apparatus.

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ACCIDENT PREVENTION IN THE ELECTRICAL FI

W. C. PEARCE, SUPERINTENDENT ELECTRICAL DEPARTMENT
SYRACUSE LIGHTING COMPANY, SYRACUSE, N. Y.

Mr. Chairman and Members of the National Safety Co
An accident is defined as an event which is unexpected or the
of which was unforeseen. In the light of this definition acc
prevention consists in attempting to prevent the unexpected
tempting to prevent events the causes for which are unfor
Thus it is that the seeker after safety to a degree knows not the
effective course to pursue for the attainment of his end. The
that the unknown is being dealt with lends a zest and keen inter
the study and practice of accident prevention. It also offer
courage to him who by dint of close scrutiny and careful
ning is successful, to any extent, in conserving the most valua
possessions—human life—or reducing to a minimum the pain
loss due to non-fatal accidents.

During the early history of the race, and, to a greater or
degree, continuing, until the last century, a large proportion of
dental deaths could be attributed to one of two causes:

1. The forces of nature, as illustrated in floods, storms,
canic eruptions, etc.
2. Wars.

Without dwelling upon this statement it is seen that as civ
tion became more and more complex and man awakened to hi
ventive powers he produced wonderfully devised machines for
ous uses. These machines were of ever increasing size and po
and, coincident with this development, the death rate due to
fruits of man's brain rapidly increased, and only in recent y
has there been inaugurated a concerted movement looking to
the correction, as far as possible, of this condition.

A WORLD SHORTAGE OF MEN.

The world today, as probably never before in history, is fa
a shortage of men, and must continue for years to face this co
tion. As methods are discussed whereby it is hoped that one or a
hundred lives may be preserved, hundreds of thousands of m
the pride of various races—are being sacrificed on the battle-f
of Europe; reducing at an appalling rate the man-power of

to set their faces resolutely toward the highest possible attainment in accident prevention in the industrial life of our country.

All occupations are more or less hazardous and idleness, probably, more so than occupation. Accidents in some lines of industry are infrequently fatal, while in other lines the accident of any moment which is not fatal is the exception, rather than the rule. To a marked degree this condition prevails in the central station industry and particularly so in distribution practice. In connection with such work a large preponderance of accidents are directly or indirectly due to electric shock or burn, and a considerable portion of these are fatal, in the face of all that may be done for the sufferer after the event transpires. The reasons for this condition are the magnitude of the force being dealt with and the rapidity with which it does its work when one is placed within its power.

Abraham Lincoln on being asked how long a man's legs should be replied that they should be long enough to reach the ground. Dropping generalities, a few suggestions right from the ground are offered covering some methods of reducing the risks associated with the production and distribution of electric energy in central station practice. Volumes have been written on this and kindred themes, and one is constantly reminded that there is nothing new under the sun. However, these suggestions are offered with the hope that they may prove to be of interest and possibly contribute to the cause of accident prevention.

WEAR SAFE CLOTHING.

Large amounts of money and time are expended in an effort to safeguard property against fire and to provide safe exits from buildings in case of fire. Less attention has been given to means for extinguishing fire in the clothing of employees.

Rules to the contrary, workmen will insist on wearing greasy overalls which are highly inflammable and constitute a serious hazard to life under favorable conditions. Difficulty has been experienced in extinguishing such fires with fire extinguishers, even though help be at hand, and a man alone with clothing on fire is practically helpless.

Wool blankets folded and hung on rails in convenient locations in stations, substations, etc., having over them "*Fire Only*" signs are suggested as a satisfactory solution to this problem. The idea of smothering such fires is an old and tried one which may well be used by the industry.

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Fire extinguishers using carbon tetrachloride are small and quickly and easily seen, especially under the exciting conditions frequently prevailing when fire breaks out. A white board 12 inches square with an eight-inch fire-red circle in the center is suspended directly above each extinguisher materially assisting promptly locating it when required.

DISCONNECTING SWITCHES.

Too great caution cannot be exercised in opening disconnecting switches, whether they are located in stations or on the distribution system. Illustrating this point the following accident which occurred recently is cited:

The oil can of a K-type General Electric Company 2,300-volt three-phase switch, suspended on a pipe structure directly below a 2,300-volt busbar, by some means became unhooked and dropped slightly away from its support. The operator wishing to lift it back in place, and thinking to practice safety, tripped the switch by use of the opening relay in the rear of the board. With great caution, he then opened one of the three disconnecting blades between the switch and the bus. Being in a hurry to restore the circuit promptly, he opened the second blade quickly, with the result that an arc was established which blinded three men temporarily and blew into the bus, shutting down the station.

Examination developed the fact that the oil switch had opened only on one contact, which, by chance, led to the disconnecting switch which he first pulled. The circuit was in the meantime operating on single phase through the remaining contacts, with excessive current flowing through them, and all conditions favorable for the establishment of a destructive arc. The best rule to follow in handling disconnecting blades is to never open them suddenly, even though good evidence may be at hand that they are dead or carry no current. In making this suggestion, it is understood that it may be at times desirable to open outdoor disconnecting blades under light-load conditions with a switch pole of suitable length.

SHORT CIRCUITING PLUGS.

Switchboard panels used in connection with series arc circuits are commonly provided with short circuiting plugs, by means of which the set is run on short circuit and which are pulled as the

are in the habit of pulling these plugs just far enough to open and allow them to remain in the board while the circuit is in operation. As a result a considerable portion of the plug is exposed and in contact with one side of the circuit. This is within easy reach of the operator as his duties call him to the board and introduces an entirely unnecessary hazard. Short circuiting plugs should be removed from the board as soon as the circuit is put into operation.

Unattended suburban substations are commonly cared for by a man who looks after the street lamps, turns on and off the street circuits and cares for consumers' troubles, frequently devoting only a part of his time to this work.

SAFETY FOR LINEMEN.

Line construction and repair work is done by linemen reporting to headquarters. These linemen, working on street lighting circuits or other circuits which must be interrupted for them, should be adequately protected against the possibility of the switch being inadvertently closed. Because of the fact that there is no regular operator in attendance this problem is difficult, but the following solution is suggested, after a trial of a number of years in several substations:

A leather envelope is used as a tag to be hung on the switch controlling the circuit to be protected. On one side of this envelope is printed the customary warning that men are working on the circuit. Within the envelope is a card properly arranged to receive full information as to the time the tag is placed and removed from the circuit, for whom it is so placed and for what purpose. The workman wishing to be protected makes his record on the card and hangs and removes the tag himself. Two or more gangs working on the circuit at the same time have equal protection, the last one to clear from the circuit removing the tag. The cards are collected from the substations at suitable intervals and become a record.

LIGHTNING ARRESTERS.

Aluminum cell lightning arresters, for a number of years, have been very generally used for the protection of distribution and transmission lines. They have been found to be highly efficient, require little attention, and it has been the prevailing opinion that their use introduces a negligible hazard. A recent fatal accident involving one of these arresters is worthy of attention:

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A four-tank General Electric, 11,000-volt arrester had in operation for a number of years on the substation end of a mission line. With other arresters it was located in an arrester room entirely isolated from other apparatus. On the day of the accident the arrester-room was reported full of smoke, coinciding with the tripping out of the oil switch at the source end of the line.

The local fire alarm was pulled and a force of men promptly responded with fire extinguishers. The door leading to the arrester room was opened and although little could be seen because of the smoke, a slight fire was discovered and extinguished. The men who had responded to the alarm were standing just outside the door answering a fire roll call, when an explosion took place. A ball of flame shot through the doorway, burning several men so severely that, as a result, one died and others were confined to a hospital in a critical condition for a number of weeks.

ARRESTER ON CHARGE.

Upon investigation it was found that the charging mechanism was so arranged as to make it possible to leave it in the charging position, the charging contacts being found closed when the investigation was made—evidently the man who had charged it ten hours earlier left it on charge. The temperature of the oil had slowly risen until the film had disintegrated, allowing a rush of current and an explosion which exploded the oil in one of the tanks and tripped out the circuit. The operator at the source end of the line restored the circuit after a lapse of one minute, which was customary. About four minutes from this time the second tank exploded, with the result mentioned. The lessons to be learned from this incident are:

1. Aluminum cell arresters under certain conditions become a grave accident hazard.
2. Charging mechanism should be so arranged as to make it impossible to leave the arrester on charge.
3. Frequent checks should be made to determine the amount of current passing through the arrester when charging.

DIVIDED AUTHORITY.

Lines marking the boundaries of empires or countries are verbal because of international misunderstandings; to say no wars are created by them. A similar situation exists in many other cases.

tween the production and distribution departments. Divided authority is always undesirable and in this connection it may even become hazardous. Even when accompanied by the best of intention and spirit of co-operation it frequently transpires that the exact line of demarkation between these departments is a source of annoyance and introduces a hazard which should be avoided if possible.

Reference is made to the protection of men working on or in dangerous proximity to arc circuits, and the following suggestion is offered after watching its operation for several years on a system operating two thousand magnetite lamps:

A number of small brass padlocks are used, one for each foreman or trouble man who may have occasion to work on the arc circuits during the day. Two brass tags are provided for each lock, the lock and two tags constituting a set, all bearing the same serial number and one tag bearing the foreman's name. The key to the lock is attached to one of the tags. The locks are firmly mounted on a suitable board, hasps down, key holes up, and under each on the board is a brass screw hook.

Each foreman on receiving his orders for the day receives from the general foreman his two tags and key to his lock. If he is to work on or near arc circuits he locks the check bearing his name on the lock bearing his number, placing the other check, to which is attached the key, in his pocket. On completion of his work he unlocks the check and hangs both checks on the screw-eye below the lock. Operators are instructed to put on no circuits until every check has been taken from the locks, and to accept no telephone advise that men have cleared from these lines. The board is located in the general line foreman's office in the morning and is moved to the switchboard at 1:00 p. m. Should any checks remain on the board one-half hour before time for starting the street lights, the general line foreman's office is advised of the fact and a motorcycle rider is dispatched to determine the cause and bring in the key if the gang is clear of the line.

In actual practice, however, this contingency seldom arises. This system was devised in an effort to avoid accidents due to misunderstandings on the telephone.

SAFETY BELTS AND RUBBER GLOVES.

The ever-present hazard to linemen is involved in the work which is done on lines operating at from 2,000 to 4,000 volts. The public

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will not consent to frequent or infrequent interruptions to this of service and consequently the work must be done with the men alive. In order to safeguard life, as far as possible, every precaution must be taken and no expense spared in providing men with suitable protective devices. The most important of these devices are safety belts, rubber gloves, rubber armlets or sleeves and protective shields. Each line gang should be provided with two or more protective shields and a pair of rubber sleeves. Every lineman should be furnished a safety belt and a pair of rubber gloves, which should be of the best quality the market affords. They should be turned in and tested at frequent intervals and replacements made at least as frequently as the men may require. The use of rubber armlets is particularly urged when working on or through live or grounded lines.

Under some conditions the lineman should use all of these devices, but under all circumstances when working on lines operating at a pressure exceeding 500 volts the rubber gloves should be worn. Linemen become hardened to the dangers of their occupation and frequently prefer to work on live lines with bare hands rather than undergo the discomfort sometimes experienced in the use of rubber gloves. However, the fact should be borne strongly home to them that without exception the gloves must be worn under the conditions stated.

Experience has proven that the only successful method of enforcing this regulation is to promptly discharge every man caught infracting it and hold the foreman strictly accountable for enforcement. The proper use of rubber gloves is the cornerstone of the safety structure in distribution work.

RUBBER MATS FOR SUBWAY EMPLOYEES.

Subway employees face the necessity of executing a considerable amount of "live" work which they must do without the protection which is offered to linemen by dry wooden poles. In order to improve this condition, as far as possible, heavy rubber mats tested for at least 10,000 volts should be provided and a rule enforcing their use compulsory by workmen when splicing cables.

A large portion of the work done "alive" on subway cables involves voltages not exceeding 250, which pressure the profess

be avoided, it being impossible to establish a so-called dead line in dealing with human life and this force. A voltage is harmless or dangerous to one, depending largely on the resistance of the body and the condition of the heart. It is a matter of record that a pressure of 200 volts or less has proved fatal in many instances, even though energetic first-aid treatments were promptly administered, supplemented by the use of the pulmotor. All commercial voltages should be considered as dangerous possibilities.

KEEP COOL.

The most soul-trying time that comes in connection with the duties of a line foreman is the time when from one cause or another one of his men receives a fatal or dangerous electric shock or burn. Under the stress of such a situation, particularly if the victim is suspended on his safety belt or lying across a high-tension line, many men go to pieces or at least become so excited that no concerted action may be expected. When such an occurrence takes place two essentials should be looked to promptly.

1. The injured man must be brought to the ground as speedily as possible and artificial respiration commenced at once.

2. No time should be lost in summoning medical aid and the company's pulmotor.

The first of these must be left to the foreman to handle as he may, but he should be relieved of all responsibility regarding the second. This may be accomplished by detailing either the driver or one of the groundmen to reach for the nearest telephone and start the machinery in motion which will bring aid to the scene. The driver is the logical man for this work, and should have it regularly impressed on him that this is his bit in such an event. By impressing on the men the part they are to play in event of accident, the natural disorganization due to the case will be reduced to a minimum.

Rules for the protection of electrical workmen may be multiplied indefinitely to good effect, but the gospel of accident prevention will be best promoted by instilling into the minds of the men the fact that they are dealing with a force so destructive and rapid in its action that no stone will be left unturned to add to their safety while working with it and that no amount of protective apparatus will effect its mission unless accompanied by an intelligent and careful co-operation on their part.

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VOTE OF THANKS TO SECRETARY ROSSELAND

Mr. Maclachlan of Toronto offered a motion that a vote of thanks be tendered to the Secretary for his efficient work. With his permission the motion was amended to include a vote of thanks to all the officers and those who presented papers. This motion was duly seconded and carried unanimously.

CHAIRMAN DOUGLAS: It is now almost 1 o'clock and if there is no further important business to come before the meeting, a motion to adjourn is in order. I bespeak for the incoming officers of the Section a continuance of the hearty co-operation you all have given me. The new Chairman, Mr. Scott, has asked me to request the new officers to meet with him at the close of this meeting.

A motion to adjourn was then made, which was duly seconded and carried.

HELP THE OTHER FELLOW.

That's the Spirit of Safety, and in the end it spells success. It brings out the best there is in every man, and it strikes at the very source of poverty and misery, of oppression and gloom. It's the spirit that draws all men together by a common bond. It is a spirit of accomplishment, worthy of the most sincere thought of the best minds and of the best thought and consideration of lesser minds, and is only attained by united and purposeful effort of persevering men. It is reflected in the daily work and the home life of every man who is endeavoring to be guided by this Spirit of Safety; in more efficient work and better working conditions; in happier faces and more cheerful surroundings; in brighter homes and in more contented wives and mothers, because of the assurance of Safety to husbands and sons; in better fed, better clad and better educated children.

National Safety Council

Governmental Sectional Meeting

New York City

Sept. 14, 1917

ROYAL MEEKER, Chairman

Commissioner, United States Bureau of Labor Statistics, Washington,

MEETING called to order by Mr. Royal Meeker, Chairman. No report was submitted by the Chairman, and the Secretary being absent, the program was taken up immediately.

CHAIRMAN MEEKER: The first subject this morning is the "Safety in United States Government Work," by Mr. C. W. Price, Field Secretary of the National Safety Council.

SAFETY IN UNITED STATES GOVERNMENT WORK

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

Mr. Chairman and Members of the National Safety Council:
At two of the sectional meetings Mr. R. M. Little, Chairman of United States Employees' Compensation Commission, has told the story of the survey which has been conducted in government plants. In my remarks this morning I do not wish to review the work which has so ably covered, but rather to place before you what the engineers who conducted it sought to accomplish by the survey.

During the early days of the survey, after the field force was appointed, the director of the survey issued a statement to the effect

men setting forth what we might reasonably expect to accomplish in the first six months, during which time the district directors and engineers were to be more or less closely in touch with their respective plants. The following outline includes the substance of this statement:

SCOPE OF THE WORK.

1. Inform and convince the Commandants of the plants regarding safety work by placing before them what had been accomplished in a large number of industries. Submit to them data to demonstrate that safety always makes for increased efficiency. Emphasize the point that the last eight years' experience in industry has demonstrated that one-third of accident prevention is accomplished through mechanical safeguarding and two-thirds is dependent upon educational methods.

2. Meet the heads of departments and their foremen individually or in groups and place before them information as to what has been accomplished in safety work and the methods which have been found most effective. Copies of bulletins issued by the National Safety Council covering the essential features can be furnished.

3. Secure the appointment of an experienced safety engineer at each of the plants. This is the most important feature of a safety organization and the one feature which the plants stand most in need of.

4. In each of the plants organize a central committee, consisting of three to six of the heads of the more important departments, this committee to consider all important matters submitted to it by the safety inspector and to recommend to the industrial manager what action should be taken. This committee will relieve the manager of much of the detail and will be of great service to the safety engineer in getting speedy action.

5. Organize a thoroughgoing safety bulletin service by placing in each department a bulletin board of approved type and securing a supply of bulletins from the National Safety Council, so that the bulletin board exhibits can be renewed each week.

6. Make an analysis of the accident experience in each of the plants which will reveal the weak spots and will furnish valuable help in convincing the foremen.

7. In company with the plant safety engineer, the survey engineers should make a careful detailed inspection of the plants and submit a report to the Compensation Commission, indicating the

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more hazardous points which should be covered in the order of their importance.

8. At the very startoff work should be gotten under way on some of the more hazardous conditions and practices, so that a demonstration will be made and interest will be awakened.

9. Instruct the foremen in regard to the construction of safety guards and furnish photographs and blue prints.

10. In each department where there is hazard have a work committee of three to five of the rank and file appointed to make inspections at least once a month and submit a report of recommendations to the central committee.

11. Conduct safety meetings during noon hours for the workmen in the various departments and seek to arouse in them an intelligent interest in safety so that they will appreciate the movement and be interested in protecting themselves.

12. Establish a central organization at Washington, consisting of a chief safety engineer, with a central committee representing the various governmental departments; this central organization be known as a department of the United States Employees' Compensation Commission.

A LIVE SAFETY ORGANIZATION.

The one central thought in the above outline and the one thought which the district directors and their engineers have kept uppermost in mind from the outset is that during the survey in each of the plants a live safety organization must be worked out and set in motion. An organization similar to the ones which have become standard in practically all of the industries in which the most efficient safety work has been done. The survey must not stop short of reaching every foreman and workman and informing them in regard to the results which have been achieved in the industries, so that government plants may start in where the industries have left and without wasting time in experimenting, may work along lines which have been demonstrated to bring results.

Between May 10 and July 12 I visited nine navy yards, arsenals, two quartermaster depots, one United States Marine depot, the Bureau of Engraving and Printing at Washington, the United States Mint at Philadelphia, and the Government Printing Office at Washington. In visiting the navy yards and arsenals I was accompanied by the district directors of the survey. In each case we presented letters of introduction from the Bureau of Engraving and Printing.

War. In each of the plants visited we were received with great courtesy by the Commandants and were assured that they were sincerely interested in safety and would give their co-operation. In the majority of the plants the Commandants told us frankly that they appreciated the fact that their plant was not up to the standard of many industrial plants and that they welcomed the survey because it would give them the help which they needed. With one exception, the Commandants of all of the arsenals and navy yards expressed themselves as most interested in having an experienced safety engineer appointed to take charge of the work. They indicated that their present condition was partially due to the fact that they had had no one in charge who was competent to promote the work.

We met the heads of the various departments in each of the plants and were very much encouraged to find how open they were on the proposition and how ready they were to have outside men come in and help them to reorganize the safety work. This attitude means much for the future development of the work, because the attitude of these men will largely determine the attitude of the under foremen. In a number of the plants we met all of the foremen in meetings and gave a talk on the work which is being done in industries along safety lines. Our contact with the foremen convinced us that if safety engineers of ability and tact were employed there would be no question about securing the co-operation of the foremen. This is a very important point because in the experience of industries it is found that unless the foremen are in sympathy with the safety movement it is impossible to interest the workmen. In making detailed inspections and organizing educational work, the field engineers are aiming to keep in close touch with the foremen of the various departments so as to win their confidence from the start and to give them some active part in developing the safety organization. When the survey is finished, the safety engineers will have met personally or in groups every foreman and sub-foreman in the plant and will have had an opportunity to place before them the essential feature of efficient safety work especially along the line of reaching and interesting the workmen.

SURVEY OF MORE SERIOUS HAZARDS.

In each of the arsenals and navy yards we spent from one to two days, and during that time made a survey of the plant in order to ascertain what were the more serious hazards. With the exception of two or three plants all of the arsenals and navy yards visited had

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less than 50 per cent of their mechanical hazards covered by guards. In two of the plants less than 10 per cent of the points guarded. We did not find in any of the plants anything like an efficient organization for the promotion of safety, and there was no evidence of the sort of intensive educational work which has come to be recognized as indispensable in order to develop and maintain a real interest among the workmen.

In justice to the Commandants and other department heads it should be said that this condition is not due in any way to a lack of their part of proper consideration for their workmen. On the contrary, we found practically all of the Commandants, department heads and foremen sincerely interested in protecting their men from injury. The conditions found were due largely to the fact that Government plants have been outside of insurance or State inspection. No provision has been made for department heads and foremen to visit industrial plants where efficient safety work is done, and, therefore, they have not had an opportunity to inform themselves in regard to the methods which have been developed in industry during the last eight years. In all of the plants we found many guards which were not of the most efficient design.

Now that the survey has been practically completed, as a result of four months' efforts, what permanent results have been accomplished, what part of the program outlined in the forepart of my address has been carried out? I think I can honestly say that much has been accomplished:

RESULTS ACCOMPLISHED.

1. Commandants of the plants have been reached and effectively convinced of the practicability of safety work.
2. Heads of departments and foremen have been instructed regarding the experience of many industries in efficient accident prevention work.
3. Thirteen high-grade safety engineers have been appointed, within a few days, will be "on the job" to take charge of the safety work in the arsenals and navy yards. In my estimation, the appointment of these men covers three-fourths of the service which the survey has rendered.
4. In practically every one of the plants a plan of organization has been formulated and adopted by the Commandants.
5. In every one of the plants, within a few weeks, a thoroughgoing bulletin board service will have been established.

6. The accident experience of the various plants has been tabulated by the Compensation Commission and placed in the hands of the Commandants.

7. In all but two of the navy yards and arsenals the detailed inspections have been completed. Inspections at the two plants will be completed within a few days.

8. A plan has been worked out by which Mr. A. H. Young, of the American Museum of Safety will act temporarily as chief safety engineer (without salary) to serve the commission until Congress shall authorize the appointment of a permanent engineer.

I wish here to express my own appreciation of the splendid work which has been done by the district directors and by the engineers who have served under them. When I consider that every one of these men was picked because of his expert knowledge and wide experience in safety work, and when I think that in these men we have represented practically the entire experience of the last ten years in safety work in industry, I appreciate what a valuable service has been rendered by these men going into the Government plants and passing on to the officers and foremen the valuable experience of the industrial world along safety lines. It has been a rare pleasure to work with these men, because they have thrown themselves into the work with patriotism, enthusiasm, and unselfishness.

When I consider that in each of these Government plants we are now practically certain of having an efficient safety organization, similar to those which have proven so effective in industries, and when I consider there is to be employed an experienced safety engineer in each of the plants, and considering the attitude of the officers and foremen of the plants which have been visited, I feel confident that we have a right to expect the same results in accident reduction within the next two years that has been realized in practically every plant in which work has been undertaken along the same lines, where they have succeeded in reducing deaths and serious injuries and in some cases 75 per cent.

DISCUSSION.

CHAIRMAN MEEKER: Gentlemen, the discussion of this interesting paper will be opened by Commander Jessup, of the Brooklyn Navy Yard.

COMMANDER JESSUP: I feel something like a waste basket on this question, because the officers of the Brooklyn Navy Yard had

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their own thoughts on the subject. They brought them to me and I dumped them—told me to bring them here—so that what I have to say is not all my own, but a mixture of all the thought of all the people in the navy yard and a part should be credited to our safety engineer.

In regard to safety organization in the navy yard, it is a little like a deathbed repentance, because we are just beginning to realize its importance. As outlined in Mr. Price's paper, we are getting down to a working basis. We expect to have it in good running order very soon and undoubtedly will accomplish the results expected.

Mr. Price said that the educational side of safety work accounts for about two-thirds of the improvement in conditions. I believe that his estimate is away below the mark, and I want to tell you that in the Navy, of course, we have work that is similar, only we call it safety work, because our work in the Navy is dangerous and to get efficiency, under our conditions, we have to train the mind beyond what we train the hand in order to keep our crews where they will do the most good. What I mean is this: In a turret you have, say, fourteen men. If you have seen a turret you know it is a very small space in which to work fourteen men and still keep going the turret. That means, in order to get the work done, that each man must be so trained that his mental activities are instinctive and involuntary—that he hasn't any sense of thinking, his hands get an impulse from his brain, involuntarily. The results obtained from such training are absolutely lasting and can be relied upon in an emergency.

Just after the Spanish war we were down in the doleful decline as far as efficiency in gunnery went. We discovered through experience during that war that we didn't know how to shoot. We didn't know it, we were perfectly honest about it, but we had not known it. I happened to be in charge of a turret on the Olympia, Admiral Dewey's flagship, an old-fashioned turret, in which the heavy eighteen-inch guns came thirty-two inches to the rear on every discharge and then went back "into battery." The man who loaded that piece had to stand in the rear of it and move out of the way, and that gun came back within two inches of the man's chest on every rebound. He had to stand there without flinching and without thinking about it. That was just one little place where his mind had to be trained to know and appreciate that that gun was coming to a certain point and was coming any further—

WORKING OUT A PROBLEM.

We loaded the two guns in that turret once in a minute and five seconds. This was during the Spanish war days. When Admiral Sims came from China with his new scheme for target practice he came aboard the *Olympia* and told us about it. We had quite a confab about it. Previous to that time, when we had daily drill, I had always gotten through the drill in my turret long before the bugle sounded. I didn't have anything to do and I couldn't think of anything more to do. After Admiral Sims had gotten at us that bugle blew in just about half the time that we should have had for proper drill. We never were through with the drill when the bugle sounded—not only myself, but the men were never through with the drill. They all wanted to go on. Why? Because their minds were working on a problem we had to solve. It makes no difference what that problem is, whether it is loading a gun or whether it is handling a lathe in a shop, if the mind is not on the job somebody is going to get hurt. If the fellow that is running a machine does not think about what that machine is, how his hands have got to move, and act so that his thoughts are involuntary—his actions are involuntary—the control behind the brain which says, "That is dangerous, and that is not dangerous," that fellow is going to get hurt. After all the psychology side of it, I think, amounts to at least two-thirds of the problem.

Let us get back to the turret, because that is interesting. See what happened. We were loading those two guns in a minute and five seconds. After Admiral Sims left the ship we started in with proper ideas; we started to think about the problems that would make for the speeding up of the firing of each turret, because if you can fire two shots with one gun in a minute where you fired two shots with two guns in a minute, what is the use of having the second gun? You could throw away the second gun and double your firing with one gun, or you can double the amount of firing. In three weeks' time, without any mechanical change in the turret except what we were able to make aboard ship with a piece of brass, we cut the loading time of those guns down to nineteen seconds, and that was merely because every man in that turret had had his brain trained to fill his own little particular pigeon-hole accurately, promptly, and with safety to himself. That is how much the mind has to do with any operation, whatever it may be.

In your safety work, until you get your workmen trained so that their minds take care of their bodies, you won't have the proper

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effect in cutting down the examples of carelessness in various tions—you can't do it. You have to make the workmen think at without knowing they are thinking. It has to be just the n thing and only by appointing an engineer, such as we are appo now—a man who has nothing to do except to keep up this thi in the workmen—that is the only possible way in which this wor be done, particularly in Government plants.

GOVERNMENT PLANTS AND OUTSIDE PLANTS.

What is the difference between Government plants and ou plants? There is a difference that probably none of you have thought of, once in about three years the whole governing pers of the navy yard shifts. At times it is not absolutely in three y but in four or five years. I went to the Brooklyn Navy Yard years ago, next month I go to sea and some other man takes my That is occurring constantly and people who have been there enough to know the job have to go back to other work and some c fellow comes in and begins to pick up and learn the threads. U such circumstances there is little time to give to outside consid tions—I mean considerations which do not have to do with the ou of the actual stuff from that shop. When a man is learning how get output what time has he to give to outside considerations, safety in operation? If he has a safety engineer as one of his h of departments, who keeps this work going all the time and makes reports and calls attention at the right time to anything that sho be looked out for, then you have an efficient organization to care your workmen. You cannot do it any other way.

Before I go any further I want to tell you what our medical off thinks of the situation, because I think it is a rather good digest what has happened in the navy yard. He reports accidents for fiscal year, 6,049. The plant last year averaged somewhere in neighborhood of 8,000 men; I haven't the figures accurately, but i somewhere in that neighborhood. Today we have nearly 14,000; course, the war condition has augmented the number of employ

The naval officer says that the majority of accidents occur laborers and helpers; mechanics and skilled men are very much l frequently injured and when they are hurt it is often the fault unskilled labor, that is laborers and helpers. You will note that port refers particularly to the untrained men. I don't think there

of the laborers and helpers, on the average, is no more hazardous than that of the skilled men, but they do not think.

FIELD OF USEFULNESS OF SAFETY WORK.

The medical officer goes on to say: "The field of usefulness of safety work is in educational methods to the extent of at least two-thirds; arousing interest in the men and securing their co-operation. Mechanical safeguarding, though very important, occupies a minor position."

That two-thirds is probably a proper average, worked up as you get any average, but if you have got the fellow to thinking, and his brain is trained, he will better safeguard himself, adjust himself involuntarily to his machine, so that the mechanical safeguard is really the offshoot of the training of the brain. That is why the psychology of safety is so important.

The medical officer says it is very important to impress upon men the importance and value of immediate first-aid treatment for apparently trivial injuries, especially those involving the eye. It is very difficult to get the men to wear safety goggles. This is important, especially in naval work, on account of the large amount of chipping and scraping. The most effective bulletins gotten out by the National Safety Council are those on eye protection.

The figures of accidents for the fiscal year are somewhat misleading, as, while the safety work has probably done good, it will be noted that the largest number of accidents happen in months when much Sunday and night work was being done and for which overtime was being paid.

I cannot say how much of the doctor's deduction is true, but it is his firm idea that overtime and Sunday work augment accidents. He says that the lack of time for diversion of men unaccustomed to such deprivation caused them to report a large number of trivial injuries and endeavor to be passed out on compensation on time for which they would not receive extra pay. The big drop in the number of cases for August, 1917, is contributed, to a large extent, to the effect that nearly all cases were directed to report to the yard dispensary for continuous treatment, not merely for report, dressing if necessary, and pass out on compensation.

REPORTING BACK TO DISPENSARY.

We have had a great deal of trouble due to the fact that there are a number of doctors outside of the navy yard who get their livelihood

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from diagnosing these injuries so that the men can lay off and get their pay. Now we make them report back to the dispensary treatment and that has brought the number of cases down rapidly. Of course, that is not on the accident side, but it is on the side of getting the true number of accidents.

The doctor says that the reason why the proportion of accidents in Government yards is slightly higher than in civilian industries is because a good record is kept of even the most trivial accidents. The policy is most liberal and the man is always given the benefit of any doubt. This fact is well known and causes older men and men not in the best physical condition to seek employment there. Politics also plays a part. That is the doctor's idea.

The number of accidents in 1916 was 3,409; in 1917 up to the end of August, 3,381. In July, 1916, there were 601 accidents, and in August, 1916, 760 accidents. In July, 1917, there were 410 accidents and in August, 1917, there were 331 accidents. That is, in the last two months of almost a double force. The number of accidents has been coming down gradually, but the last two months show rather a big jump down. That might be somewhat accidental, but there has been a gradual decrease, showing that there has been some effect from watching this matter. I am quite sure that when our very efficient safety engineer gets to work we will improve our record.

I would like to say that Mr. Price's idea that naval officers are stiff, formal, people, is rather prevalent, but no seafaring men are ever stiff and formal. The fact that we are military men is no bigger thing than that we are seafaring men. In other words, our training is such as to make us just as human as the most human civilian that ever lived. We are always open-minded on any subject which means progress.

ARMY NOT REPRESENTED.

CHAIRMAN MEEKER: We are instructed, in our general program, that twenty minutes will be allowed for discussion on each of the addresses. I think we will count Commander Jessup's discussion as an address so that we still have twenty minutes for debate.

I think it would be exceedingly profitable to have a continuation of this discussion. I hope you will put Mr. Price and Commander Jessup on the grill. I did my utmost to secure an Army man to give the arsenal side of the question, but I failed to do so.

You ought to have a lot of questions to fire at both Mr. Price and Commander Jessup. If I were...

like to fire a question at Commander Jessup. Is his explanation of the greater prevalence of accidents in Government plants the correct one?

MR. SANFORD (General Electric Company): I have been doing field work at one of the Government arsenals. In looking over the statistics of the accidents I was struck with the amount of lost time in all kinds of accidents. I turned the list over to the chief physician of the General Electric Company for his comment and he told me that they averaged about four times what he would naturally expect for the same kind of accidents in his own plant. It seems to be the case, as the Commander said, that the workmen select any doctor they want to, and then, if the workman is a member of two or three fraternal organizations that pay benefits in addition to his full week's

SUPERFICIAL EXAMINATIONS.

Another point I wanted to mention: The arsenal at Watertown is one of those that has tried the systematic safety movement. They still continue the accident committees in the factory department. Those committees make a very superficial inspection, referring to the instructions, every other Monday. Their reports—I looked over a large number of them—consisted in recommendation of safeguards for three or four machines. They seemed to think that was the extent of their work—they would save the rest of the machines for the next report.

I would like to suggest in this connection that while these committees are not so familiar with safety work as the trained men, that the first thing they have in mind in the line of safety is mechanical pay, he would stay out just as long as he possibly could get a doctor to back him up.

safeguards. I recommended to these committees, and I think it would be well for others to bear it in mind, that the committees should look more for congestion of aisles and for placing of material at machines. Laborers placed the material at the machines and the machinists did not pay much attention to the method in which it was piled. The bulk of accidents in that arsenal seemed to be caused by falling material or by men falling over material improperly left in the aisles. The chief function of workmen's committees should not be to make inspection of mechanical safeguards, they should be on their toes all the time, so to speak, to see that aisles are kept clear and that material is not left in a condition where it might topple over and cause injury.

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HEALTH OF WORKMEN.

DR. ROOS (State Industrial Commission of New York) :
I listened earnestly to Mr. Price's address on safety, but I did not hear him say very much about the health of men employed in large government navy yards. A number of years ago, when the Division of Industrial Hygiene of the State Department of Labor was created, we were struck by the large number of cases of lead poisoning reported by the Brooklyn hospitals of men working at the Brooklyn Navy Yard. After a conference with the medical officer in charge, and by agreement with the Secretary of the Navy, the Division of Industrial Hygiene was permitted to make a survey of the chippers, painters and scalers employed at the navy yard. We were amazed at the number of men who were suffering with chronic lead poisoning, employed by the Government, and the lack of care taken in the yard as regards the health of these men. I believe that the Industrial Commission at that time took the matter up with the Secretary of the Navy, and did something along the lines of prevention of lead poisoning.

Another matter which came up at that time was gasoline poisoning. Men were permitted to go into the tanks of submarines to clean them out. They were told the tanks had been blown out, when in fact they were not entirely clear and the fumes of gasoline remained in the tanks. The men went in to paint or chip and when they came out they were in a condition of exhilaration which the medical officer at that time said was due to alcohol. We had difficulty in convincing him that it was due to gasoline fumes, and despite the fact that Dr. Alice Hamilton had reported this condition they refused to believe that fumes could cause any such condition.

I would like to ask Commander Jessup whether, at this time, anything has been done toward preventing such cases in the Brooklyn Navy Yard. We have no jurisdiction, it is a Government plant, although the cases have decreased, as reported from the Brooklyn hospitals, we have never received any report on what was actually done.

COMMANDER JESSUP: That is rather a weak spot with me, because I don't know exactly what has been done. I have heard frequent discussion between the medical officers and the industrial manager in regard to lead poisoning. If it is of interest I will get information and send it to you.

DR. ROOS: I would like to have it.

COMMANDER JESSUP: I will be glad to do so. With regard to the statement made as to why there were more accidents in navy yards and Government plants than in outside plants, that was the doctor's explanation, not my own. He had a better chance for diagnosis than I, so I merely read his statement. Any discussion on that would have to be based on what the doctor said and not on what I personally think, because I really haven't thought enough about it to give an opinion. This I do know, Government plants have not protected themselves against men who were not in the best physical condition when they came in. They have taken the say-so of outside doctors as to the man's general physical condition, rather than what they found for themselves. I believe we are now making a proper examination and we know the condition a workman is in when he comes to work.

STUDY OF OCCUPATIONAL DISEASE.

COMMISSIONER R. M. LITTLE (Chairman, United States Employes' Compensation Commission): I would like to clarify one or two points. First, as to occupational diseases to which the last speaker referred. The Surgeon General of the Army and the Surgeon General of the Navy have approved a sanitary and hygienic survey of the arsenals and navy yards, in co-operation with the Public Health Service. It was proposed by the Federal Compensation Commission and will be conducted by Dr. Schereschewski and two or three surgeons of the Public Health Service, together with Army and Navy surgeons who are up on the subject.

Second, as regards the time loss and apparent larger number of accidents in Government plants than in some others, we should remember that the Federal Compensation Law of 1908, which terminated on Sept. 7, 1916, was an act which really encouraged a tendency to malingering. There was a fourteen days' waiting period, after which, if a man were still disabled, he received pay from the date of the injury. If he received an injury resulting in genuine incapacity for ten or twelve days, naturally he would remain away fourteen days in order to get his pay. Besides, the medical service was not well organized. In addition to the dispensaries at the plant furnishing first-aid treatment, there were a good many physicians near the plants ready to give certificates of disability to injured employes as a basis upon which they could get compensation.

The new act of Sept. 7, 1916, is not yet well understood, even

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by Government officials, and the workingmen do not fully know their rights and benefits under the law. In principle it is entirely different from the old law. There is a three days' waiting period, which no compensation is paid, except for medical and surgical attention. If a disability lasts more than three days, the injured employee can only receive $66\frac{2}{3}$ per cent of his wages, and this based on a wage rate of not more than \$100 per month or less than \$50 per month.

GOVERNMENT PHYSICIANS AND HOSPITALS.

The medical service under the new act is being organized. A Commission has discretion as to the designation of hospital physicians where Government hospitals and physicians are not available. Primarily, the service for injured civil employees of the Government must be furnished by the Government's own physicians and hospitals. The question of freedom of choice when Government medical services are not available still holds, with a tendency in the Commission's mind to limit the freedom of choice and to designate certain hospitals of approved standing and reputable physicians. A definite conclusion on this point has not been reached. These factors should be weighed in considering the reduction of accidents reported at Brooklyn yard and in other Government plants. There is a new regime in compensation, with a new law and perhaps a new point of view. A safety survey has been completed; a sanitary survey being made in thorough harmony with the medical officers of the Army and Navy. Good team work is being developed and as a result we hope to make a better showing and have more reliable statistics.

SANITARY ACCOMPLISHMENTS.

Mr. Chairman, may I supplement what the Commander has said and answer the question as to what was done regarding sanitation? This much was accomplished: Knowing that the medical service would not be complete for some months, it was agreed, with the consent of the Commander, that our engineer should examine certain conditions, such as improper lighting, excessive dust or gas, sanitary conditions of floors, etc. This emergency report has been placed before the Commandant and some of the conditions have been remedied at once. We have helped lay out lighting installations in a large sewing machine department and placed in the hands of

STUDY OF EXPLOSIVE HAZARDS.

DR. PATTERSON (Pennsylvania): What provision will be made by the United States Government to bring the arsenals up to standard factory practices in the handling of explosives? I am not prepared to state whether or not at the present time they are engaged in practices which are more or less frowned upon. I am seeking knowledge on the subject and would like to know what they are doing in that direction. Do the United States arsenals live up to at least 30 per cent of the American table of distances?

COMMISSIONER LITTLE: No one can speak authoritatively for the War Department and Chief of Ordnance, but I wish to say that a most careful study has been made by competent men of explosive hazards and a report has been sent to the Secretary of War and the Chief of Ordnance. They are under tremendous pressure, and have not been able to give the report and its recommendations full and careful consideration, but a conference on the subject is being arranged for next week, and we hope that the Federal Government will adopt as far as practicable the American Table of Distances as regards handling explosives. At present the arsenals must be used to their utmost capacity. They cannot altogether be reconstructed or new ones developed, but a sincere effort will be made to minimize the hazards which exist.

CHAIRMAN MEEKER: I had hoped that some of the military-minded men in our Governmental Section would correct an inadvertence on the part of Mr. Price. For the purpose of clearing the record I wish to say that Colonel Blount is not Chief of Ordnance, unless he has very recently succeeded General Crozier.

Is there any further discussion? If not, we will proceed to the next topic. Unfortunately Colonel Bryant cannot be here. He telephoned his regrets and said that Colonel Carlton had the only copy of his paper. As Colonel Carlton is not here I will ask Mr. Roach, Colonel Bryant's assistant, to speak on the third subject for discussion. Dr. Hamilton is detained by illness in her family, she sent me her paper; I will have to read it. Many of you, perhaps, know a great deal more about chemistry in the industries and the technical names of substances used in the manufacture of airplane wings than I do, but none of you, I think, is as familiar with Dr. Hamilton's peculiar chirography as I am. I have translated certain portions of her peculiarly illegible characters into my type of illegible

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characters, so that I think I can read the paper better than a else.

You will now have the pleasure of listening to a paper on "Poisoning in the Manufacture of Airplane Wings," by Dr. Hamilton. The paper is the result of an investigation she undertook in the industry under my direction. The survey is merely preliminary and as soon as circumstances allow she will make a final survey of the industry in this country, and, no doubt, will find conditions quite different.

DOPE POISONING IN THE MANUFACTURE OF PLANE WINGS.

ALICE HAMILTON, M. D., BUREAU OF LABOR STATISTICS, WASHINGTON, D. C.

Mr. Chairman and Members of the National Safety Council:
For the most part the making of airplanes is not a dangerous industry in the sense of involving the risk of occupational poisoning, for it is chiefly woodwork and upholstering, but there is one stage in the preparation of the linens used to cover most of the surface of the structure which is attended with risk of poisoning. This is the use of so-called dope to tighten up the linen, and make it durable and waterproof. Up to the present, the base of dopes used for airplanes is a cellulose compound, either the nitrate or the acetate. The results of experimentation is still going on, and it may easily be that some other compound may come into use shortly, but at present it is safe to say that airplane dopes are cellulose acetate or nitrate dopes. These bodies are both quite free from poisonous properties and their solvents are not. A study of the risks involved in airplane manufacture resolves itself into a study of dope solvents.

Cellulose acetate is relatively non-inflammable, a great advantage. It dissolves best in tetrachlorethane, or acetylene tetrachloride, $C_2H_2Cl_4$. So far as I have been able to ascertain, all cellulose acetate dopes in this country are tetrachlorethane dopes, supplemented usually by varying quantities of acetone, or other ketones, and by methyl alcohol and benzol. Analyses made by the Bureau of Standards show that American acetate dopes contain from 2

A NEW AND MYSTERIOUS DISEASE.

It was tetrachlorethane that first called attention to the airplane industry as a dangerous trade. Almost simultaneously in Germany and England articles were published in medical journals describing a new and mysterious disease, an acute, severe, sometimes fatal degeneration of the liver, which had appeared among men engaged in doping airplane wings. This was in 1914. Early in the following year we ceased to get reports from Germany, but the English record has been published with great regularity and frankness, and lies before us for warning and guidance.

The first German report came from works in Johannisthal, where four out of a force of eight dopers were affected with jaundice of a severe type and one died. They had been applying a dope containing 60 per cent tetrachlorethane, spraying it on as well as painting, and the work was done in a poorly ventilated room. This occurrence was followed by other similar accidents in German airplane works. In one, ten men were poisoned and one died; in another, all but one of fifteen dopers had been sick, and that one had been at work only two months. One author collected the histories of eighteen cases of this so-called toxic jaundice among the dopers in German factories. He says that after the appearance of these cases two of the Johannisthal factories gave up the use of acetate dopes, but even so, a case developed four months later—an instance of long latency in a poison, a phenomenon which has been observed also among the victims.

These German dopes were analyzed and found to contain from 40 to 84 per cent of tetrachlorethane. In one district, the use of these dopes was temporarily suspended, pending further inquiry, and the experts who had made the analyses and had tested the substance on animals, strongly advised prohibition of tetrachlorethane in dope, but we have no means of knowing whether this was carried out. If it was not, there has probably been a great deal of serious occupational poisoning in German airplane manufacture during these years of intense activity.

EXPERIENCE IN ENGLAND.

In England the experience has been much the same, ending in practical prohibition of tetrachlorethane dopes and the substitution of safer ones. In England, as in Germany, the first case of toxic jaundice in a doper came as a surprise and was inexplicable to the

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physician. It was not until the senior scientific analyst of the Office had subjected all the compounds found in the dope to a tests that it was discovered which one was responsible. But wood alcohol and acetone were present as well as tetrachlore but only the last was capable of setting up in animals the change in the liver which had been found in the human case.

Much attention was aroused by this first death from air dope, and not long after it was followed by three others, all were. A fifth victim, an old man, died early in 1916, and in February of that year toxic jaundice was made a notifiable disease and brought under the workmen's compensation act. A question asked in the House of Commons elicited the statement from the Home Office that there had been up to that time forty-three known cases of jaundice in dopers, with seven deaths, five of them women. The government was said to be working to discover a substitute for tetrachlorethane, and, pending that, strict regulation of the work was enforced; down suction to carry off the heavy fumes, since the plenum system of ventilation only resulted in scattering the dangerous vapors all over the room; separation of doping from all other processes; all doping, including taping, to be done in one room; the air in this room to be changed thirty times an hour; all dopes to be examined once in a fortnight by a physician. As small amounts as 10 per cent of tetrachlorethane was said to be dangerous.

In August, 1916, a representative of the War Office and of the Admiralty was able to state in the House of Commons that considerable progress had been made in the production of satisfactory non-poisonous dopes, and that the Admiralty and War Office issued instructions to contractors specifying some seven or eight such dopes which were satisfactory to them. The result was that Dr. T. M. Legge, Chief Medical Inspector, and Sir Thomas Oliver both wrote me, by the beginning of this year, tetrachlorethane dopes were no longer in use for government work in Great Britain.

TYPES OF POISONING.

I do not wish to go into details as to the effects of this compound on animals and on human beings, but just to sketch rapidly a picture of what may be expected in a factory where such dopes are used without sufficient ventilation. The only type of poisoning recognized at first was the gastric type, eventuating in jaundice, but after

cred. Koelsch, one of the German observers, distinguished two forms especially—those with pronounced gastric symptoms, nausea, vomiting, abdominal cramps, enlarged liver and jaundice, and those with slight abdominal symptoms or none at all, but with nervous disturbances of various kinds, headache, sensations of crawling and pricking, trembling hands, reflex disorders, slight paralyses. Two cases of the gastric type were diagnosed as lead colic, though there was no exposure to lead at all. Sometimes men complained of increased appetite for food coincident with a loss of weight. Drowsiness was a very common symptom, persisting all through the working hours.

Lehmann, the greatest authority on the poisonous industrial gases, found that if there were not more than one or two milligrammes of tetrachlorethane to a litre of air, animals could tolerate it for many days with no more serious symptoms than loss of weight and drowsiness, but that if the strength of the fumes were increased the animals showed symptoms like those following chloroform inhalation, only it is four times as toxic as chloroform. It is nine times as toxic as carbon tetrachloride and tetrachlorethane. The fatty degeneration of the liver caused by it is more intense than that caused by any known poison, except phosphorus. Along with it go changes in the kidneys and in the heart muscle.

I have gone so thoroughly into the subject of tetrachlorethane poisoning because it is the most important of the constituents of airplane dope, from the aspect of industrial poisoning. I suppose it is also important in other industries, in rubber work perhaps, in the making of non-inflammable films, lacquers, artificial silk and fireproof fabrics. This is only hearsay. I do not know of my own experience anything about its use in these industries, and I should be very grateful for information. According to German authorities, the manufacture of the compound is not attended with the risk that accompanies its use.

Cellulose nitrate dopes do not contain this solvent. The substance that bears the relation to cellulose nitrate that tetrachlorethane bears to cellulose acetate is acetone. Mixed with it may be amyl acetate, methyl, ethyl and amyl alcohol, benzol and various ketones. Acetone seems to be looked on as a poison by some chemists and manufacturers. I have often been told that it is more dangerous than wood alcohol and even than tetrachlorethane. There is really no evidence that it is a dangerous substance in industry, either inhaled or absorbed through the skin. The great German authority on

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poisons, Kobert, could not find a case on record of industrial poisoning from it and believes such an occurrence to be almost impossible. Koelsch, an industrial physician, looked into the question from a different point of view and found no proof of bad effects from its use. He came across acetone in the powder industry, for it is one of the solvents used in making smokeless powder. The men using it looked on it as quite harmless, and so did the physicians in charge of them.

WORKMEN DISLIKE BANANA OIL.

The solvent next in importance for cellulose nitrate is acetate, known to the workmen as banana oil, and quite heartily liked by them. It has, of course, a sickeningly sweet, cloying and irritating effect on the eyes and throat. For these reasons workmen are likely to attribute to it all the ill health that they experience as a result of using solvents containing it, though there may be present much more powerful poisons, such as methyl alcohol and benzene. I have heard many physicians make the same mistake, of holding amyl acetate responsible for symptoms due to other substances. Several of them, and several foremen also, have told me that amyl acetate was much worse than tetrachlorethane and that they could not make their men use nitrate dopes because of the irritation caused by it.

As a matter of fact, amyl acetate is poisonous, but only slightly so, while tetrachlorethane, though it does not make the eyes red and set up an irritating cough as does banana oil, is a subtle and dangerous poison to liver, heart and kidneys. Amyl acetate has been elaborately tested by Lehmann and Koelsch, both of whom have used it on human beings as well as animals for experimentation. Briefly stated, workers using amyl acetate may be expected to complain of stinging and running eyes, dryness in the throat, tight feeling in the chest, inclination to cough continually. More rarely they may feel drowsy and tired and vaguely nervous, the feeling which they sum up under the term "dopey." Such symptoms as headache, vomiting, gastric distress, do not seem to be characteristic effects of amyl acetate. We have so far any proof of chronic organic disturbances in human beings as a result of long continued exposure to it, though experiments on animals point to the possibility of such occurrences.

It is evident, therefore, that cellulose acetate dope, with tetrachlorethane as solvent, is far more dangerous than cellulose nitrate dope with acetone or amyl acetate as a solvent.

BENZOL FUMES.

Both kinds may contain methyl alcohol, amyl alcohol and benzol. None of these is as poisonous as tetrachlorethane when used in the quantities present in dopes, but all are volatile poisons. Benzol is the most powerful. In studying the explosive industry I came across some fourteen cases of severe benzol poisoning, seven of which were fatal, and many mild cases had doubtless occurred which were not considered important enough to be recorded. All of these were caused by benzol fumes, and sometimes the fumes were not very heavy. I happened to be in a factory for the synthetic preparation of carbollic acid when a benzol recovery tank overflowed and the benzol ran out on the floor. It was less than two minutes before I was dazed and my head swimming so that I was glad to stagger out into the air and sink down on the first handy keg to get over it. It causes, in mild cases, dizziness, roaring in the ears, excitement like that of alcoholic intoxication, sometimes angry, sometimes foolish, and it is followed by the same sense of discomfort and depression that comes after a bout of drinking. There is also a chronic benzol poisoning, which has been observed especially in rubber workers, with anæmia, disturbed digestion, loss of weight, loss of appetite, tendency to early fatigue, vague nervous symptoms, and increased susceptibility to infections.

As to methyl alcohol, wood alcohol, I think there is more confusion as to its dangerousness than there is with regard to any other substance used in industry. It seems to be a question that men, even scientific chemists and sanitarians, find difficult to approach with an impartial mind. Fortunately, we have some really authoritative data on which to depend, and we can say with certainty that methyl alcohol is poisonous and produces very characteristic effects, and that it is the methyl alcohol itself that produces them, not the impurities commonly present in the commercial variety. We can also say with certainty that it is possible to produce severe and even fatal poisoning by the fumes alone. Inhalation of fumes is the usual way by which wood alcohol poisoning is brought about in industrial cases.

EFFECT ON THE EYES.

In human beings the most striking effect of methyl alcohol is on the eyes, and this effect is more constant and more characteristic than is the effect of almost any poison. There is first an inflammation of the lids, which may become purulent, or the first symptom

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noticed may be a blurring of vision which passes away as a workshop is left. The field of vision is contracted, especially certain colors, and there are dark spots before the eyes. Total blindness, usually transient, sometimes permanent, may result from exposure to heavy fumes of methyl alcohol. Together with eye symptoms usually go headache, feeling of weariness, dizziness, pain in the stomach, dizziness, perhaps staggering gait, confusion and roaring in the ears, but seldom loss of consciousness. Severe cases of poisoning would not probably follow such exposure as would be found in doping airplanes, for the quantity of alcohol used is not great enough.

It is a question, however, what proportion of wood alcohol constitutes a dangerous amount. Our denatured alcohol usually contains about 4 per cent and is supposed to be harmless, but the German man only contains 2 per cent, and yet German workmen petitioned the Reichstag to have a governmental inquiry made into the effect on the health which they insisted followed the use of denatured alcohol in industry. Individual susceptibility to methyl alcohol varies much, a fact which helps to add to the confusion concerning its effects.

Amyl alcohol, fusel oil, is, according to Salant, from seven to ten times as toxic to animals as is ethyl alcohol, is more rapid in its action, and causes a more decided fall of blood pressure.

These are the important compounds used in airplane doping. As you see, they are all volatile poisons—except, possibly, acetone, and all capable of absorption through the skin and lungs as well as the stomach. It follows, then, that men who handle these must, if they are to be protected from poisoning, work in well-ventilated quarters. They must not be overexposed by too long hours, and they must be watched by some one who is capable of recognizing the signs of poisoning. Such precautions are necessary when cellulose acetate dope is used, though it is well to remember that the English have thought best to continue their rules for doping rooms even though they have changed to the new dopes.

In the course of an investigation made for the Bureau of Statistics, I visited some eighteen airplane works in nine States. Some were tiny places employing one man for part time in the day. Most were employing two or three dopers, and three were large enough to employ more than ten. Only five were using acetone with tetrachlorethane as solvent. At the time of my visits he

April and July of this year, conditions in these doping rooms were for the most part fair, rarely bad, rarely excellent. This was, however, during pleasant, cool weather. In winter, when windows are closed, or on heavy, humid, hot summer days, the impression given would not be so favorable. However, there were not more than two plants so small and crowded as to make severe poisoning at all likely, and these were not working at full capacity, so that doping was done only now and then.

MECHANICAL VENTILATION NECESSARY.

Usually natural ventilation is depended on in these plants, but some of the larger ones have installed various systems of mechanical ventilation, more or less efficient. Even when nitrate dopes are used, natural ventilation is not enough. There should be some method of sending the air in from above and drawing it off from below, for the more dangerous solvents are heavier than air. It is well to remember that a man who faints and falls to the ground in a doping room is falling into air more heavily laden with the poison than that which he was breathing before.

I did not find any evidence of serious poisoning in our airplane works. I did not even hear of a case of toxic jaundice, though this is not proof that none has occurred. American physicians had no reason to suspect, up till recently, that such a disease might be caused by work in an airplane shop, and they would not have thought toxic jaundice in a doper had anything to do with this occupation. Still, I doubt very much that there have been any such cases. I did find instances of men who used this kind of dope being temporarily overcome by the fumes. Once, for instance, on a hot day and in an unventilated room, a man tipped over his dope can and spilled some of the dope over his clothes, stooped to pick up the can, but lost consciousness and fell, and his fellow-workman who went to help him also fainted away. They were both revived by artificial respiration administered in the open air, but the first one did not come to till after his dope-soaked clothes had been removed. The physician in charge could not see that any ill effects followed the poisoning, beyond some malaise for a few days. The slower, more deadly form, toxic jaundice, he had never seen.

DROWSINESS AND FAINTNESS.

In view of the comparative newness of this industrial poison, it may be well to describe the symptoms as they were related to me by

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dopers, even if the type of illness described was slight. Faintness, especially in hot weather, was mentioned more often than any one symptom, more troublesome on going to work, passing as the day wears on, but sometimes returning when the man left the shop for the open air. Some men fall asleep as soon as they reach home. It is worse after a holiday. Faintness, sufficient to make the man quit work, was usually due to over-exposure to air or to exceptionally hot and humid weather. One man lay down under a wing to paint it and, of course, the fumes fell on his face. Another was working in an old greenhouse where drying wings were stacked close around him and the sun shined on the glass roof. But of chronic symptoms, caused by long exposure, I heard nothing.

This was true also of the men using nitrate dope, and here there was less complaint of nervous symptoms. Itching eyelids, sore eyes, headache, slight nausea, cold hands and feet, dry throat, complained of most often by these men.

The Bureau of Statistics and Information of the New York State Industrial Commission, in their bulletin for June of 1917, published a report of the inquiry into the danger of the airplane industry from a hygienic standpoint. The investigators were Lester Roos and Dr. Rosalie Bell, who visited eight factories in the state, three of which were very small, the other five employing five to forty dopers. Two were using tetrachlorethane dopes. They examined fifty-two dopers and found some disturbance in the health of thirty-five. In some it was very slight, but in about twenty-six there were definite symptoms referable to the central nervous system or the gastro-intestinal or the urinary organs. Jaundice was observed in two men, one using tetrachlorethane dope, the other amyl acetone dope. Several men had attacks of faintness and even loss of consciousness, and a greater number of these were using amyl acetone dope than nitrate dope. No characteristic case of tetrachloro poisoning was found.

CARE FOR THE FUTURE.

There are several reasons why our dopers have escaped the troubles suffered by the English and Germans. In the first place they have never been exposed to dope poisoning for a long time continuously. I found that out of fifty-three dopers only five worked as long as a year, and only thirteen for more than

for one to three months, and eleven for three to six months. Even in this short working time they had usually been exposed intermittently only—perhaps a few hours out of the day, perhaps two or three days in the week. This is the principal reason why we have had so little dope poisoning. Another is to be found in the fact that much of the doping has been done up to now in the open air. Doping rooms are being built now, but sheds or the yard were formerly the rule. There were few wings in process of doping, few stacked about in process of drying, few men doping at the same time, so that the fumes were not heavy. All these conditions are changing, and unless we take care we may yet see cases of toxic jaundice in our airplane works.

Fortunately, nitrate dopes are increasing in popularity and are supplanting acetate dopes in the majority of factories. They are not, however, free from danger, and, indeed, the danger may prove to be greater than we now know. We shall be carrying on a human experiment in the effects of amyl acetate, benzol, methyl alcohol, acetone and other ketones, which may show results quite unexpected. For the sake of the dopers let us hope that this experiment may turn out negatively, but it will not unless doping is managed with intelligence, knowledge and care.

DISCUSSION.

CHAIRMAN MEERER: Before throwing the subject open for discussion I desire to say that it is more necessary than ever that permanent agencies, like the Bureau of Labor Statistics, be required by the force of public opinion to continue the work they are now doing in the way of investigating industrial poisonings and to spread the work out, making it more extensive and more intensive. The only reason that it is not being done now is because there are so many things for the little United States Bureau of Labor Statistics to do. I hope that the State Bureaus of Labor, industrial commissions and State agencies—authorities that have charge of such matters—will awaken to the importance of this work. We should all work together. It is my hope that we will eventually form a close union and the State agencies be given sufficient funds to enable them to enforce labor laws, look after safety, inspect factories, and assist the Federal Bureau. Co-operation is necessary. New York State has done most excellent work, but very little is known regarding it outside of New

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York because the authorities have little money to expend for publishing their findings and for postage. New Jersey cannot, except a very considerable effort and considerable expenditure of money to acquaint California with what they are doing. The same is true of all the other States. Through the establishment of the Governmental Section of the National Safety Council we hope to bring State organizations and the Federal organizations closer together. I can tell you, I can make your discoveries known more widely than otherwise they could possibly be known. You can assist in making the investigations, and that is exactly the policy that I have followed from the very beginning.

The discussion will be opened by Mr. Smith.

STUDY OF POISONOUS COMPOUNDS.

MR. M. H. SMITH (United States Bureau of Standards, Washington, D. C.): The Bureau of Standards has taken up the question of dopes since the beginning of the war mainly because of the toxicity of certain of the ingredients, particularly in the acetate dopes, also to assure good dopes for use on army airplanes.

Dope is a compound applied to the surface of the airplane to produce tautness, to afford protection, and finally to give a smooth surface so that skin friction is reduced to the minimum. These compounds consist of the acetates and nitrates of cellulose in solution, as mentioned by Dr. Hamilton, and the reason for this is that these appear to be unique in possessing the peculiar property of producing a shining film when drying out, thereby drawing up the fabric and rendering it taut. This seems to be true of few other compounds, glue or casein exhibiting the same property to a slight degree. Of the classes of dope, the nitrate dope is in greatest use at the present time but it is undesirable because of its inflammability. The inflammability of cellulose nitrate is not reduced by the application of two coats of oil varnish, as is the practice in some factories, but it is somewhat diminished by the application of two coats of an acetate dope.

As regards the use of tetrachlormethane, it bears about the same relation to acetate dopes that amyl acetate does to nitrate dopes; it adds luster, it evaporates slowly, and in combination with acetone seems to form a resinous deposit which adds to the flexibility. It is desirable to get a good acetate dope. The Government is not using the nitrate dope because it wants to, but up to the present, or at least until recently, it has been impossible to find an acetate dope produced in this country free from toxic materials.

Corps objects, with the necessary property of stability. Acetate dope is readily susceptible to deterioration, unless properly modified.

TWO NEW DOPES.

Recently, however, we have succeeded in getting two dopes free from tetrachlormethane, which are quite satisfactory. Within the past two weeks we have found a dope containing a new compound, the composition of which we have not yet succeeded in determining, as it has been difficult to isolate it. Its use originated in Germany; the compound, whatever it is, is an excellent substitute for tetrachlormethane, and is a real substitute, something which has not hitherto been found.

CHAIRMAN MEEKER: How successful is the British substitute for tetrachlormethane dopes?

MR. SMITH: It does not answer all requirements.

CHAIRMAN MEEKER: They are having much trouble?

MR. SMITH: Yes, it does not seem to modify the film sufficiently. The acetate is susceptible of greater modification than the nitrate. The nitrate film is satisfactory with less modification. Tetrachlormethane possesses the peculiar property of being a solvent, and a plastic. It is a very desirable compound, because it dissolves acetates over a wide range of hydration. In preparing the acetate it is necessary to form the acetate and then hydrolyze it, to make it soluble in acetone.

I have here a copy of the report of the New York Commission to which reference has been made, and I would like to quote some of the remarks. Dr. Roos, who is here, probably could do that better. Tetrachlormethane has already been considered.

In other words, while we have a dangerous constituent in tetrachlormethane, the danger which may result from the use of other solvents must not be overlooked. Most of the solvents are heavy and fall to the floor of the room. Abroad, they have made use of a ventilating system having a fan in the floor, and the heavy vapors are drawn down through the floor. More attention ought to be paid to the effect of vapors in the doping rooms, because very little precaution is taken except in the winter time. In two or three plants in this country there is nothing but open windows, and the smell of the dope is noticeable two or three blocks distant, if the wind is blowing in the right direction. I think there is great need for some action in the ventilation of these rooms. If it is not done merely to insure the absence of sickness, it ought to be done for the sake of efficiency,

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because no one can work in an atmosphere where these vapors are present without being affected by them.

I have here a copy of the United States Department of Health bulletin on "Hours, Fatigue and Health in British Munition Factories." This is a reprint of the experience of the British official with tetrachlormethane poisoning. I will quote the remarks at the end which refers briefly to the experiments made on rats.

CHAIRMAN MEEKER: Do you have something to add, Dr. J.

DR. ROOS: I haven't very much to add, Mr. Chairman, except that the supervision of the airplane factories in this State, so as to bring the dope rooms into a condition that will make for safety to the employees, is now under way. There isn't any doubt but what dopeing is a dangerous process. The United States Government, in its contracts for airplanes, demand that there shall be a certain number of coats of nitrate dope and a certain number of coats of acetone dope. Until a substitute has been found that will take the place of the tetrachlormethane, and as long as the United States Government is in their contracts, demand that a certain number of coats shall be applied, there will be tetrachlormethane used where airplanes are manufactured.

CHAIRMAN MEEKER: May I ask if it is used in all of the airplane factories in New York State?

AIRPLANES FOR THE ARMY.

DR. ROOS: Not in all of them. I have not the reports here yet where we made an analysis of the dopes that we found, and it is not used in all cases. Those that are using tetrachlormethane are those that are not holding United States Army contracts. Those that have United States Army contracts are under contract not to use tetrachlormethane. As Mr. Smith said, the combination of acetone; methyl alcohol, benzine and methyl acetate, produces a definite line of symptoms. To which of the solvents these symptoms were to be ascribed was pretty hard to make out, but the combination of the solvents produced a definite line of symptoms which demands a much closer study than we made in our first investigation.

We found in the plants that very little attention was paid to the condition of the men. They were not properly supervised. In one plant that I went into two men were found unconscious in a lavatory office removed from the doping room. Even with that condition present there was nothing done in the plant to prevent it.

provided by a slotting in the floor, but its effect was almost nil. We heard of a factory which was ventilating a doperoom by an installation of airplane propellers at both ends of the room—I think it was the Burgess factory at Marblehead, Mass. I have not had an opportunity to go there, but from some of the men who worked in that place, and whom we found in factories in this State, we learned that it was a fairly good means of ventilating the doperoom, that they were not overcome with dizzy spells.

MAKESHIFT SYSTEMS.

It was strange to see the makeshift systems in some of these plants. In one plant there was a system of exhaust by a wooden conduit laid on the floor, with a sort of vent at the ends. It was leaking at every joint, and was practically valueless. In some of the other plants no attention at all was paid to the ventilation. In one plant in Brooklyn we found a case where a man had been doping with the tetrachlormethane in the open. Last summer he was doping airplane wings on a hot, still day, and there was a rapid evaporation of the fumes. The man had acute attacks three different times, without knowing what was the matter with him. He went to a doctor, but no one knew what was the matter. They kept him off for a couple of days, but he went back, and with the third attack he was so sick that he quit the job. In our report we have advised that where doping of wings is conducted in the open it should be done in a shed where the strong rays of light cannot get at it and cause rapid evaporation.

The Aircraft Association is in direct contact with the New York State Department of Labor, and after conferences, conditions in the airplane factories in this State will be a great deal better than they have been up to the present time.

CHAIRMAN MEEKER: Is there any further discussion?

DR. PATTERSON: I would like to ask a question: Whether any person can furnish the Department of Labor and Industry of Pennsylvania with a list of people manufacturing tetrachlormethane?

CHAIRMAN MEEKER: That is not a very dangerous process, as we understand it.

DR. PATTERSON: We are anxious to get it in order to comply with a request for a list of manufacturers.

CHAIRMAN MEEKER: You don't care about those using it.

DR. PATTERSON: We have a fairly good list of those.



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CHAIRMAN MEEKER: The question Dr. Patterson asks is firms who are manufacturing tetrachlormethane.

MR. SMITH: It is not made in this country; it is all made in England.

BAD CONDITIONS IN DOPE FACTORIES.

DR. ROOS: I feel that the Federal bureau might profitably take a look into the factories where these dopes are being manufactured. I heard some nasty stories about one of the plants. A foreman from one of the plants told me that in the plants where they were manufacturing this dope the conditions were horrifying; that day after day men were carried out of that part of the factory where this dope was being made; that they were sent to a hospital, and that at that time the hospital had five or six men from the dope department. I think it might be advisable to look into the manufacture of dopes as well as the application of them to airplane work.

CHAIRMAN MEEKER: Was the poisoning attributed to tetrachlormethane?

DR. ROOS: This man seemed to be of a high-class. He gave a fair expression of what he thought the men were suffering from. They were carried out from the doperoom. He said there was no question about the fact that they were overcome. In most cases the men were absolutely unconscious and were taken to the hospital to be revived. What happened afterward and whether there were any deaths he didn't know, because he didn't come in direct contact with the hospital, but a great many of the men who came back to work were not in the same condition they were before. We have no factories in this State that are producing acetate dope.

SELECTION OF NOMINATING COMMITTEE.

CHAIRMAN MEEKER: Before proceeding to the next topic I want to announce the Nominating Committee. I will ask Mr. Little, Chairman of the Federal Employees' Compensation Commission, to act as Chairman, and Mr. Roach, of New Jersey, and Dr. Patterson of Pennsylvania, to act with him.

I think we ought to feel encouraged by the excellent attendance at our session. We have fifty-two delegates and visitors, a large

We will now ask Mr. Roach to speak on "The Need for Uniform Standards in the Manufacture and Shipment of Explosives."

MR. JOHN ROACH (Chief, Bureau of Hygiene, New Jersey Department of Labor): It is a rather awkward situation which confronts us this morning. I only learned a few moments ago that Colonel Bryant, who was to deliver a paper on this subject, was unable to be present and it appears that his paper has been misplaced.

What I have to say on the subject will be my own thought, as I only had an opportunity to examine Colonel Bryant's paper in a most cursory manner.

THE BLACK TOM ISLAND EXPLOSION.

The question of providing safe rules for the transportation and the handling of high explosives was brought most vividly to the attention of the people of New Jersey and also, I believe, to the lower section of New York City, by a violent explosion which took place about a year ago on Black Tom Island. The explosion was more serious to New Jersey than it was to New York, and it naturally created a great deal more public excitement on our side of the river than it did on this, due to the fact that the transportation and storage of vast quantities of high explosives had taken place in the State of New Jersey. Immediately after the explosion, in response to the great public demand, which usually arises at such a time, the authorities looked up legislation on the matter of transportation and storage. They found that while legislation had been passed some years previous on the question of storage of explosives the legislators had absent-mindedly neglected to place the administration of the act in the hands of any particular group of persons, so that the legislation probably was not enforceable, due to various defects in the act. Experts were called in from various plants that had to do with explosive materials. One of the State Assemblymen took it upon himself to write letters to many States where explosives were manufactured and tried to get all the information extant upon the subject. He found the subject had been treated lightly in all the States and that very few, if any of them, had given any consideration whatever to the matter: that differing rules and practices obtained, bringing it very vividly to the attention of the people that there should be uniform practice in this matter. The result of the discussions—we had the assistance of the State of Pennsylvania and our good friend Dr. Patterson and his chemical and explosives engineer, and were aided

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by the experts from various powder companies—were incorporated in a measure known as the Hirschfield bill. The bill became law and is now about to be enforced in the State of New Jersey.

STORAGE OF HIGH EXPLOSIVES.

I am not thoroughly posted on the measure because I have not had to do with explosives, but in a general way I know the quantities of explosive materials which may be stored and the distance from magazines to lines of steam railroads or public highways. The bill deals with the construction of barricades, the type of materials which may be used, and other matters of that sort that are presumed to be sound which experience has demonstrated, will safeguard the storage of high explosives. The law has not as yet been enforced, so we cannot speak of its utility. It may be a good law, and again it may need amendment; it may need alterations and additions, but it has not been given a fair trial. I think that the States interested in this subject should not plunge into it single-handed, but should profit by the experience of their neighbors. In this matter, as in all others, the States should co-operate, hold conferences, and contribute what information they may possess to a common fund. I believe that we will get the best possible type of regulation on this subject, as well as on others, through a policy of that nature.

The manufacture of explosives has been given considerable consideration in the State of New Jersey and the State of Pennsylvania through conferences, which cover the better part of ten months. The men available were invited to attend and corporations handling the manufacturing of explosives were asked to send representatives. A code of rules was formulated, applying directly to the protection of explosives and the handling of the numerous trade poisons that form the basis of most of the explosives.

These regulations describe the construction and type of buildings that may be used by manufacturers of explosives, the regulations describe the regulation of departments where vapors may arise and the means that must be used to safeguard the workers. They call attention to the necessity of protecting workers coming in contact with poisonous substances and provide for special care, such as the frequent changing of their clothing. The plants must provide means for washing clothing and seeing that those who come in contact with splashes are given immediate attention.

factory conditions and practices were due to the ignorance of State authorities as well as those handling the materials, as to their poisonous character; also in a small measure, perhaps, to the necessity for haste in production. The rules that have been formulated by the two States cover the questions of fumes, of dust and of proper sanitary equipment, and I have no doubt they will greatly reduce the health hazards in those plants where they are being enforced.

LOADING HEAVY SHELLS.

In all of the States, so far as I know, and I have talked with the authorities in a number where the work is carried on, there still remains the necessity of providing suitable, safe rules for the loading of heavy ammunition, such as heavy shells. I do not know that the work is carried on extensively in many of the states, but it is in our own state, and I know in several others where the shells are loaded with trinitrotoluol. In other days, when this industry was in its infancy, and when, even abroad, they were not aware of the harmful properties of the vapor or dust of trinitrotoluol, large numbers of men lost their health and even their lives in this industry, due to the prevailing lack of information on the subject. As soon as we became aware that in the rooms where large quantities of trinitrotoluol was stored and heated in tubs to bring it to the proper consistency to pour, that this substance was likely to give off harmful vapors, we asked that adequate ventilation be provided at the point where the vapors were generated. We attempted to indicate what we considered adequate ventilation, basing the quantity of ventilation we advised on the experience we had had in other industries. I am glad to say that after ventilation of that character was applied to the point where the vapors were made that the poisoning ceased. There still remains, however, dusty points—boring and planing and blowing operations—and it is apparent that a number of men have been poisoned at these points; that something is wrong with the operation. We asked that dust control be installed that would provide safety from the dust generated. This was done and poisoning ceased in those several particulars; but there is no definite or substantial set of rules to govern this matter other than shop practice that may pass from plant to plant by word of mouth.

I believe the matter should have very serious consideration, because, if the world war is to continue, many more cases of trade poisoning may and will occur in the munitions industry.

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TIME FUSES AND PRIMERS.

Another matter that we have considered, although no action has been taken, also in conjunction with our neighboring state of Pennsylvania, is a provision regulating practices of where time fuses and primers are loaded. We had a most serious accident in our state, a large number of young women were burned to death in a flare-up—not an explosion, but a serious flare-up. I will confess that I could see no very distinct hazard in the matter before this terrible accident occurred. I went through the matter with one of the district inspectors and from my limited knowledge (knowing nothing, as a matter of fact, of the subject—never having been in a plant where that particular kind of work was carried on) could not see where there was any distinct hazard to the workers in that particular industry, yet the flare-up occurred and thirteen young women were burned to death in that room.

The same may be said regarding the loading of time fuses. Our neighboring state of Pennsylvania has taken up the matter with us and we made a number of trips to plants where this work is carried on. We will undoubtedly formulate a set of suitable rules covering the matter.

While there is grave danger in handling of explosives and numbers of men may be destroyed, because when one vessel lets go there is nothing left at all, I still maintain that if you were to total casualties in that industry, according to the number of men employed and then calculate the total number of people losing their lives and health in places where dust and fumes exist, you will find more people are harmed from dust and the fumes than from explosions in munition factories.

The explosive risk is the most sensational and it attracts immediate public attention. When an accident occurs a clamor goes up for some established safety rule, but insidious poisonings from dust and fumes in the explosive industry go on quietly, many times secretly, day and night, and very little attention is paid to them except by officials authorized by the state or by the Federal government. I thank you.

CHAIRMAN MEEKER: I will ask General Manager Cameron to incorporate the paper of the Hon. L. T. Bryant in the proceedings. If there is no objection this course will be followed.

UNIFORM STANDARDS FOR THE MANUFACTURE AND
TRANSPORTATION OF HIGH EXPLOSIVES.

THE HON. LEWIS L. BRYANT, COMMISSIONER OF LABOR, STATE OF
NEW JERSEY, TRENTON, N. J.

Mr. Chairman and Members of the National Safety Council:
In discussing the subject assigned to me today, I shall treat the matter of transportation of high explosives before that of their manufacture.

The necessity for uniform standards in the matter of transportation has been so apparent that the problem seems to have been solved in an excellent manner through the regulations issued by the Interstate Commerce Commission. These regulations have been formulated upon the recommendations of the Bureau for the Safe Transportation of Explosives and Other Dangerous Articles.

Before these recommendations were made by this bureau, consultations were held with the manufacturers and shippers of high explosives and the railroads who were to perform the transportation service. Types of containers have been specifically designated for both solids and liquids and the directions for shipment outlined in minute detail.

Naturally the jurisdiction of the Interstate Commerce Commission confines itself exclusively to shipments between states and the matter of intrastate shipment is not included within their regulations. I understand, however, that in most states the transportation companies have insisted upon a compliance with rules substantially the same as those insisted upon by the Interstate Commerce Commission.

Previous to this action on the part of the Interstate Commerce Commission, which was encouraged by the Institute of Makers of Explosives, the different states enacted regulations which were framed without regard to the requirements in other states, and, as a consequence, were entirely lacking in uniformity. This state of affairs made it necessary for shippers to be conversant with a variety of laws and which were at times confusing and difficult to observe.

SUGGESTIONS FOR STATE CODES.

If it should be thought advisable to enact state regulations for the transportation upon railroads of high explosives and other dangerous articles, the regulations provided by the Interstate Com-

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merce Commission might well form the basis for such standards. As these rules are based on a long period of experience and have been tested for that mission, it is unlikely that state officials with a limited range of experience could add much to their value.

These regulations provide a list of shipping names by which explosives are known and which must be plainly marked on the package, and a number of articles by reason of their highly explosive nature are forbidden transportation. Certainly any state code should give rules of this character due consideration.

The question of transporting high explosives through the highways of the state in either horse-drawn or motor vehicle is a matter which should receive careful consideration. Very little carelessness has been known to exist in this type of transportation and the lives of pedestrians as well as those directly concerned in transporting the material have been in danger.

NEW JERSEY REGULATION.

The act relating to the manufacture, keeping, storage, transportation and sale of explosives, which was enacted during the New Jersey Legislature of 1917, has handled this question of transportation in the following manner:

"Every vehicle while carrying explosives upon the public highway shall display upon an erect pole at the front end of such vehicle and at such height that it shall be visible from all directions, a flag with the word '*Danger*' printed, stamped or sewed thereon in white letters at least six inches in height, or, in lieu of such a flag, the words '*Explosives, Dangerous!*' must be painted or attached to the ends and each side of such vehicle in white letters on a dark background at least six inches in height.

"It shall be unlawful for any person in charge of a vehicle containing explosives to smoke in, upon or near such vehicle, to drink while the vehicle is in motion, to drive the vehicle in a careless or reckless manner, or to load or unload such vehicle in a careless or reckless manner; or to make unnecessary stops.

"It shall be unlawful for any person to place or carry, or cause to be placed or carried, any metal tool or other similar piece of metal in the bed or body of a vehicle containing explosives, unless such metal is contained in a box or other container approved by the Commissioner of Labor or his authorized representatives.

ing explosives, any exploders, detonators, blasting caps or other similar explosive material, or to carry in or upon such vehicle any matches or any other flame-producing device, except safety matches carried in a container approved by the Commissioner of Labor or his authorized representatives."

This provision of the law was decided upon after consultation with experts in the matter of such transportation and there seems to be no reason why, if these general provisions are necessary for safe practice in New Jersey, they should not be included in the laws of other states.

MANUFACTURE OF HIGH EXPLOSIVES.

The matter of the manufacture of high explosives would seem to resolve itself into two general problems: First, the safety of the operatives employed within the plant, and, secondly, the safety of those inhabiting the surroundings adjacent to the plant or points within fixed limits either from the public highways or steam railroads or trolley cars.

The protection of the operatives within the plant is two-fold: First, from such injuries to health as may arise from contact with poisonous or unhealthful processes incident to the manufacture, and, secondly, from explosions. The matter of the interior regulations was taken up jointly by the representatives of the Departments of Labor of Pennsylvania and New Jersey. The leading authorities were consulted and a number of exhaustive conferences were held.

Joint regulations were formulated by these two states which were intended to fully protect the workers concerned in the industry. Due consideration was given to the best obtainable safe practices in vogue both in this country and abroad and the regulations adopted included the best obtainable methods of safeguarding the operative from both the danger to health and the explosive hazard incident to the occupation.

HEALTH HAZARDS.

Generally speaking, the matter of the health hazard is largely that of insuring the artificial removal of injurious fumes and dust, the maintenance of proper ventilation, the furnishing of adequate washing facilities, including showers, suitable toilet accommodations, separate and distinct eating places and medical examinations. The workers should receive most careful instruction as to the dangers incident to the employment, and great care should be taken against coming in contact with the absorbent poisons.

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The joint regulations referred to include among their provisions the following:

"Where the amount of gases or vapors produced in room buildings is considered dangerous to health by the inspection department, an efficient exhaust system constructed in accordance with plans, which must be filed with the Department of Labor, must be installed and kept operating during all times when persons are employed therein.

"Warning signs must be posted on the premises which shall prohibit workmen from entering buildings where harmful fumes exist, or tanks or confined spaces which are not entirely clear of these fumes. In case an entrance into buildings or tanks is necessary, the worker must wear an approved helmet, and in addition he must wear a life line, which shall be in the hands of an assistant stationed outside of the tank. Employees who have been exposed to fumes and who feel sick shall report their condition to the foreman and shall be given proper treatment without delay. The responsibility for complying with these regulations shall rest with the foreman or other official designated for that purpose by the management of the concern.

"For every fifty persons or less employed in a plant where workers are exposed to harmful vapors there shall be present at all times at least two persons who are trained or competent to administer means of resuscitation by the prone pressure or Schaefer method or by mechanical devices that must be approved by the Department of Labor. A sufficient number of helmets of an approved type shall be kept at each plant where they shall be available for use by every employee who has occasion to enter places where there may be asphyxiating or poisonous gases or fumes or vapors.

"All employees who are required to wear helmets shall be thoroughly instructed in the use of such apparatus and shall be physically examined by a licensed physician at least once in ninety days or at the absence from work due to either sickness or accident.

"Bathing facilities shall be provided and clean clothing shall be kept on hand so that all persons who are exposed to dangerous vapors and who are required by the regulations to bathe and change their clothing shall have opportunity to do so."

The regulations call for the installation of approved methods of dust and fume removal in all cases where they exist.

impossible to obviate all of the dangers incident to explosions, the most obvious and practical safeguard is to insist upon having the work performed by the minimum number of operatives necessary for a given process, so that, in the event of an explosion, just as few workers as possible may be affected. These working units should be so separated by fireproof enclosures that, in the event of a fire or explosion, the danger will not be transmitted to another unit of the plant.

STORAGE OF EXPLOSIVES.

The storage of explosives is a subject of great importance in the regulations and requires that all buildings in which any quantity of explosives is manufactured, handled, used or temporarily stored shall be classed as explosive buildings. Buildings used for storage for periods exceeding forty-eight hours shall be classed as magazines.

Explosive material not in process of manufacture but which is being used in loading detonators, timing or priming caps or any like manufacturing process shall not be stored in workrooms wherein people are employed, except under the following conditions:

"Where the quantity used for the day's run does not exceed one hundred (100) pounds, it is permissible to keep in closely covered receptacles that necessary for the day's run.

"Where the quantity necessary for the day's run exceeds one hundred (100) pounds, only one hundred (100) pounds may be stored in the workroom at one time and then only at a place where it shall be suitably protected from careless or promiscuous handling. Additional supplies shall be brought from the magazine as needed.

"Explosive materials being used in the above processes may be stored in any quantity in storage buildings erected for that purpose, provided that such buildings are not used for other purposes and are located at proper distances from other buildings wherein persons are employed or are protected by suitable natural or artificial barricades.

"Fulminates or materials of like sensibility shall be brought into workrooms in quantities sufficient only for concurrent use.

"Where materials giving off explosive vapors are stored in separated or underground storage systems outside of buildings they may be distributed by approved types of pipe lines throughout buildings where persons are employed.

"The openings which are necessary in fire-resisting walls shall be provided with an approved type of fire-resisting door, and these

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doors shall be kept closed at all times except when in use to pass passage from one room or portion of a plant to the other. (such doors shall be posted an approved danger sign, warning at the carrying of matches or an open light and prohibiting the ent of any but authorized employes or others designated by the ma or superintendent.

"The number of employes in such rooms or portions of a shall be kept to the minimum compatible with the process of r facture. This can be obtained by building additional fire res portions or by the addition of small unit buildings.

"No open or naked lights, such as lanterns, stoves, torches shall be allowed in such rooms or portions of plants, except fo essary repairs under proper supervision. Watchmen or others portable lights shall be supplied with vapor-proof lights.

"Such rooms or portions of plants shall be lighted (if art light is needed) by means of an electric system installed in cc or in lead-encased cables, with vapor-proof keyless lamps. switches or fuses shall be located on the outside of such 1 or buildings in a protected place. This installation must cor to the Underwriters' standards. It would be preferable an sirable if all lights could be projected by reflectors into rooms the outside through properly located windows. The employ of electric motors other than those of sparkless induction ty: the above rooms, is forbidden.

MUST USE SAFETY CONTAINERS.

"The danger from explosive vapors requires that all 1 or portions of plants in which they are used, generated or f and wherein persons are employed, shall be separated from rooms or portions of the plant by fire-resisting walls or parti pierced with such openings only as are necessary except when rooms or portions of plants consist of separate buildings. In places where the material which is being used or which pro the explosive vapors does not exceed ten gallons in quantity : confined in approved safety cans, it will be necessary only to hibit the use of naked flames, to post approved danger sign to observe safe practices. Materials which give off explosive v shall not be stored in workrooms wherein people are employed, 1 such materials are stored in closed containers properly v Where practical, safety cans should be used.

"No emlove shall have in his possession. at any time in

explosives plant, any match or other flame-producing device unless he is authorized in writing by the superintendent to do so, in which case approved safety matches may be used.

"A search for matches shall be made by some authorized person at least twice a week at irregular intervals. The finding of a match or other flame-producing device on the person of an employe not authorized to have matches in his possession shall be cause for instant dismissal.

"All employes handling loose explosives or working in or around explosives manufacturing buildings, where there is a possibility of explosion by the attrition of metals, shall wear powder shoes or rubber-soled shoes (without iron or steel nails). No pockets shall be allowed in the clothing worn in any such work except one skeleton pocket in either the coat or trousers. Neither iron nor steel buttons nor other metal attachments shall be allowed on such clothes, nor shall metal objects, such as knives, keys, etc., be allowed to be carried in the pockets.

"All explosives buildings shall be provided at each entrance with suitable devices whereby the shoes of all those persons entering such buildings can be cleaned and all persons before entering such buildings shall wipe or clean their shoes.

"Where explosives are carried from one building to another, as, for instance, from magazines to workrooms, employes carrying such explosives shall not be allowed to follow each other closely, but must allow an interval of at least one minute in time or one hundred (100) feet in distance. This does not apply to such explosives as trinitrotoluol and smokeless powder.

"The workrooms, when desirable, shall be heated by an approved system of steam, indirect hot air radiation or hot water. The temperature of steam shall not exceed 120 degrees Centigrade. The radiators shall be at least one (1) inch distant from all wooden walls or other inflammable material and shall be attached in such a manner that they can be easily inspected and cleaned."

In addition to the foregoing regulations the following shall be observed with reference to the manufacture and handling of the respective substances enumerated below:

NITROGLYCERINE AND DYNAMITE.

☞ "The floor of the nitrator house shall either be covered with sheet lead or the nitrator shall stand in a suitable lead pan, drained to the drowning tank. All seams and joints shall be lead burned

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in a careful manner, so that there may be no crevices in which nitroglycerine will lodge. The floor shall be so constructed that it can be readily washed and drained. New lead floor covering shall be extended by means of a round corner at least three inches up the side wall, thus making a sanitary corner.

"At least two reserve thermometers shall be kept in each nitrator house for use in case of emergency.

"No iron valves shall be allowed on any nitroglycerine pipe except quick opening nitrator plug cocks, which shall be frequently lubricated. All other valves or stopcocks on nitroglycerine pipe or containers shall be of stoneware, earthenware, hard rubber or wood and shall be kept clean and greased. No repairs shall be made during nitration except in emergencies. Nitrators shall be provided with coils for cooling by cold water, or brine or other suitable means and also with means for both mechanical and compressed air agitation. No more than two nitrators shall be installed in any one building. During nitration the attention of one employee shall be given wholly to observing the thermometer and running the glycerine. No charge of nitroglycerine shall be sent to the nitrator house in a hose line while nitrating operations are in progress.

"Each nitrator house shall be provided with a drowning tank which shall have a water capacity of at least five times the amount of the acid charges and be provided with an air agitator and a vent inlet. All valves shall be located conveniently for the operator in case of emergency.

"The floor of the separator house shall be covered with lead, with all seams and joints lead burned in a careful manner so that there may be no crevices in which nitroglycerine will lodge.

"Not more than two charges shall be allowed in a separator house at one time. The maximum number of regular employees in a separator house shall be three. All stopcocks or valves on nitroglycerine pipe lines or containers shall be of stoneware, earthenware, hard rubber or wood. Catch boxes shall be provided on all outside lines for wash water, and inside catch boxes, if used, shall be cleaned weekly, at times when there is no charge of nitroglycerine in the separator house. No charge shall be sent from the separator house at a time when a charge is being received. Each separator house shall be cleaned and the floors washed daily at the conclusion of day's work. It is permitted to carry on the three operations: nitration, separation and distillation at the same time."

that the regulations prescribed for each individual operation are complied with.

"Not more than twelve employes shall be allowed inside of a cordite blending house. Not more than ten employes shall be allowed inside of a gravity type of blending house. By gravity type is meant that type of blending house in which the entire charge of powder is deposited in a bin or funnel situated one or more floors above the packing floor. Not more than eight employes shall be allowed inside of a bin type of blending house; *i. e.*, a house in which all operations are carried on on one floor."

CLASSIFICATION OF EXPLOSIVES.

The following materials are classed as explosives: Black powder (all varieties), dry guncotton, nitroglycerine, dynamite, chlorates, fulminates, fireworks and any other of their compounds or mixtures or any other substances which are subject to explosion by the aid of shock, friction, spark or heat. Smokeless powder, wet guncotton and wet nitrostarch, while not properly classed with the above as explosives, are also included in these regulations.

While the summary of regulations for the manufacture of explosives covers a wide range of activities, it is not entirely complete and the Department of Labor of New Jersey, in conjunction with the Department of Labor of Pennsylvania, are now engaged in accumulating data with reference to providing rules for the safe loading of high-explosive shells and the filling of timing fuses and primers for high-explosive shells and Russian and American shrapnel. A catastrophe that occurred recently in a New Jersey factory, where primers were being loaded, caused the loss of life of thirteen people and emphasizes the urgent necessity for safety standards on this subject, while a disaster of far-reaching consequences involving a greater loss of life in a Pennsylvania plant forms additional evidences of the necessity for action.

Before the act relating to the manufacture, keeping, storage, transportation and sale of explosives was introduced at the 1917 session of the New Jersey Legislature, Mr. Hershfield, the sponsor for the bill, directed communications to each state in the Union, asking advice as to the best type of legislation for this subject. If the replies received by him could be read at this conference, no better argument for a uniform law could be produced. There seemed to be no comprehensive legislation on the subject and the provisions

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of the act which was finally drafted were largely pioneer in character.

It defines with great detail the distances at which buildings, ways and highways may be located with reference to definite amount of explosives. It sets forth accurate definitions of buildings, ways, and highways and includes a quantity and distance table.

It defines the maximum amount of explosives which may be stored and sets forth the allowances made for properly constructed barricades. It gives in detail the type of containers which may be used for keeping or storing explosives in any place within the state and provides for properly labeling the containers. The character of magazines in which explosives may be kept or stored is indicated, and makes it necessary to keep conspicuously posted thereon the words: "*Magazine—Explosives—Dangerous!*"

It prohibits the storing of blasting caps or other detonators or fulminating caps or detonators in any magazine in which other explosives are kept or stored. Reports must be made to the Commissioner of Labor setting forth: First, location of magazine; second, contents of magazine, and, third, distance from the nearest buildings, railroads and highways.

A certificate of compliance must be secured from the Commissioner of Labor which may be cancelled by him where future conditions do not constitute a compliance with the law.

LICENSE FEE AND INSPECTION.

The law provides a license fee and requires an inspection at least once during each year of every licensed factory or magazine. It covers the transportation by vehicles on the public highways already set forth, provides for penalties for non-compliance and makes the following exemptions:

(a) For the regular military or naval forces of the United States or its allies, and the duly authorized militia of any State or Territory thereof, and the police or fire departments of this State or of any municipality or county within this State, providing the same are acting within their official capacity and in the performance of their duties.

(b) To explosives being transported upon vessels or railroad cars in conformity with the regulations adopted by the Interstate Commerce Commission, the transportation or use of blasting explo-

dred (200) pounds at any one time and to any explosives in quantities not exceeding five pounds at any one time.

It includes a provision relative to municipal ordinances and prohibits the use of liquor or matches within a plant. It provides for an indemnity bond to cover final judgments that may be rendered for damages caused to persons and property by reason of any explosion at the factory of the explosives there manufactured or handled, and permits the waiving of this bond where ability to discharge such judgment is set forth to the satisfaction of the Department of Banking and Insurance.

The necessity of covering these various provisions in a uniform manner would seem apparent to any student of the situation, and has certainly been recognized by the Institute of the Makers of Explosives. This institute has prepared a suggested state law which includes regulations covering the matters which have been discussed in this paper. Their pamphlet on rules covering the handling, storing, delivering and shipping of explosives would also seem to be an appeal for uniformity in this class of regulations, and the type of standard storage magazine recommended by them is a further argument for uniformity.

CO-OPERATIVE SYSTEM BEST.

The trend of the working policy of modern industry in dealing with its living units is to substitute the imperative and unsatisfactory spirit that commands for the modern and more enlightened spirit of coöperation, and thus spur the worker on to his greatest effort by persuasion rather than to demand it through fear or force. Some of the larger and better managed industrial corporations who were dissatisfied with working results achieved under the old system, after investigating the possible cause of discontent and friction prevailing throughout their working jurisdiction, arrived at the conclusion that the constant migration of labor that severely handicaps the profitable operation of business is due in a large measure to unsuitable working surroundings, affecting either the safety, health or comfort of employes.

Experience has demonstrated that a plant labor policy is a failure when it is not broad enough to comprehend the physical needs of the human body and its dependence on warmth, cleanliness and food, and furthermore does not inspire confidence in the worker that the employment is provided with the largest measure of safety to life and limb that the nature of it will permit.

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The advantages that accrue to industry when a careful intelligent investigation of working processes has been made a basis for establishing shop rules are manifold and are now understood by an ever-widening circle of intelligent employees; condemn practices that cause exposure to physical risk.

The physical care of the workers, in the light of scientific research, is not a proper subject for speculation or experiment; indeed it is now ranked as a matter of incalculable importance and is placed in the same business columns with the question of wages, hours of labor and production.

PROGRESSIVE EMPLOYERS WOULD WELCOME UNIFORM LAW

The nature of certain portions of the explosive industry requires a man of more robust health than in other occupations, and alcoholism makes a worker far more susceptible to the dangers of the industry.

To my mind the very nature of the industry under discussion makes it necessary for the enactment of regulations which are prepared by those having a more technical knowledge of the subject than could properly be expected from the average legislator.

There can be no doubt but that the conscientious manufacturer who is anxious to properly safeguard the life, limb, health and comfort of his workers, would welcome uniform legislation on these lines, and certainly the unscrupulous or indifferent employer should not be permitted to expose his workers to unhealthful and dangerous conditions.

On the whole, I believe the best way to reach the situation is the adoption of a uniform standard of regulations by the states or a Federal act covering the situation.

DISCUSSION.

CHAIRMAN MEEKER: Mr. DeBlois is down to open the discussion but I am going to take the liberty of calling upon Dr. Patterson representing the several-times mentioned neighboring state of Pennsylvania. I know he will have something to tell us on this subject.

DR. PATTERSON: To my mind this problem has two distinct phases. First, the manufacture of the explosive; second, its transportation.

The states of New Jersey and Pennsylvania were able to come together and adopt two distinct sets of safety standards; first, standards for plants manufacturing and using explosives; second -

making and using nitro compounds. We believe that these standards, which are now in force in the states of Pennsylvania and New Jersey, represent the very last word upon this subject. I feel this is true, not because we think we know it all, but because, in the preparation of our standards, we secured the opinions of men who were practical in the industry—men who were thoroughly familiar with every phase and aspect of the hazards encountered, both in manufacturing and handling. The dominant characteristic of these standards is the voluntary reduction agreed to by the men operating the plants in the number of men who may be exposed to hazards in any one particular spot. I might emphasize this by saying that in numerous departments of the industry, prior to the application of these standards, considerable numbers of employes were exposed to the hazards of fire and explosion, but this has been cut to a minimum and the total number of men now affected by either flare or explosion at one point is eight.

UNIFORM SAFE PRACTICES.

A fact that I would like to leave with the Governmental Section, and to impress upon the entire Council, is that what is regarded as a safe practice in New Jersey and Pennsylvania, and what is known and considered by the experts to be the proper way of handling dangerous materials should, in their humble judgment, become the safe practice throughout these United States. There is no reason that we know of, or can see, why what is considered safe practice in Pennsylvania should not be considered safe practice in New York and other states, and we sincerely hope that the time has come, or is almost here, when other states in the Union will join with New Jersey and Pennsylvania, effect a working agreement, and adopt similar standards of safe practice.

The transportation of explosives is one over which the states have practically no jurisdiction, because in a majority of cases the transportation is in interstate and not intrastate commerce, and, therefore, jurisdiction lies exclusively with the Federal Government, which very wisely, with the aid of the railroads and the manufacturers seven years ago organized the Bureau of Explosives, which has jurisdiction, through the rulings of the Interstate Commerce Commission. Pennsylvania and New Jersey are working, as Mr. Roach has said, on the formation of a set of safety standards for the loading of ammunition and the preparation and loading of time fuses. It is their hope that the committee will again meet early in

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October and that certainly by the 15th of November we will be to issue a set of standards on this most important subject.

We feel that if this is done it is going to conserve the live health of those who are engaged in this most important work by getting the material ready for our men at the front. We are satisfied that, with the aid of the committee that has kindly consented to help us—practical men in the business—we will have a set of regulations, if the employers will live up to it as we know they will, under which their men may continue their work without interruption.

WORK OF THE BUREAU OF LABOR STATISTICS.

CHAIRMAN MEEKER: I had hoped that Dr. Patterson would refer to the attempt of the United States Bureau of Labor Statistics to push along the enterprise he has so much at heart, namely, by making known to the other states what Pennsylvania and New Jersey are doing in the way of working out safety codes governing the manufacture of high explosives and the transportation of such explosives. I have published the codes as an appendix to a bulletin devoted to poisons used in the manufacture of high explosives. I do not remember the exact number of the bulletin, but if you are interested and have not received the bulletin, write in and you will get as many as you want. I want the other states to know the good work done in Pennsylvania and New Jersey.

DR. PATTERSON: The state of Pennsylvania and the state of New Jersey feel that they owe a distinct debt of gratitude to Mr. Meeker, not only for the wide publicity which he has given to the efforts of the two states to conserve the lives of their working people but also because he sent Dr. Alice Hamilton into our state to help us. It is a matter of great personal regret that Dr. Hamilton is not here to tell you at first hand of the work she was able to do in various explosive plants in New Jersey and Pennsylvania, as her work has been characterized by the utmost ability. We are much indebted to Mr. Meeker for the splendid work he has done and he will be able to push it along a good deal farther.

CHAIRMAN MEEKER: Might I suggest that the Nominating Committee in its deliberations consider the advisability of formulating a resolution of regret that Dr. Hamilton has been detained from attending our meeting because of the illness of her mother.

Mr. DeBlois, will you kindly take up the discussion?

interest to both Dr. Patterson and Mr. Roach. I suppose that you gentlemen who have not been in a high-explosive plant have the general idea that it is a collection of rough shacks scattered over a large area, through which there pervades a deathly stillness of expectation, broken by an occasional explosion. I would like to destroy that idea at the outset. At least in the plants of the DuPont Company, experience indicates that our fatalities per thousand per annum of employes is comparatively low. It is very comparable with the statistics for mining and railroad employes, and in fact it is lower than some. Last year we had about 2.7 deaths per thousand. This year we hope to cut that pretty nearly in half and think we will do so.

I want to seize this opportunity to emphasize one point—I think it ought to be brought out for what it is worth. Realize that a large company, such as ours, engaged in general chemical work, is manufacturing practically all the most dangerous materials that are used in industry, that is, the high and lower explosives, strong acids and various poisonous compounds. How is it, if we make these dangerous things, that we are able to maintain a very low fatality rate, comparable with industries that handle comparatively innocuous materials, and which have a very low accidents rate? The answer to that question is the answer to the whole safety problem. Would it be possible to get a clearer formulation of the truism that accidents do not depend on the material you are handling, nor the way you are handling it, but on the carefulness of the people who are working on those materials and the supervision of the men in charge of the work; of course it is through such methods that we have accomplished the results we have.

The things, perhaps, that make for safety more than anything else in an explosive or heavy chemical plant are the constant encouragement to care, obedience to rules, and, more than anything else, at least in the case of explosives, good housekeeping. Good housekeeping means scrupulous housekeeping; it means every particle of explosive and waste product manufactured being kept under observation, seeing that it does not filter through cracks in floors or lurk in concealed places or get into the clothing of men and be carried into their homes.

GROWTH OF CHEMICAL INDUSTRY.

It is right there that I think the best work in regulation, either by the Federal government or by the states, can be done; that is,

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in the enforcement of those essential and very general provisions that make for safety in all manufacturing plants, and make for safety particularly in explosive plants. In the chemical industry, at least, the growth that is under way is enormous. It is a comparatively new thing in the country's work. We have gone into it, and like most other manufacturers are expanding tremendously, tackling new problems, the secrets of which were held only by the Germans.

This phenomenal growth will continue beyond the war, unless we meet with competition which will set us back. Those engaged in the chemical industries will agree with us that industrial growth can be best stimulated by healthy competition. If we do not have competition we soon lose our enthusiasm and interest and our efficiency is lowered. Competition in the chemical industry is based on individual effort; in other words, you have to produce an article which you think is better or cheaper than somebody else is making. More than in any other industry, I think, the chemical manufacturer depends on what is called secret processes. Secret processes are almost its stock in trade. The secrets are its tools and its ability to produce something better than any one else depends on them. I do not mean to say that undue secrecy is to be encouraged, because I do not think it is. No trade secrets, as you know, remain secret very long, but they serve their purpose temporarily, at least, to stimulate the work.

In the back of the mind of every large chemical manufacturer is the feeling that through state regulation his essential secrets may be either exposed or he may be regulated into getting out a product along certain stereotyped lines, such as every other chemical manufacturer will be forced also to follow. There is a great deal of apprehension on this point and yet I think it is something that those who are adopting regulations should keep well in mind. We must not take away the helpful spirit of competition. The crux of the situation may be here:—it should be the function of the State Department of Labor or Industrial Board to take necessary measures against processes that are absolutely dangerous, that cannot be corrected, that are inherently destructive to life and health; but I think in that action they should be very careful to go slowly. Is it better to instruct a man or help a man to do his work in the safest way he can, rather than to tell him how to do the work from the beginning? That is the point I want to make; we must not have such regulation as will discourage progress and the application of it

NO CONFLICT OF AUTHORITY.

It has been our experience in the DuPont Company to be pretty closely associated with Mr. Meeker's bureau, and perhaps more particularly with the Departments of Labor and Industry of the states of Pennsylvania and New Jersey, during the past year or so. Experience, with which I have had a little to do, has left just this impression on my own mind: Those gentlemen, of course, are absolutely sincere in their work; they have exactly the same aims that every reasonable, up-to-date manufacturer ought to have; that is, they are trying to reduce occupational diseases and death and injury from accident, and every up-to-date manufacturer knows that it is not only a humanitarian but a good economical proposition to work the same way. You can see from the attendance at this conference there are many who believe it and are right after it. The aim of these state and federal bureaus is the same as ours. There will not be a conflict of regulations as long as there is a clear understanding, and that clear understanding can be had. I think, the best way, through close co-operation of state industrial boards and departments of labor with the manufacturers, before drawing up or incorporating in their final form the regulations which they believe should be put into force. In New Jersey and Pennsylvania that plan is worked out in a most admirable way, and while it has worked so that smaller manufacturers might, perhaps, consider some of these regulations as hardships, I think they have all grown to recognize the sound judgment on which those regulations are based and to realize that in the end the industry is going to benefit very materially by what these state departments and the Bureau of Labor Statistics in Washington has been able to accomplish.

EXPOSURE TO SPECIAL HAZARDS.

CHAIRMAN MEEKER: I have two or three questions I would like to put to Mr. DeBlois. One is, what is the exposure to the special hazards in the DuPont plants, *i. e.*, the hazard to health from poisoning and the hazard of accident from explosions? Of course, your returns are based upon the whole number of employes on your pay roll, or rather upon the number of man-hours worked by the whole plant, reduced to standard 300 day workers. Now, a large proportion of your men are not exposed to these special hazards at all. I do not want to be inquisitorial, you will understand, but that is a most interesting point. I wish we knew a great deal more about it.

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I think eventually the DuPont Company will show the way so explosive manufacturers will not be afraid to put statistics of industrial hazard along with the statistics of the railroads, the steel mills, and all other corporations. Until we do that we do not know where we are. We should know a great deal more, so we can determine what is the proper safety campaign to encourage. Where are the great industrial hazards, where must the emphasis be put in order to reduce the wholly inexcusable accident rate at which we suffer? Can you answer my first question?

MR. DEBLOIS: Referring to the first part of your question, which is, the exposure to industrial poisonings, I am sorry that I cannot give figures from memory. We sent them to your bureau perhaps three months ago, at Dr. Hamilton's request. They were divided into poisoning from nitric fumes, trinitrotoluol, and several others, ether, benzol, and so on.

CHAIRMAN MEEKER: I do not think you quite understand the question, if you will pardon me. What proportion of your total employes are exposed to these hazards?

MR. DEBLOIS: To industrial poisonings? That was shown actually in what we did send in:—the number of cases of sickness; the disability in each case, and the number of employes so exposed as nearly as they could be obtained. I cannot give the figures from memory. As a matter of fact, with the exception of nitrous fumes they were extremely low. On the other hand, we cannot really get adequate statistics on a good many things. Take cases of benzol poisoning, with the exception of one fatality from suffocation, we have never had a case of poisoning in which the man lost time other than his time in going to the hospital for observation and coming back to work the following day. Of trinitrotoluol poisoning we have had a number of cases, but no serious cases and no deaths. We are having, especially through the warm weather, the usual minor cases which, in our plants, generally run from two to five days. Perhaps the most illuminating figure I can give you is that for our plant opposite Chester, Pa., a high-explosive plant. There we compile what we call the "poisoning factor" each month, which is the ratio of the hours lost on account of occupational diseases to the total pay roll hours of those exposed. That bulks together all occupational diseases or poisoning cases, which includes those from aniline poisoning, trinitrotoluol, in the loading of shells, not acid fumes, but poisoning from dinitrobenzol, if there was any (but the

on account of the more profuse perspiration and impregnation of the skin and face by wiping perspiration off with the back of the hand; probably, also, to some extent, to the great volatilization of the products. During the month of July, which was the worst month, our factor for that plant ran two-tenths of 1 per cent,—slightly over 0.24, I think. Now, 0.2 of 1 per cent as an injury factor means that with the 300-day per year the average employes so exposed would stand to lose 0.6 of a day on account of poisoning. That takes in every lost-time accident from poisoning. Stop to think a minute;—if you lost 0.6 of a day once a year on account of normal sickness in any kind of business you would be getting off pretty lucky! I think practically all our own plants maintain about that same percentage or possibly a lower one. In winter it will drop to almost nothing.

EXPOSURE TO EXPLOSIONS.

In regard to exposure to explosion: I am very sorry that I cannot give you any figures. We have never been able to compile satisfactory figures, although we tried to for some of the life insurance companies some years ago. I do not believe we will ever be able to get them, for this reason: In an explosive plant you have a vast number of buildings, perhaps 600 or 800, with a few men in each building. All through that area are classes of employes, truckers, for instance, who are exposed to a certain extent. You might call it an intermittent exposure. We also have mechanics and repair men who, while they do not really go into the building while explosives are in it, may be exposed in passing through that area. In addition to that, we have this condition: Dr. Patterson mentioned the American table of distances. That is supposed to cover or provide for safe distance at which dwellings, railroads, and so on may be placed from magazines. The American distance table was formulated from the world's explosion experience, that is, from every accident on which data was available, and it is based not on what we call missile damage but on "major structural damage" to buildings—in other words, the breaking or displacement of supporting timbers in the wall or roof, or other sort of serious injury to the building itself, that injury being due either to air wave or to actual shock and not to the missile. If the American distance table was based on the projection of missiles we would hardly have a totally safe location for an explosive plant in any eastern part of our country. On our explosive plants what is called "the safety area," where the men are not directly exposed to the action of explosives, is located at such a

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distance that it is immune from damage by air wave or con. However, it is not absolutely immune to damage from missi we did that our present tracts of land would have to be e enormously. For instance, one of our plants is now about fi long and runs back perhaps two miles. There would be p difficulties in the way of getting larger tracts—it would be impossible.

Therefore, Dr. Meeker, there is really no definite line that drawn between employes who are exposed to this danger a ployes who are not so exposed, and while we have gotten up s in the past they probably have not been worth anything. It is complex problem that would, perhaps, appeal only as being c to a man used to the operation and arrangement of explosive We would like to have reliable figures on it ourselves.

CHAIRMAN MEEKER: So that your whole employed f exposed to the explosion hazard?

Mr. DeBlois: To a very remote extent.

EDUCATIONAL WORK IMPERATIVE.

CHAIRMAN MEEKER: I think Mr. DeBlois has oversta case when he said, in about these words, that safety did not upon the material handled or the way in which it was hand think that is not an unfair presentation of his thought, if exact words. I think it depends a whole lot on the material l and the way it is handled. I do not mean to minimize in th the importance of educational campaigns to teach safe prac the men—we need a great deal of educational work, and i educational work, in the last analysis, in order to instruct the e ers in properly constructing their plants and providing safe for their employes to work.

Dr. Roos: I was much pleased to hear about the w agreement between the states of New Jersey and Pennsylvan I would like to know what steps are taken by the state of P vania and the state of New Jersey to enforce such standards have set down. The state of New York has a law which r reports of industrial diseases. Within the last year or so, hospitals in New York City, we have had a number of ca industrial diseases from the state of New Jersey. One in par was a case from the factory making explosives in the vicin New York, where, when the man was interrogated, he said tha

the only washing facility was for the men to take a towel, go down to the creek, get a pail of water and wash. I might also call the attention of Mr. DeBlois to the fact that when he says there have been no cases of death from trinitrotoluol poisoning, there have been cases in Bellevue hospital in which the men gave as their place of employment the DuPont factory in Delaware. I do not know whether any other states in the vicinity of Delaware have had cases where death ensued from trinitrotoluol poisoning or have reported them to the DuPont Company.

It is all right to have standards, but the question is in enforcing them, and making the factories live up to them. These things look nice in print, but the question of having factories live up to standards is an entirely different matter. I might ask the representatives of the states of New Jersey and Pennsylvania what means they have taken? I know from actual cases I have seen that in some of the factories no provision whatsoever is made for the health of employees.

CHAIRMAN MEEKER: New Jersey has a new representative present. Commissioner Bryant, have you anything to say in answer to Dr. Roos' question?

SAFETY WORK IN NEW JERSEY.

COMMISSIONER BRYANT: I am very sorry that I was not here earlier, but owing to the railroad strike I had some mixup in getting information which I wanted to bring with me to the Congress. I understand that Mr. Roach has made a presentation of what we have undertaken in our state. I was particularly interested in Mr. Roos' remarks about the enforcement of standards. I do not believe there is any one connected with the official life of this movement who is more of a stickler for the enforcement of standards than the Department of Labor of the State of New Jersey. I feel that a standard which is uniformly and efficiently in force is better than a comprehensive standard which depends more or less upon the voluntary enforcement of the concerns interested.

This whole problem of explosives is more or less new in the state of New Jersey, particularly the specific requirements for healthful preparation and safe manipulation of the industry. The paper which I prepared spoke of the fact that the law which had been enacted by the last session of the Legislature went into effect one day this month. We have secured the services of Dr. Gordon, formerly assistant instructor in chemistry at Princeton University, to

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take charge of the work for the state of New Jersey. He commence his duties until Oct. 1, and consequently special along this line has not been undertaken.

We have attempted to enforce general regulations in this situation regarding the elimination of harmful fumes, injurious dust and the general carrying out of the provisions in the regulations which are jointly issued by the Department of Labor of Pennsylvania and the Department of Labor of New Jersey. Mr. Roach, who is here, can speak more accurately as to the extent of enforcement than I can, because he has inspected practically every high-explosive plant in the state, and in addition to that we have had plant inspections by Dr. Gordon. It was a mistake with him then, but we have had them investigated by several inspectors in the districts where they are located and we have confidence in the comprehensive enforcement of the regulations. I do not wish to say that all these requirements are carried out at this time in the state of New Jersey. The print is hardly dry on the regulations and it would be absurd to make that statement, but I do make the statement that the regulations as adopted by the state will eventually be carried out and will be carried out as rapidly as proper inspection and enforcement can accomplish it.

THE EXPLOSIVE HAZARD IN PENNSYLVANIA.

DR. PATTERSON: In the state of Pennsylvania we are making every effort to carry out these regulations. During the last year Mr. Spicer, chemical engineer in my department, who had some training as a chemist in the DuPont Company, and is therefore familiar with work in explosive plants, devoted practically all his time to an investigation of the explosive plants in Pennsylvania. I have been on a great many trips with him, but unfortunately he has now become a Captain in the Ordnance Department of the United States Army and is on duty in Frankfort arsenal. During the next year it is my intention to carry on this work to the best of my ability by personally inspecting the large number of explosive plants in our state. We hope to have the co-operation of the managers of these plants and secure a living up to the regulations which are now in our statute books.

CHAIRMAN MEEKER: I think Mr. DeBlois should have an opportunity to be heard, as his name has been mentioned as being in your company.

MR. DEBLOIS: I am sorry I did not hear all of Mr. Roach's

ment, but I was out of the room. I would like to know when and where and the date of this case of trinitrotoluol poisoning in Bellevue hospital which he says came from the DuPont plant.

DR. ROOS: This case came to Bellevue some time in the middle of June. The man stated that he had been at work in the DuPont plant and was laid off. He came to Bellevue hospital and died inside of forty-eight hours from trinitrotoluol poisoning.

MR. DEBLOIS: This is very surprising, and one of the most surprising things about it to me, from a practical knowledge of our safety work, is that the man's dependents did not come back to us for compensation.

DR. ROOS: The records of Bellevue hospital did not show any friends or relatives of this man. He gave as his address an employment agency on Roosevelt street. He seemed not to have any dependents or friends. That is as far as the records show. However, the case is on the records of Bellevue hospital and is on the records of the State Industrial Commission, and I am sure that a reference by you will give you the name. If you can find out anything more about it we will be just as pleased as you.

MR. DEBLOIS: I would like to know where the information came from that he was employed at the DuPont plant.

DR. ROOS: From himself, on his admission to the hospital.

MR. DEBLOIS: It is possible for a fatal case of trinitrotoluol poisoning to occur in one of our plants. Our records show no such case, nor have we a record of a serious case of trinitrotoluol poisoning, certainly not a case recognized as toxic jaundice, but it is not impossible for such things to occur. We cannot always know what becomes of a lot of our men who are probably injured and go away. That point is clearly brought out in Dr. Hamilton's report on the trinitrotoluol poisoning situation.

DR. ROOS: I have a case of industrial disease from the DuPont Powder Company that I held off for some months, trying to find where the man went after he left Bellevue hospital. It is a case of picric acid poisoning. This man disappeared from Bellevue and no one has been able to find a trace of him since.

MR. DEBLOIS: We would like to know that, too. Although we have made thousands of pounds of picric acid we have never had a case of poisoning. I would be glad to get that data and have it looked into.

CHAIRMAN MEEKER: I would like to suggest to Dr. Roos that, if he gets similar cases in the future, he write at once to the DuPont

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Company. I think they will co-operate in every way. Am I right, Mr. DeBlois?

MR. DEBLOIS: Absolutely.

CHEMICAL HAZARDS IN ENGLAND.

MR. ROACH: It is not surprising that Dr. Roos has been able to locate a case of industrial trinitrotoluol poisoning. If he were to locate a lot of those cases all he would have to do would be to read up the English reports in health cases. I think he would find that the English experience was a sad one in that particular respect. It is only a few days ago that I read one of the early English reports in which it said that manifestly there was no danger from the dust or vapors of trinitrotoluol, and speaking of it as rather a harmless material used in the explosive industry. In my address at the gathering I mentioned that we had cases of such poisoning and had deaths from trinitrotoluol poisoning and I think that even in the United States where the production has been carried on has had similar experience if they have even fairly accurate reports of such cases. I presume there will be other cases of such poisoning in the future of ammunition. In the manufacture of trinitrotoluol it is understood that any such dangers exist as in the loading of ammunition. I think Mr. DeBlois will bear me out in that. His company has much more experience in that than probably any one else in the country, but they have not had more experience in loading ammunition. I venture this statement, that where you find high explosive ammunition loaded with trinitrotoluol you are going to find cases of poisoning and the number of those cases will depend on the shop manager, on the sanitary accommodations provided and on the dust and vapor control that are presumed to carry away the vapors and dust at the point where they are generated.

No state has a monopoly on industrial poisoning. No state can enforce regulations unless regulations are adopted. No state official—usually absolutely ignorant of industrial processes, taken from a walk in life where he has not come in contact with industry—can expect to legislate on industrial matters unless he draws into conference men and women who have had industrial experience. In the first instance they must formulate industrial regulations and in the second instance the rules themselves will not be effective unless they are enforced. I think most states have decided to call in the people interested in the establishment of the

ference and the rules receive their approbation, which they usually give in the main, then the rules are enforceable and their usefulness does not depend entirely on the intelligence of the departments of labor in the various states.

I venture to say that you can go into the state of New Jersey and find plants that are not well equipped with good, substantial sanitary and washing equipments. I think, however, that you will find, in the main, in all of the plants, that the washing equipment is good. In some of the plants the washing equipment may be primitive. I doubt very much whether you could find in any of the plants in the state at this present moment an entire lack of proper washing or dressing equipment or where harmful trade poisons are used in a place where the men may gather at the lunch period to eat their meals. All the states have the same problems in that respect. It is only a few weeks ago that I received a pamphlet from the New York Department of Labor, issued, I believe, through their Division of Hygiene, in which they show the deplorable conditions that exist in Paris green manufacture, the entire absence of even the most elemental accommodations for washing and antiquated and perfectly useless types of dust control. It was no reflection on the department officials that there was no enforcement of standard regulations because they investigated and exposed the conditions. I presume they took the proper steps to correct them. That is the only way they can be corrected. When we know of trade poisoning cases then we know that there is a loophole somewhere, either the regulation is not sufficiently comprehensive or the inspection is not good, one or the other.

REPORT OF NOMINATING COMMITTEE.

CHAIRMAN MEEKER: I will ask for the report of the Nominating Committee.

MR. ROACH: The Nominating Committee has unanimously agreed on Dr. John Price Jackson, Commissioner of Labor of Pennsylvania, for Chairman of the Governmental Section.

Dr. Alice Hamilton, Special Investigator of the United States Bureau of Labor Statistics, for Vice Chairman.

Leonard W. Hatch, Chief Statistician, Bureau of Statistics of New York State, for Secretary.

In addition, the committee desires to have the Chairman of the

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Section send a telegram of regret to Dr. Alice Hamilton for inability to be present.

CHAIRMAN MEEKER: Do you wish to act upon the communications as one report? If so I will ask for action on the report as a whole. (The adoption of the report was moved, seconded and unanimously carried.)

The Section then adjourned.

The Will to Win

You know what that means. Every time you tackle a hard job you stop a moment and concentrate all your thinking power on the task ahead of you. You try to draw a picture in your mind of the work you are to do and how you propose to do it.

During the next few months you will be called on to do this many times—sometimes in the shop, sometimes at home. You are helping to make history.

Have confidence in yourself. You *can* do it. You have the *will to win* if you have the courage to try.

REMEMBER
You Are an
Industrial Soldier

National Safety Council

Marine and Navigation Sectional Meeting

New York City

Sept. 14, 1917

GEORGE W. WYLIE, Chairman

Clyde-Mallory Steamship Company, New York City

E. G. MARTIN, Secretary

THE first Marine and Navigation Sectional Meeting of National Safety Council was called to order at 10 a. m., day, Sept. 14th, 1917. Twenty-five delegates were present, and whom were:

Dr. F. L. Hoffman, Prudential Life Insurance Company.

Mr. H. W. Forster, Independence Bureau.

Mr. G. W. Wylie, Clyde-Mallory Steamship Company.

Mr. A. R. Smith, *The Marine News*.

Capt. A. McGray, Neptune Association, Masters and Mate
Ocean and Coastwise Steam Vessels.

Mr. A. A. Renshaw, Standard Transportation Company.

Dr. H. J. Blumensohn, New York City.

Mr. E. Platt Stratton.

Mr. C. D. Mallory, Clyde-Mallory Steamship Company.

H. Cole Estep, *The Marine Review*.

Mr. H. G. Kershaw, Independence Bureau.

Mr. F. N. Davey, Parsons & Eggert.

Captain Proctor.

Mr. W. M. Laborde, *Nautical Gazette*.

The meeting was opened by Mr. G. W. Wylie, Chairman of the Section, who introduced Dr. F. L. Hoffman, Statistician, Prudential Life Insurance Company of America, who addressed the Meeting on "Accident Hazard in the American Merchant Marine." Dr. Hoffman brought out the following points:

1. Distinction in Navigation Hazards:

- (a) Accidents due to weather conditions and other natural causes.
- (b) Accidents due to construction of vessels, carelessness of employes and neglect of employers.

2. Causes of Maritime Disasters:

	Coastwise and Transatlantic, Per cent.	Great Lakes, Per cent.
(a) Foundering	7.5	4.3
(b) Stranding	24.4	27.8
(c) Collision	29.9	34.3

3. Necessity for the Federal Government keeping statistics of all accidents in all branches of the American merchant marine.

4. Greater risk to life and limb in small vessels.

5. Occupational hazards on barges on Atlantic coast more serious than in coastwise navigation generally.

6. Greater risk in dock labor than is generally assumed.

7. Amendment should be made to navigation law to provide for the reporting of deaths and injuries on all vessels subject to navigation laws.

8. Companies should establish efficient safety organizations.

9. Necessity for Federal legislation for protection of all engaged in merchant marine.

Address by George W. Wylie, of the Clyde & Mallory Steamship Companies, New York City, on "Safety First in Coastwise Shipping."

1. No protection in United States for longshoremen.

2. No fixed hazard.

3. Casual labor.

4. General safety education.

5. Present disregard for safety.

6. Necessity of reaching executives of companies.

7. Unconstitutionality of state compensation laws.

8. Necessity for Federal statute.

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GENERAL DISCUSSION.

CAPTAIN ARTHUR McGRAY:

1. Necessity for Federal laws.
2. Employes themselves to blame for majority of accident
3. This country has more practical means for prevention accidents than any other country.

CAPTAIN PROCTOR:

1. Sailors on merchant vessels should be taught to swim.
2. Instead of laws being made to save lives of people in case disaster, laws should be passed that ships themselves should be made safe.

MR. E. PLATT STRATTON:

1. Men should know how to take care of themselves in case of accident.
2. Distinction between boatmen and sailors.
In Titanic disaster every life boat lowered by boatmen was saved. Few lowered by sailors successfully.
3. Titanic disaster would not have happened had ship been properly constructed.

MR. C. D. MALLORY:

1. Necessity of reaching executives of companies.
2. Owners should do what is right and practical to protect employes.
3. Companies should formulate classes of instruction to educate officers, quartermasters and men, etc.
4. Should have American sailors and officers in American merchant marine.
5. American merchant marine should be part of Naval Reserve

CAPTAIN PROCTOR:

1. American merchant marine should be part of Naval Reserve with trained officers and men.
2. If American merchant marine had trained officers and men this would reduce accidents at sea.

DR. H. J. BLUMENSOHN (Longshore Industry):

1. Disease due to manner in which materials are stored.
2. Should have concrete piers with proper and sufficient wash

3. Character of men employed on docks.
(Not due to hereditary but to improper training, unclean living, bad company).
4. Health safety as important as accident safety.

DR. F. L. HOFFMAN:

1. General navigation problems:
 - (a) Navigation hazards concerning ships and having nothing to do with men on board.
 - (b) Occupational hazards—concerning men and having nothing to do with ships.
 - (c) Shore and dock hazards.
2. Farce of boat drills on board ships.

MR. A. R. SMITH:

1. Necessity of having trained men on ships.
2. Necessity for safety organizations in steamship companies.
3. Registration system should be enforced as on lakes.

MR. A. A. RENSHAW:

1. Hazards on lighters.
2. Casual employment on lighters.
3. Majority of accidents at sea due to ignorance, not carelessness.

MR. G. W. WYLIE:

1. Officers and men of merchant marine should be trained.
2. American merchant marine should be part of Naval Reserve.

On motion duly made, seconded and passed, the meeting was adjourned.

E. G. MARTIN, Secretary.

SAFETY FIRST IN COASTWISE SHIPPING.

GEORGE W. WYLIE, CLYDE-MALLORY STEAMSHIP COMPANY,
NEW YORK CITY.

Mr. Chairman and Members of the National Safety Council:
"Safety First in Coastwise Shipping" or, preferably, "Accident Hazards in Coastwise Transportation," is a desirable subject upon which to speak because there are so few statistics or experience records available for dispute.

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We readily recall the important results of:

- (a) The international conference on safety of life at sea following the Titanic disaster.
- (b) The Seamen's Act.
- (c) The conference on the subject of making passenger vessels more secure from destruction by fire held by the Department of Commerce, also
- (d) The valuable reports of the supervising inspector steamboat inspection service of that same department; as
- (e) The report of the committee appointed to investigate the sinking of the steamer Eastland.

All of which reports, conferences, and resulting legislation are directed to the benefit of passengers and seamen on vessels. But not the entire field of the marine hazard. There is, in all steamship operations, whether lake, gulf, transatlantic or coastwise—a unique trade in which there is no apprenticeship. Abroad it has found its place among other industries and is not looked upon or classified as an entirely unskilled labor. On the other hand, the United States is the only nation with a large foreign commerce which has absolutely no regulations for the protection of the men engaged in this is the longshore industry. To my mind herein lies the greatest day hazard of the coastwise shipping. The danger of the seaman's life has become a truism, but the extreme hazard attending the longshore work has been overlooked.

NO FIXED HAZARDS.

In view of so many safety regulations and devices in effect to prevent the loss of life and limb caused by fire and collision, let us turn for the moment to the longshoreman and the hazards of his employment. In the ordinary industry we deal with fixed hazards and a more or less permanent class of labor but in stevedore and longshore work neither of these conditions exists, the hazards vary according to the kind of cargo being handled and the means of transportation used.

It is not a difficult matter to affix a safeguard to a machine and force its use to the mutual benefit of both employer and employee but to apply safety measures to the handling of various kinds of cargo each of which must be moved and stowed with regard to contents, weight, bulk, size and fragility, and by an everchanging class of employees is a problem worth the attention of the shipping industry.

majority of the accidents and fatalities to longshoremen are not due to defective ship's gear and rigging or to inadequately guarded or improper pier equipment but rather as the result of the inherent risk of the employment.

CASUAL LABOR.

It is a fact that longshoremen as a body are made up of the uneducated classes of many nationalities who work under chronic conditions of oversupply and shortage of labor, but this is only another reason for the enforcement of accident prevention measures. This can best be accomplished by the teaching of the advantages of the application for safety principles to all the employes of all of the steamship companies from president to freight-handler. This kind of employment certainly warrants the statement founded upon experience in other businesses that one-third of the accident prevention problem is involved in mechanical safeguarding and two-thirds in the education of the workmen to the realization that safety work benefits him more than the employer.

PRESENT DISREGARD FOR SAFETY.

With the safety movement so advanced in all other lines of industry it is surprising to find the entire disregard for the already familiar slogan "Be Careful!" in connection with longshore work on the piers, in the ships or on the lighters owned or controlled by steamship companies. That such a condition of affairs exists generally cannot be denied if you consider the excessive number of accidents and the unwillingness of insurance companies to accept longshoremen as a class for any form of insurance except at a prohibitive rate as evidence of this assertion. The best explanation that I can offer for this general acceptance of the old story without any attempt to add a chapter on safety in line with the progress in all other industries has been the lack of personal supervision by the companies themselves and their willingness to rely upon that representative to whom they have paid large sums annually for protection and indemnity and little service in respect to the prevention of accidents. To successfully effect safety practices we must go a long way back of the individual employe and get at the heads of the business.

UNCONSTITUTIONALITY OF STATE COMPENSATION LAWS.

Aside from the general needs for the institution of adequate safety regulations, another and even graver exigency has presented itself

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by the upset of the state workmen's compensation statute, as shoremen, caused by the recent decision of the United States Supreme Court in the cases of Southern Pacific Company vs. and Clyde Steamship Company vs. Walker. The effect of the decisions by the highest court in the land makes it more necessary ever for the individual transportation companies affected to take care of themselves for such legislation as may be enacted to cover industrial accidents of carriers by sea. I doubt if there are many ship company representatives present who fully appreciate the need for a uniform law governing this branch of the transportation business although the need of a federal statute has been felt ever since the state compensation laws became effective, for under the steamship companies were obliged to pay as many different rates of this insurance as states in which they operated, irrespective of the fact that the hazard was always the same.

THE BENEFITS OF OUR OWN EXPERIENCE.

With a view toward the humanitarian side of the industrial accident problem and for the purpose of gathering useful statistics concerning their particular risks of employment the steamship companies which I represent, *i. e.*, the Clyde, Mallory and Southern Steamship Companies, organized and put in effect under company supervision a self-insurance department. By means of a department the formation of Central and Pier Safety Committees, the installation of bulletin boards, and the installation of practical devices for the prevention of accidents suggested by the workmen themselves, we have not only reduced the number of accidents while handling more than the usual amount of tonnage, but have obtained the co-operation of every workman from stevedore down to shenango. We have hunted for and found what we believe to be the most frequent causes of accidents: the most hazardous commodity, and the places where the greater percentage of our accidents occur. Materials falling from tiers, jars between loads and being caught or cut by hooks in both their own or fellow workmen's hands produce most of our injuries. Lumber is by a large majority the most hazardous commodity that we transport. We have found that 70 per cent of our accidents occur in the holds of vessels, 15 per cent on the decks, 10 per cent on the wharves and only 5 per cent on lighters and barges (although I might add that our lighterage operations have been the cause of all of our accidents). The results of our own experience have been as follows:

field for accident prevention. Greater results than these that I have mentioned are possible to every member of this Committee from such a co-operation of representatives as we wish to begin here today.

Therefore I think it fitting and proper to begin the work of the Marine and Navigation Section with a resolution:

Whereas, We (those present at this first meeting of the Marine and Navigation Section of the National Safety Council) appreciate the hazards peculiar to all shipping operations and realize the benefits to be obtained from the earnest co-operation of all of us engaged in marine and navigation work; therefore be it

Resolved, That we most earnestly suggest to all water transportation companies the establishment, without undue delay, of the safety organization of their employes under the direction of a qualified safety engineer.

(The resolution was adopted.)

THE ACCIDENT HAZARD IN THE AMERICAN MERCHANT MARINE.

DR. F. L. HOFFMAN, STATISTICIAN, THE PRUDENTIAL INSURANCE COMPANY OF AMERICA, NEWARK, N. J.

Mr. Chairman and Members of the National Safety Council: The approximate loss of life in the American merchant marine may be conservatively placed at from five to six hundred deaths per annum. The estimate is based upon the assumption of a fatality rate of 3 per 1,000, which, in all probability, is rather below than above the facts of actual experience. In the British merchant marine the corresponding fatality rate is 5 per 1,000.

At the outset of the discussion a clear distinction requires to be made between navigation hazards proper, or such as are directly attribute to weather and other agencies resulting in maritime disasters, and accidents more or less inherent or incidental to maritime employment, such as directly concern the men employed in navigation and occupations pertinent there to, as separate and distinct from accidents to passengers or other persons on board, in consequence of maritime casualties more or less extraneous to the management of the vessel as such.

Primarily, the causes of maritime disasters are foundering, stranding and collisions, which in the American experience for recent years account for 62 per cent of the disasters attributable to all causes.

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Of the total, 7.5 per cent were attributable to foundering, 24.4 per cent to stranding and 29.9 per cent to collisions. In the case of vessels on the Great Lakes, however, foundering accounts for only 1.3 per cent of the disasters, while strandings account for 27.8 per cent and collisions for 34.3 per cent.

There is, therefore, a very close and, in fact, most important relation between maritime disasters and, first, thoroughness and trustworthiness in weather warnings; second, in the correct charting of harbors, coasts, etc.; third, in a thoroughly well-equipped and well-maintained lighthouse and lightship service, including, of course, other aids to safety in navigation; fourth, a thoroughly well-equipped and maintained life saving service; fifth, the highest attainable degree of efficiency in steamboat inspection, the survey of vessels, the inspection of hulls in connection with marine insurance, etc.; and, finally, the most qualified governmental supervisions of the efficiency of the labor employed for navigation purposes.

NO TRUSTWORTHY STATISTICS.

There are no trustworthy statistics for the United States regarding the loss of life in navigation, and practically no statistics whatever regarding the injuries sustained in connection with the labor on ships or in the loading and unloading, or in the handling of freight or other duties of longshoremen, etc. Since the inherent risk of maritime occupations is the danger of drowning, it is but in conformity to the anticipated results, as disclosed by the industrial experience of the Prudential Insurance Company, that in contrast to a proportion of 1.3 per cent of deaths by drowning in the mortality from all causes for all occupied males, the proportion was 11.0 per cent for persons employed in navigation.

The proportionate mortality is subject, however, to a very considerable range, as best illustrated by the fact that the proportion of deaths by drowning in the mortality of barge captains was 39.1 per cent, of mates 37.5 per cent, of deckhands 20.0 per cent, of captains 16.5 per cent, of marine firemen 12.5 per cent, of sailors 11.1 per cent, of marine engineers 9.4 per cent and of longshoremen 5.1 per cent.

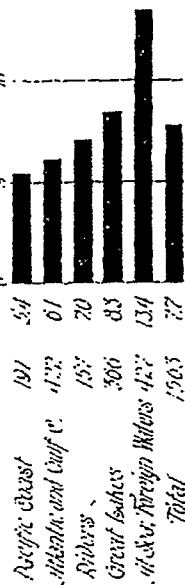
According to the medico-actuarial experience, the general mortality of men employed in navigation is considerably above the average of employments without exposure to navigation hazards. In the experience of the British merchant marine the accident fatality —

Accident Hazard—American Merchant Marine

Tatalities in Disasters to Vessels

U. S. Life-Saving Service, 1910-1914

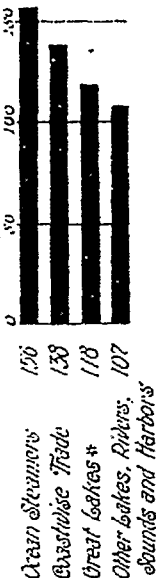
Losses - Rate per 1000 Persons on Board



Mortality of Officers and Engineers on Steam Vessels

Medico-Actuarial Investigation

Ratio Percent, Actual to Expected Deaths

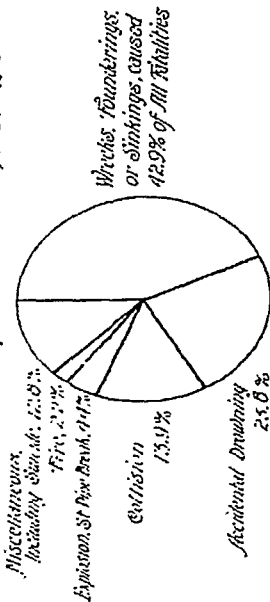


The Death Rate from Accident among those whose duties keep them on Rivers, Lakes, Sounds and Harbors was three times the Normal; among those on the Great Lakes, four times; among those engaged in the Coastwise Trade and on Ocean Steamers, five times.

*Of the Total Deaths, 30% were due to Accident; and of these, three-fourths were due to Drowning

Nature of Accidents Causing Loss of Life

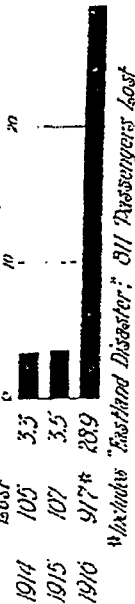
U. S. Steamboat-Inspection Service, 1907-1916



Passenger Fatality Rate

U. S. Steamboat-Inspection Service, 1914-1916

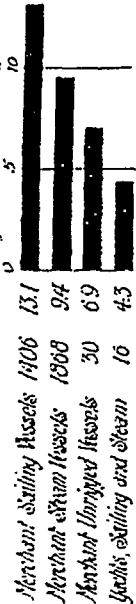
Passenger's Rate per 1000000 Passengers Carried



Tatalities on Vessels Totally Lost

U. S. Bureau of Navigation

Lives Lost - Percent of Persons on Board



Marine and Navigation Sectional Meeting

1909-1913, or, specifically, 4.8 per 1,000 for masters, 4.6 for seamen and 4.2 for engineers. As regards the fatality hazard at sea, it would, therefore, appear to be no very material difference in the accident liability of the most specific occupations.

STEAM VESSELS SAFEST.

Since the most important difference in navigation relates to motive power employed, it is extremely significant that according to British experience, the accident liability in the navigation of sailing vessels should be very decidedly in excess of the corresponding accident liability of steam vessels. During the period 1909-1913, the general mortality rate (including diseases) was 12.7 per 1,000 men on sailing vessels, against 3.8 per 1,000 for men on steam vessels. The accident mortality due to wrecks and casualties was 8.1 per 1,000 for men on sailing vessels, against 1.5 per 1,000 for men on steam vessels. The mortality due to other accidents was 2.6 per 1,000 for sailing vessels and 0.6 per 1,000 for steam vessels. The mortality from diseases, excluding suicides and homicides, was 2.0 per 1,000 for sailing vessels and 1.7 per 1,000 for steam vessels. It is, therefore, self-evident that the replacement of sailing vessels by steam vessels has very materially reduced the hazards to life in navigation and in all probability in a measure an improvement has also resulted in the general health of the men largely no doubt, because of better sanitary conditions, more commodious sleeping quarters, better ventilation, etc.

A further reduction in the accident rate has resulted from the ever-increasing average size of the vessels employed. According to the American experience for recent years for vessels under one hundred tons, for illustration, in distress 47.8 were lost, against a loss of only 2 per cent in the case of vessels of a size of 6,000 tons and over. Since the small vessels, of those under one hundred tons, constitute 25 per cent of the total American marine, the losses are obviously of considerable economic importance. Other statistical evidences sustain the conclusion that the relative loss of life is decidedly less in the case of the larger vessels than in the case of the smaller vessels and that, therefore, an increase in the average size of vessels is equivalent to a reduction in navigation hazards to passengers and crew.

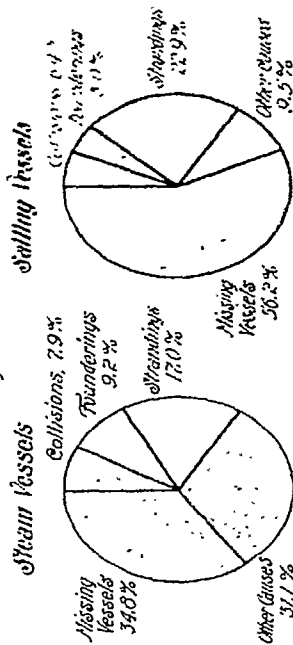
There are no trustworthy statistics as regards the relation between the age of the vessel to the risk of total loss, but, of course, this factor invariably involves a higher ratio of lives lost in the case of older vessels.

Accident Hazard——British Merchant Marine

Causes of Fatalities, 1894-1913

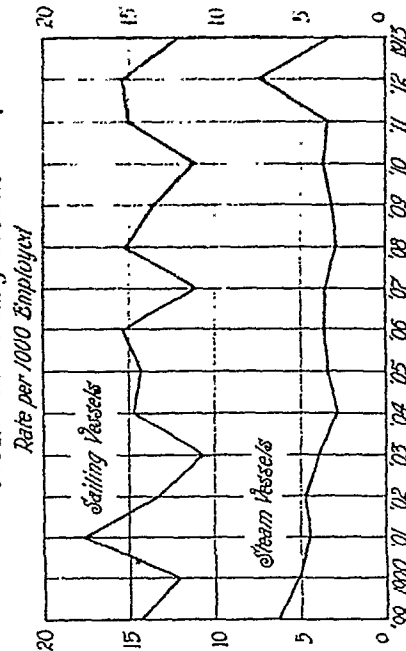
Seamen and Passengers; Steam or Sailing Vessels

Percent of All miles lost



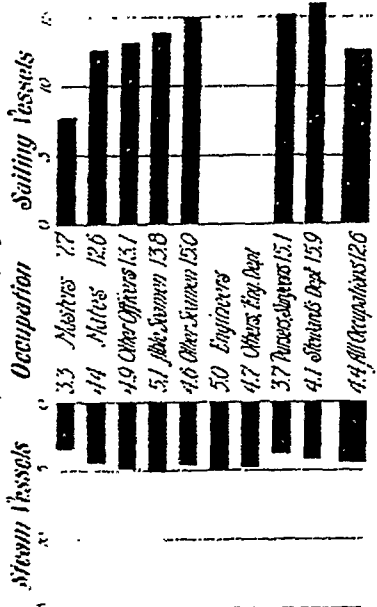
Comparative Accident Mortality of Seamen, 1899-1913

Steam and Sailing Vessels



Comparative Accident Mortality in Specified Occupations, 1909-1913

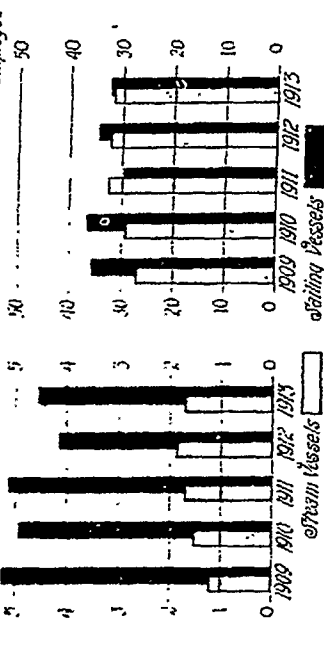
Rate per 1000 Employed



Casualties to Seamen, 1909-1913

Workmen's Compensation Experience

Per 1000 Employed



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on board. Of the vessels in the American merchant marine 5 per cent are under 15 years of age, 21.3 per cent are from 15 to 20 years old, and 25.5 per cent were built more than twenty-five years

SEASON OF YEAR AND MARITIME DISASTERS.

It is also of interest in this connection to state that there is a well-defined correlation between the season of the year and the occurrence of maritime disasters involving the loss of life and property. For the whole territory of the United States and adjacent waters 18 per cent of the marine disasters occurred during the spring, 23.1 per cent during the summer, 31.6 per cent during the autumn and 27.3 per cent during the winter. On the Great Lakes, however, where navigation is practically suspended during the winter months, 46.2 per cent of the disasters occurred during the autumn and 6.9 per cent during the winter. These statistics are of value, indicating the seasonal variations in the necessity for adequate weather warnings and the efficient provision for life-saving services. It should be pointed out in this connection that in former years much more careful attention was given to the reporting of the loss of life and the charting of storms on the Great Lakes than is the case at the present time.

Of the vessels meeting with disasters of more or less importance in the United States during recent years, 64.5 per cent were steamers, 26.7 per cent were schooners and 3.9 per cent were barges; but for the Atlantic and Gulf coasts combined 49.9 per cent of the vessels in disaster were steamers, 37.5 per cent were schooners, and 6.7 per cent were barges. There are reasons for believing that the occupational hazard in connection with barges on the Atlantic coast is decidedly more serious than is the case in coastwise navigation generally.

The average loss of life in navigation is, of course, measured by different methods, but perhaps the most satisfactory for general purposes is the proportion of persons lost to those on board. According to the reports of the U. S. Life Saving Service, or what is known as the Coast Guard, of the vessels in distress on the Atlantic and Gulf 6.1 per 1,000 of those on board were lost, against 5.4 on the Pacific, 8.3 on the Great Lakes, 7.0 on rivers and 13.4 at sea and in foreign waters. For all navigation territories combined, the fatality rate was 7.7 per 1,000.

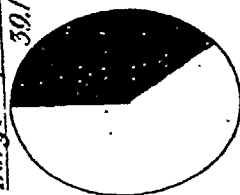
The tentative statistics are merely presented for the more thorough analysis of the available data regarding the loss of life in navigation.

Accidental Deaths by Drowning — Water Transportation

Industrial Mortality Experience of The Prudential Insurance Company of America 1913 — 1915

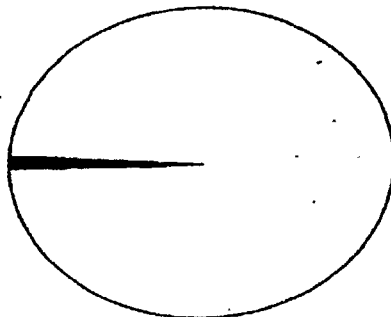
Percent of Deaths from All Causes

Barge Captains
30.1%



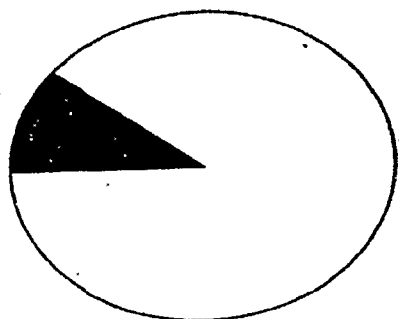
All Occupied Males

1.3% by Drowning



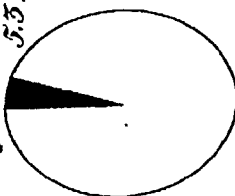
All Navigation

11.0% by Drowning



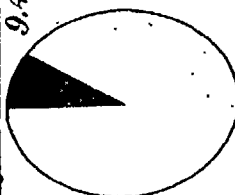
Longshoremen

5.5%



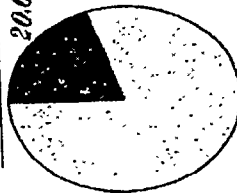
Engineers, Marine

9.4%



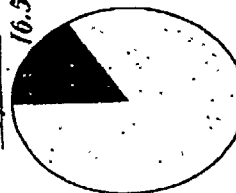
Deckhands

20.0%



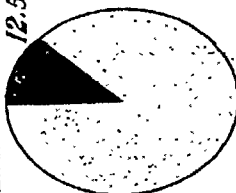
Captains

16.5%



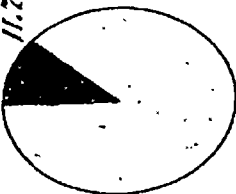
Firemen, Marine

12.5%



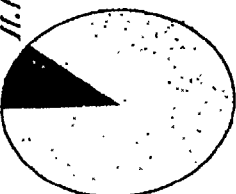
Sailors

11.7%



Boatmen

11.1%



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with reference to the men employed in navigation and occupations more or less related thereto. The whole question of dock labor illustration, is one of the first importance, in view of the practical certainty that the fatality and general inquiry rate among this class of men is much higher than is generally assumed to be the case. Conversely, there are the strongest reasons for believing that measures of accident prevention in navigation, dock labor, etc., will be productive of far-reaching and most gratifying results.

REPORTING OF ACCIDENTS.

It is most regrettable that no well-defined governmental action has ever been made in the United States to collect worthy statistics of the loss of life in the American merchant marine and the injuries sustained by the men employed, according to nature and degree of seriousness. The statistics which are now collected by the Bureau of Steamboat Inspection, the Coast Guard, etc., are inadequate to the present-day needs for an efficient Safety First movement in all of the industries concerned with water transportation. Since under the navigation laws every master is required to report deaths on board during the voyage and possibly while the vessel is in port and subject to admiralty jurisdiction, provided, however, that the vessel is engaged in foreign commerce or in coastwise commerce between ports on the Atlantic and Pacific, it is strongly urged upon the National Safety Council that a unanimous resolution be adopted to the effect that the foregoing provision of the law should be enforced, but that an amendment to the Navigation Act should be passed by Congress and made to provide for the reporting of deaths and injuries on all vessels subject to the navigation laws and that the Bureau of Navigation be provided with a sufficient clerical staff and facilities for the statistical tabulation and analysis of the information secured. Such action would be in conformity to the long precedent of the British Merchants' Shipping Acts, under which admirable returns have been secured for many years. Add thereto, it may be strongly recommended to all companies engaged in water transportation that they follow the admirable precedent of the companies engaged in transportation by rail, as regards establishment of an efficient safety organization, absolutely indispensable to the attainment of the highest degree of security and comfort on the part of the employee. In view of the fact that most of the accidents are subject to the operations of the Workmen's Compensation Law, the prevention of such accidents is obvious.

a matter of considerable practical importance, aside from the humanitarian, which demands that, as far as practicable all unnecessary accidents should be done away with. It may be said in conclusion that on the basis of the British Workmen's Compensation experience with reference to navigation, the probable fatality loss in the American merchant marine for the year 1917 is represented by an approximate value of \$750,000, while the non-fatal injuries on the British basis represent an additional loss of \$750,000, which in all probability by American standards of compensation would be materially increased over the British average amounts paid in conformity to Workmen's Compensation Laws.

Finally, attention may be directed to the fact that especially during a period of war no class of labor is of higher economic and social value to the nation than those who are employed in navigation and who are, therefore, entitled to the highest consideration of security and comfort obtainable under a well coordinated policy on the part of the government, the transportation companies, labor organizations, and the public at large.

National Safety Council

Electric Railway Section

New York City

Sept. 13, 1917

E. C. SPRING, Chairman

Superintendent Transportation, Lehigh Valley Transit Company,
Allentown, Pa.

H. B. POTTER, Vice-Chairman

Assistant to President, Boston Elevated Railway Co., Boston Mas

J. H. HARVEY, Secretary

Superintendent of Efficiency, Kansas City Railways Company,
Kansas City, Mo.

THURSDAY MORNING SESSION

THE meeting was called to order at 10:05 o'clock by Mr. E. C. Spring, Chairman.

The Chairman in an informal address welcomed the delegates and reviewed the work of the Section for the preceding year. The report was well received and the activities of the officers in order.

Secretary Julien H. Harvey was then recognized and reported as follows:

REPORT OF SECRETARY.

Gentlemen: As Secretary of the Electric Railway Section of the National Safety Council for the year 1916-17 I desire to submit the following report:

Immediately upon the election of your present officers, Chairman Bullock outlined certain work which he wished covered during the year.

the year. It was his desire that our organization be more thoroughly perfected and to your Secretary was assigned the duty of gathering data showing the various forms of safety and welfare work carried on by the member companies. A small index card was sent out from Chairman Bullock's office with a circular letter explaining this matter in detail. With this you are, of course, familiar, but I feel that the results may be of interest. The total membership to date comprises 139 companies and in submitting the following data I have grouped the companies into three classes, as follows:

Class 1—Urban,
Class 2—Urban and interurban,
Class 3—Interurban.

This shows the following division of the 139 companies with total employees in each class:

	<i>Employees.</i>
Class 1— 55 companies.....	62,598
Class 2— 65 companies.....	66,456
Class 3— 17 companies.....	2,066
2 holding companies	
Totals, 139 companies.....	131,120

Reports have been received from 124 of the 139 companies, which additional reports would somewhat increase the number of employees reached by the National Safety Council service.

An analysis of the facts as set forth on the data cards shows the number of each class engaged in any or all of the various safety and welfare activities as follows:

	<i>Urban and</i>			
	<i>Urban</i>	<i>Interurban</i>	<i>Interurban</i>	<i>Total</i>
Employees' benefit associations.	29	26	4	59
Pension plans	11	15	1	27
Group life insurance.....	7	7	1	15
Medical service	18	27	9	54
Savings and loan associations..	7	6	..	13
Safety organizations	16	35	4	55
Magazines, employees	18	20	2	40
Magazine, public	6	8	..	14
Bulletins	24	35	9	68
Totals	136	179	30	345

Electric Railway Section

Attached was another data sheet, dividing each of the classes further, based on the number of employes.

On receipt of these cards by the Secretary, a group of envelopes was forwarded to each member, requesting the return of such literature issued by them from month to month. The material received has been forwarded by the Secretary to the General Manager of the National Council, who has in turn transmitted this to the member companies. While many members do not issue such material, yet it is felt that by careful attention to this matter and prompt forwarding of such material a great deal of benefit can be rendered to the member companies. Speaking for my company, we have obtained many ideas from literature which we have received through this service.

SAFETY AND WELFARE ACTIVITIES.

In collecting data on the different safety and welfare activities, no effort has been made to analyze the methods in which this is carried on. It appears to me from the standpoint of international organization there is much future work to be done in the accumulation of data on these specific activities for any member desiring information thereon. To illustrate with the subject of group insurance: Our records show that there are fifteen companies which carry some form or other of this insurance. If data were available in the Secretary's office, showing in a concise way the particular features of each plan, together with a suggested plan developed by a Standards Committee, all of this would be of vast benefit to any company desiring information on the subject. It is not in the province of the Secretary to make specific recommendations to any body, nevertheless he respectfully suggests that this matter be given consideration.

At the beginning of the year our membership was approximately ninety companies. To date we have, as before stated, 139 members, an increase of 54.4 percent.

In closing I desire to express my thanks to each member of the Section for the cordial co-operation and help given the Secretary in the performance of his duties.

Respectfully submitted.

REPORT OF MEMBERSHIP COMMITTEE.

Mr. George Oliver Smith of Henry L. Doherty & Co., New York City, presented a verbal report for the Membership Committee. His report showed the Section in a flourishing condition, having made remarkable gains during the last year. Mr. Smith was congratulated upon the successful work of his committee.

REPORT OF THE SAFETY EDUCATION COMMITTEE.

Mr. Chairman and Members of the National Safety Council: The work of the Safety Education Committee of the Electric Railway Section for the year 1916-17 has consisted entirely of the preparation of fifty-two bulletins for periodical distribution to the Section members.

Two main points have been considered in writing these bulletins:

1. The biggest problem which the Electric Railway has to meet in its safety work is the prevention of accidents in connection with the operation of cars. If the best results are to be accomplished the company and the public must work in harmony. The co-operation of the public must be obtained and the trainmen must realize the important bearing which the safe performance of their duties has on any safety movement. Their interest and sympathy with the work must be obtained and held. For this reason the year's bulletins have dealt strictly with the problems of every-day car operation.

2. Bulletins must be read regularly by the trainmen if the greatest good is to be realized. They must be sufficiently interesting that the men will want to read them. With this in mind we have made free use of illustrations in order to get attention. The great majority of these have been cartoons prepared by a cartoonist of Columbus, Ohio, who is not only much appreciated in his own city but is widely known throughout the country for his most excellent work.

The co-operation of various members of the Section in furnishing copies of their literature through Secretary Harvey has been keenly appreciated. Undoubtedly they will frequently recognize in the bulletins as they come to them familiar phrases, anecdotes or ideas originating with them. It is very often difficult to find entirely new ideas for use in the preparation of the safety literature

Electric Railway Section

and help obtained from the local work of the companies has been thankfully received and unhesitatingly appropriated, the latter knowing that we are all in the work for the greatest results possible we can not let good material slip past unused.

HAROLD W. CLAPP,
Chairman, Safety Education Committee.

APPOINTMENT OF NOMINATING COMMITTEE.

The following Nominating Committee was appointed: V. Woltz, Toledo Railway and Light Company; C. L. Turner, H. Doherty Company; H. B. Adams, Aurora, Elgin & Chicago Railway.

CHAIRMAN SPRING: The first subject for our consideration this morning is "What Does the Safety Worker Want the President of His Company to Know."

WHAT DOES THE SAFETY WORKER WANT THE PRESIDENT OF HIS COMPANY TO KNOW?

CHARLES B. SCOTT, BUREAU OF SAFETY, CHICAGO, ILL.

Mr. Chairman and Members of the National Safety Council: When your program committee selected this subject it may have had in mind that the presentation would bring out helpful suggestions as to just what detailed information of safety plans and statistical record of results should be placed before the president of a company by the safety supervisor. It seems to me that such a line of discussion would not bring out the most valuable possibilities of the subject. If the observing president is not fully satisfied with the showing on his balance sheets or the morale of his organization as reflected to him in the routine of his regular observations he will, no doubt, call for special statistics or analyses of expenditures and for information about contributing causes reflected in a careless organization.

The form of reports or the frequency of reports from the safety worker to the president is largely a matter of local or individual requirement and no fixed or standard form or quantity of information would meet general needs.

Perhaps the program committee intended that the subject should bring out the acknowledged fact that safety is a matter of common sense.

is the important one that the safety worker should have his president know, but I am not going to touch upon this phase of the subject because if the president has not been informed and convinced of this result of safety work by the proof contained in the record of a decade of safety work he is not likely to be convinced by the local verbal argument.

BY-PRODUCT OF SAFETY WORK.

There is one by-product of safety work with electric railways the existence and value of which has not been sufficiently impressed upon the average president of this particular industry. Undoubtedly safety work creates confidence and better relations between these public service companies and its patrons, between public carriers and the communities served. The more experience I have with accident prevention work on electric railway properties and the more I observe the varied relationship in different communities the more am I convinced that systematic, constant efforts by the company are potent influences for the desired friendly feeling from the public.

A careful observer on a strange property has no great difficulty in determining whether or not the transportation property has an efficient and a systematic plan of safety; and observance of the conductor while loading passengers, his attention to the aged or infirm, his manner of replying to questions from passengers, all reflect safe operation or haphazard operation; and the traveling public is not long in making up its mind as to its friendliness or unfriendliness acquired from such observation and experience. The public service property giving no attention or half-hearted attention to its safety of operation, may reasonably expect sharp criticism and ill feeling from its patrons, notwithstanding it may have other claims for their confidence and support.

The Secretary of the Membership Committee has just reported that 139 companies are now members of this Section, but that only fifty-five of these were operating under a systematic or definite plan for accident prevention. I am wondering why the eighty-four companies who are doing nothing along safety lines spent their money for memberships. It was hoped when they became members that they did so because they were in earnest and desired the assistance of the Council in the development and execution of their plans, but they have now enjoyed this membership for a year without any tangible efforts upon their part to carry out the purposes of

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the organization. They are like those people who believe salvation is assured by taking membership in the church and letting the matter of their future welfare rest on that affiliation.

INACTIVE MEMBERS.

Not long ago a national association of public service corporations mailed 500 inquiries to members asking how many of them had a well-defined and definite plan of accident prevention. One hundred replies were received. Sixty-five of the companies had no plan for accident prevention; and although thirty-five replied that they had definite plans, a review of their procedure showed that only ten were employing really intelligent methods that insured continuation and dignity for the work.

I am referring to this inactive membership of this Section in this record of public service operators to show you that the presidents of such companies do not appreciate the importance of safety work. The safety worker wants the president of his company to know that his work is an important one. Such apathy as I have described may in a measure be chargeable to the safety worker rather than wholly to his executive.

Some executives feel that safety is being overworked and the impression is sometimes almost justifiable if it is founded upon the multiplicity of superfluous and inefficient efforts of the safety worker. Safety work to inspire the support and confidence of the operating head or the executive head must be sane and practical and an enthusiastic safety worker may sometimes bury support and confidence under an overload of literature or an eternal flow of suggestions. Be practical and not wholly theoretical; pick out things to do and do them, do them well and lastingly, do your work in a businesslike way and you will maintain the co-operation of the men higher up who are accustomed to appreciate practical and tangible results.

Let your plans and accomplishments be so definite and workable that your president will be convinced that safety is not a pattern of petty prizes or gilded awards, that it is not a matter of petty prizes or gilded awards, that it is workable by continually pouring safety talks into the ears of men, but that it is a commonsense, practical and businesslike proposition, having the same place and dignity in the organization as the other activities of operation.

Four years ago, at the Second Annual Congress of the National Safety Council, I heard a speaker advance the idea that safe

largely a matter of discipline and at the time I not only did not agree with him, but I felt that such an idea endangered the structure on which most of us had erected our plans and perhaps jeopardized the cherished methods that were then being so generally employed to create primitive interest in accident prevention in the minds of the workers. Four years have passed and the four years' experience has proved to me the soundness of the speaker's argument. I believe many of us have experienced this changed idea of the value of discipline and of close supervision, and are each year more thoroughly convinced that these two elements of industrial management and operation are essential and important factors in our work and that in the past our work has suffered because of our failure to appreciate the urgent necessity for better supervision and discipline in the property with a poor safety record.

EXECUTIVE SUPPORT IMPERATIVE.

The president of the company must also know that executive support and executive backing are necessary for effective safety work. The safety worker is fooling away his time if he is deprived of executive support. In my own experience I have found that safety work without this support is not only difficult and discouraging but almost fruitless in the results obtained. Time was when I hoped to solve the problem of accident prevention by enlisting the interest of the trainmen through sentiment and their own individual sustained co-operation by an appeal to thus serve humanity, on the theory that the attitude of the executive had but little if any material bearing on the continuance of this co-operation. I have, however, changed my opinion of the possibility of making headway under such unfavorable conditions and am convinced that sustained interest and co-operation on the part of workmen depends upon their belief or disbelief in the sincerity and earnestness of their executives.

It is no easy task to secure the backing of president, executive officers, superintendents, foremen and sub-foremen and especially so if the chief executive is indifferent towards our work. On the contrary, it is usually the case that the very moment the chief executive places his stamp of approval on the work and gives his organization to understand that he is personally interested in its perpetuation and the results, the various subordinates will immediately line up with their own personal influence and co-operation and that the enthusiasm originating with the head filters down until it permeates the entire organization. If you secure substantial,

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sincere and dignified interest in your work from your president will greatly minimize your difficulties in securing the co-operation of your superintendents, trainmasters and lastly your trainmen.

FRUITS OF SAFETY WORK APPARENT.

With such support it will not be necessary for you to report to your president the number of bulletins you have issued, the number of safety talks you have made, the number of safety buttons you have distributed, nor even to submit to him statistics to prove the value of your work, for he will see the fruits of your work reflected from his balance sheets; he will feel it as he comes in touch with the organization and he will appreciate it from the improved sentiment and disposition of his patrons.

I hope the discussion of the subject following these remarks will be along the lines which I have tried to bring to your attention, because I firmly believe this view of the subject is a most important one and one that has been overlooked in our interest in the important details which are rendered worthless unless the executives of our company are backing us up in our work.

DISCUSSION.

CHAIRMAN SPRING: We are greatly indebted to Mr. Scott. I am now going to see that my president gets a copy of the proceedings of this meeting.

When I was located in Ohio—I was president of the Central Electric Railway Association—it was part of my work to organize about a public service commission in the state. At that time there was a strong opposition against forming a railroad commission or a public service commission. I got the ear of Governor Herring and it was through his efforts that the present Public Service Commission of Ohio is doing the splendid work that it is today. The work of the Ohio commission is known in all the adjoining states; we are more than fortunate in having with us this morning Mr. Noonan of that commission. I am going to ask Mr. Noonan to speak on this subject.

THE INDUSTRIAL COMMISSION OF OHIO.

MR. NOONAN (Industrial Commission of Ohio): I really do not come to the Safety Congress to make any remarks. I am here to listen. I have to talk so much the rest of the year that it

me good to sit at these meetings and hear others speak. I am here this morning out of courtesy to Mr. George Oliver Smith, who urged me very strongly to come. Mr. Smith and his company have given me so much co-operation and extended so many courtesies that I felt an obligation to attend.

I am not connected with the Public Utilities Commission of Ohio, which is doing such splendid work. I am connected with the Industrial Commission of Ohio, having charge of safety work in all the factories of the state.

In my position I come in contact with all sorts of accidents—accidents in steel mills and foundries, in boiler shops and cigar plants—and in every case the causes are fundamentally the same. A man is injured in a foundry, his foot is burned. There may be various causes but the causes really are the same as if a woman was injured in a clothing factory. There are not different causes for different industries. Among ordinary causes of accidents some very important ones are common to all industries. Before I held my position with the Industrial Commission I thought I knew a great deal about safety, but I was amazed when I took up my present work and went into various industries to find that there were two or three fundamental causes of accidents. One of them Mr. Scott has referred to—lack of discipline.

LACK OF DISCIPLINE.

Gentlemen, lack of discipline must be charged up to your executives. We have heard a great deal of talk about accidents being charged up to the workmen, 50 per cent of them. That is all bunk. If you have accidents in your plants or in your organization that are charged up to carelessness you might as well put it down that the carelessness should be charged to the man or the men who preside over your organization. You can have no successful accident reduction (I don't care who your safety men are or what your safety policies are or what your safety meetings are or what your motion pictures are or whatever the propaganda may be) unless the man at the top or the men at the top are heart and soul back of the safety movement as a business proposition in their organization.

When I go to a plant anywhere in the state where there are accidents the first thing I look for is discipline, whether there are safety rules and whether they are being enforced. I could stay here until midnight and quote plant after plant and bring our records and files to prove conclusively that many men and many women

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are being killed and injured because of lack of shop discipline. lack of shop discipline should be charged to the men who are at the head of those organizations.

How can a railroad be safe if the men on that railroad are obeying rules anywhere along the lines? Can it be safe, gentlemen? Who under heaven has the authority, the power, to enforce rules but the president or the general manager? On the other hand, I never saw a plant where they were actually cutting down accidents where you didn't find the president and head of it a hearty pathizer, himself a worker for safety, himself setting the example, himself seeing that his workshop rules were enforced.

There is a tremendous amount of wasted effort in connection with accident prevention work. So much effort is wasted that employees in our organizations do not take it seriously, and there is something wrong with our safety movement. It is regarded as a joke, the men laugh about it, and in plants where they have very little safety the man who attempts to start accident prevention work is regarded as a fool. Why? Because the men at the head have not set the example, have not helped the propaganda of the safety movement, by the enforcement of shop rules.

REDUCED ACCIDENTS ONE-HALF.

Last September I went into a plant I had never before visited. It was a plant where I knew nothing of their safety work. I do not know whether they are members of the National Safety Council or not. I was talking with the president in his private office and regarding his accidents. He told me he had reduced his accidents. In your mind you, he didn't send out for some one else, he didn't press the button and ask some clerk—he turned to his own files and said he had reduced minor and major accidents 50 per cent in a year. He showed me the figures. I asked him how much his employees had decreased in that year. He said: "Why, the employees have decreased, they have actually doubled." That man actually reduced his accidents one-half in twelve months.

This was about 11 o'clock in the morning and I said to my friend, "Noonan, there must be something wrong, or, rather, there must be something right here; there is some reason for this." I tried to find out that reason, but I could not get it in the first hour. I went to luncheon with him and while we were at luncheon the telephone

Mr. Noonan; I am expecting a new arrival in my family." After he rang off he came back and said: "You know when I think of my family I think of my workmen too; I do not want one of my men to be injured; I do not want one of them to go home with blood on his hands or with an eye out, because if they do the children of those men will suffer."

That man had the right, rock-bottom principles and he had carried them into his plant. He was getting results because he didn't want the other fellow to suffer, he didn't want any one to suffer, just as he did not want his own family to suffer. I was not quite satisfied, however. I knew there must be something better than what he had told me. I am going to tell this story, because the first time I told it I thought it was merely an incident, but it has gone the rounds of the country and has been quoted and credited in different magazines, so there must be something to it.

We had a safety meeting in the yard and after we got through this gentleman said to me: "Did you notice among the foremen a gray-haired man?" I said, "Yes." "His name is George," he said, "and he used to be one of our worst boozers." Here it was, gentleman, that I found the reason for the accident reduction in that plant. The gentleman went on: "I want to tell you about him. I tried to get George to give up booze, but I did not succeed. I said to George, 'I will bet you a \$5.00 hat that you can't keep sober for three months.' George took the bet and won the \$5.00 hat. The day he won it he went out and got drunk and stayed drunk for ten days."

"WHY DON'T YOU BUY A HOME?"

When George came back his employer decided not to speak to him, he ignored him, and so it went on for a couple of years. Once in a while the boss would talk to this man, but he would not preach to him, he would just talk to him and ask him whether he couldn't keep sober. Finally one morning George came into the private office and wanted to get off that day. The boss asked him why and he said: "Well, I have got to move out of my house; they have sold the house and we must get out." The employer said: "George, don't you like the house?" George replied: "Yes, sir, I like it and my wife likes it, but we have to move."

The employer said: "Why don't you buy it?" The man replied: "I haven't the money." The employer said: "Of course, you haven't the money: you have squandered it all these years." George replied: "Yes, I know it, and I am ashamed of myself." Before

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that man left the office the boss had arranged with the bank for money and it was loaned to him and when he went home at 5 o'clock his wife was a greatly surprised and happy woman to know that she didn't have to move, that the house was her own—the first she owned.

You would expect that the best part of the story would be that George went on a jag, but, no; the best part of the story is this: five years have passed and that man has not touched a drop of liquor. Better still, he has paid for the house. That story had gone into the homes of the men working in that mill; they all know about it. Those men are co-operating to prevent accidents. You do not have to have bulletin boards or safety meetings or other preaching to have your men will co-operate with you. I tell you, gentlemen, the workmen of this country are willing to co-operate with their employers if they get half a chance.

PREVENTING EYE ACCIDENTS.

I could tell you many stories like that to show that accident prevention can be very successful where the employer, the executive, takes a personal interest. I know a company—I was connected with it at one time—that had a great many accidents in one department. Every Friday morning the vice president or some other official presided at a meeting and the accidents were read. It certainly looked bad to have continual accidents, eye accidents particularly, so I decided to take the bull by the horns. A few days before the usual meeting I showed the vice president a report of the eye accidents for a number of months. He said: "Bring this up at our meeting on Friday morning." I called on the superintendent of that particular department and asked him what was the trouble. He said: "Well, I can't get the men to wear goggles. They tell me to go to hell and say they will get a job elsewhere." That superintendent was wrong, he simply did not try to win his men. That was reported and the vice president said: "Beginning today we will have this rule: All men in that department must wear the goggles provided. If a man is caught disobeying that order he will be laid off for two weeks, and for a second offense will be discharged."

We had the rule printed and took it down to this particular department. We had the men read it, we had them put their names on it, and we got the goggles. We told the men that if they did not like those particular goggles we would get some other kind. A

told them that the vice president was anxious to co-operate and he had sent out a little message to them. In a period of eighteen months that company did not have a single eye accident in that department. First of all, we had the influence of the executives, followed up by discipline.

Gentlemen, you must have discipline. What is the value of discipline? The value of discipline is that it brings home to men their moral obligations. You must have discipline in your government, you must have discipline in your state affairs, you must have discipline in the Nation, you must have discipline in the army, and you know how strict discipline is in the United States army today. You know how rigid is the discipline which the regular army is imparting to these men who have been drafted. The officers say to the men: "You are going to learn something you have never learned before and that is discipline." That is a fact. As a people we are undisciplined. We acquire the habit in the home, we carry it into the schools, we say we will do this and we will not do that; we say we will obey mother and will not obey mother, that we will obey the teacher and will not obey the teacher, and the fact is that in our schools the teachers are actually afraid to enforce discipline.

SAFETY A MORAL OBLIGATION.

In the industries, on the railroads, in every factory and workshop there is this tendency to disobey and disregard orders. I think if you will look into the railroad and trolley accidents that have occurred in the last few years you will find that in a great many cases the most serious accidents have been caused by the prevailing disregard for some rule. Discipline brings home the moral obligation. You may preach to the men about safety by bulletin boards, by prizes, by buttons, by banquets and motion pictures, but if the workman does not feel that morally he must take care of his life, that morally he must give his best service to his employer, that morally he must conserve himself and his life for the sake of those who depend upon him, that morally he must protect himself for the sake of the community in which he lives, you are getting away from the moral obligation.

There is an awful lot of preaching about accident prevention, but we are leaving out one of the first essentials—that the man who has a moral conception, a moral obligation, will be safer than the man who has none. He will feel that he must take care of himself, that he must give his best service to his employer and that

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obligation applies to the employer as well as to the workman. employer must take care of his men, conserve them and protect them and do all possible to make their lives safe.

There are other causes where the executive may do something to reduce the accidents; for instance, speeding up. We are living too fast. More people are dying in New York today of heart disease than from any other affliction. More men are dying between ages of 45 and 55—in their very prime. I see them being cut off on all sides. We are living too fast, we don't sleep enough, we don't rest enough, we don't think enough, we don't read enough, we don't take the right kind of amusement. As a people, we have gone on foolish amusements. Everywhere in New York, where there is space enough for a man or woman to walk, is a place where they must dance. The women of the country have gone wild on amusements. All that has a bearing on safety. We are getting away from normal conditions. I don't know what we are coming to.

The safety movement is a very, very important one; it is that every employer should regard as being of the utmost importance—one of the most important things he has to do. I certainly have no sympathy for an employer who does not take a personal interest in accident-prevention work. I feel that here, in your association, in this great Congress, that if you can go out and stir things so that your executives, in the various companies in which you are engaged, will take more of a personal interest, we will see that the accidents are beginning to be reduced. Perhaps one of the hardest things that the safety man has to meet is to have placed on his shoulders the work of trying to reduce the number of accidents and then to feel that the men at the top are not backing him heart and soul, and when, at the end of the year, the accidents have been somewhat reduced, in all the organization or in some particular department, the men who have been responsible for that do not get a word of praise.

ONE OF THE GRANDEST OF MOVEMENTS.

I think the safety movement is one of the grandest movements that the world has ever seen, because its effects are so far-reaching. It is all right to talk about dollars and cents; that is, primarily, the purpose of accident prevention; but if we went in to win this war just because of the dollar I think we would never win it, but if we go in it for humanity's sake that is a different thing. You have a stimulus, you have a purpose, for which we are all ready to fight and sac-

fice ourselves and give up our money and give up our manhood. So it is in the safety movement and with the men or the companies who place the dollars first. Just as soon as the workmen feel that you are trying to stop accidents in order to save money they are not going to co-operate. I have been preaching that for four years and yet many people find fault with Noonan and say he is too enthusiastic, he looks at everything from a humane point of view. But I am in the game and I am trying to be on the winning side of safety work. For God's sake don't let the workmen feel that the dollar comes first.

You heard the speeches at the banquet last night. We have been busy in this country chasing the dollar—it is the metal God of the people of this country, it is the cause of all our selfishness and greed and unhappiness. We find men ruining themselves and their homes in order to acquire more money; men are measured by the amount of money that they have and by the amount of pleasure that they can get from it. Therefore, we must have some other God before us than the metal God, the God of the dollar; we must have something that is worth living for, something that is worth while struggling for and that is in our homes, not the love of the dollar but the love of man, the love of our brother. When we get that spirit into our accident-prevention work we shall begin to win, but you cannot win on the basis of the dollar.

CHAIRMAN SPRING: We are very grateful to Mr. Noonan. The next speaker is Mr. G. Oliver Smith.

A SUGGESTION TO EXECUTIVES.

MR. G. OLIVER SMITH (Henry L. Doherty & Co.): I might offer as a suggestion to executives this thought: Study human nature. Every executive has a hobby. I think that after you have been appointed to the accident prevention work in your company that you should not study accident prevention for the first few weeks of your tenure of office—you should study your executives. You should find the line of least resistance in approach and by the line of least resistance I mean the angle in which that executive is most interested in the operation of his property. Size up your man first, find out what is his particular hobby, then work your accident prevention around that. Do not go to him and say you want to be the little accident preventer of the entire organization. On the other hand interest him in it. It is very easy to say "interest him in it." but if you will simply size up your man and then determine on your

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method of approach I will guarantee that you can get the ear of any executive, no matter how cold or how stiff or how indifferent he may appear to this phase of his operation, if you will just size him up. If he is a man who thinks in dollars and cents, in order to get your entering wedge in, talk dollars and cents to him. If he is interested in the social welfare of his employes, approach him along that line, but whatever you do study your man first. The results will come very much easier and are very sure.

MR. H. B. ADAMS (Safety Supervisor, Aurora, Elgin & Chicago Railway): The matter of discipline is one which we have tried to enforce on our little line and we have succeeded to a certain extent only—a limited extent, I might say, on account of the unions. The unions are very particular about how a railroad company enforces discipline and we find difficulty in laying off a man or in charging a man that violates what might be called a technical safety rule. If a safety rule is a part of the operating rule, and we can get the man under the operating rule without much reference to the safety rule, we can get the discipline on that one individual, but the rest of the men do not recognize the fact that that man was disciplined more for the disobeying of a safety rule than for the violation of an operating rule. I would like to know how to overcome that feature.

HEALTH OF THE WORKER.

DR. HARPER: The health of the individual employe is an angle that has been scarcely touched. You must have the confidence of the executive and operating officials of your company in order to have their earnest co-operation in conserving the health and well-being of their employes. On Feb. 1 of this year we instituted among our properties the physical examination of employes. We are fortunate in having with us an executive who is imbued and saturated with what Dr. Farnum dubbed yesterday the "bacillus humanitaricus" so essential and vital to the successful carrying on of this world. Employes are carefully examined, given a rigid and careful physical examination, bearing in mind a number of particular objects. We are trying to weed out the potential accident producers. Do I make our object clear to you? Mr. Noonan dwelt a little bit on the tension of our present mode of living and also on the fact that a whole lot of those fellows are overeaters. Did you ever consider the fellow with a great big pouch and great big chops? He almost goes to

fellow to run a car, say, at sixty miles an hour. To make the picture clear to you: About two years ago I recommended to an operating official an examination of his operations. "Oh!" he said, "what good will that do?" Within three months one of his motor-men, running a limited at high speed, crashed into another car. Upon investigation they found he was nearly dead with Bright's disease and was asleep at the time of the accident. A number of people were killed and many injured.

Have I made myself clear? Many of those fellows are potential accident producers. The fellow that has a malignant syphilis or an active gonorrhea—frightful venereal troubles with which, I am sorry to say, a whole lot of them are afflicted—those fellows should be cured before they are put on a motor. They are potential accident producers and unless the operating officials of interurban lines take active measure you are going to have trouble.

The lines that Mr. Smith represents as safety director have given us earnest co-operation, but some of the other ones have not, because the executive officials are not awake to the importance of the health of their employees.

INTERESTING THE CLAIM DEPARTMENT.

MR. V. J. WOLTZ (Toledo Railway and Light Company): In Toledo we are very fortunate in having as our chief executive a man who does not look at safety work from a dollars and cents standpoint; in fact, our chief executive is principally interested in securing a diminution of accidents and a conservation of life and limb. We have a peculiar proposition, somewhat in the line of Mr. Adams', in that we very recently were taken in by the Street Railway Men's Union.

It may be of interest to give you a little insight into the work we have been doing. I have charge of the claim department of the property, the safety end being taken care of by Mr. Metzger. I am vitally interested in safety work—primarily I might say from a selfish standpoint, because when the president looks over my monthly report he usually has something to say about the money we are spending. But aside from that I am genuinely interested because of the work that we are doing.

Last winter and during the spring we conducted safety meetings at the different barns. One week we would have a meeting at Central avenue, in the afternoon we would talk to the night men and in the evening we would talk to the day men. The meetings were con-

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ducted by Mr. Coates, the president of the property. He is always there. We are fortunate in having an executive who is not afraid to go out of his private office to talk and make a direct appeal to his men. He could not say to the men that they should do so-and-so, but he did make a direct appeal to the men for the purpose of instilling in them the objects of the company in trying to prevent accidents, and his efforts met with a great deal of success. After every talk I noticed that we had a considerable decrease in the number of accidents on that particular line. The minute we began on these talks I noticed a correspondingly large increase in the number of accidents.

Discipline is the proper thing in the enforcement of Safety ideas—there is no question about it. If the executive will leave his private office and get down to personal appeal and talk to the men, he will do a great deal of good. It is up to the head of the transportation department to try to instill into his men the proper principles of Safety First, but the head of the operating department, head of the transportation department, is so hampered in our case by the unions that he cannot enforce proper discipline. He has to talk to them along the appeal line. He has to ask them to do it instead of saying they must do it, and that is the trouble with the property at the present time, although we have had a great deal of success with these meetings at our barns and shops.

DISCIPLINE IS BASIC.

MR. VAN DERHOEF (Dodge Manufacturing Company): The question of discipline, I think, is basic. As a country we have more wrong ideas as to what that word means than a little. As a country we are not a military nation. We probably will be before we get through, but I have been amazed, in taking up military in a small way, and have acquired an entirely different idea of what discipline means, what it consists of, and how it is produced.

Military practice in the army and navy of this country today is very different from what it was a few years ago. I think a majority of our people have a very erroneous idea of what military discipline is. Some time ago I read a very interesting story. I cannot vouch for it as being correct because I have never been to West Point, but I understand that at West Point, in a prominent place, where all the students are compelled to see it frequently, is a bronze tablet which contains a paragraph from the address of

of the leading generals of the country to a graduating class of some years ago. He pointed out that there were two kinds of officers, those the men obey because they have to and those that the men obey because they want to; that the United States had no use for the one kind but did want the other. I think you should secure and read the infantry drill regulations of the United States army as passed by the War Board. They can be obtained for 40 cents.

In the regulations you will find an entirely different idea of discipline from what most of us have had—the basis is obedience because the men want to obey their officers. In industrial and shop work we can learn a great deal by getting down to the principle which is worked into the drill regulations. All training and military discipline is shaped to one end, to be successful in battle—everything else is incidental. The whole object of the army and navy, when in battle, is to be successful, and the whole idea of discipline is brought out and talked to the men to show why it will make them successful.

There is no line in which safety work is more carefully followed out than it is in war work. Naturally, when men go into battle a great many are going to be killed. The side that will win is the side, probably, that will have the least number killed and is the most efficient. While war is a dangerous occupation, like some we have in civil life, it is a necessary occupation at this time and safety in battle absolutely depends on discipline. Discipline is the one thing which will produce team work and co-operation and the safety of a firing line, the ability of the firing line to hold the enemy depends absolutely on discipline, and it is a discipline which must be entered into in a friendly way, in a perfect spirit, by all the men in it.

You can use force, you can use punishment, but that is of no earthly use on the firing line. On the firing line, to be successful, the men must produce results because they want to produce them, and they can only produce them by discipline. I think that, if in our office and shop work we could get the right spirit of what discipline consists of, and could get that into our stations all down the line, we would have no difficulty in enforcing, and, therefore, no difficulty in getting the results which come from, discipline.

CHAIRMAN SPRING: We will pass to the next subject. As Mr. Hardy's paper was so closely allied with the report of Mr. Scott, we will pass directly to the paper on "Report on Investigation of Automobile Hazards," by Mr. C. B. Scott, manager, Bureau of Safety, Chicago, Ill.

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REPORT ON INVESTIGATION OF AUTOMOBILE
HAZARDS.

C. B. SCOTT, MANAGER, BUREAU OF SAFETY, CHICAGO, ILL.

Mr. Chairman and Members of the National Safety Co
When Captain Bullock entered the military service he asked me to attend to the details of the report which this committee was to make at this meeting and I consented. He informed me that the office would forward the statistical data which they had accumulated as a result of the inquiries he had made, but I did not receive it until Tuesday of last week and then in rather bad shape. The statistics had not been boiled down and I had a great deal of difficulty in getting together an intelligent report on this important subject. I have, however, done the best I could in bringing out the material developed by his material.

I regret this, because I believe of all the subjects being considered at this meeting that this is the most vital and important. I do not believe there is a single problem causing us more trouble than one harder to solve, than this automobile question. Fortunately I am familiar with the work of the Committee on Grade Crossing of the American Electric Railway Association and I have been in touch with similar committees of the Steam Road Association and the American Railway Association. I find that what I have to say about this matter is in the minds of both of these associations.

The committee was appointed to make an investigation by sending out letters of inquiry to member companies and operating companies, whereby they might arrive at a conclusion as to the fundamental and main causes of so many accidents involving automobiles and electric cars, and that thereby they might be able to propose some procedure by which these accidents could be lessened.

Chairman Bullock went at this work in a very businesslike way. I want to make it clear that Mr. Bullock took upon himself a great big job, one that necessarily involved his office force in a great deal of work, and that if he had been permitted to complete the work we would have had a most valuable report here. As it is it will only be a report of progress. I would not be in favor of presenting only that I believe that if some of the points are thought over between this and the next session, it will develop some concrete and valuable suggestions at the next meeting.

REPORT BASED ON 18,000 ACCIDENTS.

I do not know how many letters of inquiry Mr. Bullock sent out, but he received replies from a very large number of companies and these replies and this information is based, as I remember it and which will be verified later in the report, on something over 18,000 accidents. I have divided the territory from which these reports come into several divisions. I have divided the causes of the accidents reported, I have tried to bring out the important point as to the proportion of those accidents due to the negligence of the driver of the automobile and the proportion that were due to the motor men of the electric car, thinking that was the most valuable information.

At the 1916 Annual Congress of the National Safety Council, held in Detroit, many electric railway men were present, with whom it was the prevailing conviction that in electric railway operation automobile accidents had become the most serious accident hazard of the electric railway industry.

At this Congress company after company, through its representatives in the meetings of the Electric Railways Section, reported that its accidents involving automobiles were outstripping all other classes of accidents and that apparently the end was nowhere in sight.

It was thereupon determined, with the approval of the Executive Committee of the National Safety Council, that there should be organized under the auspices of the Electric Railway Section an investigation of the automobile hazard throughout the country, which would endeavor to produce through the coming year reliable data as to the following:

1. Prevailing causes of and circumstances characterizing such accidents.
2. An authoritative statement of the scope of the hazard affecting—
 - (a) Urban operation, where effective police traffic regulation is possible.
 - (b) Suburban operation, where police traffic regulation is necessarily light.
 - (c) Interurban and country operation, where there is no police traffic regulation.

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- (d) Grade crossings, where highways intersect private rights of way.
3. A report upon the efforts that are being made by various companies and organizations to deal with the automobile hazard and suggestions as to desirable lines of co-operation for the future.
 4. Licensing of drivers and registration of owners, drivers' vehicles.

The subject was too large to attempt to formulate a policy for a given year, and this report is intended to be purely of informational character along the lines above indicated.

The first step taken in this investigation was an effort to secure the co-operation of electric railway companies. In response to a printed letter sent out to fifty of the principal street railway companies of the country, requesting that they co-operate with this committee in the matter of producing authoritative statistics of automobile accidents, forty-three assured the committee of their willingness and agreed to fill out each month an automobile accident report which had been prepared and furnished by us.

REPORT OF INVESTIGATION—PART I.

These monthly statements or reports divided the accidents into three divisions as to location, viz.: (1) In street ahead or behind, (2) at street intersection and (3) grade crossings. Each of these groups were subdivided into those occurring in the town or city and those occurring in rural districts.

Besides showing location the form divided the accidents according to cause, as follows, viz.—

- I. Defective or slippery rail.
- II. Defective or slippery pavement.
- III. View obstructed by snow, rail or fog: (a) motorman, (b) chauffeur.
- IV. Sudden stop by (a) car (auto hits car), (b) auto (car hits auto).
- V. Defective equipment: (a) car, (b) auto.
- VI. Passengers interfere with motorman.
- VII. Negligence of motorman: (a) Excessive speed, (b) insufficient clearance, (c) disobedience of traffic rules. (d) inattention, (e) other negligence.

VIII. Negligence of chauffeur: (a) Excessive speed, (b) insufficient clearance, (c) pulled on to track in front of car, (d) disobedience of traffic rules, (e) inattention, (f) other negligence.

IX. Miscellaneous accidents not classified above.

Upon receipt of these reports they were divided in five groups with reference to the geographical location of the territory served by the reporting companies, viz.:

Eastern district.
Central district.
Southern district.

Western district.
Pacific district.

In the preparation of the following data, from the information contained in the reports everything has been worked out according to the population of the cities or territories from which the reports were received. This method gives an absolutely fair and correct basis for the comparison of accidents between the respective localities.

The following figures give the number of automobile accidents *per million population* reported as occurring during the six months ending July 31, 1917, in each of the foregoing divisions, into which the country was divided for convenience in making these comparisons.

Eastern	13.874	Western	36.172
Central	20.592	Pacific	25.857
Southern	18.602		

PART IB. PREVAILING CAUSES AND CIRCUMSTANCES CHARACTERIZING SUCH ACCIDENTS.

Causes arranged in the order of their seriousness:

	<i>Per cent.</i>
Pulled onto track in front of car (neglect of chauffeur)	18.7
Excessive speed (neglect of chauffeur)	12.4
Insufficient clearance (neglect of chauffeur)	11.6
Miscellaneous accidents not classified	10.7
Other negligence of chauffeur	9.6
Inattention (neglect of chauffeur)	8.2
Sudden stop by car (auto hits car)	6.8
Sudden stop by auto (car hits auto)	4.0

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6;

	<i>Per cent</i>
Disobeyed traffic rules (neglect of chauffeur).....	3
Insufficient clearance (neglect of motorman).....	3
Defective or slippery pavement.....	2
Inattention (neglect of motorman).....	1
Other negligence of motorman.....	1
Defective or slippery rail.....	1
Excessive speed (neglect of motorman).....	1
Defective equipment of auto.....	1
Defective equipment of car.....	
View obstructed by snow, rain or fog.....	
Passengers interfere with motorman.....	(no accs)
Motorman disobeyed traffic rules.....	(no accs)

Each of the districts did not present the same problem of prevention for the reason that these respective districts did not report the same particular cause as being the one which contributed to the largest number of accidents.

The most serious cause which prevailed in each of the sections of the country are as follows, viz.:

Eastern: Chauffeur pulled on track in front of car.

Central: Excessive speed of chauffeur.

Southern: Chauffeur pulled onto track in front of car. (Note—Excessive speed of chauffeur was a close second.)

Western: Insufficient clearance (negligence of chauffeur. (Note—Sudden stop by car, auto hitting car.)

Pacific: Chauffeur pulled onto track in front of car.

Sixty-four and two-tenths per cent of all accidents received from all parts of the country are reported as occurring on account of the negligence of chauffeurs.

NUMBER OF AUTOMOBILE ACCIDENTS PER MILLION POPULATION SIX MONTHS ENDING JULY 31, 1917.

EASTERN DISTRICT.

	Feb.	Mar.	Apr.	May.	June.	July.	Total.
Defective or slippery rail.....	.021	.057	.006	.032	.011	.017	.144
Defective or slippery pavement..	.199	.115	.042	.030	.053	.028	.467
View obstructed by snow, rain or fog—							
Motorman .....	.....	.....	.....	.....	.....	.....	.....
Chauffeur .....	.....	.....	.....	.....	.....	.....	.....
Sudden stop by—							
Car (auto hits car).....	.120	.031	.031	.041	.042	.040	.305
Auto (car hits auto).....	.024	.046	.034	.043	.077	.046	.270
Defective equipment—							
Car	.003	.....	.....	.009	.....	.....	.012
Auto	.024	.049	.014	.021	.006	.032	.146
Passengers interfere with motor-man .....	.....	.....	.....	.....	.....	.....	.....
Negligence of motorman—							
Excessive speed	.074	.066	.065	.066	.047	.009	.327
Insufficient clearance	.204	.123	.154	.186	.159	.214	1.040
Disobeyed traffic rules.....	.....	.006	.006	.009	.009	.011	.041
Inattention	.039	.023	.037	.025	.066	.211	.401
Other negligence	.030	.032	.048	.055	.219	.068	.452
Negligence of chauffeur—							
Excessive speed	.187	.147	.191	.294	.200	.114	1.133
Insufficient clearance	.249	.186	.208	.337	.256	.368	1.604
Pulled on to track in front of car	.453	.186	.709	.620	.602	.760	3.330
Disobeyed traffic rules.....	.095	.....	.036	.009	.020	.012	.172
Inattention	.109	.109	.205	.146	.197	.580	1.346
Other negligence	.210	.069	.240	.289	.313	.300	1.421
Miscellaneous accidents not classified above	.101	.074	.223	.289	.325	.251	1.263
Totals	2.142	1.319	2.249	2.501	2.602	3.061	13.874

NUMBER OF AUTOMOBILE ACCIDENTS PER MILLION POPULATION SIX MONTHS ENDING JULY 31, 1917.

CENTRAL DISTRICT.

	Feb.	Mar.	Apr.	May.	June.	July.	Total.
Defective or slippery rail.....	.042	.018	.016	.006	.....	.003	.085
Defective or slippery pavement..	.042	.027	.016	.019	.036	.009	.149
View obstructed by snow, rain or fog—							
Motorman	.009	.003	.006	.....	.....	.....	.018
Chauffeur .....	.....	.....	.....	.....	.....	.....	.....
Sudden stop by—							
Car (auto hits car).....	.185	.136	.336	.419	.384	.318	1.778
Auto (car hits auto).....	.091	.121	.253	.172	.556	.190	1.293
Defective equipment—							
Car .....	.....	.012	.006	.006	.....	.034	.058
Auto	.042	.039	.039	.053	.037	.....	.210
Passengers interfere with motor-man .....	.....	.....	.....	.....	.....	.....	.....
Negligence of motorman—							
Excessive speed	.009	.....	.....	.006	.....	.012	.027
Insufficient clearance	.024	.067	.036	.065	.103	.043	.338
Disobeyed traffic rules.....	.....	.....	.012	.....	.003	.003	.018
Inattention	.006	.036	.015	.022	.028	.025	.122
Other negligence	.018	.015	.003	.022	.028	.009	.095
Negligence of chauffeur—							
Excessive speed	.679	.845	.916	.857	.868	.266	4.431
Insufficient clearance	.036	.125	.113	.216	.165	.152	.807
Pulled on to track in front of car	.258	.221	.163	.274	.364	.406	1.686
Disobeyed traffic rules.....	.036	.027	.039	.050	.053	.053	.258
Inattention	.093	.167	.064	.121	.131	.134	.710
Other negligence.....	.321	.233	.190	.193	.147	.018	1.102
Miscellaneous accidents not classified above	.888	1.257	1.316	1.471	1.278	1.187	7.397
Totals	2.779	3.349	3.539	3.972	4.181	2.772	20.592

Electric Railway Section

NUMBER OF AUTOMOBILE ACCIDENTS PER MILLION POPULATION MONTHS ENDING JULY 31, 1917.

SOUTHERN DISTRICT.

	Feb.	Mar.	Apr.	May.	June.	July.	
Defective or slippery rail.....	.033	.022	.128	.103	.135	.162	
Defective or slippery pavement..	.082	.044	.....	.....	.....	.....	
View obstructed by snow, rain or fog—							
Motorman .....	.....	.....	.....	.....	.....	.....	
Chauffeur .....	.....	.....	.....	.....	.....	.....	
Sudden stop by—							
Car (auto hits car).....	.098	.044	.077	.052	.135	.027	
Auto (car hits auto).....	.082	.044	.....	.....	.....	.135	
Defective equipment—							
Car .....	.....	.....	.....	.....	.....	.....	
Auto	.040	.066	.....	.....	.027	.027	
Passengers interfere with motor-man .....	.....	.....	.....	.....	.....	.....	
Negligence of motorman—							
Excessive speed	.049	.022	.026	.....	.054	.027	
Insufficient clearance	.148	.022	.129	.165	.216	.135	
Disobeyed traffic rules .....	.....	.....	.....	.....	.027	.....	
Inattention	.066	.066	.051	.052	.027	.081	
Other negligence	.049	.044	.077	.104	.108	.135	
Negligence of chauffeur—							
Excessive speed	.836	.511	.692	.384	.703	1.055	
Insufficient clearance	.229	.376	.307	.277	.422	.568	
Pulled on to track in front of car	.656	.553	.923	.559	.919	.946	
Disobeyed traffic rules.....	.049	.088	.052	.129	.027	.162	
Inattention	.377	.200	.410	.766	.405	.864	
Other negligence	.016	.199	.205	.129	.027	.081	
Miscellaneous accidents not classified above	.016	.022	.....	.....	.....	.....	
Totals	2.835	2.323	3.077	2.720	3.242	4.405	1

NUMBER OF AUTOMOBILE ACCIDENTS PER MILLION POPULATION MONTHS ENDING JULY 31, 1917.

WESTERN DISTRICT.

	Feb.	Mar.	Apr.	May.	June.	July.	
Defective or slippery rail.....	.025	.044	.044	.097	.046	.129	1
Defective or slippery pavement..	.116	.077	.322	.092	.169	.256	:
View obstructed by snow, rain or fog—							
Motorman .....	.....	.....	.022	.....	.....	.052	
Chauffeur .....	.....	.....	.....	.....	.....	.....	
Sudden stop by—							
Car (auto hits car).....	.525	1.078	.411	.939	.739	1.384	1
Auto (car hits auto).....	.067	.189	.189	.277	.123	.257	1
Defective equipment—							
Car .....	.....	.....	.022	.....	.015	.....	
Auto	.074	.011	.....	.016	.015	.155	
Passengers interfere with motor-man .....	.....	.....	.....	.....	.....	.....	
Negligence of motorman—							
Excessive speed	.050	.111	.100	.048	.185	.154	
Insufficient clearance	.293	.533	.145	.180	.185	.435	1
Disobeyed traffic rules .....	.....	.011	.....	.077	.....	.....	
Inattention	.067	.112	.056	.....	.492	.103	
Other negligence	.100	.055	.066	.154	.030	.205	
Negligence of chauffeur—							
Excessive speed	.358	.426	.134	.739	.477	.949	3
Insufficient clearance	.583	1.684	.666	1.138	.969	1.667	6
Pulled on to track in front of car	.825	.694	.289	.877	1.046	1.103	4
Disobeyed traffic rules.....	.275	.089	.256	.493	.353	.898	2
Inattention	.183	.300	.300	.262	.185	.513	1
Other negligence	.167	.232	.289	.257	.385	.744	2
Miscellaneous accidents not classified above	1.125	.....	.022	.180	.731	1.385	3
Totals	4.833	5.646	3.333	5.826	6.145	10.389	36

NUMBER OF AUTOMOBILE ACCIDENTS PER MILLION POPULATION SIX
MONTHS ENDING JULY 31, 1917.

EASTERN DISTRICT.

	Feb.	Mar.	Apr.	May.	June.	July.	Total.
Defective or slippery rail.....	.021	.057	.006	.032	.011	.017	.144
Defective or slippery pavement..	.199	.115	.042	.030	.053	.028	.467
View obstructed by snow, rain or fog—							
Motorman .....	.....	.....	.....	.....	.....	.....	.....
Chauffeur .....	.....	.....	.....	.....	.....	.....	.....
Sudden stop by—							
Car (auto hits car).....	.120	.031	.031	.041	.042	.040	.305
Auto (car hits auto).....	.024	.046	.034	.043	.077	.046	.270
Defective equipment—							
Car	.003	.....	.....	.009	.....	.....	.012
Auto	.024	.049	.014	.021	.006	.032	.146
Passengers interfere with motor- man .....	.....	.....	.....	.....	.....	.....	.....
Negligence of motorman—							
Excessive speed	.074	.066	.065	.066	.047	.009	.327
Insufficient clearance	.204	.123	.154	.186	.159	.214	1.040
Disobeyed traffic rules.....	.....	.006	.006	.009	.009	.011	.041
Inattention	.039	.023	.037	.025	.066	.211	.401
Other negligence	.030	.032	.048	.055	.219	.068	.452
Negligence of chauffeur—							
Excessive speed	.187	.147	.191	.294	.200	.114	1.133
Insufficient clearance	.249	.186	.208	.337	.256	.368	1.604
Pulled on to track in front of car	.453	.186	.709	.620	.602	.760	3.330
Disobeyed traffic rules.....	.095	.....	.036	.009	.020	.012	.172
Inattention	.109	.109	.205	.146	.197	.580	1.346
Other negligence	.210	.069	.240	.289	.313	.300	1.421
Miscellaneous accidents not classified above	.101	.074	.223	.289	.325	.251	1.263
Totals	2.142	1.319	2.249	2.501	2.602	3.061	13.874

NUMBER OF AUTOMOBILE ACCIDENTS PER MILLION POPULATION SIX
MONTHS ENDING JULY 31, 1917.

CENTRAL DISTRICT.

	Feb.	Mar.	Apr.	May.	June.	July.	Total.
Defective or slippery rail.....	.042	.018	.016	.006	.....	.003	.085
Defective or slippery pavement..	.042	.027	.016	.019	.036	.009	.149
View obstructed by snow, rain or fog—							
Motorman .....	.....	.....	.....	.....	.....	.....	.....
Chauffeur	.009	.003	.006	.....	.....	.....	.018
Sudden stop by—							
Car (auto hits car).....	.185	.136	.336	.419	.384	.318	1.778
Auto (car hits auto).....	.091	.121	.253	.172	.556	.100	1.293
Defective equipment—							
Car .....	.....	.012	.006	.006	.....	.034	.058
Auto	.042	.039	.039	.053	.037	.....	.210
Passengers interfere with motor- man .....	.....	.....	.....	.....	.....	.....	.....
Negligence of motorman—							
Excessive speed	.009	.....	.....	.006	.....	.012	.027
Insufficient clearance	.024	.067	.036	.065	.103	.043	.338
Disobeyed traffic rules.....	.....	.....	.012	.....	.003	.003	.018
Inattention	.006	.036	.015	.022	.028	.025	.132
Other negligence	.018	.015	.003	.022	.028	.009	.095
Negligence of chauffeur—							
Excessive speed	.679	.845	.916	.857	.868	.266	4.431
Insufficient clearance	.036	.125	.113	.216	.165	.152	.807
Pulled on to track in front of car	.258	.221	.163	.274	.364	.406	1.686
Disobeyed traffic rules.....	.036	.027	.039	.050	.053	.053	.258
Inattention	.093	.167	.064	.121	.131	.134	.710
Other negligence	.321	.233	.190	.193	.147	.018	1.102
Miscellaneous accidents not classified above	.888	1.257	1.316	1.471	1.278	1.187	7.397
Totals	2.779	3.349	3.530	3.972	4.181	2.772	20.592

Electric Railway Section

NUMBER OF AUTOMOBILE ACCIDENTS PER MILLION POPULATION MONTHS ENDING JULY 31, 1917.

SOUTHERN DISTRICT.

	Feb.	Mar.	Apr.	May.	June.	July.	T
Defective or slippery rail.....	.033	.022	.128	.103	.135	.162	
Defective or slippery pavement..	.082	.044	.128	.103	.135	.162	
View obstructed by snow, rain or fog—							
Motorman .....	.....	.....	.....	.....	.....	.....	
Chauffeur .....	.....	.....	.....	.....	.....	.....	
Sudden stop by—							
Car (auto hits car).....	.098	.044	.077	.052	.135	.027	
Auto (car hits auto).....	.082	.044	.077	.052	.135	.135	
Defective equipment—							
Car	.049	.066	.....	.....	.027	.027	
Auto	.049	.066	.....	.....	.027	.027	
Passengers interfere with motorman .....	.....	.....	.....	.....	.....	.....	
Negligence of motorman—							
Excessive speed	.049	.022	.026	.....	.054	.027	
Insufficient clearance	.148	.022	.129	.165	.216	.135	
Disobeyed traffic rules.....	.....	.....	.....	.....	.027	.....	
Inattention	.066	.066	.051	.052	.027	.081	
Other negligence	.049	.044	.077	.104	.108	.135	
Negligence of chauffeur—							
Excessive speed	.836	.511	.692	.384	.703	1.055	4
Insufficient clearance	.229	.376	.307	.277	.432	.568	2
Pulled on to track in front of car	.656	.553	.923	.559	.919	.946	4
Disobeyed traffic rules.....	.049	.088	.052	.129	.027	.162	
Inattention	.377	.200	.410	.766	.405	.864	8
Other negligence	.016	.199	.205	.129	.027	.081	
Miscellaneous accidents not classified above	.016	.022	.....	.....	.....	.....	
Totals	2.835	2.323	3.077	2.720	3.242	4.405	16

NUMBER OF AUTOMOBILE ACCIDENTS PER MILLION POPULATION MONTHS ENDING JULY 31, 1917.

WESTERN DISTRICT.

	Feb.	Mar.	Apr.	May.	June.	July.	T
Defective or slippery rail.....	.025	.044	.044	.097	.046	.129	
Defective or slippery pavement..	.116	.077	.322	.092	.169	.256	
View obstructed by snow, rain or fog—							
Motorman .....	.....	.....	.022	.....	.....	.052	
Chauffeur .....	.....	.....	.022	.....	.....	.052	
Sudden stop by—							
Car (auto hits car).....	.525	1.078	.411	.939	.739	1.384	4
Auto (car hits auto).....	.067	.189	.189	.277	.123	.257	3
Defective equipment—							
Car .....	.....	.....	.022	.....	.015	.....	
Auto	.074	.011	.....	.016	.015	.155	
Passengers interfere with motorman .....	.....	.....	.....	.....	.....	.....	
Negligence of motorman—							
Excessive speed	.050	.111	.100	.048	.185	.154	
Insufficient clearance	.293	.533	.145	.180	.185	.435	
Disobeyed traffic rules.....	.....	.011	.....	.077	.....	.....	
Inattention	.067	.112	.056	.....	.492	.103	
Other negligence	.100	.055	.066	.154	.030	.205	
Negligence of chauffeur—							
Excessive speed	.358	.426	.134	.739	.477	.949	
Insufficient clearance	.583	1.684	.666	1.138	.969	1.667	
Pulled on to track in front of car	.825	.694	.289	.877	1.046	1.103	
Disobeyed traffic rules.....	.275	.089	.256	.493	.353	.898	
Inattention	.183	.300	.300	.262	.185	.513	
Other negligence	.167	.232	.289	.257	.385	.744	
Miscellaneous accidents not classified above	1.125	.....	.022	.180	.731	1.385	
Totals	4.833	5.646	3.333	5.826	6.145	10.389	3

NUMBER OF AUTOMOBILE ACCIDENTS PER MILLION POPULATION SIX MONTHS ENDING JULY 31, 1917.

PACIFIC DISTRICT.

	Feb.	Mar.	Apr.	May.	June.	July.	Total.
Defective or slippery rail.....	.442	.006	.026	.033	.007	.013	.527
Defective or slippery pavement..	.151	.144	.201	.140	.180	.046	.862
View obstructed by snow, rain or fog—							
Motorman	.014	.006	....	....	....	....	.020
Chauffeur .....	....	....	....	....	....	....	....
Sudden stop by—							
Car (auto hits car).....	....	.006	.012	.333	.080	.019	.450
Auto (car hits auto).....	.158	.325	.232	.180	.240	.282	1.417
Defective equipment—							
Car	.007	.006	.006	.020	.013	.006	.058
Auto	.036	.056	.075	.046	.014	.107	.334
Passengers interfere with motorman .....	....	....	....	....	....	....	....
Negligence of motorman—							
Excessive speed	.007	.012	.006	.020	.007	....	.052
Insufficient clearance	.064	.138	.132	.440	.094	.177	1.045
Disobeyed traffic rules.....	....	....	....	....	.007	....	.007
Inattention	.064	.025	.031	.026	.080	.026	.252
Other negligence.....	.014	....	.019	.067	.054	.066	.220
Negligence of chauffeur—							
Excessive speed	.287	.232	.281	.237	.267	.193	1.497
Insufficient clearance	.474	.413	.419	.474	.447	.260	2.487
Pulled on to track in front of car	1.504	.900	1.100	1.260	1.333	1.004	7.101
Disobeyed traffic rules.....	.108	.105	.119	.359	.080	.100	.871
Inattention	.366	.450	.475	.280	.414	.652	2.037
Other negligence	.374	.463	.469	3.593	.480	.432	5.811
Miscellaneous accidents not classified above	.021	.056	.019	.040	.060	.013	.209
Totals	4.091	3.343	3.622	7.548	3.857	3.395	25.957

NUMBER OF AUTOMOBILE ACCIDENTS PER MILLION POPULATION SIX MONTHS ENDING JULY 31, 1917.

TOTAL ALL DISTRICTS COMBINED.

	Eastern.	Central.	South- ern.	Western.	Pacific.	Total average.
Defective or slippery rail.....	.144	.085	.293	.385	.527	.267
Defective or slippery pavement....	.467	.149	.416	1.032	.862	.585
View obstructed by snow, rain or fog—						
Motorman .....	....	.018	....	.074	.020	.022
Chauffeur .....	....	....	....	....	....	....
Sudden stop by—						
Car (auto hits car).....	.305	1.778	.169	5.076	.450	1.556
Auto (car hits auto).....	.270	1.293	.525	1.102	1.417	.921
Defective equipment—						
Car	.012	.058	....	.037	.055	.033
Auto	.146	.210	.169	.271	.334	.226
Passengers interfere with motorman .....	....	....	....	....	....	....
Negligence of motorman—						
Excessive speed	.327	.027	.178	.648	.052	.246
Insufficient clearance	1.040	.338	.815	1.771	1.045	.802
Disobeyed traffic rules.....	.041	.018	.027	.088	.007	.036
Inattention	.401	.132	.343	.830	.252	.392
Other negligence.....	.452	.095	.517	.610	.220	.379
Negligence of chauffeur—						
Excessive speed	1.133	.431	4.181	3.083	1.497	2.865
Insufficient clearance	1.604	.807	2.189	6.307	2.487	2.679
Pulled on to track in front of car	3.330	1.686	4.556	4.834	7.101	4.801
Disobeyed traffic rules.....	.172	.258	.507	2.364	.871	.834
Inattention	1.346	.710	3.022	1.743	2.637	1.892
Other negligence	1.421	1.102	.657	2.074	5.811	2.213
Miscellaneous accidents not classified above	1.263	7.392	.038	3.443	.209	2.470
Totals	13.874	20.592	18.602	36.172	25.857	23.019

Electric Railway Section

REPORT OF INVESTIGATION—PART II.

Urban operation where effective police traffic regulation is sible:

1. In street ahead or behind, 41.5 per cent.
2. At street intersection, 58.2 per cent.
3. Grade crossings, .3 per cent.

The following table is an analysis of the number of accidents per million population, analyzed as to district location, street highway location, and also as to months:

ACCIDENTS PER MILLION POPULATION SIX MONTHS ENDING JULY 31,

FEBRUARY.			
	In street.	At street intersections.	Grade crossings.
Eastern	.878	1.264	.....
Central	1.372	1.407	.....
Southern	1.557	1.278	.....
Western	1.416	3.417	.....
Pacific	2.074	2.017	.....
	7.297	9.388	.....
MARCH.			
	In street.	At street intersections.	Grade crossings.
Eastern	.908	.411	.....
Central	.980	2.369	.....
Southern	1.597	.726	.....
Western	1.969	3.677	.....
Pacific	1.637	1.706	.....
	7.091	8.889	.....
APRIL.			
	In street.	At street intersections.	Grade crossings.
Eastern	1.022	1.224	.003
Central	.561	2.978	.....
Southern	1.949	1.128	.....
Western	.922	2.411	.....
Pacific	1.852	1.746	.024
	6.306	9.487	.027
MAY.			
	In street.	At street intersections.	Grade crossings.
Eastern	.908	1.598	.....
Central	.614	3.355	.003
Southern	2.016	.704	.....
Western	1.139	4.687	.....
Pacific	5.006	1.872	.070
	10.278	12.216	.073
JUNE.			
	In street.	At street intersections.	Grade crossings.
Eastern	.908	1.691	.003
Central	.559	3.622	.....
Southern	2.323	.802	.027
Western	1.599	4.546	.....
Pacific	2.375	1.422	.060
	7.764	12.173	.090
JULY.			
	In street.	At street intersections.	Grade crossings.
Eastern	.975	2.086	.....
Central	.460	2.309	.003
Southern	3.059	1.346	.....
Western	2.977	7.402	.....
Pacific	1.644	1.822	.130
	9.115	14.765	.133
Total six months—			
Eastern	13.874	Western	13
Central	20.592	Pacific	2
Southern	18.602		

REPORT OF INVESTIGATION—PART III.

Copy of a letter typical of the work being done by electric railway companies, in an effort to secure co-operation in the prevention of automobile accidents:

BUFFALO AND LAKE ERIE TRACTION COMPANY.

George Bullock, Receiver.

ERIE, Pennsylvania, March 31, 1917.—*Dear Sir:* When a street car and an automobile come together which invariably suffers most? The automobile, of course. The motorman of the street car may be injured, but the occupants of the automobile usually get the worst of it.

We are conducting a vigorous campaign to prevent accidents and as you will note we have the hearty co-operation and assistance of the Board of Commerce, the Commercial Club and the Erie Motor Club. Fewer accidents mean a saving of money to us, to be sure, but we really have a higher motive than that. Accidents mean misery and sometimes death. If we can influence this community so that there shall be fewer automobile accidents, our reward is ample.

We do our part by educating our motormen and conductors to avoid collisions with automobiles and other vehicles.

You can do your part *without any cost to you*, and we ask you to do it. Do you forget to check the speed of your car when you approach out of an intersecting street, with obstructed view either way, onto a street where street cars operate? If so, your habit should be changed. Some automobile drivers turn to the left onto a track in front of cars going in the same direction in order to pass a more slowly-moving vehicle or one standing at the curb. It is easy to misjudge the speed of a trolley car and to mistake the amount of space in passing between the car and other vehicles. Did you ever do this? If so, for your family, yourself and for your friends, stop it.

Always *be afraid* of being hit and you will probably escape.

Our experience and investigations compel us to speak candidly. We are making this a personal matter. If you are a *careful* driver you will not resent this letter. If you are inclined to be careless you cannot in fairness resent it. At any rate, we prefer your resentment to maiming or killing someone.

Electric Railway Section

"SAFETY FIRST" is a great big humanitarian movement
we all pull together we can succeed. Will you help?
Kindly let us hear from you. Yours very truly,

BUFFALO & LAKE ERIE TRACTION COMPANY,
By A. R. Myers, General Manager

Approved:

Erie Board of Commerce,
by F. S. Bond, President.

Commercial Club,
By F. O. Richardson, President.

Erie Motor Club,
By P. T. Johnson, President.

Copy of full page advertisement from *Chicago Daily Jour*
prepared by Chicago, North Shore & Milwaukee Railroad:

GRADE CROSSING ACCIDENTS

are accidents which occur where the highway crosses tracks of
electric or steam railroad.

Laws have been enacted, warning signs have been posted,
prevent these accidents, yet they are

CONSTANTLY INCREASING IN NUMBER.

WHY?

BECAUSE:

of 7,779 persons traveling over grade crossing only 79,
actual count (or about 1 per cent) stopped, looked a
listened.

The analyses of 20,000 grade-crossing accidents involvi
electric railway cars and automobiles show that electric ra
ways were wholly responsible for 4 per cent.

THE RESULT:

Each year 1,747 fatal accidents occur at grade crossings.

THE REMEDY:

STOP!—LOOK!—LISTEN! for an approaching train b

The law requires as high a degree of care on your part as it requires of the motorman.

An automobile can be stopped in much less distance than a street car can be stopped, if both are going at the same speed. Bear in mind, also, that a street car cannot turn off from its tracks to avoid a collision.

Trainmen are doing their best to prevent this class of accidents, *but cannot be wholly successful without your aid*, and we appeal to you for your co-operation in this matter of such great mutual importance.

BE CAREFUL

PROTECT YOURSELF

Copy of poster issued and distributed by The Aurora, Elgin & Chicago Railroad Company:

COLLISIONS BETWEEN AUTOMOBILES AND STREET CARS.

Friend Driver: Our motormen are doing their best to prevent this class of accidents, *but cannot be wholly successful without your aid*, and we appeal to you for your co-operation in this matter of such great mutual importance.

Allow us to make a few friendly suggestions, of some ways in which you can do your part in this good work, which are called to mind by collisions which have occurred in the past.

First: Before crossing a track at a street intersection, *look both ways and have your auto under control*, so that you can *surely stop* before reaching the track, if there is a street car coming from either way.

Second: Always *stop, look and listen* before crossing any track on a country highway.

Third: When driving alongside a street car track, *never turn onto the track, or close to it*, without first looking back for a street car which may be coming behind you.

Be particular about this when passing a vehicle which is standing near the curb.

Fourth: Use *more than ordinary care* when driving out of Buildings, Yards or Alleys onto streets where there are car tracks.

Fifth: Remember that an *automobile* can be stopped in *much less distance* than a *street car* can be stopped, if both are going at

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the same speed, and bear in mind also that a street car cannot stop off from its tracks to avoid a collision.

Sixth: A few seconds delay may prevent a severe personal injury or costly property damage.

Seventh: The law requires as high a degree of care on your part as it requires of the Motorman.

SAFETY FIRST IS THINKING FIRST.

By thinking and working together, we can be of great mutual benefit; and together can make *safety* the *first* consideration, *in fact* as well as *in name*.

THE AURORA, ELGIN & CHICAGO RAILROAD COMPANY

Boost for Safety

Pass This Word

NUMBER OF AUTO ACCIDENTS REPORTED

Upon which the foregoing investigation and statistical information is based:

	<i>Feb.</i>	<i>Mar.</i>	<i>Apr.</i>	<i>May</i>	<i>June</i>	<i>July</i>
Eastern	722	379	796	884	938	1,018
Central	957	1,136	1,069	1,273	1,345	910
Southern	173	122	120	139	111	163
Western	580	530	300	391	388	514
Pacific	517	552	584	555	590	405
Total	—					
	1					

SAFETY AT GRADE CROSSINGS.

December 21, 1916.—*To the Conference on Safety at Grade Crossings of Highways and Electric Railroads.*

GENTLEMEN: Your Executive Committee has held a number of meetings and has divided the work of the consideration of various subjects assigned to it among several subcommittee follows:

Committee No. 1—Physical Surroundings at Crossings.

Committee No. 2—Fixed Signs and Signals.

Committee No. 3—Method of Operation.

Committee No. 4—Car and Vehicle Signal Equipment.

Committee No. 5—Publicity and Education.

Committee No. 6—Urban Traffic Regulations.

The reports of these subcommittees to your Executive Committee form the basis of the report herewith respectfully presented.

Your Executive Committee submits for your consideration the following recommendations:

1. Obstructions upon the highway outside of cities and villages which preclude a proper length of vision at crossings should be removed by the public authorities at public expense.

2. Obstructions upon railroad companies' private rights of way which preclude a proper length of vision at crossings should be removed by the railroads at their own expense.

3. Obstructions upon private property outside of cities and villages which preclude a proper length of vision at crossings should be removed by the town, county or state. Legislation should be secured to the end that such obstructions should be removed. If such obstructions are not removed by said town, county or state, the Public Service Commission should be empowered, upon its own initiative or on request of the railroad company or individuals, to order such removal, the expense to be equitably apportioned.

4. That determination of necessity for removing obstructions be based upon data secured along the highway for a distance of two hundred feet, and along the railroad right of way for a distance of one thousand feet from the center line of the intersection of the crossing.

5. That all public highway crossings of electric railroads outside of cities and incorporated villages, including those protected with gates or flagmen, be equipped with stationary crossing-signs, and all signs at grade crossings should be illuminated during hours of darkness. The type of sign to be in accordance with those approved by the former Board of Railroad Commissioners for use on steam railroads at grade crossings.

Realizing that the erection and illumination of crossing-signs will impose a financial burden upon the railroad companies, it is further recommended that the illumination of crossing-signs be extended over a reasonable period of time, and that the crossing-signs at crossings of state and county highways and other crossings of especially dangerous character be equipped with lights at the earliest possible date.

6. That stationary distance signals be installed on the highway: this signal to be within 5 feet of the edge of the traveled roadway, at an angle of not less than 75 degrees to the tangent to the highway; the sign to be composed of a concrete post bearing a metal

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disk approximately 3 feet in diameter, the lower edge of to be 42 inches above the elevation of the crown of the and bearing the words "Railroad Crossing 500 Feet."

7. That as the use of a practical and reliable automatic crossings would be an added element of safety, it is recommended that the various electric railroad companies give further consideration and investigation to the subject of the use of automatic signals at crossings.

8. That the cost of erection, maintenance, and operation of stationary signals at grade crossings be borne by the electric company concerned; that the cost of erection and maintenance of all stationary distance signals be borne by the state, county or town; and that efforts be made to secure legislation providing for their installation, maintenance, and equipment.

9. That legislation be secured providing that warning signal whistles on electric railroads be commenced at a point not less than 800 feet from the crossing and not completed until head car train has reached the crossing.

10. That this committee co-operate with committees of the National Railway Association and other similar bodies in efforts to standardize the type and position of all signals along electric roads at crossings and along highways, and methods of flagging and giving warning signals.

11. That motorists be required to approach all electric railroad crossings in a safe and prudent manner, with their cars under control so that they may be stopped short of the crossing until a sufficient length of vision along the railroad is obtainable to assure safe crossing.

12. That automobile associations and electric railroad companies use all possible means to impress upon automobile drivers the importance of safe operation over grade crossings.

13. That warning whistles upon trolley cars be of such type as not to produce sounds similar to those of the automobile horn.

14. That warning gongs upon trolley cars be maintained in working condition for use within village and city limits.

15. That automobile horns be standardized as to volume and tone.

16. That steps be taken to secure legislation requiring vehicles including horse-drawn vehicles as well as automobiles, to carry lights by night as to be visible from front, rear, and both sides.

17. The Executive Committee is in hearty accord with the recommendations of the

mendations made by the subcommittee on Urban Traffic Regulations; but in view of the fact that the Mayors' Committee of the State of New York has under consideration ordinances governing urban traffic of all kinds, it is not deemed advisable to make any specific recommendations on this subject at present, except that it is recommended that electric railroad companies give proper consideration to the question of stopping or slowing down cars before going over improved streets on which there is heavy vehicle traffic in cities and incorporated villages.

18. That the subcommittee on Publicity and Education be continued, to act as a center of information and publicity to utilize the various possibilities for the general dissemination of information referring to laws, rules, regulations, and recommendations in reference to safety at highway crossings of electric railroads.

19. That the life of the Executive Committee be extended, with instructions to continue its investigation of the matter of safety at grade crossings of highways and electric railroads in co-operation with such other agencies as may be productive of beneficial results. Further, that the Executive Committee be instructed to use all proper means available to secure compliance with the various recommendations herein contained.

In conclusion, your committee desires to express its sincere appreciation of the spirit of hearty co-operation evidenced during its labors by the various state departments, the automobile associations, electric railway companies, and individuals who have given liberally of their time and effort in the consideration of this subject, and especially those who served as members of the various subcommittees. It has been only through this co-operation that your committee has been enabled to present to you positive recommendations as the results of its labors, and the entire success of the whole undertaking is dependent upon a continuation of this unanimous co-operation.

SEYMOUR VAN SANTVOORD, Chairman.

MULTIPLICITY OF SIGNS.

Just a word, and not as a part of the report that I submit: I don't know but what it would be a good idea for this meeting to go on record, as a result of the report that has just been made, in making some sort of helpful and specific recommendations as to an improvement or a remedy for the conditions that are causing so much trouble. My experience in connection with the work of this

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committee and conference with the other committees of the E Railway Association and the American Railway Association convinced me that one of the greatest mistakes that the e railway people are making in this work is the installation of a multiplicity of signs. I know a road that has wigwags, board signs of all shapes, distance signals, and so many different kinds of things to attract attention and warn people that it is confusing.

I was told that with one of their wigwag signals a fellow upon the track and was watching the thing and wondering what was for when a car hit him. I believe the solution of this proposition is a standardization of signals. I believe the electric railway people ought to adopt a sign and that the steam roads should adopt the same sign, so that the public will get to know what signal means. If you could stop the cars on some interurban in the distance from here to the rear of the room you would have trouble. In that connection Mr. Smith spoke about going sixty miles an hour. He is away off on that; we have miles beat a block. If people appreciated the speed of the train and that the danger was similar to that of a steam road, I think we would get better results. I think that could be brought about by standardization of signs.

Another thing: I think the electric railway people, the steam road people and the automobile people ought to get together and make a concerted movement, backed by the three national organizations. We are fooling away our time in a little Section like this talking and harping on this thing, trying to do something. It won't have any standing and it will not get by. If we could arrange some way, and there is a way to work out a plan whereby we could get a joint committee of these three national organizations—automobile, street and electric cars and steam roads—and then standardize some strong way of getting at the automobile people and not each company putting up some peculiar wigwag, or some peculiar electric ball, or some foolish sign and have them plastered all over his road, we would get somewhere. I am sure something could be brought out along that line.

NEED OF UNIVERSAL DANGER EMBLEM.

MR. V. J. WOLTZ: I would like to ask Mr. Scott if he knows or has heard of any sign that could be used along the same line.

MR. SCOTT: I do not know of anything of the kind. I appreciate the need for it, but I do not know of it. There may be a sign of that kind. This matter of a distance signal, I think, is something new; putting a sign 300 feet from a crossing, saying that this is a high-speed electric road. We tried that out on the Chicago & Milwaukee electric line and it is doing some good.

MR. ADAMS: Another difficulty that we find in our part of the country is the advertising proposition—different automobile tires and all that sort of thing. There will be a sign just about two feet in diameter, a circle with Safety First on it, "Use Goodrich Tires," or something like that, and those are stuck right in between the distance signs (300 feet from our track) and the track, with the consequence that our warning signal is entirely unheeded. The people that drive the country roads see so many signs that they don't know the difference between an advertising sign and a warning sign. I believe that the standardization of the sign itself is something to be recommended and ought to be accomplished.

Another thing, I believe that if legislation could be had prohibiting the placing of any except railroad warning signs within a certain distance of any highway grade crossing that it would be a good proposition.

MR. H. SCHOMBER (Manhattan & Queens Traction Corporation): A great many of us could accomplish a lot of good by trying to co-operate with the police department. On our road, by talking with the various police captains, we have induced them to install a simple system on country roads, which, I think, is for the benefit of the automobilists as well as the motormen on trolley cars. At every crossover, or wherever there may be bad curves in the road, or dangerous places, as they term them, we use a red bulb; on the street lights, located on the highways, instead of using a white electric bulb; that is, the municipality places a red light near these danger points.

The motormen can see it and the autoist can see it and I think if we would get the police department's co-operation in installing red lights, or by making a local ordinance that any motorman running at a higher speed than ten miles when he approaches a red light is violating a city ordinance and will be punished for it. As I understand it, in our locality, the police department is going to install the lights along our entire boulevard system. If some of us could get in touch with the local municipal departments we would accomplish a good deal along those lines.

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PLACING OF DISTANCE SIGNS.

MR. VAN DERHOEF: As a driver I would like to call attention to one thing that I think would help a lot and that is the cutting out of all signs not only between the distance signal on the crossing but at least 100 feet from the distance signal. In driving along a road with a lot of trees and real estate signs it is almost impossible to pick out the distance signal. There ought to be an absolute clear space, so that the sign would stand out from everything. There should be no sign between the distance signal and the crossing. I have been doing a great deal of driving on Long Island, and this thing is noticeable there, because, within three miles you can see the railroad track thirteen times and you get a beautiful example of all kinds of signs.

They have done something down there on some of the high crossings, putting up a distance signal 300 or 500 feet back from the road, stating that there was a dangerous crossing. There are some places where the main highways cross, and where the traffic is very heavy, that are very dangerous. In a great many localities on Long Island and in New Jersey they have crossing signals, but they have distance signals, but very often they are confused with other signs and it is almost impossible to pick them up.

One thing that causes a good deal of trouble in driving is the use of the green and red lights. Newark uses green exclusively. In other places they use red lights for crossings, which you cannot distinguish from red lights around piles of stone, and usually red lights mean to stop. These lights do not mean to stop, but to slow down. There is no uniformity in the use of green and red lights. If every city would use the same system it would help. If an automobile driver tries to watch the people, to keep from running over them, he cannot watch the signs, and if he watches the signs he will run over some one.

MR. SMITH: We had a Committee on Standards last year, and if you will refer to our report I think you will find some interesting data as regards a crossing sign to be used by crossing watchmen. We went into the question of uniform crossing signs. It was found to be about the biggest problem that this section had ever tackled.

CHAIRMAN SPRING: Mr. Smith's suggestion is an excellent one, but I don't think it should be referred to the Committee on Standards, but that a committee be appointed, not necessarily to do a specific thing, but for those men who are acquainted with the a

ciations mentioned by Mr. Scott to get in touch with the secretaries of those associations and see what can be done. It is so large a subject that it would seem difficult, but if we appoint a special committee it will have plenty to do this year just discussing this matter.

APPOINTMENT OF SPECIAL COMMITTEE.

MR. VAN DERHOEF: I was nearly run over the other day on the Erie road. A horse ran away and the crossing man was looking at the horse and held the sign down. I was almost out on the track, because he was looking down the street at the runaway horse and holding the sign down instead of up. Of course, that was not the fault of the sign, but it shows how those signs can work just exactly opposite to what is intended. I understood the sign being held down to mean that I was to go ahead.

MR. SMITH: I feel that the Standards Committee is going to have plenty to do without going into this phase of the work. I think this subject is so large that we could profitably have a special committee. I would suggest that the committee be limited to three members and that it report to the Executive Committee of the Section, say in six months, as to what it has been able to do, and then report at the next Congress as to what we think ought to be done. I think the chair should appoint the committee.

CHAIRMAN SPRING: The Chair will appoint the committee later. This is a proposition on which we could talk indefinitely. It is one of the most important subjects we have and it may be possible that we can take it up again this afternoon.

On the program for this afternoon we have two papers. We are very fortunate indeed to secure as speakers Mr. H. V. Drown of the Public Service Corporation and Mr. H. A. Nicholl, General Manager, Union Traction Company of Indiana. I hope every one will be here, because these gentlemen have made a special effort to attend.

The meeting stands adjourned.

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THURSDAY AFTERNOON SESSION

THE Section was called to order at 2 o'clock by the chairman, Mr. E. C. Spring.

CHAIRMAN SPRING: We have two very good papers for this afternoon. After they are discussed we will resume consideration of the automobile problem if time permits.

The first paper is "Co-operation Between the Claim Department and the Transportation Department." It will be handled by H. V. Drown, of the Public Service Corporation of Newark.

CO-OPERATION BETWEEN THE CLAIM DEPARTMENT
AND THE TRANSPORTATION DEPARTMENT

H. V. DROWN, GENERAL CLAIM AGENT, PUBLIC SERVICE CORPORATION, NEWARK, N. J.

Mr. Chairman and Members of the National Safety Council:
It seems to me, if I were asked what one accomplishment is desired by claim men, I would reply: "A real, whole-hearted co-operation with the transportation men." I base this upon a consensus of opinion I have heard over a period of many years from nearly every street railway claim agent in the country. Many claim men report that the transportation officials are co-operating with them to the fullest extent, but others, alas, feel they are greatly handicapped through lack of team work. I do not believe I am putting it too strongly when I say no claim man, however competent he may be, can keep the damage account down without the help of the transportation department, and, by the same token, that no transportation official can make good without such support from the claim department. In other words, true co-operation is necessary to the success of both parties, and the lack of it means failure or mediocre results.

Most of the trouble, I believe, is based on the lack of knowledge each has of the other's problems. The transportation manager, for example, may believe that the claim man is too liberal in his settlements; that he is making settlements on account of accidents which the car crews are not to blame. The claim man may believe that the operating official and his subordinates are not giving sufficient attention to safeguarding against accidents; that they are not

to it that the accidents are promptly and fully reported. Once the spirit of criticism and distrust is aroused, antagonism and discord grow apace—all to the disadvantage of the respective officials and to the companies they represent.

WORTH-WHILE CO-OPERATION.

There comes to my mind a concrete example illustrating how easily one official may gather a false and unfavorable impression of the other's work. One day, shortly after I came with the Public Service Railway Company, while talking with one of our division superintendents he casually remarked: "I see ——," mentioning the division claim agent, "has settled the —— case. Why should we have paid that man \$200 when he deliberately jumped off a moving car? It takes a long time for one of my conductors to get that much money in, in nickels." There was nothing in the crew's report to indicate a reason for spending any money on the claim, and it was quite natural that the transportation man should have arrived at the conclusion he did. I at once recognized an opportunity not only to correct this one false impression, but also to make a start toward inspiring confidence in our work. I got out the papers in the case in question and found that while the conductor had reported the passenger as leaving his car while it was in motion, the passenger, who was quite severely injured, had made an affidavit to the effect that the conductor had started the car prematurely while he was alighting. The conductor had secured no witnesses, but three disinterested and reputable persons who witnessed the accident, who were located by our investigator, corroborated the claimant in every detail. The division superintendent at once understood and thought the settlement well worth while. This official, who started out to distrust us, is now one of our strongest advocates.

Worth while co-operation must be based on cordial relations. If each official has a brotherly interest in the other's welfare, the rest is easy. A little recreation together—a dinner now and then—goes a long way toward bringing this about. The claim man and the transportation man, with good food tucked away under their belts and good weeds burning freely, will vie with each other in shooting ideas across the board, and it is remarkable, under such circumstances, how their viewpoints will merge and how soon they realize they are working for the same cause and that each is necessary to the other's success.

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ACCURATE REPORTS NECESSARY.

Cordial relations once established and the necessity of co-operation realized, the ways and means of bringing it about follow automatically. It is highly important for the transportation department to have certain reports from the claim department on the situation. On all accidents of any consequence the claim department should furnish a resume of the investigation. These furnish a basis for action for the prevention of similar accidents and also are valuable as a part of the records of the events involved. Monthly comparative figures by carhouses and districts covering the number and character of accidents and claims are essential. We find the comparisons based on the number of accidents presented much more reliable than those based on accidents resulting in claims. Claimants, as we know too well, insist on being taken into consideration, while operating officials and their men have varying notions as to what accidents should be reported. We often find one division showing a lower rate of accidents than another, yet running higher in claims and resulting cost.

In safety work, which is now conceded to be absolutely vital to good management, co-operation between the two departments in question is most necessary. Both officials should appear to the employees as advocating safety measures, and if the proper man is large enough to justify one man devoting all or a part of his time to the work, one should be chosen, if possible, who has had both operating and claim experience.

All that I have said concerning co-operation between the claim and operating officials I mean to apply with equal force to the supervisory force, and, in a measure, to the rank and file.

ATTAINING MAXIMUM EFFICIENCY.

When the manager of a property hears of such indications of co-operation as the following, he may be sure that two of his departments are well on the way toward the attainment of maximum efficiency: The superintendent, admitting that too many of a certain type of accidents are occurring, requests the claim agent to work with his supervisory force to offer suggestions for better management; the conductor coming in with the names of witnesses to an accident in which he was in no way involved, it having been caused by one of his fellow employees; the claim agent submitting to the superintendent a list of accidents which he has investigated and found to be preventable.

tendent a careful study of accident figures upon which he can base intelligent efforts for improvement; an investigator reporting defects in equipment or violation of rules coming under his notice, and making suggestions for the prevention of certain types of accidents.

There are many forms of organization, including the now almost universal safety committee, through which we can work, but they are merely foundations—the skeletons upon which we build. Correct organization and detail are necessary, but the machine we create must be alive, it must have a heart, there must be charity and sympathy in its operation, and, above all, an earnest desire to make good.

DISCUSSION.

CHAIRMAN SPRING: The paper is one that is very interesting and we ought to get a good many thoughts from it. Mr. Woltz, will you give us your experience?

MR. V. J. WOLTZ: I am heartily in accord with the spirit of Mr. Drown's paper. In my company we have had a great measure of co-operation between the superintendent and the safety director and also from the claim department. Reports to the claim department come direct from the operating department and they are classified as to the variety of accidents. Then each particular accident is taken up with the superintendent of transportation. The safety director gets a copy of the reports and it is his duty to digest and classify them. In that manner we keep a correct and accurate account of every type of accident.

You cannot get anywhere with safety work—let us say the manner in which men operate cars—unless you have full co-operation between the different officials. The claim department, perhaps, has a selfish motive in the work, but aside from that there is an earnest wish on our part, merely as a conservation of life and limb proposition, to see that these accidents are reduced.

After a claim has been paid in a particular accident it seems foolish to the department to spend time digesting and analyzing the facts, but they should know that there is a good and valid reason for the payment of every claim. Sometimes claims are paid as a matter of policy—that may seem to be a very foolish statement, but, if it is a matter of policy, it is assumed that the policy is one which in the future might aid us in the prevention of a certain particular class of accidents.

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VALUE OF COURTEOUS SERVICE.

I think there is another proposition that might be gone in this connection—the manner in which the transportation department gets in touch with the general public. It should be known by the public that the superintendent of transportation is sincerely interested in the manner in which his motormen and conductors are operating their cars; the conduct of the conductor, especially in helping the aged and infirm on and off their cars; the manner in which cars are started or stopped, and particularly in the manner in which the doors (if it happens to be a patent-type car) is operated. It is known by the general public—through the transportation department alone, not through the safety department or the claim department—that the superintendent is doing everything within his power to see that his men are particular in conducting themselves in a proper manner, we are going to have a splendid response on the part of the public and a consequent reduction in the number of accidents.

To this end our transportation department has conducted a campaign of education, not only in our public schools but in every neighborhood. The gentleman in charge of the work can get an audience. He shows a number of films and a number of stereopticon views which show accidents and shows at every meeting. He gives a short safety talk and shows these pictures, and I understand a great deal of good is being accomplished. In fact, I think it is very much reflected in our report for the present time. If the campaign is continued I anticipate greater returns.

DISCUSSION.

CHAIRMAN SPRING: I would like to ask Mr. Drown his opinion. If a property does not have a regular safety engineer, which is the better department to handle the safety end—the claim department or the transportation department?

MR. DROWN: I should say that, if it were possible, they should handle it jointly—it would be much better if the man in charge was not considered as representing a particular department. I think the ideal arrangement is to have a safety man in charge.

CHAIRMAN SPRING: Isn't it the idea of an up-to-date claim department to extend its energies as much in preventing accidents as in settling for them?

MR. DROWN: Indeed it is.

CHAIRMAN SPRING: Isn't that a proposition which is not considered today by a majority of the departments on the electric lines? Are they not looking more toward settling claims than to preventing accidents?

MR. DROWN: I think that view would have held good a few years ago, but today more than half the companies are realizing the necessity for accident prevention and their claim departments are taking an active part in such work.

CHAIRMAN SPRING: Don't you think it should be a part of the claim department's work to find ways and means to protect the public and the employes of the company?

ACCIDENT REPORTS AND TRANSPORTATION DEPARTMENT.

MR. DROWN: Yes, sir; I do. But the work, particularly with the employes of the company, does not bear proper weight, if it is understood to come entirely from the claim department. The motive behind it is credited to selfishness. Mr. Van Brunt, who does such work for our company, is not understood to belong to the claim department at all; in fact, he gets most of his instructions from me; but as far as the men are concerned, they understand that it comes from the company, not from any one department.

There is one more point I would like to make: In my paper I refer to a report on each accident to the transportation department. I do not mean by that a report immediately after the accident occurs, but a report worked out and based on investigation; a report in which I can make just such a statement as I make to the division superintendent, explaining just what the evidence was found to be. For instance, our employes make a report indicating that they are entirely blameless. Investigation develops conditions quite contrary, possibly they were entirely at fault. The superintendent, who is the official immediately in charge of transportation is enabled to arrive at a correct analysis of the case through the report that we make to him after our investigation is made. He finds it a great help.

CHAIRMAN SPRING: Do you think that the first report of the accident should go direct to the claim department?

MR. DROWN: I think it should, because they have the most urgent need for acting on it immediately, but some companies have carbon copies made of the report for their transportation department. Certainly, an accident report should go to the claim officials as soon as possible.

CHAIRMAN SPRING: Don't you think the superintendent of trans-

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portation, through the claim department office, can come to a logical decision as to the responsibility of the motorman and conductor for an accident if he goes over the situation with him? The claim department has the other side of the story.

MR. DROWN: Exactly. That is just the object of this report. The form we have is a brief one. It is headed with the essential information, including the names of the motorman, conductor, badge numbers, the car number, the place of the accident, the date and all that data; then follows a summary of the statements of the employees most involved. If it is a collision with a wagon, that would be the motorman; collision of cars, that would be the motorman; boarding or alighting accident, that would be the conductor. Then comes a statement of the claimant or claimants; then comes a summary of the statement that averages, compositely, the statements of the witnesses. In that way the transportation officials have all three sides of the question: The interested statement of the car crew, the interested statement of the claimant, and the disinterested statement of the witnesses. It is only in that way that we can arrive at any conclusion.

WHERE RESPONSIBILITY LIES.

MR. HARVEY: In line with the discussion of your questions, Mr. Drown, I would like to say just a word in regard to our experience in inaugurating our safety work in Kansas City. We went into it in a comprehensive way just a year ago. The very question that was asked, "Who should handle and be responsible for the safety of the claim or transportation department?" occurred to us. We had in mind the selection of a man who should devote his entire time to the work. Our question was whether we should take a man far from the transportation work or one posted on the problem from the standpoint of the claim department.

We worked out the matter in this way: We first selected a general safety committee, as we call it. It was composed of three members: the publicity agent of the company, the general claims attorney and the superintendent of efficiency. The publicity agent would furnish his views, the claim department their ideas, and the superintendent of efficiency could help from the standpoint of the transportation end. Then we selected a supervisor of safety, a man who had been in the transportation department for a good many years and who was particularly well qualified from his own experience and from his ability to do this kind of work. He reported to this joint committee of three.

We worked out our program—this applies particularly to our public safety work—handling it in this way. The claim department and the other departments of the company have kept in constant touch with all that was going on and we had the suggestions of all these different departments. The work has gone on very advantageously. We had a very successful year and made a substantial reduction in the number of claims as well as the actual amount of money expended. Like many other companies—at least that is our experience—the claim department and the transportation department were too far apart. We always looked on the claim and legal departments as being in a kind of world by themselves. We did not get close to them. They were always talking about these things and from our standpoint we were always talking about them. We did not get down to bedrock and talk these things over together. We did not get their point of view and they did not get our point of view, but through the new organization we have managed to eliminate a great deal of the misunderstanding.

DIVISION SUPERVISORS.

One little feature of the manner in which we have conducted our work has aided materially. We have nine division supervisors. They have a little association of their own and meet every two weeks. The discussion of safety is one of their regular routine matters and we have arranged to have our general claims attorney attend all these supervisors' meetings. He is there and when they discuss safety, why, he is talking about it from his standpoint, and in that way they are working things out. It has resulted in each department knowing a great deal more about the other departments' business and their viewpoints.

MR. GEORGE OLIVER SMITH: I believe that the man in charge of accident prevention work should make a distinct analysis of each accident that is out of the ordinary. I believe that the claim department has one viewpoint and the transportation the other. On the other hand, I think it should be the duty of the man who is in charge of the transportation department to analyze that accident from the viewpoint of "What can I do to prevent a repetition of this accident?" I do not believe that the average safety agent of the railway company pays enough time to the analyses of accidents. Right there the opportunity presents itself. The claim department can settle the claim. In any change of type or equipment—it may be a minor change—what can the safety man do towards preventing a repetition of that acci-

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dent? I think he should get a third distinctive viewpoint on accident of that kind.

CHAIRMAN SPRING: Here is a chance for the transportation man to tell his troubles—tell what he has been up against. In the majority of the electric railway companies today, I think, the main theme in the safety propaganda has been up to the transportation department more than any other, and if it had not been for the transportation men things would have gone crooked a good many times. From my own experience. Last week I happened to be in a shop where the State Compensation Insurance Commissioner was there. In going through the plant the first question he asked the superintendent whether the company maintained a safety organization. The superintendent of equipment had been with the company only about six months and he didn't know whether they did or did not and he was absolutely stuck. If I had not been on the ground and told him what we did and explained it to him, that would have been one point against the company.

VALUE OF SAFETY INSTRUCTION.

MR. H. B. ADAMS: As far as our company is concerned, safety work was really an outgrowth from the claim department. I was the claim agent for our company and the claims kept getting larger and larger, instead of smaller and smaller from year to year. It finally dawned on me that other companies were doing safety work and saving some of these accidents, so why not we? I took it up with our general manager and told him that I thought it was better to prevent the accidents than pay for them afterward. He said: "Go to it!" Well, that put it up to me. I had never had much experience in handling men, so I went to one of our division superintendents, a personal friend, and I told him what we were up against. "Now," I said, "it looks to me as though you are not afraid and other division superintendents ought to play this safety game and play it to win."

He kind of hung back, he didn't want to take the lead in it. The thing led to another and I finally called a meeting of the men and prepared a little talk, giving them an analysis of the claims which had been presented. I discussed several typical accidents as the basis of instruction. I found a hearty response, but the division superintendents did not seem to want to get up and say anything. It took me over two years to get those fellows going, but finally they started and from that time on we began to get results.

At the end of about three years of that kind of work the general manager decided that he wanted to have a Safety First department and he picked me to give up the claim department and go into that work. The first thing I did was to try and get into harmony with the heads of all our departments, from the traffic department up. I was very successful and from that time on we have had no trouble.

With the accidents, as they happen, the report goes first to the division superintendent; he simply reads it and sends it over to the claim department as quick as he can. A copy of the report is made and returned to the division superintendent, another is given to the general superintendent and a third is given to the safety agent.

I analyze these reports very rapidly. I do not make a record of the analysis of each report unless there is any peculiarity about an accident—if there is a difference of opinion among the employees, and there is very frequently a wide discrepancy between the story found in the report and the story of the claimant and his witnesses. When we get enough of that information upon which to base an opinion as to whether the motorman and conductor are guilty or not guilty, we give the data (as has been suggested by Mr. Drown) to the division superintendent and he then takes action as to disciplining the man that is involved. The point of view, perhaps, is wide.

ARRIVING AT A DECISION.

The point of view of one department head differs from the point of view of another department head, and it is a good deal like the story of the priest in the little village, who was very fond of the children, and was always encouraging them to learn something. He offered a prize for the smartest child under 14 years of age and he invited the children to come to the town hall on a certain day, when he would award the prize. The day came and the smart children were all brought forward by their fond parents and assembled at the town hall. It appeared that on the edge of the village there was a hovel where a boy had been brought up—you might say kicked up—he was a regular ragamuffin, a street Arab. He would fight at the drop of a hat and he had had an eye knocked out. He did not come in the classification of the educated and he did not know what was going on.

The morning that this meeting was to be held his father sent him for a loaf of bread. He went downtown to get the bread and on

the way back he passed the town hall just as the children were going in. He wondered what was going on and he went up the building, and, as he came to the big door in the center there was a space on both sides—just as he peered around the corner of the door to look in the priest came forward to make his test. The priest simply came forward, looked his audience over and raised one finger. The boy saw it and immediately raised two. The priest looked around and raised three fingers. The boy clenches his fist and held it up. The priest looked around again, raised his hand and pointed to his eye. The boy hauled off with the loaf of bread and was just ready to throw it at him when the priest said: "Come forward, my boy, you get the prize." He reached behind him and took a gold piece from a table. The boy came forward, took it, looked at it, saw that it was gold, turned around, and ran away.

The audience wondered why the prize was awarded by the priest to that boy as the smartest child in the village, and the priest, in explanation, said: "You all wonder why I gave that boy the prize. I made the test. I raised my finger to indicate that there was only one God above us all. Not a single child, not a man or woman indicated by look or act that he knew what I meant except that boy. That boy immediately raised two fingers, indicating that while there was one God there was also the Son of God.

"I then raised my three fingers to indicate the Father, The Son and the Holy Spirit. The boy immediately closed his hand to indicate that while there was the Father, the Son and the Holy Spirit they were all in one, in the grand Trinity, the Blessed Three in One. I then extended my hand in benediction, pointing to my eye, indicating that he who believed in the Father, the Son and the Holy Spirit the great Three in One, would have the everlasting eye of omnipotence upon him. The boy immediately raised a loaf of bread, indicating that if we eat that we should never suffer for the staff of life."

That was the priest's point of view. What had happened to the boy? The boy ran home, threw his bread on the table and said to his father: "Oh, father, see what the priest gave me." The old man took it, looked at it, and said: "You little devil, where did you steal that? Yes, you did steal it, you never got it without stealing. He thought he was going to catch the boy.

"Don't whip me, father! Don't whip me! The priest gave money to me." "How did he happen to give you \$10?" "I don't know why the devil he done it. I saw a lot of kids going into the town

hall and I went to see what was going on. Just as I looked into the door, the priest he seen me and raised up one finger, making fun of my one blinker. I raised two fingers just to let him know that I could see as much with one eye as he could with two. Then the priest raised three fingers, meaning there was only three good eyes between us. I shook my fist at him, as much as to say that if he did much more I would black his eye for him. He raised his hand, like this, to his eye, and I thought he was making fun of me and I hauled off with the loaf of bread when he said: "Come up and get the prize." There was the same act, viewed from two viewpoints.

With the railroad men and the heads of the different departments the viewpoints may be as opposite as the two in this illustration. They must be brought together, they must be synchronized, they must work together, and unless they do that the safety agent cannot do his work properly. The safety agent has the biggest part of his job in getting the heads of the departments together. If they get together they will agree with the safety agent.

DIFFICULT TO CONVINCE OFFICIALS.

MR. WOLTZ: There has just come into the room a man who I know you will be very glad to hear from. He represents one of the largest railroads in the world and he has had a lot of experience. I would like to hear from Mr. Rose, of the Pennsylvania Lines.

MR. J. C. ROSE: The subject "Co-operation Between the Claim Department and the Transportation Department" is something that I have had experience with and I think every one here knows that lack of harmony has been the ruling passion. It is very difficult to convince the operating official that there is anything you can do to improve his service. You might possibly convince yourself that there are some features of the work which could be improved, economically and efficiently, by saving the injury to the passenger and the third person. It has been one of the most difficult things in the railroad industry to have the so-called legal or claim department viewed in any other light than as a nuisance. There is great difficulty in harmonizing the operating department, as opposed to the legal or claim department, and I think the Council can do much to secure harmonious action between them.

The National Safety Council is a great institution, 3,500 members contributing \$100,000 a year, just for the development of safety along all lines. I think this association has a wonderful opportunity

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for interesting the owners of properties in the Safety First movement.

CHAIRMAN SPRING: Mr. Drown, there was one point in paper that I am not quite clear on. Do you advocate the tabling of accidents upon prosecuted claims?

MR. DROWN: I do not think the fact of litigation makes any difference. I referred to the report at some length, but I did not want to give the impression that we make that report on every accident only on accidents of some consequence.

ACCIDENTS WORTHY OF NOTICE.

CHAIRMAN SPRING: In that accident report, you do not tabulate all accidents?

MR. DROWN: Not on that special report to the transportation department—only accidents that are worthy of notice.

CHAIRMAN SPRING: But you do in your accident report to your company?

MR. DROWN: Oh, yes.

CHAIRMAN SPRING: The next subject on the program is "Some Methods of Securing and Sustaining the Co-operation of the Trainmen in Accident Prevention Work." We are particularly fortunate to have a gentleman handle this paper who is an expert. He has won the bronze medal and his company the Brady award for safety on its property. I know you will be delighted to hear Mr. H. A. Nicholl, General Manager of the Union Traction Company of Indiana.

SOME METHODS OF SECURING AND SUSTAINING THE CO-OPERATION OF TRAINMEN IN ACCIDENT PREVENTION WORK.

H. A. NICHOLL, GENERAL MANAGER UNION TRACTION COMPANY,
INDIANA, ANDERSON, IND.

Mr. Chairman and Members of the National Safety Council:
The subject on which I am asked to address you sounds a good deal like an S. O. S. call. There is a hopeless tone to it which I believe strikes a responsive chord in all of us.

Some methods of securing and sustaining the interest in safety. Securing is one thing, sustaining is another, as here used, and

much more difficult proposition. By the fact that the word "sustain" is used, I take it that "securing" is used only in the sense of obtaining initially, although, of course, if anything is secured it is usually tied down and counted upon to stay. So far as my experience extends I am quite certain it will take several methods to secure interest in safety and at the same time sustain that interest unless several methods for obtaining both results can be grouped under the caption "supervision"—of which more later.

It should not be difficult to interest trainmen in accident prevention at the start of the work. Almost anything which is new or different or a novelty will excite interest for a time, but the big problem is how to sustain that interest to a sufficiently high degree.

That aspect of the subject is something worthy of constant attention.

FORMATION OF SAFETY COMMITTEES.

There would seem to be no better method of *securing* interest in the prevention of accidents than by inaugurating a carefully considered plan for the formation of safety committees. The larger the property the more numerous and more diversified as to membership the committees should be. On some properties, committees may be assigned to divisions, on others to car barns, departments, power stations, etc. The plan itself should contemplate not only securing the interest of the trainmen at the start, but sustaining it afterwards, such as means for exciting the spirit of rivalry, the spirit of emulation, of loyalty, self-interest, co-operation, etc. If we admit that plans should be made as outlined, then it is desirable to consider the two aspects of our subject together. As co-operation is the keynote to success in all undertakings requiring organized effort, the membership of each committee should include the working members of as many of the different departments as conditions will permit, for in that way many of the problems and difficulties with which each department has to contend will be better understood by employees of the other departments.

Committees should frequently be changed as to individuals, either by new appointments, say every six months for most of the membership, or by rotation; that is, one or two old members dropping out and new ones taking their places every month or so, or by some other method which will permit as many employees as possible to serve for a reasonable time. It is probably desirable also to have

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certain permanent members on each committee, such as sub-division superintendents, foremen, etc., for obvious reasons.

In making the individual appointments it is desirable not to appoint men who are already interested in safety work, but also well to appoint some employees whose interest is lukewarm in the hope of converting "doubting Thomases" and thus secure greater co-operation on the part of those employees and increase the general interest.

The work of these local safety committees will consist in handling and acting upon suggestions from their own members and from other employees. A general safety board of permanent members, heads of departments, etc., is desirable in order that suggestions of a general nature coming up from the local committees may be handled without autocratic settlement by management.

THE VALUE OF CO-OPERATION.

The appointment of committees tends, of course, to demonstrate the operation of the property and furthers the co-operative management idea, at least insofar as safety matters are concerned. It is not an undesirable condition, especially considering the present lack of co-operation. In these days when the value of democracy in the world is being so prominently placed before us, with the exception of autocracy unaccompanied by the personal touch, it is not too difficult to realize that this co-operation, which we must have in working through committees, will be promoted by a democratic method which need in no way interfere with proper discipline. If we only get the co-operative influence to extend beyond the field of safety and over into the domain of efficient operation, by requiring obedience to rules and correct methods of performing work, we would indeed reach a degree of perfection which would make us welcome democracy anywhere.

At the time of installation of the safety committees a general educational campaign should be undertaken in which as strong an appeal as is possible should be made to all employees (and particularly to the heads of departments) to co-operate in the intended campaign, which, it should be stated, is intended to be made a permanent feature of the operation. Employees should be encouraged, even urged, to make suggestions, especially those in relation to safety, efficiency and economy, and it should be the effort to make every employee understand that his suggestions will be welcome and that he

have no fear of displeasing any of his superiors by the making of suggestions. The impression should be given that while all suggestions would be carefully considered it would be manifestly impossible to approve all of those made, for reasons which could be explained. Suggestions which are adopted increase the interest of the employes making them. They feel that they have a share in the operation and in the improvement of conditions, which adds to their feeling of proprietorship.

PERSONAL RESPONSIBILITY NEEDED.

You may not agree with me, but I believe that the more employes we have who talk "my road" as if the property actually belonged to them the better the property will be operated, because the feeling of joint personal responsibility in the success of the company will necessarily be more prevalent, and personal responsibility is what we want when it comes to reduction of accidents. Special stress should be laid on the benefit to the employe himself of any and all results accomplished in the reduction of accidents. More employes suffer in proportion to their number than do passengers, but all employes do not seem to realize that a great part of the good in operating safely accrues to themselves. Self-interest is, after all, the strongest moving force in the world and it should never be lost sight of. Disguised appeals to self-interest are always in order.

"Some methods for sustaining interest in the prevention of accidents" is asked for. If I had a panacea for what is almost the greatest of our ills it is certain more orders for the remedy would be forthcoming than could be filled. I have mentioned very briefly in passing, three lines of effort, particularly: Supervision, co-operation, and self-interest. The first, supervision, concerns the ability of the organization and is absolutely necessary, of course, whether the matter of safety is treated separately or not, but certainly the greater the ability in the supervision the more efficient will be the work of accident prevention.

Co-operation concerns the *esprit de corps*—the spirit in which the men do their work. No one can dispute the statement that good feeling, the absence of knocking and bucking and friction, must increase the efficiency (and safety and efficiency must be considered together), because more can be accomplished with things moving freely than when the brakes are set. The man with a grouch is about as helpful as would be setting the brakes going up-hill.

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MUST START AT THE TOP.

As with supervision, so with co-operation, it must start at top—if it doesn't start there it will surely stop there. If officers and department heads cannot work together without friction and always with an eye single to the best interest of the company as a whole, without particular regard to the interest of any department, then you may be sure there will be friction all the way down the line. I do not believe there is anything so provocative of carelessness as knocking. If, for instance, the man at the head of the transportation department (trainmen are included in our subject, you know, hence this example) is a knocker and does not co-operate with the management, you may be sure his associates will be knockers and there will be carelessness among the trainmen.

Self-interest, I think, can be depended upon to furnish strong incentives toward sustained interest in safety work. Means must be found for feeding this self-interest and a *variety* of diet should prove to be the most efficacious. I want to assure you that no one is more anxious to learn of an approved system of diet to accomplish sustained interest than myself. I have felt that the principal need for efficient operation and safe operation was some form of premium or reward which would appeal to the man's self-interest. This premium or reward could be either individual or general. If individual, the premium would be paid to the few who might excel in their personal efforts towards the reduction of accidents and operating expenses. If general—that is, for the benefit of all—could be obtained from some form of profit-sharing, the fund from which would be available at certain periods of the year and according to the prosperity of the institution.

FITNESS OF EMPLOYEES.

Related in a degree to self-interest are the fitness of the employee for and his satisfaction in his job, that is, if the working conditions are pleasant, so much so that the employee likes his work, and if the wages (or gross income from wages and bonuses, if any) are sufficient to pay expenses and as much as the property can afford, then self-interest will prompt a man to be interested in doing what it is necessary to do to retain his position, and this should include his co-operation in accident prevention. Visits by organizers for outside organizations are generally

source of unrest among employes, and make men lose rather than increase their interest in their work. You will sustain interest in your safety work to a great extent if you will keep them away and do injury to it if you permit them around.

Whatever can be done should be done to *sell* the man his job, so he will be disinclined to listen to extravagant claims of agitators as to what outside organizations can obtain for him in the way of better working conditions and increased wages for less work.

With our company the system of committees is essentially as outlined earlier in these remarks. Our methods of keeping attention centered upon safety work, maintaining interest therein and securing co-operation, so far as it seems possible for us to do so are along the following lines:

PRIZES FOR SAFETY PAPERS.

In order to start the men with a desire to serve on committees (and this appeals, of course, to their self-interest) we give a banquet to all members of safety committees at the end of each six months. Eighty or ninety men are usually in attendance and we have found the banquets are looked forward to by the committee members and are enjoyed and appreciated. Good-fellowship is certainly advanced by these periodical occasions. Every six months there is a contest for the best paper on some subject having relation to safety. These papers are judged just prior to the banquet and the three prize papers are read at the banquet by the winning contestants who, in addition to receiving the prizes, are always invited to attend. The writing of the papers is good in itself but they serve two other purposes. or, rather, they promote safety and sustain interest in two other ways: First, in being read at the banquet, they reach the outgoing committee members, just as they are relinquishing office, with little doses of safety administered by fellow employes. This is desirable, especially because it is hard to get new people to deliver talks and lectures on safety matters.

The second way in which we use these prize papers is by republishing them in our magazine *Safety*, which is distributed to all employes monthly. The papers here serve the same purpose as at the banquet. The magazine is another method we adopted to help maintain interest in safety matters and we believe it does good, although we do not claim that all employes read every issue from cover to cover.

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As safety reminders we have safety buttons worn by members and ex-members of committees: blue for grand safety board, for local board and black for ex-members.

In order to have employees feel personal responsibility, which I have previously mentioned, in relation to safety matters, we have tried to give "Safety First" a sort of separate entity on the property—that is, matters peculiarly and essentially concerned with safety are given preference and safety committees have the authority to call upon heads of departments to attend to conditions which come within the regular scope of a department's authority and the department heads are required to satisfy the committees so far as they can. We have tried to avoid doing anything which would reduce this sense of responsibility; that is, we want to get rid of the "I don't care," "It doesn't concern me," "Let George do it," "I should worry" ideas, and thereby help a little to sustain interest.

• NO PANACEA FOR ALL ILLS.

As stated, there is no panacea that I know of that will positively sustain interest, but good old hard work will count, and the head end of the hard work should be devoted to securing and developing the type of men whose interest in accident work will not flag as time goes on. I do not want to appear to get off my subject, but the selection of employees and the training of the men is so important that you will agree with me when I say it is almost useless to attempt to sustain interest in accident prevention if we do not have the right material to work with. If we employ a careless or lazy man it will be a hard task to change his constitutional inclination and sometimes we will find he lacks interest, but that may be largely because he is inefficient and the wrong man to employ. Again, and it has been said so many times, I hesitate to bring the subject up here for fear of losing *your* interest: Accidents will be avoided if rules are obeyed and this without regard, particularly, to sustaining interest in safety. Rules are not obeyed, we know it, and yet we continue to permit disobedience to exist or else we have to admit that it is impossible to obtain obedience to rules and regulations. Right here it can be stated again that nothing pays better dividends than *supervision* the right kind of supervision, day and night, week in and week out.

THE DESIRE TO OBEY SAFETY RULES.

To return to my subject. A man must have in his heart the desire to *obey* or else he will disregard restraints placed upon him.

And this is where sustaining interest in safety will obtain good results. I speak of a man's heart in this connection because a man can be reached through his heart when you cannot reach him through his head. As Abraham Lincoln has told us, his sentiment is a stronger moving force than his reason. Add to sentiment the motives of fear and self-interest and you have at least three incentives for dwelling upon Safety First and all its precepts in your effort to obtain obedience to rules.

Further, and I may again appear to be leaving my subject, nevertheless I believe it will not do to confine our efforts to *preaching* Safety First and fail somewhere in the training and drilling of men in their work, so that they will know automatically what to do in the face of an unexpected situation; that is, our system will fall down if we do not take sufficient care to see that the men who operate the equipment understand thoroughly and can use the best methods of handling it and taking care of it. Train the man and thereby *practise* accident prevention.

SKILL IN APPLYING THE PERSONAL TOUCH.

Finally, skill in applying the personal touch by those higher up, and friendly feeling by the men for their superiors, *and therefore for the company*, may not of themselves sustain interest but will help to keep employes satisfied.

We have always felt that interest could be maintained by keeping up a big campaign if that were possible, but there are difficulties in the way of obtaining material for keeping up a big campaign, so we have tried to avoid going into it too strong but have kept doing a little constantly in order to make safety what might be called the "bread and butter," the steady, diet in our operation.

A little anecdote came to my attention the other day which I want to use in closing, as an illustration of what we do *not* wish to accomplish, that is, run in a big splurge for safety and then not sustain it:

An Englishman rushed after a swiftly departing train and just managed to clutch the side rod of the rear coach. He was immediately thrown into the cinders and skidded along the right-of-way on his stomach. A spectator picked him up and remarked:

"Too bad you couldn't catch your train."

"My word!" responded the victim, "I caught her all right but I couldn't hold her!"

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DISCUSSION

CHAIRMAN SPRING: We are indebted to Mr. Nicholl for paper and it offers a wide field of discussion.

MR. C. B. SCOTT: To my mind this is the best paper that has been presented to the Section. To fully appreciate it we connect it with the executive position that Mr. Nicholl occupies. It is a splendid paper. I was first impressed with the suggestion of co-operative management, and that is, to my mind, a very important subject. You will note that Mr. Nicholl echoes sentiments of the session this morning in which the whole drift was toward the idea of greater supervision and greater discipline. I think that part of the paper ought to be taken to heart by every one and applied in their own work. It is ideas on that subject, in accord with the paper that has just been delivered, that do good. We have been talking about details that are of very importance compared with the ideas presented in this paper as to ideas of co-operative management, of strict supervision, of obedience to rules and discipline and of the selection of the proper people to perform your work. These are the matters to which you can devote too much time, and I hope to hear a free discussion of this paper.

THE PERSONAL EQUATION.

MR. VAN BRUNT: I feel that the gentleman just preceding does not look at Mr. Nicholl's paper from the angle that I came here to learn and it is my business to go to the men employed by public service corporations and talk to them and endeavor to get them interested. I can get them interested, anybody that I want to use my voice and one single idea can do that, but Mr. Nicholl's paper has helped me very much in that it told me several methods in detail for getting the men interested. I have been going along from year to year and every six months I find it necessary to get something new to talk to our men about. We fellows who are doing this class of work must be more or less governed by conditions. It seems to be that the very details we want ought to come from you fellows who have had experience and one from other properties. You can help me and I have sent out the S. O. S. call. Help along! I am looking for help wherever I can get it and I feel very much indebted to the information I have received. I want to draw attention to an important detail—the personal equation—that which is very interesting.

think that all the points were well made and I shall go away from here feeling under obligations to Mr. Nicholl.

MR. WOLTZ: I am sorry that Mr. Nicholl was not here this morning. He might have heard some things that were not very pleasant, but he would also have heard a good many things that were nice. I shall have to ask just this one question: "Do you have on the Union Traction line a system of bonuses?"

MR. NICHOLL: No, we do not, but we are looking into it.

MR. WOLTZ: I should be glad to talk to you for awhile along that line.

MR. SMITH: Mr. Van Brunt has asked for suggestions. Have you ever stopped to ask your men to be careful in the operation of their cars? You may at the same time materially reduce your power consumption. With coal at the present price I think that is a very sensible thing to do. I do not advocate coaster recorders or things of that kind, but if you can teach your men to run your cars carefully you are killing two birds with one stone.

MR. VAN BRUNT: Please tell us how.

MR. SMITH: On some of our properties it is by instruction; instruction in the operation of equipment, continuous instruction. Put your man through the school, but bring him back once in so often.

INAUGURATING A SCHOOL OF INSTRUCTION.

CHAIRMAN SPRING: That is a point that is well taken. I have just been able to put through an appropriation of \$10,000.00, as a starter, for the inauguration of a school of instruction. Every operating man here knows that it is all we can do to get men and as fast as we can get them they have to go out on the lines. They should have more instruction, but with labor conditions as they are at the present time we are obliged to put men on the road that are not fully capable, or else pull our cars into the barns. The draft has taken a great many of our men and to overcome the shortage we are installing a school of instruction, we are putting in a real system: Both straight and automatic air; putting up a skeleton of a car: showing a hand brake, together with the air brake; also our electric equipment, showing coaster recorders, and all that. We believe it is one of the greatest safety factors we can get. Our safety committee has been instrumental, more so than our operating heads, in promoting the plan, and I believe that the school will be very valuable. In fact, we consider it absolutely essential to a property that can maintain a school of this character. If there is any

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one here that has had experience with these instruction school would be glad to hear from him because I am after all the information I can get.

MR. WOLTZ: Our chief instructor, Mr. Kelly Smith, is in attendance at this meeting. For the last week he has been in Brooklyn and Newark and will later go to Boston, studying the school of instruction. In addition to the instructions the men get at the school while learning we have two division instructors who put the men up on the road—not only the new men, but the old men as well. Our experience records show a gain in production and progress in safety work. I think Mr. Smith could give you valuable information.

MOTORS, CONTROLLERS AND AIR BRAKES

MR. KELLY SMITH: We have a school of instruction at Totten. We call in our motormen and conductors and put them through a course of instruction; then we hold an examination, asking 120 questions. This work is in my charge. I am also responsible for instructions as to motors, controllers, and air brakes. We have a system of block lights, and we give a lesson on this subject that the men learn before they leave the room. If they are not letter-perfect they are required to return for further instruction. Block signals are operated under a section of the state law and our men must obey the law. I also give them an accident report blank and tell them how to make it out.

These points cover their principal examination. They have a final examination; that is, after their breaking-in period. It takes a motorman all the way from fifteen to twenty-one days to break in.

We pay the platform instructor 25 cents a day in addition to his salary and the new man receives \$1.50 a day during his breaking-in period. The men break in on the lines selected by the division instructors and when they come in the instructor examines them. If they pass successfully on that line they are advanced to another line so on until they have finished the course; then the division instructor gives them a thorough examination on all lines and if they pass O.K.'s them and sends them back to me for a final examination. I give a list of 120 questions to a motorman and 100 to a conductor. They sit down and write out the answers. They are required to turn in an accident report blank fully made out, so that I may know they understand how to handle these reports. I check the exam-

tion papers and correct them. They must get a grade of 80 to pass. That, except a few details, covers the main points of our school at the present time.

THE WRITTEN TEST.

CHAIRMAN SPRING: How do the written examinations turn out? For instance, I recently had an examination and our best men brought in the smallest averages; men that really were not competent or capable brought in the better averages, because they were a little better scholars and could answer the questions better. Do you depend entirely upon the written answers?

MR. KELLY SMITH: I question the men as to what they mean. I know if they understand what they are writing about in answer to my questions. I give them no chance to copy. They have to understand the work to pass the examination. I find that new men often answer the questions better than do the old men when they come back looking for a job.

CHAIRMAN SPRING: I remember a very amusing situation that occurred during one of our written examinations. I operate in the German district of Pennsylvania and one of the men, who was a very poor scholar, wrote the whole thing out in Pennsylvania Dutch. He certainly had me up a tree.

"A PSYCHOLOGICAL TEST."

MR. SCOTT: We attempted at one time to use a little psychology in employing men. I corresponded with a great psychologist and became very enthusiastic. I had a psychological way in which to present our final examination by making a fellow feel at home. A young man came in and I said: "Hello, Charlie: where did you come from?" He told me and I said: "Oh, I came from there myself. I know your father and your family and I am glad you are coming in to take employment." I had him sit in a chair and I made him feel at ease and I finally passed him on the whole Munsterberg test. That day I went to mother's for lunch and I said: "You remember the Joneses that used to live out in the country where we lived? One of those boys came in for a job today." "Which one?" she asked. "Charlie." "Oh, no," she said, "not Charlie." "Yes," I said, "Charlie." "Well," she said, "I saw Mrs. Jones the other day. I hadn't seen her for a number of years and I asked her about the children and she told me they were all in good health except Charlie." "What did she say was the matter with

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Charlie?" I asked. "Why, his mother told me he was crazy; went down and took him off the car and sure enough I found he was crazy."

MR. WOLTZ: We are very careful and thorough in our reports. One day, in looking over the details of a report, I noticed a conductor had written something very much like this: "Going on No. so-and-so run, at the corner of Eleventh and Monroe street the back of my car swung off Monroe street onto Eleventh street. A man ran out from the curb and attempted to catch the rear end of my car—it was an open-platform car." The report gave all the details. The man, of course, was thrown to the ground. "I immediately stopped the car and went back and inquired his name. He refused to give me his name. I insisted that he give me his name. He still refused to give me his name and I inquired some more, and finally he said: 'Oh, hell!'" The conductor continued his report and said: "'Mr. O' Hell said he was not hurt."

STREET CARS AND AUTOMOBILES.

CHAIRMAN SPRING: I have been requested to turn back to the unfinished subject of this morning, "The Prevention of Accidents Between Street Cars and Automobiles." Mr. Scott gave us a splendid report on investigations of automobile hazards, but we did not touch on the prevention of accidents between street cars and automobiles. Let us take up the discussion and try to finish the subject. According to our reports, the Central States had 6,690 automobile accidents last year.

MR. WOLTZ: I would like to know why the Middle West has more accidents than the East?

MR. NICHOLL: I expect they have more trains and more automobiles. That would be the natural sequence, I should say. Most of the lines have the usual highway crossing signs. These are set up and maintained by the railways. On our property we have a warning sign on every grade crossing on the highways, 300 feet from the crossing. In some instances we have put two kinds of signs, one calling attention to the distance and the other to the danger. In some places we have no crossing signals and state authorities have not compelled their use yet, because of their general inefficiency. We do not intend to put them in unless we can find a signal that will work all the time. If a passenger or a vehicular driver expects a bell to ring or a flag to act and it doesn't work because it is out of order we are then facing a greater liability than we were before.

We are trying to prevent accidents by constant supervision and training of our men. We also put signs in automobile garages, paint them ourselves and distribute them throughout the country through which we operate, warning automobilists of the dangers of crossings, particularly those adjacent to garages. We have other data and literature on accident prevention which we post in our cars—11 by 22 signs—warning automobilists to be careful on grade crossings.

MR. HARVEY: In connection with the campaign against automobile accidents, we have tried a stunt which is no doubt familiar to a great many of you. Bulletins are posted in all our car barns and places where the men congregate, asking them to report infractions of traffic rules, such as the passing of standing cars, pulling onto track in front of moving car, etc. These reports began to come in to us and original letters were written to each driver or owner. In every case the license number would be secured and the name of the party owning the vehicle obtained later. We arrived at a point where we were receiving from twenty to fifty of these reports every day and in each case a strictly original letter was written to each owner. In this letter it was stated that this should not be taken as a matter of criticism; but rather that we were engaged in a big Safety First campaign, that we wanted their co-operation and asked for it. We were much gratified by the reports received. Probably 50 per cent of those written to replied and almost without exception the replies were of such a nature that it was felt some good had been done. After a time the number of reports commenced to fall off, and in consequence semi-monthly bulletins were posted at the various car houses listing the men who had turned in reports and the number turned in by each. This spurred the men on and more reports were received than could be taken care of. This work was kept up for ten months until the effect had somewhat worn off and was then dropped for a time. We cannot tell, of course, just what was gained by this campaign, but we do feel that the personal touch with individual cases had some effect. In a few months we will probably take this work up again.

THE OCCASIONAL KICKER.

MR. NICHOLL: We use the same system and have secured good results, but only a small portion of the people we write to have replied. Probably our letter is not as diplomatically worded as yours, but most of our correspondents took kindly to it. In one instance, however, a man was very angry. We wrote to a school trustee

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about a driver who carries children to school every morning and the driver to be more careful. The trustee turned the letter around and said if our motormen were more careful we would have so many accidents.

MR. HARVEY: With us the negative letters were very much the minority.

CHAIRMAN SPRING: I am very much interested in the situation and wish we could get the system started out our way. I do imagine there is a property more bothered with automobile accidents and near-accidents than the one I am interested in. Automobile accidents, the last two months, increased 115 per cent over a year ago. We are absolutely up against it. We are on the way, between Philadelphia and New York, and since the national army encampment has come to our town we have automobiles all over the United States. I noticed two yesterday from California. We are absolutely at our wit's end to know what to do. I wrote letters to the automobile clubs around our city, asking them to arrange for smokers at their clubhouses for the purpose of enabling one of our representatives to talk on accident prevention. One club invited us to be present on a certain night. I went down and got — for our service. It was the overcrowded cars and most of that kind they went for me about. I had all I could do to get away without a chance to defend our company, without being able to accomplish anything at all other than, perhaps, of giving a better idea of why we did not extinguish our headlights. We printed 50,000 cards, with a very appropriate suggestion for automobile drivers. We put them at every tollhouse on our property—we operate on a great many tollroads. We gave them to the tollkeepers and asked them to give them out to the automobiles they passed through. We did it at our own bridge—we have a bridge seven-eighths of a mile long—but the tollowners complained that the cards littered up the roads. We found our own bridge littered every morning, so we discontinued the cards.

There does not seem to be anything to be done in the matter of persuasion with the automobile situation today. It requires drastic measures. Prosecution and legislation will be necessary. We have gone into the prosecution end of the matter. As stated by Mr. Harvey, all of our conductors have a blank to make out whenever an automobile passes a common carrier when stopped to let passengers board or alight. We have, at our own expense, prosecuted automobilists that were exceeding the speed laws. We

turned over these cases to the municipal authorities and have seen that they were prosecuted. That is doing more good today than anything else. The Philadelphia papers recently printed an announcement by the Philadelphia Automobile Club, cautioning automobilists along the lines of our property to be on the lookout.

DRASTIC MEASURES NECESSARY.

I believe the time is coming when the Electric Railway Section and the Steam Railway Section of the National Safety Council should appeal to the Executive Board of this Council to consider drastic measures and attempt to secure legislation in the various states regulating automobile traffic. I believe that is one of the most serious problems we must face. If anyone here has had any experience in prosecutions let us have it and get busy.

MR. ADAMS: We have had experience in two of our cities, Peoria and Elgin, and we have enlisted the co-operation of the city authorities to the point where they will carry on prosecutions if we will supply the witnesses; if a man violates traffic rules anywhere around our tracks our men report to us. I report to the police department and they arrest the violator. The police bring them in and fine them and we try to secure the publication of that fine in the local papers. After two or three fellows are fined there are no violations for a few days. Two to half a dozen fines are levied each week and we feel that if it is continued this is going to do a lot of good.

MR. SMITH: The Long Island Railroad made some very interesting experiments. Their system is to prosecute for damages to the train any automobilist who gets in a mix-up with one of their trains on a grade crossing. There has been some talk here in New York of the railways doing the same thing.

We have tried the general educational scheme in the Doherty Company and I write it up in our monthly magazine. We are preaching the value from another standpoint—we are not talking very much about the street car end of it, but we are driving at the automobilist. We do not specify that we are a street car company, we are trying to educate the automobilist. If any delegate wants a copy of our magazine you will find the August issue of the *Doherty News* here. I feel rather bashful about presenting it as it is one of our first sheets in this campaign, but you are at liberty to reproduce any part of it if you desire.

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STREET TRAFFIC VIOLATIONS.

MR. KELLY SMITH: Toledo has some very narrow streets up to the 1st of August the traffic ordinances were not rigidly enforced. The Toledo Railways and Light Company in conjunction with the Commerce Club, the Automobile Club and the directors of the city have tried to plan some method of action and enforcement of laws that went into effect Aug. 1 and also the drafting of new ordinances. The first six months of 1917 accidents increased 50 per cent. Since Aug. 1 we have shown a reduction of about 45 per cent. The reason for this reduction is found in police court. The police judge has been in office for some time and we thought he showed too much consideration for automobile drivers. He fined them and then suspended the fine. Lately he has taken a little different view of his office, principally because there are now four police judges instead of one after the first of the year; is, they will rotate in office, so no one man will have the court the whole time. This is due wholly to the action of the Automobile Club in forcing more drastic laws and also in enforcing the existing laws.

Each week I classify our automobile accidents and forward a report to the Executive Committee of our Safety Council in Toledo. The classification shows the location, whether in the business district, residence district, and it is surprising, even though Toledo has narrow streets, that the largest percentage of accidents is in the residence section, due principally to excessive speeding.

A safety signal of some kind, to call the attention of the automobile driver approaching a street car intersection is often necessary, I believe. Toronto has done some work along that line. The superintendent of motive power told me they are using a red light at intersections of every street car line in the residence district. I can see that red light—it is hung below the arc light—about fifty blocks away, and when our superintendent gets back to Toledo we are going to try the Toronto system.

At the request of the safety director of the city we installed a red band, painted on the arc light, at several dangerous intersections, but we found that the shadows were too great for what I might have accomplished, so we changed and painted red signal on the light. I think we should have the red light below the arc light.

The speeder in the residence district is causing the most trouble. In the business districts it is just a fender or an axle bent or so

thing like that, because the speed is slow and the automobile can avoid accidents. Most of our accidents have been caused by automobiles parking in the streets or pulling out from the curb in front of cars. That is, I think, also another question that should be gone into. There is no limit to the time that an automobile can park in our streets and some of the streets are very narrow.

THE SILENT POLICEMAN.

CHAIRMAN SPRING: Several cities and towns in Pennsylvania are carrying out an idea they call "the silent policeman"—a red light by night and a red flag in the daytime. When they first installed the idea the machines ran over them and broke them off, but they got such heavy fines that they became more careful. It regulates traffic and keeps it where it belongs.

Mr. Nicholl spoke about installing crossing bells at dangerous crossings. That is a situation our company has been up against. We spent \$52,000 on crossing bells and after they were all installed we had the worst accident in the history of our company or in the history of the state. It happened at a protected crossing, where a bell was ringing and it was absolutely proven that the bell was ringing when the accident occurred, but we had to defend ourselves as to whether the bell was ringing or not. For that reason our company has taken the stand of not installing any more crossing bells on our property—for the simple reason that they work against us.

After looking over the statistics of the last few years we find that the least number of accidents happened at unprotected crossings. We believe that it is better to simply use a 300-foot warning sign, "Stop, Look and Listen!"

We also had a case where a wigwag sign was placed on the track. A farmer drove on the track, stopped to watch it and was injured. People may be so interested in looking at the thing work, watching the red lights come, that they do not see the car until it is too late.

MR. CHARLES L. KEELER (Poughkeepsie): I handed in a copy of our state highway laws during the morning session. It is a new regulation and became a law in New York on May 1 of this year. The law is very comprehensive and if it is followed out and the municipalities and the officers and police commissioners enforce it as it is written the number of accidents will be materially reduced, but in towns where the police do not recognize the highway laws, and it is a matter of politics to let them lapse, what are we to do? What is our redress? A copy of this law has been placed in the

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hands of every licensed automobilist in the state of New York. What opportunity have we to prosecute unless we can get the co-operation from the police boards and the police commission?

CO-OPERATION OF MUNICIPAL BOARDS.

CHAIRMAN SPRING: That is a point that needs a great deal of thought, the co-operation of the municipal boards. Without co-operation the railways cannot do a thing. In our city, until we got the Department of Safety and the chief of police, it was impossible to carry out any suggestion toward parking and zones for the schools, but all of these we have been able to do about after getting the co-operation of the local authorities.

NEWSPAPER PUBLICITY.

MR. WOLTZ: There is one thing that has been overlooked. I think it is one of the best things a company can get: Publicity through newspapers. In analyzing reports of fines, etc., I usually see that the newspapers get it. I have a friend who is a reporter and we go over the reports. Then he goes to see the safety director of the city. The next thing is a caption about every accident on the cars. I think that is one of the greatest mediums that you can reach and I do believe enough attention has been paid to it.

CHAIRMAN SPRING: The *Philadelphia Ledger* devotes considerable space to a safety campaign and several other papers in Pennsylvania have taken up the work. Advertising has been tried and seems to be very effective. Some of the large companies of the city report good results.

MR. WOLTZ: The *New York Sun* is carrying on a safety campaign, showing the number of automobile accidents and the number of persons killed or injured.

MR. VAN BRUNT: The *Evening Mail* is doing the same thing but there is one thought advanced in this discussion which has not come to a focus. Wouldn't it be possible, before we adjourn, to pass a resolution urging our directors to get in touch with the municipal authorities in the states that we represent and give them an idea as to our size and influence, who we are and what we represent and in that way bring some pressure to bear upon them to enforce such laws as now exist? In almost every state and municipality there are good laws, but they are not properly enforced. If we can bring pressure to bear, by means of our numbers or by means of our prominence in the business world, on the police court jus-

and other officials who have charge of such matters—wouldn't that be a help in promoting safety?

DRIVE AGAINST PUBLIC ACCIDENTS.

MR. G. O. SMITH: I might answer the last question. Our Executive Committee has very seriously considered this question of public safety. The President, Mr. Van Schaack, has some very interesting plans for next year and if the funds are available—and it looks now as if they might be—we intend to make a determined drive, as an organization, against public types of accidents. This should include, most emphatically, the automobile hazard. It will give me great pleasure to push that all I can.

CHAIRMAN SPRING: The new Chairman of this Section should be instructed, by the consensus of opinion of this meeting, at the next meeting of the Executive Committee, of which he is a member ex-officio, that he represents the Electric Railway Section as its head and should bring these matters to their attention. That will make it very effective.

MR. ADAMS: I would like to make an appeal to every member of this Section to take a hearty interest in the Public Safety Sectional meeting tomorrow morning at 9:30 o'clock. We railway men are especially interested in public safety work and I believe we ought to do our utmost tomorrow morning to make that meeting a success.

CHAIRMAN SPRING: At this morning's session it was your wish that a committee be appointed by the Chair to take up the matter of standardizing car crossing signs. The Chair will appoint Mr. George Oliver Smith as Chairman, with leave to select his committee.

The Nominating Committee will please report.

REPORT OF NOMINATING COMMITTEE.

MR. WOLTZ: The committee reports the following nominations: Chairman, Mr. Julien H. Harvey, Kansas City Railways.

Vice Chairman, Mr. H. C. Baldwin, Connecticut Co.

Secretary, Mr. J. C. Davison, Denver Tramways Co.

Membership Committee—Mr. R. S. Metzger, Toledo Railways and Light Company.

Safe Practices Committee—Mr. J. H. Pratt, United Railways & Electric Co., Baltimore.

Safety Education Committee—Mr. H. W. Clapp, The Columbus Railway, Power & Light Co.

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Program Committee—Mr. A. J. Van Brunt, Public Service Corporation of New Jersey.

CHAIRMAN SPRING: You have heard the report of the Nominating Committee, what is your pleasure?

It was moved, seconded and unanimously carried that the session be closed. It was moved, seconded and unanimously carried that the Secretary cast one ballot for the names as read by the Nominating Committee. (The nominees were duly elected.)

CHAIRMAN SPRING: Gentlemen, I thank you for coming to this meeting, because I know the condition of the country, I know the demands upon your time and the duties it is imperative for you to perform. I was very glad indeed to note that the Nominating Committee suggested men of activity in safety work in the railway industry. I know you have placed this Section in the hands of men worthy of the honor conferred on them, and I congratulate you on your choice of Chairman for the coming year. Geographically located, as he is in Kansas City, he will be in a position to handle the business of the Section both East and West. It is a pleasure to turn over the gavel to Mr. Harvey, our new Chairman.

MR. HARVEY IN THE CHAIR.

CHAIRMAN HARVEY: Gentlemen, I have no desire to make a long speech, but I want you to know that I appreciate very deeply the honor you have conferred upon me. There is a lot of work attached to the position you have given me and all I can say is that I will cheerfully and gladly do everything in my power to further the interests of our Section. We have every reason to feel encouraged by the interest shown, at a time like this when, as we all know, the cost of materials, labor and everything, in fact, that a traction company requires is going up by leaps and bounds.

At the same time we have a fare that cannot be increased. It is more necessary than ever that safety get in its best looks. I have heard this morning of the growth of our Section. From a group of fifteen companies it sprang to 140 in two or three years. The indications for the coming year are that we will be able to do even more. The larger we become in point of members the greater the things and the better work we can do.

I thank you very deeply and assure you that I will do my utmost during the coming year to merit your approval.

THANKS TO CAPTAIN BULLOCK.

MR. G. O. SMITH: Captain Bullock, as you know, is a past member of the Executive Committee of the Council, and was very active in the work of this Section; if he had not been in the Section I doubt if it would have reached the proportions it has today. Captain Bullock, as you know, received a commission in the Quartermaster's Corps of the army and had to resign the chairmanship of the Section.

I would like to offer the following motion: "*Resolved*: That the Electric Railway Section of the National Safety Council, at its Sixth Annual Safety Congress, conveys to the past Chairman of the Section, Captain H. A. Bullock, the best wishes of the membership of the Section, and expresses the hope that Captain Bullock will take his usual energetic part in the work of the Section at its next meeting; and be it further

"*Resolved*: That it is the desire of the Section to express to Captain Bullock their sincere thanks for the painstaking and energetic work performed by him as Chairman of the Section during the past year."

The resolution was adopted by unanimous vote.

CHAIRMAN HARVEY: The statistics submitted by Mr. Scott in his report this morning will be incorporated in the proceedings and be open for your perusal and study. I would recommend that you secure copies of the report and make such use of it as is possible.

The Section then adjourned.

National Safety Council

Foundry Sectional Meeting

New York City

Sept. 13, 1917

F. G. BENNETT, Chairman

Buckeye Steel Castings Co., Columbus, Ohio

F. W. SHEPARD, Vice Chairman

Safety Inspector, American Cast Iron Pipe Co., Birmingham, Ala.

S. W. ASHE, Secretary

Educational and Welfare Department, General Electric Co., Pittsfield

THURSDAY MORNING SESSION

THE meeting was called to order by Mr. F. G. Bennett, Chairman, at 9:50 o'clock.

OPENING REMARKS BY CHAIRMAN.

CHAIRMAN F. G. BENNETT: Your Chairman has nothing of great importance to report. Your Secretary, in his report, will show the activities of the Section during the year. There has been a considerable increase of membership in the Foundry Section, and Secretary Ashe will present this matter in detail.

There are several matters that should be given attention to. I imagine they will be taken up a little later in this meeting. I will now hear the report of the Secretary, Mr. Ashe.

REPORT OF THE SECRETARY.

Mr. Chairman and Members of the National Safety Council:
As we have quite a long program this morning I have made only a few brief notes.

The membership of our Foundry Section, at our last meeting, was about seventy-two members. Since that time we have lost two members and gained seventy-one, so that today the increase in membership in the past year is 100 per cent. It is interesting to note that this increase was steady throughout the year and was not the result of any particular campaign. In other words, the increase of membership indicates that new foundries are joining the Section and feel that they are receiving special attention.

It is planned to consolidate the Foundry Section with the Iron and Steel Section and in the new arrangement I hope that a definite scheme will be worked out whereby the Foundry Section will maintain its identity, so that small foundries will be able to have their own problems discussed as well as the very general problems of the iron and steel industry.

Your Executive Committee has done considerable work the past year, even though it has not been possible, due to geographic distribution, for some of the members to get together on more than one occasion.

SPECIAL BULLETIN.

Your Secretary prepared a special bulletin which we found useful in instructing new men in safety. We found that the ordinary notices and bulletins placed on a regular, flat bulletin board did not attract the proper attention, so a small, black easel was constructed, about four feet in height. This display easel was placed in a conspicuous place in the foundry, where it would not be knocked over. On the board were mounted colored bulletins, showing how to pour metal, how to wear moulders' shoes, goggles, etc. Several pairs of broken goggles were mounted on the board beside a printed notice in chalk calling attention to a special meeting to be held during the noon hour.

It was found that this easel attracted great attention, the men who could understand explaining the pictures to the men who could not read. Later, the talks we gave were illustrated with moving pictures.

We have a large drying oven for cores and the screen was placed at the back of this oven, the men looking in from the outside. We employ about 600 men in our foundry and it is safe to say that every

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man was present. So much so, in fact, that production on the particular day dropped eight tons, due to the men stopping work normally finished their cores or moulds during the noon hour.

We also made a very elaborate survey of the hernia question and arranged a special meeting with the Industrial Accident Commission of Massachusetts to see if a better understanding could be obtained regarding this subject. The conference was quite satisfactory. The symposium which we prepared has been turned over to the Hernia Committee of the Section, with the request that it be incorporated in whatever material they might issue. This will also embrace all the material that was given last year on this subject and if it is published, and it should be, there will be investigated by more than 100 doctors and surgeons in this field, making a very complete paper.

ACCIDENTS DUE TO NEW MEN.

As Chairman of the Committee of Safety and Health of the National Association of Corporations Schools, we made a careful survey of accidents and health conditions and found that from 40 to 60 per cent of the accidents which occurred were due to new men—men in employment less than six months—which shows that we can reduce labor turnover to normal proportions, that it lies within our power to reduce our accidents as they now exist from 50 per cent. In other words, labor turnover is really our most serious trouble, and if we can cut it down we will automatically cut down the number of accidents.

The moral of this is that there is still much work for the union man to do in co-operation with the employment and welfare departments in holding employees and making them more contented.

CHAIRMAN BENNETT: Mr. Elam, have you a report on the part of your committee?

REPORT OF THE PUBLICITY COMMITTEE.

Mr. Chairman and Members of the National Safety Council. The chief activity of this committee the past year has been in helping the General Manager of the Council provide bulletins for the material. I regret to report that the committee was unable to furnish sufficient copy to provide a bulletin for each weekly distribution on some distinctly foundry subject.

A number of the members of this Section have rendered

committee splendid assistance, but to make the bulletin service of the Council most effective to foundries we must have greater co-operation from the foundry members in furnishing live subject matter. This holds good whether the Foundry Section is merged with the Iron and Steel Section or remains a separate Section.

CHAIRMAN BENNETT: Mr. Cullen, Chairman of the Membership and Program Committee, I believe your report has practically been given by Mr. Ashe and by the program that we have.

MR. C. CULLEN (Gould Coupler Company): It has.

APPOINTMENT OF NOMINATING COMMITTEE.

CHAIRMAN BENNETT: I will ask Mr. Cullen and Mr. McLain to serve with Mr. Phelps on the Nominating Committee. This committee will merge with the Nominating Committee of the Iron and Steel Section and will report tomorrow morning at 9:30 o'clock. The session will be a combined meeting of the Foundry and Iron and Steel Sections for the purpose of combining in the Metal and Metallurgy Division of the Council's activities.

I think we can go right ahead with our program and transact our business. Something more, however, will be said later regarding the merging of the two Sections into the Metal and Metallurgy Division. Mr. Van Schaack and Mr. Cameron will explain the details of the amalgamation.

Our first paper is by Mr. W. E. Watters on "The Method of Training and Obtaining the Co-operation of Foundry Foremen in Safety Work." Mr. Watters.

METHOD OF TRAINING AND OBTAINING THE CO-OPERATION OF FOUNDRY FOREMEN IN SAFETY WORK.

W. E. WATTERS, SECRETARY CENTRAL SAFETY COMMITTEE,
NATIONAL MALLEABLE CASTINGS COMPANY.
MELROSE PARK, ILL.

Mr. Chairman and Members of the National Safety Council.
As I arise, this thought comes to my mind: Is it right that I should be chosen as the speaker on the subject of "The Method of Training and Obtaining the Co-operation of Foundry Foremen in Safety Work"? I feel keenly the ability of those present to talk on this

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subject, and I appreciate the kindness which permits me to do so at this time.

The method of training and obtaining the co-operation of foundry foremen in safety work needs much thought. We must go behind and beyond the surface of things. A physician, in order to get at a definite understanding of the physical structure, necessarily traces through tissue, fibre, bone and muscle. An institution seeking a method of training and obtaining the co-operation of foundry foremen in safety work must necessarily penetrate the minds of the foremen. As a physician determines the plan of construction, so you can only determine the quality of the foundry foreman through the language that he uses. To train and obtain the co-operation of any class of workmen requires much thought.

A great scientist, some years ago, discovered and presented to the world one of the greatest scientific facts relating to life that has ever made its way into our understanding. I allude to the principle of development, or growth. Our attitude toward things in general must be developed. You are undoubtedly aware that outside influences cause development, or the unfolding of qualities of mind which are lying dormant within us. Qualities, and particularly the quality of mind which should be expressed in the training and obtaining the co-operation of foundry foremen in safety work, must be developed, or, in other words, must be given preference and attention. You know and I know that no two persons hold just exactly the same thought on any one subject. If this is a fact, then we cannot have the same ideas regarding the training, developing and obtaining the co-operation of foundry foremen in safety work.

MEN MUST BE FAIRLY TREATED.

The institution with which I am connected is giving this subject much thought. We realize fully that our foremen must be men possessing executive ability—men who are capable of expressing tangible and visible ideas, men who are appreciative, men who are enthusiastic, men who are faithful, men who realize that the men under their supervision are human beings, drawing their life from the same source as they, and are entitled to equal rights, privileges and opportunities. We instruct them not only to be just to the men, but to be friendly and kind. We believe that this attitude expresses a quality of mind that is a valuable asset to the institution and to the employe.

Most of us are conscious of the fact that there are many classes of people in this world. There are some whose minds are thoroughly alive to the spirit of the occasion and others who simply let nature pass before them without the least sign of interest. They make no effort to understand the underlying principles of anything. They never evidence enthusiasm or interest over any one thing, and, therefore, cannot enthuse.

THE WORK OF THE WORLD.

The very reverse is the case with those whose minds are alive and quickened by deep thought. For instance, who are the men that have brought this great subject of Safety First before the world? Surely they must be the enthusiastic men—men of executive ability, men who are doing things! How is it possible for the pessimistic individual to enthuse over anything? For instance, over the subject we are discussing today? In the first place, this type of man has very few pounds of the great power called enthusiasm to put into the accomplishment of any purpose. He believes that no good results will follow his efforts—therefore, why should he enthuse?

Now, take the optimistic fellow, if you please. It is different with him. He holds that only good will respond to his efforts and to his living, and, therefore, he can enthuse over all. This type of man can summon a thousand pounds of enthusiastic power to his assistance. What are the results? Obstacles are cleared away.

Enthusiasm is to the workman what steam is to the engine. It is inseparably related to his action. Enthusiasm registers and manifests his interest in his work.

Do you know that we are social beings, both from a national and local point of view, whether we be superintendents, presidents or individuals without titles? I mean to say by this that we are members of local societies, such as the one represented here today, where we intermingle with others and immediately become friends. How essential it is that each one of us adopt the right kind of attitude toward one another in this meeting. It makes a great difference to me as to what kind of an attitude I take here, if I am to go away feeling that good results have been accomplished. Enthusiasm and attitude, therefore, are two essential qualities of mind necessary to the training and obtaining the co-operation of the foundry foremen in safety work.

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POWER THAT IS WITHIN.

Experience is a great power. It helps us toward the thing we have designed. We have many experiences of this in our establishment and we have put forth every effort to profit by them. Safety First movement in our establishment is as fixed as the tuition itself. We have the subject constantly in mind, and so a day goes by that we do not profit by some incident or other.

Many of us are employers of men. We know from experience how susceptible men are to discouragement. We also know how susceptible they are to good will and kind words from their superiors. The superintendent and the foundry foreman must become conscious of the fact that their influence upon the men can be developed strongly by the continuous and efficient carrying on of their work. This working principle applies not only to the effectiveness of safety appliances and the study of accidents, but also to the organization of the safety committees and welfare workers, by inviting the safety committee to take part in social activities among the workers. Only when the manager, the superintendent, foremen and all employees believe in safety and pull together to put Safety First, can all things can the maximum reduction of accidents be secured. Foundry foremen must understand that safety work and the regular operations of the plant are intimately linked.

SAILING THE SEA OF SAFETY.

We find men whose actions indicate to us that their experience might I say, the wind of their experience—is not blowing in the right direction. Their actions show that they are not fully satisfied that they are not progressing, nor are they advancing as rapidly as they feel they should. We try to explain to them that the man who masters his calling knows that the sailing of the craft in one direction does not depend upon the wind blowing that way. It depends upon the wind blowing from some direction, perhaps the very point toward which he is sailing. The sail which he hoists gives an attitude toward the wind which governs the course of their movements. The very power of the wind which would drive the craft to a rugged, rock-bound shore carries it away to a harbor. We try to show these men that their attitude toward their company is the sail of their life's craft. If may be they have adopted an attitude that the wind of their present experience

not blowing in the right direction. We ask them to exert all of their power to lift themselves out of their present experiences.

Some time ago I was privileged to read an article by Mr. J. F. Kent of the American Cast Iron Pipe Company of Birmingham, Ala., in which he states that the chairman of their board of directors does not try to see how little wage can be paid, nor how difficult, but how easy, they can make the work for their men. He also states that they believe implicitly that a man has a right to expect something more than that which he gets in his envelope. I heartily agree with him in this statement.

ACCIDENTS CAUSED BY MIND WANDERING.

We ask our men to try a new sail—the sail known as attitude. We ask them to feel kindly toward every movement that we suggest that is for their betterment and for the company's interest. Soon, by taking this attitude, we find that their old experiences pass away and their craft sails on into our executive class. We try to deeply impress upon their minds that the cause of most accidents is mind wandering. We say to our men: "If you are tying your shoe, be sure and think *shoe*." In other words, we ask them to think. *think*, THINK.

We never like the foreman who takes a wily attitude. We know positively that this attitude deprives him of power. You know and I know that people have no confidence in a crafty man. We seek among our foremen a quality known as faithfulness. You, no doubt, seek the same quality—a faithful employee. Right here let me tell you of a story I heard that brings out the point of faithfulness:

"A little, weazened Irishman had applied for a job loading a ship. He was told that he was too small, but he finally persuaded them to give him a trial. As he seemed to be making good, they gradually increased the size of his load until, on the last trip, he was carrying a 300-pound anvil under each arm. When he was half-way across the gangplank it broke and the little fellow fell in. With great splashing and spluttering he came to the surface. "Throw me a rope," he shouted, and again sank. A second time he rose to the surface. "Throw me a rope, I say." Once more he sank. A third time he rose, struggling and splashing. "If one of you fellows don't throw me a rope I will drop one of these dang things."

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MUST THINK SAFETY.

My friends, if I have said one thing on this subject that cause you to think, I will feel fully repaid for whatever I have put forth. Somehow I have been disturbed with the thought as to whether I have held steadfastly to the subject, and whether I have made it as clear to you as it appears to me. Right now another story comes to my mind that, perhaps, illustrates my point.

Little Willie, for the first time, was visiting his grandmother's farm, and there saw a cow grazing. The little fellow was out in the field with his cousin John, when suddenly he exclaimed: "Cousin John, what are those things on her head?" His cousin answered: "Why, those are horns." They walked on together and had not gone very far when the cow mooed, long and loud. In quite a fever of excitement little Willie looked up at his cousin and asked: "Cousin John, which horn did she blow?"

My friends, I can only leave you with this thought: They expect to find in our foremen five qualities of mind, namely: Association, Gratitude, Faithfulness, Co-operation and Enthusiasm.

DISCUSSION.

CHAIRMAN BENNETT: Discussion is now open on this paper. I would ask each gentleman to state his name and the name of his company when he arises, so that the stenographer can keep a correct record. We would be very glad to hear from any person that would like to ask Mr. Watters a question, or to add to the paper.

MR. ROY E. BONSBIB (United States Metals Refining Company): How does Mr. Watters arouse this enthusiasm? We all recognize the fact that that is necessary, but how do you arouse it?

MR. WATTERS: Possibly the manner in which we go after accidents and injuries and the methods in which we hold our safety meetings have something to do with it. We have eight plants scattered over the United States, each of them holding different kinds of safety meetings and getting together in different kinds of ways. By an analysis of these methods we are able to pick out the best.

In all of our plants we have a plant safety committee, composed of the foremen of the various departments. This remains constant. We have a workmen's safety committee which changes every month. The workmen's committee is selected by the foreman of the department, who knows his men, and there are anywhere from four to eight men in each department. These men hold their meetings

a week. The foreman of the department is chairman of this committee. They make all the reports and every week these reports are submitted to the plant committee of the men from the various departments. The general superintendent acts as chairman of this committee. This committee discusses the reports turned in by the workmen's committees. It does not make a bit of difference how foolish they look, they are all taken in their turn and the foreman, when he goes back to the plant committee, reads the minutes of the previous meeting and must give a reason to his men why things they have called attention to have not been acted upon to the satisfaction of the men. That keeps up the enthusiasm of the workmen. Here is the way we get after our foremen: If an injury happens the safety inspector and the foreman of the department and his under foreman are immediately called on the carpet—they must tell exactly how that accident happened, no matter who it hurts, and they do not like to be called on the carpet very often.

DISCIPLINE FOR ACCIDENTS.

When an injury or an accident does happen they make a point to investigate immediately and report to the safety man, and the safety man and the superintendent of that department talk it over and make their report to the general superintendent. Then shortly afterward a meeting is held, calling all the foremen of the various departments, and they hold a regular little trial over it and determine who was at fault. The man that is at fault must take his medicine, it makes no difference who it is. Some of them get a week's lay-off and some of them are discharged, but we discipline them in every case.

It is possible in this fashion, by getting after the foremen and the workmen, to secure the interest and co-operation of the foremen, because they want to hold down the rate of accidents in their department.

Does that answer your question?

MR. BONSB: How serious must the accident be before that procedure is followed?

MR. WATTERS: Anything from a day lost up to whatever it might be. A mere scratch or a mere slip of a hammer or a wrench slipping off; if a workman scratches himself, something of that kind, it is reported and the department of the safety engineer takes it up and settles it; but anything that looks like a day lost must go through a trial.

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CHAIRMAN BENNETT: Mr. Watters, I would like to ask you a question: Do you carry on the same investigation and procedure in all accidents, even though no one was injured?

MR. WATTERS: If we know of it?

CHAIRMAN BENNETT: Yes.

MR. WATTERS: Yes, we would.

CHAIRMAN BENNETT: Do you have a system of knowing these accidents when no one is injured?

MR. WATTERS: Only when we get a report from some workmen or the foreman of the department.

CHAIRMAN BENNETT: You do not have a mechanical accident report?

MR. WATTERS: No, we do not have a report of that kind or a report that is made up every day by inspectors of machinery.

CHAIRMAN BENNETT: That is what I mean.

MR. WATTERS: That report is made up daily; various inspectors on various machines make out these reports.

CHAIRMAN BENNETT: Another question: What class of men have you found that you get the best results from? The man who is directly over the man?

MR. WATTERS: No, the general foreman; the foreman who is at the head of the department.

MR. MCBAIN (Union Carbide Company): Who disciplines the foreman, a fellow foreman or the superintendent?

MR. WATTERS: The superintendent.

CHAIRMAN BENNETT: We will go to the next paper. On the program you will note there is no speaker's name, but Mr. Ash prepared the discussion on this topic and I will ask him to present his paper. He has had considerable experience in his plant or work.

EXPERIENCE WITH AMBRINE AND PARRESINE PITTSFIELD WORKS.

S. W. ASHE, EDUCATIONAL AND WELFARE DEPARTMENT, GENERAL ELECTRIC COMPANY, PITTSFIELD, MASS.

Mr. Chairman and Members of the National Safety Council:
One of the most beneficial medical discoveries which has come out of the present European struggle has been the use of ambrine for the treatment of burns. Formerly, when a person was badly burned

a considerable surface, it was exceedingly difficult, even where skin grafting was resorted to, for the patient to recover. With the absorption of the body from the burns which occurred, kidney trouble resulted many times and the patient died. Also when the dressings were changed, the pain which the patient suffered was very intense, as the bandage coming off took with it many times some of the new skin which was forming. With the ambrine method, much of this trouble has been eliminated and the possibility of recovery has greatly increased.

Ambrine itself is a very fine grade of paraffin containing anti-septic substances. Various substitutes have been developed in this country, due to the difficulty of obtaining an adequate supply of ambrine. Parresine, which is composed of a light grade of paraffin containing 2 per cent of eucalyptus is one of these substances. Whatever material is used is melted in a water-jacketed atomizer and raised to the temperature of 150 degrees Fahrenheit. It is then applied to the surface of the burn in the form of a fine spray. The wound is first thoroughly cleansed with a wash such as Carrel-Dakin solution, then thoroughly dried before the paraffin mixture is applied. This is best accomplished by means of an electrical hair dryer. After the warm glaze coating has been applied to the burned surface, thin sheets of cotton gauze are placed over the surface of the burn and more ambrine or substitute is applied by means of a camel's hair brush. In this way the wound is completely sealed in a semi-adhesive shell.

This process keeps out the air from the wound, and eliminates a very large part of the pain which is usually caused by such burns. Light bandages are placed over the ambrine for a period of several days. When the bandages are removed the shell easily peels off without bringing the new tissue with it. The results which have been obtained from this new method of treatment, which is now being used by the United States Steel Corporation besides our Schenectady and Pittsfield Works, has resulted in decreasing notably the period of time necessary for recovery over the old method. Through the efforts of Mr. C. A. Coffin, Chairman of the Board of Directors, who has been interested in war relief work, and Mr. A. L. Rohrer, the company was able to secure a fair quantity of ambrine. About five pounds of the material was given to the Pittsfield Works. Shortly after we received the material a local woman was very badly burned by having a lamp explode in her hands while on a stairway. She ran downstairs with her clothes on fire and was badly burned

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about the lower part of the body. Dr. Thomes in conjunction with Dr. Paddock and Dr. Tracy made several applications of ambrine to the woman, and later followed the treatment with the use of parresine. It is interesting to note that the woman is almost entirely cured.

We have been using parresine as well as ambrine at the Hill Hospital, also at our Emergency Hospital. We have had several opportunities to use it with success on foundry burns.

Dr. Wm. O'Neill Sherman, Chief Surgeon of the Carnegie Company, was really the first to introduce it in this country. It is largely through his efforts that the new method has been brought up. One notable result in the treatment of third degree burns with the ambrine method is that no scars are left. The following letters from Dr. Sherman and Miss MacInnes are of interest:

EXPERIENCE AT PITTSFIELD.

The first burn case which I treated with parresine, in our Emergency Hospital, was that of a boy of 18 employed in the foundry who received a hot iron burn. This case was very unsatisfactory to the fact that he would not leave dressings on the burn and would not come for treatment regularly.

The second case was a burn on the whole back of the right arm of a girl from the Heating Device Department, which was caused by a gas torch. Parresine was applied immediately and I dress the burn every morning, and after six dressings the hand was entirely healed leaving no scar.

I approve of the treatment very much and this latter case was referred to Dr. Tracy, and he is very much pleased at the result. This new method takes from 55 to 60 per cent as long as the old method.

I. MACINNES, R. N.

CARNEGIE STEEL COMPANY.

General Offices: Carnegie Building, Pittsburgh, Pa.

April 23, 1911

*Dr. William O'Neill Sherman, Chief Surgeon,
General Electric Company, Pittsfield, Mass.
Attention Mr. Sidney W. Ashe.*

Dear Sir: In reply to your letter of April 20th, will say we have not used "parresine" but we have not as yet arrived at any definite

clusions as to whether or not it is equal or superior to "ambrine," but certainly the results secured with "parresine," or any other paraffin preparations, are far superior to those secured by the old method.

I am enclosing herewith formula which is known as "English Formula No. 7;" this has given excellent results. I certainly would use the formula enclosed. "parresine" or a similar product.

Most sincerely yours,

WILLIAM O'NEILL SHERMAN.

FORMULA FOR NO. 7 PARAFFIN.

Resorcin	1 per cent
Eucalyptus oil	2 per cent
Olive oil	5 per cent
Paraffin molle	.25 per cent
Paraffin durum	.67 per cent

Melt the paraffin durum and add paraffin molle and olive oil. Dissolve the resorcin in absolute alcohol (soluble 2 in 1); add the alcohol resorcin and lastly add the eucalyptus oil when the wax has cooled to about 55 degrees Centigrade.

A smaller amount of resorcin may be used. The whole of the resorcin does not remain in suspension, and we have used a paraffin containing 0.25 per cent resorcin with good results.

Difficulty having been experienced in obtaining resorcin in large quantity, beta naphthol, which has the additional advantage of being a cheaper antiseptic, has been substituted for resorcin in more recent preparations:

Beta naphthol	0.25 per cent
Eucalyptus	2.0 per cent
Olive oil	5.0 per cent
Paraffin molle	.25.0 per cent
Paraffin durum	.67.75 per cent

We have employed No. 7 paraffin in certain stages of the treatment of trench feet. The mode of application of paraffin to the ulceration following frost bite is in every respect similar to the application of paraffin in the treatment of burns, and the results have been equally satisfactory.

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CARREL-DAKIN SOLUTION.

As you all perhaps know, there are two very great things, important things, that have come out of the European war for industrial surgeons. Those two things are the use of the Carrel-Dakin solution for the treatment of wounds and the use of the ambrine or paraffin method for the treatment of burns. I am not a surgeon and I have some very able men here, so I am going to call on them to show you the technique and answer any questions.

The Carrel-Dakin solution method of treatment, perhaps, if you are familiar with. The method as it is described is simple. If you have a deep cut, for instance a cut that comes with a shell fragment, the first thing they do is to thoroughly clean the wound. If there is any tissue in the wound that ordinarily would try to save with this method they cut it away, so that the liquid which is supplied will be able to make contact with all of the wound. Then they shave around the outside of the wound and get it as clean as mechanical means will permit. They pack gauze compress in the wound and then they have a receptacle—with a little tip on the bottom—that jar holds the Carrel-Dakin solution. That solution is made up of chlorine of lime of certain definite proportions—the exact formula has been given in the medical journals by Dr. Sherman. If you do not want to make it you can use substitutes, such as chlorozene, which you can purchase from laboratories. I understand it does very well. The secret of the Carrel-Dakin solution is that it is a very strong germicide, I should say approximately twenty times as powerful in killing germs as an ordinary germicide you would use.

From the container which holds this liquid they run a tube near the wound, terminating in another little glass receptacle. I might draw a picture of it better than to attempt to describe it in words.

This is the glass vessel (the speaker made a drawing) a rubber tube comes down from the vessel and on the end there is a little glass receptacle which has little outlets to it, depending on the number of tubes they want to attach. They run little tubes from the glass vessel down into the wound—little bits of rubber tubes that are not more than a quarter of an inch in diameter. The ends of these are tied with pieces of string. They make a number of little perforations at the end of the tube and they may have four or five coming down lying among the compresses. They have a net cock here so they

allow the liquid to run down into the wound, so that every two hours they can keep the gauze in the wounds thoroughly saturated with this liquid.

CHANGING THE DRESSING.

Every twenty-four hours the dressing is changed. In other words, the principle of the treatment, as I gather from a layman's standpoint, is like the way we would treat a nail puncture. You know that with a nail puncture, when a nail runs into the foot and is drawn out, there is a tendency for the wound to heal across the top first and if you are not careful an abscess is likely to form at the bottom of the puncture, and as a result you have blood poisoning or some form of serious infection. You are familiar with the fact that in our emergency hospital the treatment of such a wound by the first-aid man is very simple. They just take a little piece of bandage or gauze and saturate it with boracic acid and put that over the outlet to the wound and bandage it on. The surface of the wound is also painted with a little iodine.

Every two hours we change that compress. In other words, the object is to keep the compress wet, and by keeping that little compress wet we keep the top of the wound open. If you look at a nail puncture the next morning after you have used the dressing you find a little bit of a hole there, maybe the size of a nail point, but that is enough to keep that wound open and all the infection from the bottom will come out.

My idea is that this thing works the same way. By keeping the gauze saturated with this solution down in the wound it keeps all the little pores of the wound open, so that all of the infection can come out. As fast as the germs come out they are killed by this powerful germicide.

After the wound has been thoroughly cleansed they make microscopic tests for a certain length of time and when they are sure there is no infection they close the wound. The whole success of the method depends, 99 per cent, I believe, on the technique and care which is used in handling everything. This new method has been a wonderful help in surgical cases, because a great many limbs have been saved that ordinarily might have been lost.

The second portion of this subject is the anbrine treatment for burns. In addition to the descriptive article reproduced from our work paper, *Current Notes*, I am including herewith an interesting article from Dr. McMullen, covering the experiences of our Schenectady Works.

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A CASE OF SEVERE THIRD DEGREE BURNS TREATED WITH AMBRINE

By Charles G. McMullen, M. D., Schenectady, N. Y.

The new and radical treatment described in this article has to date been practiced principally upon the horribly severe burns received in warfare. The reports that have been made of its wonderful healing possibilities induce us to recommend that the medical profession consider its possibilities in treating electrical burns. In the article Dr. McMullen describes the technique of the treatment and reports the progress of healing in a particular case. The appendix very interestingly summarizes the literature on the paraffin treatment of burns.—(Editor *Current News*.)

The letters by Miss Edith May, published in the *Outlook*, April 1916, excited a somewhat skeptical interest in the use of ambrine practiced by Dr. Berthe de Sandford at Issy-les-Moulineaux, France. The caustic editorial of Dr. Simmons in the *Journal of the A. S. S. I.*, Aug. 12, still further confirmed my skepticism. In February, 1917, at the Meeting of the Third Conference of Physicians, Department of Labor and Industry at Harrisburg, Pa., after hearing Dr. Sherman's paper on the Carrel-Dakin technique, in the discussion of which paper Dr. Sherman made some very commendatory remarks about the ambrine treatment, my real interest in the subject was aroused. The atomizer and apparatus necessary to carry out the technique were purchased at Philadelphia, and a supply of ambrine was secured through the efforts of Mr. A. L. Rohrer, of the General Electric Company.

I had under treatment, at this time, a patient who had been extensively burned about the face and hands by a hydrogen gas explosion, and more deeply burned about both thighs and legs from ignition of his clothing. He had been under treatment since February 5, 1917. The burned tissues of the legs were sloughing and he was having considerable constitutional disturbances as the result of absorption. Large boric packs were used until the sloughs had separated, which took place on the 21st, sixteen days after the burn was received.

At this time the use of ambrine was begun. The patient was somewhat skeptical about "experiments," and hesitated about his use of the new treatment. After the first application of ambrine he was fully converted, and the comfort experienced while wearing the dressing and the absence of suffering while the dressing was changed was exceedingly gratifying to both patient and myself.

I expected, of course, that several operations of skin grafting

very remarkable advance of epithelium and the small autografts developing from time to time, which also developed with the same rapidity, obviated the necessity of grafting. The daily dressings were continued until May 30th, when the patient was discharged from the hospital.

Its remarkable efficacy as regards rapidity of growth of newly formed epithelium is, I believe, due to the fact that this dressing does not in any way interfere with the delicate layer of advancing epithelium.

The granulations never become exuberant; therefore it is never necessary to use escharotics to destroy them.

The period of convalescence is shortened one-third to one-half, and the scar tissue is unusually soft and pliable and, as yet, this case has shown no tendency to contractures.

Regarding the technique, the first coat of ambrine is best applied with an atomizer, even a soft camel's hair brush is somewhat painful. An atomizer with a hand bulb is not satisfactory, however. An electric compressed air apparatus obviates this difficulty.

The ordinary absorbent cotton teased out in thin bits and applied was found to be much better than sheet cotton. The dressing must be changed each day.

A résumé of the literature prepared by Helen R. Hosmer, of the Research Laboratory of the General Electric Company, is appended.

Appendix—Literature on the Paraffin Treatment of Burns.

Reference ¹ gives a brief general account by the correspondent of the *Medical Record* of Paris on the efficacy of ambrine treatment of the terrible burns caused by liquid fire from shells. A hospital of 150 beds for the treatment of such burns has been established at Issy-les-Moulineaux, just outside of Paris, under the charge of Dr. Berthe de Sandford, the originator of the ambrine treatment in France. The substance was originally devised as a treatment for rheumatism, but application in an emergency to extensive burns gave such good results that Dr. Sandford was led to advocate its use even in the face of much indifference from his colleagues.

Hull ² has investigated the ambrine treatment for burns and

¹ *Medical Record*, 91, 160-1, Jan. 27, 1917.

² Hull (Roy Army Med. Corps), *British Medical Journal*, Jan. 13, 1917. *Canadian Practitioner and Review*, 42, 169-73, April 1917. *Abs. Jl. Amer. Med. Assoc.* 68, 373, 1917.

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believes that it produces singular rapidity of healing in slight and improved results in bad burns:

"Observations carried out in a military hospital gave one impression that the treatment was valuable. Burns healed rapidly; constitutional symptoms rapidly abated; pain was reduced to a minimum; scarring appeared to be obviated, or at any rate not apparent. The need for grafting large burns appeared avoided. * * * The patients were singularly free from sepsis. * * * Observers who had large experience of burns treated with picric acid, ointments, and other methods in ordinary use, unanimously of the opinion that the paraffin method was superior to the older methods. The experience of those who had witnessed the results of burns after liquid fire attacks was that the ambrine treatment would save many lives and accelerate the recovery of burns."

He attributes its efficacy to mechanical factors; protection from air, prevention of damage to newly formed granulations, keeping the tissues immobile by the splint-like effect of the wax, and the heat of application encouraging the flow of blood and lymph to new capillaries.

By laboratory experiments he found that heating a suitably pure paraffin to 130 degrees C. with superheated steam lowered its melting point two degrees and made it mobile and workable. The results obtained by the use of such paraffin were indistinguishable from those obtained with ambrine. But addition of antiseptics and stimulating substances was always found to give great help in cleaning up the wound, etc.

He prepared a formula, known as No. 7 paraffin, which gave excellent results, better than ambrine, healing severe burns without cicatrices or extensive scarring.

This consists of:

Resorcin	1 per cent
Eucalyptus oil	2 per cent
Olive oil	5 per cent
Paraffin molle (soft)	25 per cent
Paraffin durum (hard)	67 per cent

The resorcin may be reduced to 0.25 per cent, or 0.25 per cent betanaphthol may be used instead.

Hull uses the paraffin for the first dressing, sometimes replacing it after two days, for two days with hot boric fomentations. The f

is first washed with sterile water and dried, preferably, with an electric blower. Without interfering in any way with blisters, it is then covered with wax at 50 degrees C. applied with a brush, sterilized in wax, or in very painful cases with a metal spray. A very thin layer of cotton wool comes next and is covered with a second layer of paraffin, more wool and a bandage. The dressing is changed daily, until the pus formation is small, and then every two days. Dead skin layers are removed at the second dressing. Sloughs usually separate after a few dressings.

"The results obtained by the use of No. 7 paraffin have surpassed the results obtained by ambrine or any other tried preparation. Severe burns of the third degree, accompanied by sloughing, and in a very septic condition, have cleaned and taken on healthy repair under this treatment. Severe burns of both palmar and dorsal surfaces of the hands, extending to the tendon sheaths, have healed in three weeks without contracting cicatrices." * * *

"The treatment is practically painless and patients rarely complain of pain after the first application. It has never been found in the least necessary to give an anaesthetic for the first or subsequent dressings. The rapidity of healing, the absence of sepsis or pain, the healthy new skin resulting without contractile cicatrices or deformity, have been really remarkable. Burns come clean more rapidly than under ambrine treatment. Sloughs of deep tissues, in some cases down to bone, readily separate, and the burns become clean."

Matas² explains the lack of interest shown by the medical profession in the use of ambrine by the fact that its originator has allowed it to be exploited as a proprietary product and has kept its composition secret at a time of so great a crisis. His personal experience has confirmed the favorable reports of others. The history of the discovery of ambrine given in reference (1) is repeated and Hull's article describing the beneficial action of the ambrine treatment is quoted almost in full.

Matas has prepared Hull's formula No. 7 paraffin containing betanaphthol, of which the cost is less than 18 cents a pound against \$5.00 a pound for ambrine.

Experience with the paraffin treatment in some ten cases has been very favorable. It is easily applied at 100 degrees F. by means of a cotton mop for the first layer and a brush for the subsequent layers, of which there should be several in the more movable regions.

² Matas, *New Orleans Medical Journal*, 69, 677-88, 1917.

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Drying by gentle mopping and exposure to the air is sufficient. The mixture is soothing and pain ceases immediately in every type of burn and the relief continues while the wax is in place. The valuable observations of others are repeated.

Dowd⁴ gives clinical details of several bad burns treated and shows comparative results for paraffin and other dressings. He gives a mixture of

Paraffin	2 part
Vaseline	2 part
Stearic acid 1 part, which melted at 112 degrees F. (41 degrees C.).	

Other cases where ambrine was used were mentioned in discussion. The dressings were very painful and there was little evidence of superiority in the treatment.

Haworth (Western Pennsylvania Hospital)⁵ recommends the treatment of severe burns or other wounds that fail to epithelialize by the application of a wax made up as follows:

Paraffin (Gulf Ref. Co., Pittsburgh)	7.0 gm
Liquid petrolatum, U. S. P.	3.0 cc.
White beeswax	10.0 gm
Rosin	7.0
Resorcin	0.2
Sudan III.	0.05
Alcohol (95 per cent)	10.0 cc.

Other ingredients desirable for special cases may be added. Directions for mixing are given.

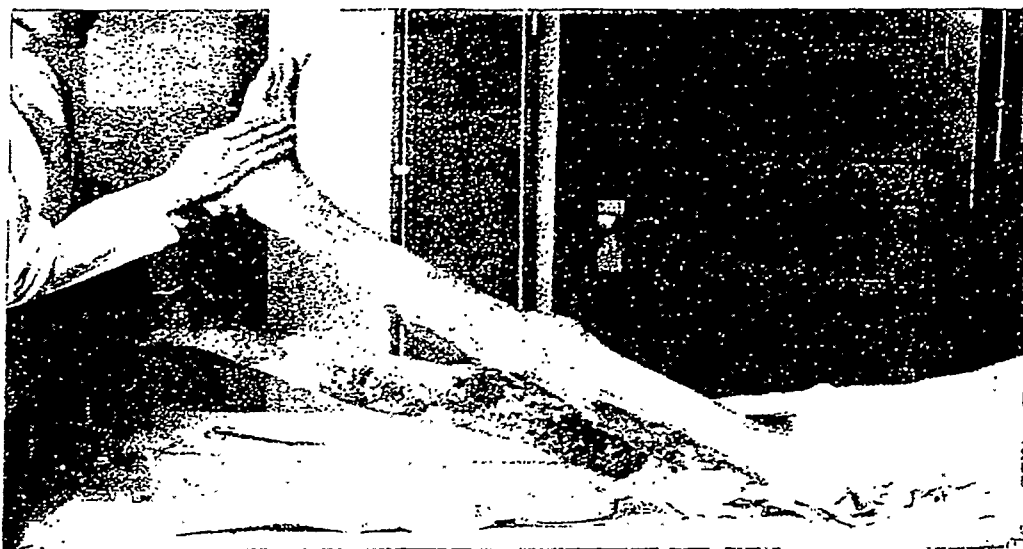
Reference⁶ gives the formula of parresine, a mixture said to have the same properties as ambrine, as follows:

Paraffin (M. P. 48-49 degrees C.)	94-96 per cent
Gum elemi	0.20-0.25
Japan wax	0.40-0.50
Asphalt	0.20-0.25
Eucalyptol	2.00
Alkannin and gentian violet to color.	

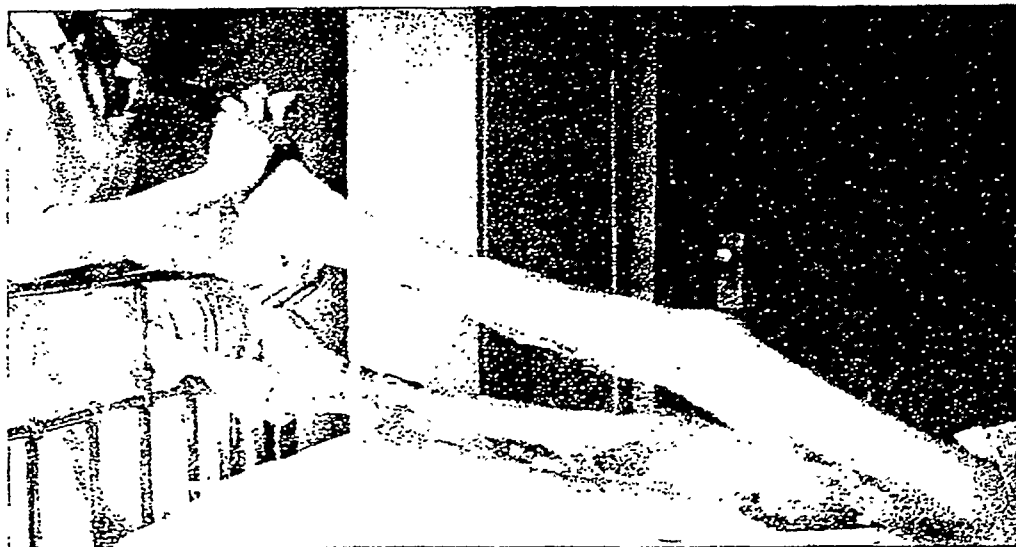
⁴ Dowd, *Annals of Surgery*, 65, 781-5, 1917.

⁵ Haworth, *Journal Amer. Med. Assoc.* 68, 1404, May 12, 1917.

PHOTOGRAPHS SHOWING PROGRESS OF BURNS TREATED
WITH AMBRINE AFTER ONE, TWO, THREE, AND
FOUR MONTHS



NO. 1. MARCH 3, 1917.



NO. 2. APRIL 2, 1917

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This is prepared by the Abbott Laboratories, Chicago. patent. Trade mark applied for.)

Leech[†] gives the brief history of ambrine and describes appearance of the three similar preparations. Hyperthermic resine and Mulene.

Ambrine has about the following composition:

Paraffin	97
Fatty oil (sesame?)	1
Asphalt-like body	0
Coloring matter and undetermined	1

Mulene appears to contain paraffin, beeswax, a fat-soluble dye, and considerable rosin.

Leech gives directions for making a mixture of:

Paraffin (M. P. by U. S. P. method 47.2 degrees C.)	97.5 g.
Asphalt	from 3-5 drops
Olive oil	1.5 cc.

This closely resembles paraffin, melts at 45.4 degrees C., is pliable and strong at 38 degrees C., adheres exceedingly well to skin, and detaches easily. The cost of materials is about 10¢ a pound.

Leech has examined and determined the properties of 25 different brands of paraffin and the proprietary products similar to ambrine. The values are given. He concludes that nearly all have the properties that would make them useful. Several appear superior to ambrine and it probably could be substituted for it. Such

"Paraffin 118-120 F.," Standard Oil Company of Indiana.

"Paraffin 120-122 F.," Standard Oil Company of Indiana.

"Paraffin No. 9," Waverly Oil works, Pittsburgh.

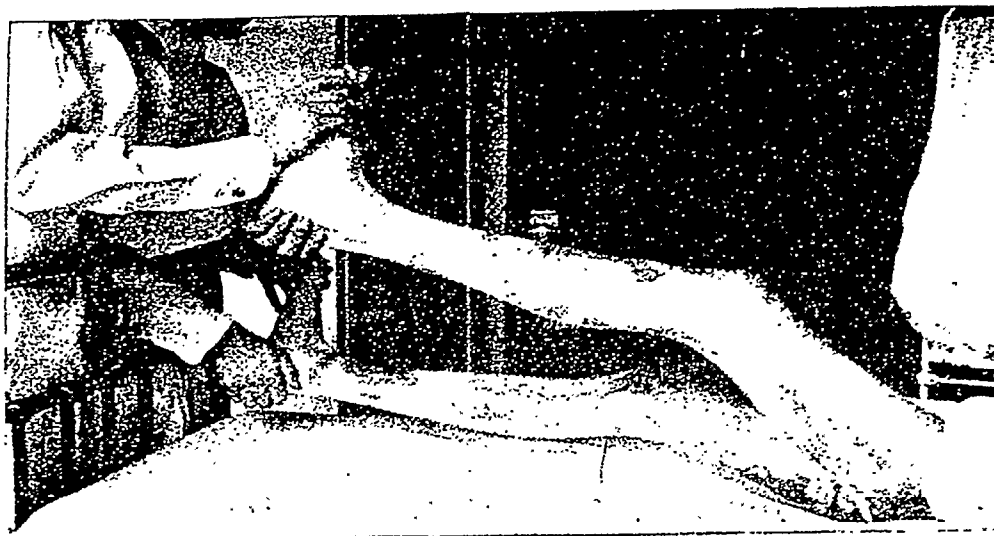
"Hard paraffin," Robert Stevenson & Co., Chicago.

"Paraffin 118-121 F.," The Atlantic Refining Company, Philadelphia.

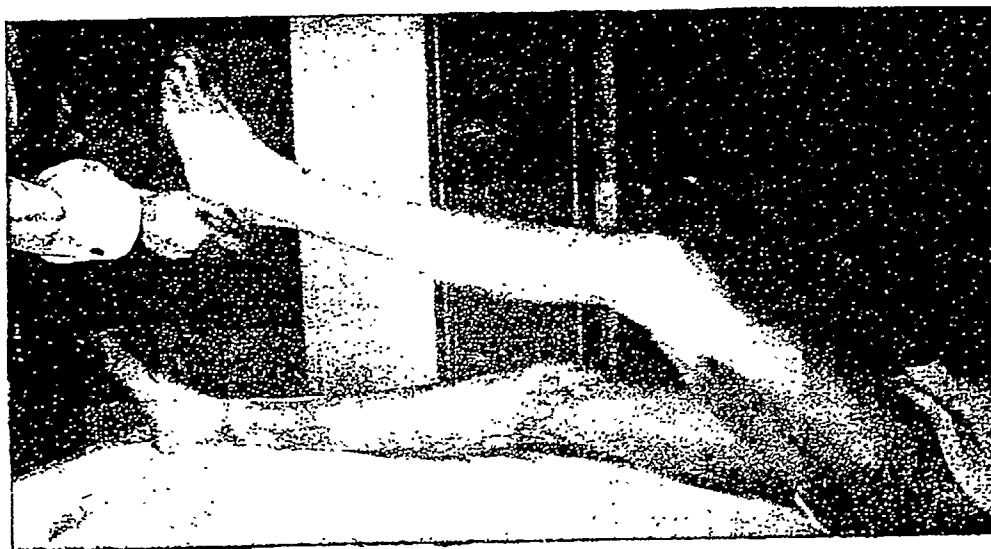
Sollmann^{*} has studied the physical properties of a series of paraffin mixtures designed for use in the place of ambrine and other similar proprietary products now appearing. He has correlated the important properties as: melting point between 48 and 53 degrees C., hardness, ductility, and pliability, and he has de-

[†] Leech, Journal Amer. Med. Assoc. 68, 1497-1500, 1917.

^{*} Sollmann, Journal Amer. Med. Assoc. 68, 1037-41, 1917.



NO. 3, MAY 2, 1917



NO. 4, MAY 28, 1917

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simple measures for the last three which he explains quite fully. He gives a table of the properties of 28 substances, none containing more than two constituents, of the following classes:

- I. Paraffin
- II. Paraffin-wax
- III. Paraffin-asphaltum
- IV. Paraffin-oil
- V. Paraffin-petrolatum.

The commercial paraffins, melting between 48 and 53 degrees, are quite similar to ambrine, possibly a little more fragile. The addition of small quantities of wax modifies the properties very slightly. The proprietary products, Ambrine, Mulene, and Parresine are of this class and approach very closely in properties to the simple paraffins. The last named is softer and more fragile than ambrine. The paraffin-asphaltum mixtures are distinctly more pliable, adhesive, and capable of forming thinner layers, but do not form perfect films. Paraffin-oil combinations are considerably softer and more pliable than the paraffins. The paraffin-petrolatum mixtures are very greasy, and crumble easily.

Tests of their behavior on application to the skin showed that the three proprietary mixtures mentioned and some nine of the simple mixtures did not differ essentially from the simple paraffins.

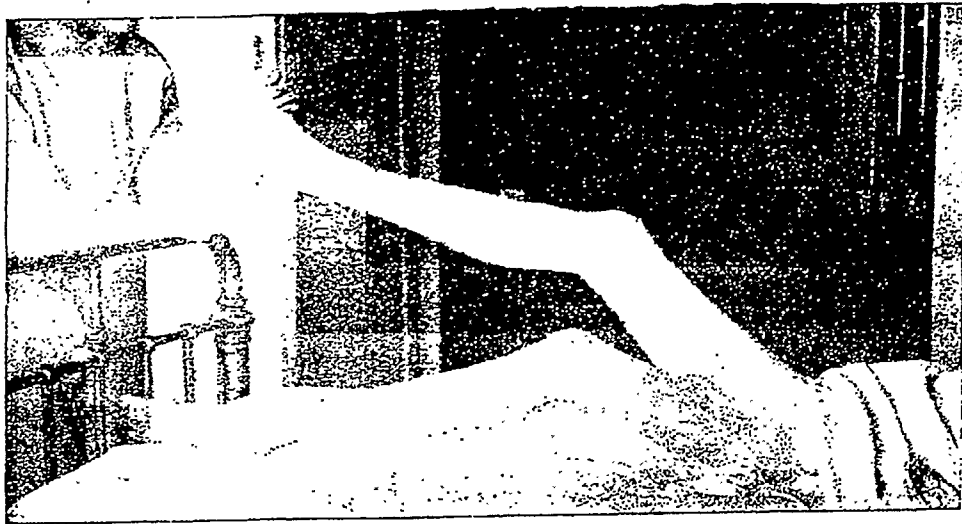
Sollmann² continues his experimental studies of the paraffin treatment of burns and other open wounds by considering the effect of the value of the various constituents upon the physical properties and reporting clinical results.

Simple paraffin will accomplish all that any of the mixtures can do. Admixture of other waxes produces no improvement except that asphalt does increase adherence a little. Rosin and most of the waxes tried raise the melting point. The effect of the addition of some fourteen different oils, etc., is given, but none produced significant improvement.

Certain paraffins are very superior to others. The choice should be those which are liquid at or below 50 degrees C. and the resulting film should be pliable at 28 degrees C. and ductile at 31 degrees C. Such are easily produced. Addition of antiseptics is of no value, as only an infinitesimal quantity reaches the surface.

Sollmann finds that the application of the first coat is apt to be painful, and avoids the difficulty by preceding it with a coat of liquid petrolatum, applied with an oil atomizer. To this may be added

² Sollmann, *Journal Amer. Med. Assoc.* 68: 1700-1901, June 16, 1917.



BURNS COVERED WITH THIN FILM OF AMBRINE



SHOWING METHOD OF APPLYING AMBRINE

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medication desired. The author is working out a series of solutions for this purpose. A film of cotton and the paraffin coating are applied in the usual way.⁴

Sollmann states that almost all surgeons who have used paraffin treatment are more or less enthusiastic as to its advantage over the older methods of treatment. As it is particularly desirable at this time to get a correct estimate of its value as far as possible, he proposes a number of methods of comparing its effect with that of other methods. He also suggests a number of substances, local anesthetics, antiseptics, epithelial agents, etc., should be tested out in conjunction with the use of the initial coating of petrolatum.

Beiter¹⁰ (of the United Alloy Steel Corporation) has used paraffin mixtures with various oils, antiseptics, etc., on over dressings of burns and lacerated wounds. In the absence of observed advantage these mixtures were discarded in favor of commercial paraffin, "parrowax." The method of application proposed by Sollmann was found preferable to direct application with brush, especially by the patient.

Beiter seems to find the chief advantage of the paraffin treatment from the fact that the granulating surface does not grow in and adhere to it as it does into gauze, and consequently is not disturbed at redressing. This very much increases the rate of epithelialization and the comfort of the patient. The method produces quicker healing of superficial burns than any other familiar to the author does not, however, shorten the time of healing nor decrease scar tissue formed in deep burns. The comfort at dressing is greater than with any other treatment. The firmness, rigidity and smoothness of the covering is also conducive to comfort at times. Also, when properly applied, it is cleaner than any dressing because the discharges are confined, do not soil the dressings and produce no unpleasant odor.

The paraffin dressing is inexpensive, a pound of wax and a quart of liquid petrolatum together costing about 65 cents and being sufficient for many burns. It replaces the rather expensive gauze, however, time-consuming.

Hudson,¹¹ after mentioning the fact that the early skeptics

¹⁰ Beiter, *Journal Amer. Med. Assoc.* 68, 1801-2, June 16, 1917.

¹¹ Hudson, *Med. Dir. N. Y. Medical Journal*, 105, 301-2, 1917. *E. Pont de Nemours & Co. Medical Record*, Jan. 27, 1917, p. 160. *Can.*

physicians concerning the ambrine treatment of burns was due to the fact that the substance recently made its appearance in France as a patent medicine applicable to rheumatism and other ailments, describes a spraying apparatus which he had to devise and make for his own use. The mixture has to be kept between 50 and 70 degrees C. during application, and this necessitates the use of an electric heater for the air used in order to avoid solidification in the nozzle. An illustration and dimensions are given.

The apparatus, which is not patented, works perfectly and with a 10-lb. air pressure and a hole in the nozzle the size of a No. 47 drill an area of one square foot can be covered in about two seconds, a great advantage in extensive burns. A smaller hole may be better for ordinary use. The container should hold about two pounds of melted ambrine.

It is necessary to have a good volume of air as from a compressed air tank or an electrically operated automobile pump, such as the "Lectroflator." The latter must have a safety valve to keep the pressure down. Hand bulbs and small pumping machines are not satisfactory.

The few cases in which the treatment has been tried indicate considerable good in the method, though it may be advisable to give a preliminary cleansing of the wound as by wet dressings of Dakin's solution for a day or two.

Application is not painful if the ambrine be kept below 70 degrees C. and redressing is easy, rapid, and painless.

MR. ASHE: I know there are many men more able than I to give you information on this subject. Dr. Lauffer is here and will give you all the details.

AMBRINE TREATMENT INDISPENSABLE.

MR. J. STANFORD BROWN: In the early part of 1916 my attention was drawn to the ambrine treatment and I immediately asked our surgeon, Dr. Henry, if he would not try it out if he had not already done so. He told me he had not, but he had been considering it. After that he started right in and we have used it ever since and would not be without it for anything. I want to emphasize every word that Mr. Ashe has told you in regard to the comfort to the patient and the efficiency with which the ambrine acts and the ease of redressing. We have found it indispensable.

I am happy to say we do not have any large number of deep burnings. We are fortunate in our steel mill. Of course, we might

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have a spill on the open hearth or something of that kind electric sparks, but in the three years that I have had charge of work I am happy to say that we have been spared that sort of terrible affliction to our men. I can only add in conclusion that we have not tried it, for God's sake try it—you will never stop us.

MR. W. L. CHANDLER (Dodge Manufacturing Company) would like to ask one or two questions. In the first place, did the Carrel-Dakin solution bite? That is, is it a painful application? Another thing, did I understand from Mr. Ashe that ambrine was applied more than once? How many applications and how frequently? How do you get the old application off?

CHAIRMAN BENNETT: I suggest that as we have three persons present that I know have had experience in this field, possibly a discussion will answer that. You can ask them questions and they take the floor.

SECRETARY ASHE: I would much rather have the speaker answer such questions.

CHAIRMAN BENNETT: Dr. Lauffer of the Westinghouse Electric and Manufacturing Company.

DR. C. A. LAUFFER (Medical Department, Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.): The paraffine preparation for burns is made differently at various places; it is composed of hard paraffine and soft paraffine, or paraffine and white beeswax. The principle involved is that the hard paraffine cracks and breaks; it is necessary to have a flexible envelope covering the burned part. Oil of eucalyptus and other ingredients are sometimes used to enhance its antiseptic properties.

The precise composition of ambrine is not known. It is a proprietary preparation and has been selling for about \$5.00 a pound, but the preparations that are substituted for it give the same results, and some of the formulæ will not cost over 30 cents a pound to make up.

Two very good preparations made in Pittsburgh are cerele and mulene. Some of the very worst burns handled in the Pittsburgh district are treated with cerclene, mulene and West Penn. We have employed them with success, in the treatment of burn wounds involving considerable loss of skin.

APPLYING THE TREATMENT.

Now, as to the application. Burns of the first and second degree, treated at once by the paraffine method, are very

healed. Third degree burns are less successfully handled when treated at once with paraffine preparations. Under circumstances where there is considerable necrotic tissue resulting from the burn, that necrotic tissue, when covered up by paraffine and sealed hermetically from the air, may become very offensive. One of the prevailing indictments against the ambrine treatment was the fact that when the ambrine dressing was removed, the wound was so offensive that the patient could scarcely be tolerated in the hospital. Consequently, at the present time, the wound is made clean and sterile by means of the Carrel-Dakin solution, before the paraffine treatment is inaugurated.

By the old methods of surgery an area of gangrene was allowed to remain until Nature formed the line of demarcation and it was ready to come off itself. At the present time, when gangrene arises, the area of gangrene may be cut off with scissors or removed with a knife, and the wound, thus freed from necrotic tissue, is treated with Carrel-Dakin solution until the area is relatively sterile. The paraffine method may be resorted to for closing in the skin defect. The same method prevails in the treatment of burns.

In my paper on "Low-Voltage Hazards," to be read before the Iron and Steel Section of the National Safety Congress, unguentine is recommended in the treatment of electric burns. The blisters of second degree burns are allowed to remain until they become uncomfortable to the patient before scissoring them away, when ointments are employed. Under the paraffine method of treatment, however, the blisters are removed at once or within a day or two. All the loose outer skin is scissored away and the paraffine envelope is placed on the clean, living tissue.

Now, as to the frequency of application. The dressings are made once each day. A great deal of exudate, a gelatinous substance, comes out of the wound, and it is that jelly-like substance which separates the paraffine from the wound and makes the paraffine dressings easily removed. It is on this account that the dressings are so rapidly removed. When the dressings have been removed, the exudate from the wound, the loose skin, together with all of the necrotic tissue which may be loosened, are removed with chloroform mops. Chloroform very readily dissolves and washes away all necrotic material. Then a hot air electric fan is employed—such as used by barbers and shoe shiners—to thoroughly dry the skin. When the wound is thus cleaned and dried the paraffine application can be made.

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A practical method for applying the paraffine dressing employ strips of gauze bandage, three or four inches wide. The strips are cut in lengths longer than the wound to be covered; the ends are held in the fingers while the center of the strip is dipped in the pan of molten paraffine. The strip thus saturated in the paraffine is then placed on the wound; one strip after another is applied. The strips may be placed on the wound like the shingles on a roof. When the surface of the wound has been entirely covered with these strips of gauze, saturated in paraffine, paraffine may be applied with a brush. An additional envelope of paraffine is thus placed over the whole surface, covered by the paraffined gauze. The brush is sterilized in the lower part of the double boiler in which the paraffine is heated.

Cotton gauze may then be laid on. Redintol sheet cotton, sorbent, 9x12 inches, J. & J., serves the purpose well. A final layer of paraffine can now be applied with the brush, thick and even. Finally laid on, and over the whole surface a bandage may be applied.

SEPARATE BRUSHES AND KETTLES.

There must be a separate brush and a separate kettle of paraffine for each patient, should that form of technique be employed, in which the paraffine is brushed on the wound. A minimum equipment is needed when the brush is sterilized by boiling in the bottom of the kettle, as just described, and only one brush is required for any number of patients, as the brush in no case comes in contact with the wound.

The application of the paraffine by means of sprays is preferred, because the wax reaches all the recesses of the wound much better, when sprayed on. A new spray comes out every week; the paraffine becomes clogged, making these sprays useless. By heating the air electrically, before it enters the spray, by means of an electric coil over which the air must pass, an ambrine spray, invented by Dr. Hudson of the Du Pont de Nemours & Company, promises better results than are obtained from other sprays. A spray is not a necessity, as the gauze strip method for applying the paraffine, as just described, is being employed at the West Penn Hospital, Pittsburgh, and has been employed with success in our works hospital in the application of paraffine dressing.

SECRETARY ASHIE: You forgot to tell the gentlemen about the severity of the bite in connection with the Dakin solution.

DR. C. A. LAUFFER: Dakin solution does bite; it is not comfortable. Dakin solution burns the skin surrounding the wound.

outer layer of the skin is composed of dead cells, and Dakin solution is a solvent for dead tissues, the outer layer of the skin will be dissolved and disintegrated, leaving the sensitive inner skin, unless the skin is protected with gauze, saturated with yellow vaseline, or some other protective. Dakin solution goes through the tubes into the deepest recesses of the wound. The deep muscular tissues and other deep tissues do not have irritability to the same degree as the skin; hence the deep wound does not bite—it looks bright red, clean and healthy. Different patients respond differently to pain; there are different degrees of sensitiveness: various preparations of Dakin solution more or less irritate the tissues—all of them bite to some extent.

Does that answer the question?

MR. T. T. WRIGHT (United States Cast Iron Pipe and Foundry Company): I would like to ask a question while the doctor has the floor. It is not clear in my mind just how the two methods are employed. In conjunction with each other, or when do you use the paraffine or when do you use both together? For what class of burns do you use one or the other, or both? That does not seem to have been brought out very clearly. I think that we could be instructed a little along that line. I believe it would be helpful and I know it would be to me.

CHAIRMAN BENNETT: Dr. Lauffer can explain the use of paraffine.

WHEN TO USE THE DAKIN SOLUTION.

DR. LAUFFER: During the period when there is pus, when there is still sloughing, then it is in order to use the Dakin solution. But when the surface has become clean, then you can employ the paraffine treatment.

For instance, one of the cases now under treatment in the West Penn Hospital is a patient who was sideswiped by a red-hot steel rail; it caught his ankle and all the tissues were deeply burned, exposing the bone. It has required several weeks to remove the burned, necrotic tissue, but now that the wound is clean, they are employing the paraffine treatment.

MR. WRIGHT: On slight burns it is not necessary?

DR. LAUFFER: On slight burns, where there are blisters, where the inner skin remains intact, one employs the paraffine treatment from the first. In this connection it should be emphasized that the paraffine treatment is used not only for burns, but for other wounds as well. For any wound that presents a large loss of skin surface,

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the paraffine treatment can be employed. It assists in the :
tion. The scar which remains when the paraffine treatmen
ployed is softer and more pliable. Instead of having thick,
ing, scar tissue, which draws and contracts, there results
pliable, soft scar.

A case very much in point is a patient whose face was :
with sulphuric acid. Ordinarily a man who has his face
burned in this manner is scarred for life and has terril
tractures. This man is nearly as good looking as he was be
injury : his scars are soft, pliable, scarcely noticeable.

FORMATION OF NEW SKIN.

Another patient had a gasoline burn involving about
inches of his arm, around its whole circumference. Un
paraffine method of treatment, in the West Penn Hospital :
burgh, there has been about three inches of good skin form
below up and about two inches from above down. Skin gr
employed at the same time. These little islands of skin, th
been planted, show growth from their edges, as do the otl
surfaces.

The paraffine treatment of burns seems to give added
to the doctor and the patient; instead of infection and ex
granulations to contend with, and skin transplants failing.
geon has a more rapid and a more satisfactory method;
largely dispense with transplants of skin, except in very la
defects.

MR. WRIGHT: I am not quite clear as yet as to whether t
tion method is one for extreme cases and the paraffine m
the general order, or whether they are always used togethe

SECRETARY ASHE: You have to use the solution to cle:
wound.

MR. WRIGHT: Always, no matter how slight?

SECRETARY ASHE: Not for small cases; you don't bother
But anything that would be called a bad burn, where you a
to get some sloughing, and some substantial infection devel
you use it. Perhaps, out of the burns that would come in
foundry, as an illustration, where you would use your paraf
out of twenty cases, you would use your ordinary antiseptic c
one, but you would use the Carrel-Dakin solution probably
out of the twenty; that is the average, because probably th
of the twenty would be serious. It depends a good deal on

ousness of your burn. That would be about the way it would be with us.

MR. BROWN: As I understand it, the ordinary dispensary work—first aid work—we treat that only with the paraffine treatment. Where we have a Dakin solution case, it is entirely a hospital case. You must have your patient in bed, and unless you have your own hospital you may have trouble. In our case we send them to a hospital a couple of blocks away. I think that is the point.

DURATION OF INCAPACITY.

MR. DAVID S. BEYER (Liberty Mutual Insurance Company): I should like to ask the doctor what effect it has, that is, in relation to the standpoint of time? How much it shortens the treatment of the wound as compared with the method in practice heretofore? Could you give me any idea on that?

DR. LAUFFER: From the figures of Dr. Hudson of the Du Pont Powder Company, who has observed the burn cases treated for that company in various hospitals, his conclusion is that the paraffine method diminishes the time lost 50 per cent at least, and not only that, but it gives correspondingly better results in the way of softer scars and less contractures.

MR. BEYER: That seems reasonable to you?

SECRETARY ASHE: That has been our experience.

MR. BROWN: I can confirm that.

CLASSIFICATION OF BURNS.

DR. LAUFFER: In answer to the gentleman's question as to the degree of burns: A first degree burn is sunburn, surface red but not blistered. Some people get a second degree burn from the sun; they have blisters and lose the outside skin. The first and second degree burn, from whatever source, can be treated with paraffine at once.

A third degree burn is so deep that the skin is entirely destroyed, including the deeper tissues, perhaps; when a third degree burn is serious, it is properly a hospital case. Those generally require a preparatory treatment with the Dakin solution, because the dead tissues should be separated in advance of employing the paraffine treatment.

MR. ROY S. BOXSIN (United States Metals Refining Company): I would like to ask the doctor if he would advise a first-aid man, who is not a medical man, to use this treatment. Would it be safe

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for him to apply it—a non-medical first-aid man? Would better to turn the case over to the doctor?

DR. LAUFFER: If you ask me my opinion, I would say, over to a doctor. If you ask me further what the doctor do, I would say that the doctor should shave the part. Some- times, employing the paraffine treatment, got the method in bad for a time, due to the fact that they apparently considered the paraffine in itself is a germicide; metal burns and electric burns not sterilize the tissues.

All the contiguous parts should be shaved, thoroughly with ethereal soap and gasoline or other cleansing agents go ahead and make the paraffine application. A first-aid man that work would do it wrong, and it is better to have the work and primary dressing done by the man who is going to have of the case, or at least have it done with the sanction and the direction of the man who is to be responsible for the treatment of the patient.

CHAIRMAN BENNETT: Dr. Davis, have you anything you like to say on this subject?

SUCCESSFUL USE OF AMBRINE.

DR. DAVIS (Cleveland, Ohio): I have had several months experience in using the different materials and I do not know I can add anything to the discussion that has been offered. I most heartily in everything that Dr. Lauffer has said. He went down practically to a "T," so has Dr. Sherman of Pittsburgh. However, I wish to lend emphasis to the statement that has been that in any situation of a third degree burn which requires the application of the Carrel-Dakin solution, that is the province of the doctor and no one else.

I know of nothing better than ambrine. I am using it and never used any other substance. I was very fortunate to get 50 pounds of it in New York last April. I do a lot of work for manufacturers and handle a lot of second degree burns. I use every burn with it and would not think of using anything else. It has worked very successfully.

I think every foundryman that is here ought to take it upon himself to have his doctor, or the doctors doing the work at the plant, equipped not only with the ambrine but also with the Carrel-Dakin method, as it would work out successfully. Dr. Lauffer

I have seen severe cases in Pittsburgh in the hospitals that he has mentioned. I have had them under observation at five-day periods and could see the progress from trip to trip. It is wonderful.

MR. F. W. SHEPARD (American Cast Iron Pipe Company, Birmingham, Ala.): Is it practicable, where the doctor is not on the job and where possibly it will be an hour or two hours before the doctor can get to the plant, in case of a third degree burn, for a first-aid man to apply the ambrine solution or the paraffin?

DR. DAVIS: Dr. Lauffer answered the question. I would say absolutely no: he has no business at all with the Carrel-Dakin or the ambrine.

CHAIRMAN BENNETT: We will now hear from Dr. Stubbs.

NO LESSENING OF OBLIGATION TO PATIENT.

DR. STUBBS (National Malleable Castings Company): The ambrine treatment, so-called, is not a simple method of treating burns and does not lessen, from my point of view, any obligation in treatment. Burns have always been and always will be an exceedingly complicated wound. However, the ambrine treatment or the paraffine treatment has many advantages in its favor. Let us go back to primary conditions: You have a man presented to you who has recently or just immediately received a severe injury; you want to do something for him and you want to do it speedily. The first thing you ordinarily try to do is to make him comfortable. The first thing that you want to do in any injury is to produce, as nearly as you can, relief. Sometimes, with the ambrine treatment or the paraffine treatment, you may be able to do so. It depends altogether on your point of view. If the treatment is to be applied by skilled hands maybe the ambrine treatment is indicated. If it is not to be applied by a skilled hand, but the patient to be transported, as the gentleman suggested, some distance to a hospital, then I believe you must go back to the original teaching, to the one original, to the first aid—for first aid is a misnomer all the way through—and the first teaching is simply placing over that a clean gauze dressing. There is to be absolutely no tampering with the wound. The most dangerous thing that you can do is to allow a so-called first-aid man to make the first or primary dressing. I want to make the primary dressings on my cases, especially if they are serious ones. A first-aid man can make minor dressings—things that are of no particular consequence, that are practically in the same condition as the second dressing—but the ordinary first-aid man that you have around the

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plant is quite as dangerous with the Carrel-Dakin proposition with the ambaine treatment as the foreman and the sub-foreman with the toothpick and the dirty handkerchief with your eye is absolutely so.

The Carrel-Dakin treatment is taking us back to the first principle of surgery, as taught by Lister, when we began doing surgery: it is to obtain drainage of wounds, pure and simple.

COMPARABLE TO A SPRINKLER SYSTEM.

The best illustration that I can give you as to what this and what it signifies is the sprinkler system that you install in plants or in warehouses and places of that kind. In order to have a sprinkler system complete it must apply to this room, to that room to all of the rooms. You must not leave out one room of that sprinkler system in any portion of your plant or any portion of your system. Just as soon as you do you have an inadequate system. First start in the room the mechanic or the heating engineer or the electric engineer or whoever it was who installed the system overlooks. It is exactly the same thing in this treatment. If you overlook one room, then you will have in that one room the probability of infection or an infection. It is an exceedingly complicated process to carry out. Anyone can take a pitcher of water and pour it over an exposed wound of the hand or the arm or anything of that kind, but you have tissues that are lacerated and muscles that are pulled and severed from their attachments; when you have bones that are broken, it requires a trained engineer to carry these various things to the deep recesses, and unless they are carried there this treatment is no better and no worse than any other treatment we carry out in the plant. Do not go home with the idea that anyone can take a burn with the paraffine treatment. I believe, from my experience, that we have reduced our period of disability from 50 to 75 per cent; we make the majority of patients much more comfortable; we reduce the period of severe pain.

NOT A CURE-ALL.

It is a complicated treatment, and as the doctor said, it has gotten into disrepute because people seemed to think that they had a cure-all the same as the newspapers advertised 606 a few years ago. It is very complicated, but it was advertised as though it was very simple. It is not simple.

The man who is a good doctor is a good doctor.

the paraffine treatment closely are pleased with it and I believe will continue to use it.

CHAIRMAN BENNETT: We have had an excellent discussion on the subject. Tomorrow afternoon the Health Service Section will have an additional discussion on first-aid treatment, which should be of benefit to all present.

We will now have a paper by Mr. F. W. Shepard, "How Improvement in Safety Conditions Reduces Labor Turnover and Accidents."

HOW IMPROVEMENT IN SAFETY CONDITIONS REDUCES LABOR TURNOVER AND ACCIDENTS.

F. W. SHEPARD, SAFETY INSPECTOR, AMERICAN CAST IRON PIPE COMPANY, BIRMINGHAM, ALA.

Mr. Chairman and Members of the National Safety Council: The reduction of labor turnover and accidents at the present time is a very vital subject, looking at it from an economic standpoint. Our nation is working under a vast overload in an attempt to equip and train soldiers and transport them to their posts of duty, to keep up with the increased demand for production, to cope with the vast transportation problem of moving troops, supplies, crops and raw material, and furnishing the world with supplies to carry on the war, and actually taking a hand in the fighting. It behooves us, as loyal and patriotic citizens, to use every economy, to eliminate every waste, to turn out (as it were) each burning light that is not necessary, in order that the generators may carry more efficiently those lights which are absolutely necessary.

Two great drains on all our resources are accidents (with their attendant losses) and the cost of labor turnover. If we can formulate plans or adopt practices to reduce these drains our efforts will not have been in vain.

It has been conservatively estimated that the introduction and training of a new man in a department, to the point of production, will cost about \$45, and to teach him a trade will cost about \$1,000. With a given percentage of labor turnover, it is, therefore, easy to figure the vast waste from this source on a dollars and cents basis. Our employers' liability and compensation laws and insurance rates give us a basis for figuring our accident cost, and it then falls on us to devise ways of reducing it. You and I may have done a great deal along this line, but have we done all we should? Have we done

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it as well as the other fellow? Have our methods been efficient lines? These are some of the questions you and I have eluded hundreds of miles to hear discussed.

UNREST AMONG EMPLOYEES.

I represent a firm engaged in the manufacture of cast iron. We call, in a large degree, upon foundry practice, pattern making, machine shop practice, armature winding, forging, railroad practice and construction work. Hence, a great many problems of accident prevention in these various trades are met and dealt with in one organization. The efflux of common labor and skilled mechanics to the North and East, where better wages were paid, the large arms and the great quantity of work, making it easy to secure employment, have caused a degree of unrest among employees unequal in the history of the nation.

In our plant we established what we term a labor-training school where the new man, after having passed the physical examination, was placed for the completion of his education in the safety and safe practices of the shop and the entire plant.

If the man was found to have had any previous training in any branch of the industry, a note was made of it, and when a vacancy occurred in a department, either temporarily or permanently, the man was sent to fill the gap. Very frequently by the time the man was placed permanently he was thoroughly trained by having made repeated shifts in the department on account of temporary vacancies. Thus, possibly, one man in this manner would prevent the hiring of fifteen or twenty men to fill temporary vacancies, the temporary vacancies being caused by the regular man getting being injured, or for other reasons being called home before completing the shift.

We are asked how we kept these men employed, how many there were, and how we kept this gang filled with its complement of men.

A gang of thirty men, or about 2 per cent of the total 1,500 employed, has worked very successfully with us. We instituted a systematic cleaning-up system, including in this system the rearing of waste material, handling of fuel and ashes, unloading material when we had an excess delivery, loading cars with finished product when we would get a surplus of cars, sanitation work and beautifying the grounds. Common labor was drawn from this gang almost exclusively. This gang had at its head a

foreman who had a thorough knowledge of the needs of the shop, who was a good judge of human nature and who had received a government certificate of training in first aid and accident prevention work. This foreman was directly under the supervision of the safety department. Any developing tendencies toward unfitness were closely watched, noted and taken up with the medical department, and steps were taken to correct the defects by special treatment. This oftentimes called for a change of work.

STEPS FOR REDUCING LABOR TURNOVER.

The increased rate of the regular job was paid to this man while filling in. This created in the man the desire to secure this job regularly. This created ambition on the new man's part, made the regular man more regular and the new or temporary man more zealous. The new man, or the man in training, having been permanently located, the next step was to fill his place. This was done by employing a green man, or by placing a man whom some of the department heads knew, or one who had references as having worked in the same line elsewhere.

Some of the steps we have adopted for reducing our labor turnover are: An established medical department, which has been in operation about three years. We have two surgeons, one house physician, one professional white nurse, two colored nurses (one a visiting nurse) and a dentist. In addition to this regular force, we have nurses in the plant, working at their trade, who are capable of waiting on the sick. These special nurses receive the same pay while nursing a case as when working in the plant. This allows a man of more moderate means to receive the proper care at a reduced rate.

A workman's benefit fund, created by setting aside a given amount of stock, at the disposal of a committee of five, consisting of the chief surgeon, chief timekeeper, the chief pipe inspector, the secretary of the Y. M. C. A., and the safety inspector, furnishes the means of relieving the financial strain incident to illness or an accident. This committee has the power of extending their aid to the employe's family. This comes in very nice where possibly the wife and mother needs an operation at the hospital and cannot have it because John has not the wherewithal.

A medical dispensary, where medicines are dispensed for minor ailments, and where Jim can have his aches and pains attended to without losing a day or a part of one to go see a doctor, who will

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not wait on him because he has not the money. Where also, kiddies have the croup or any of the common ailments of chi Jim can leave word and be satisfied to go on to work, knowing will be attended to.

Dental parlors for the colored and white, where tooth ail are soon remedied for Jim and his family.

The Y. M. C. A., with its reading rooms, where the c periodicals are brought in reach of all. Here also is statio branch of the Birmingham library, where any book may be ob for the mere asking, moving pictures and various games, tog with a piano, an electric player piano and an Edison phonog furnishing recreation, amusement and music.

A SCHOOL AND A BANK.

A day school, where the illiterate are taught to read and wr well as the primary branches of an education; an athletic field, baseball, soccer ball, football, tennis and foot races, with a other field sports, may be enjoyed. A branch bank, where de may be made and checks drawn, with a reward for the employo saves the largest percentage of his wages—teaching thrift and ing principles. A Mutual Aid Benefit Association, run by the themselves, which pays \$5.00 per week for sickness or disable \$100.00 in case of employe's death, \$50.00 in case of his wife's and \$25.00 if a child under 16 years of age is lost—all for 10 per week from the employe. This fund is augmented by the pany paying into the treasury of the association a dollar for dollar that is realized as dues. In the first year, just closing, of nearly \$6,000 was paid out in claims.

A mutuality committee plan allows an employe's grievanc be investigated and has a tendency to decrease the indiscrim discharge of men for minor causes. A mutuality committe vestigation is as much feared and has as much power in the as our National Interstate Commerce Commission. A bonus tem of good work, and regular attendance, also has its advan Last Christmas, out of a force of 1,300 men employed, 150 received a turkey and \$5.00 for working every working day i year. It will surprise you to learn that this was several hun per cent increase over the first year it was tried.

A great drawing card this year was the dispensing of se hundred garden plots, 50 feet by 150 feet. These lots were aw:

did the breaking up and plowing free of charge. These plots have allowed a great many of the men to raise their winter's supply of corn, beans, peas, beets, okra, tomatoes, sweet and Irish potatoes, and some feed for the cow. A prize is offered for the best garden and the best yard.

Modern houses are built and sold to the employes on the instalment plan, thus allowing the man to establish himself in a modern home at a rate commensurate with his wages or salary, as the case may be.

A step that seems to have made a home-run hit is the annual ACIPCO fair. Here the man, wife, daughter and son may vie with one another in every article from live stock to fine needlework. This fair is held on Labor Day; the company's colored band furnishes the music. Games consist of barrel races, sack races, potato races, pie-eating contests, and a tug-of-war, with prizes for the winners. Almost makes you want to be there, doesn't it?

PLANNING THE WORK.

We claim these various steps to be great accident preventive measures as well. As a rule, these ideas and plans are fostered and nourished at our round table monthly meetings of the central safety committee, whence they are carried to the rank and file and to the numerous shop committees by the foremen and superintendents.

Special committees are appointed from the several departments to inspect and make written reports as to the safety conditions in other departments. These reports are followed up and acted upon immediately, thus putting zest into the work.

A suggestion box, with prizes of \$15.00, \$25.00 and \$50.00 for the three best suggestions every six months, is cause for activity in efficient methods and safety devices. Regular inspections of the plant equipment and the attention paid to a suggestion made by a workman, have secured the confidence of the employes, and safe methods and practices have enabled us to reduce our accidents materially. I sincerely regret that so far no uniform method of computing accident percentages has been adopted, for I believe competition is stimulating.

Safety banquets, given to those who have passed the Safety examination, keeps up enthusiasm. Our moving picture machines for the white and colored departments keeps before the workman and his family the idea of safety and at the same time affords recreation and instruction.

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Our shop paper, published monthly, contains items of news. Its suggestions on safety, health and hygiene, gardening and other items of interest are looked forward to with anticipation by each employe.

The want ads and for sale or trade columns often enable party using them to secure or dispose of mentioned articles at low prices. The paper is so well liked that the employes send extra copies to mail to their friends and it is seldom you can find a copy about the grounds. If one man lays his paper down another man eagerly picks it up and either carries it home or gives it to a friend.

All of these methods, which are closely connected, and of which I dare not say one is greater than another, have a tendency to that ACIPCO spirit. If you wish to know what the ACIPCO is, ask anyone from the Birmingham district. They will tell you a near approach to the motto of this august body, *the unbrotherhood of man*.

You will pardon me for digressing just a moment. When General Manager Cameron notified me to prepare an article on this subject, I wrote to John J. Eagan, president of our board of directors asking him if there was anything he would like to have incorporated in this article. He made this reply:

A FIVE-YEAR RECORD.

"Some time ago I received some statistics which might give you some help to you. We began this work in 1912.

"In 1912, 830 men were employed; in 1916, 1,080 men were employed; an increase of 30 per cent.

"In 1912, 246 men were employed one year or more; in 1916, 677 men were employed one year or more; an increase of 175 per cent.

"In 1912, 65 men lost not more than 4 days; in 1916, 275 men lost not more than 4 days; an increase of 327 per cent.

"In 1912, 27 men received \$5.00 and a turkey for working every day; in 1916, 150 men received \$5.00 and a turkey for working every day; an increase of 455 per cent.

"Production in 1916 over 1912 was increased 5 per cent.

"Nineteen hundred and twelve lost time accidents, compared with 1916, showed a decrease of 47 per cent.

"My conviction is that the golden rule is fundamentally essential to the largest permanent success in the business world. Safety

spection and the other branches of coöperative work are based upon that principle.

"My suggestion to you would be that you try to stimulate the adoption of all branches of our welfare work. If you are not familiar with the pension plan recently adopted by our board of directors, I suggest that you ask Mr. Kent concerning the same, as I expect it to be a very potent factor in the future history of our company. Yours very truly,

"JOHN J. EAGAN."

I trust that some of these plans have appealed to you or given you an idea, and if so I will be glad to mail you more detailed information.

SECRETARY ASHE: As our time is limited, Chairman Bennett thought it would be well to go on with the balance of the program and have the discussion of the three papers together. I have the pleasure of reading the next paper, covering "Practical Welfare Work in Foundries."

PRACTICAL WELFARE WORK IN FOUNDRIES.

S. W. ASHE, EDUCATIONAL AND WELFARE DEPARTMENT, GENERAL ELECTRIC COMPANY, PITTSFIELD, MASS.

Mr. Chairman and Members of the National Safety Council: Many large foundries operated by the iron and steel industry have, for some time, carried on welfare work. This work was started because many plants were located at some distance from a town and, therefore, it became necessary to really build a town adjacent to the plant. Streets were laid out; sewerage systems, lighting systems and water supply installed; hospitals, Young Men's Christian Associations, schools and libraries were built, and many playgrounds were laid out. This was done with the realization that the average human being required something more than the ordinary routine of work, refreshment and sleep to be contented. If the worker did not have his social needs provided for, he would seek employment elsewhere or dissipate.

Foundries that have undertaken this work are still continuing it, indicating that they feel it has been wise. However, where so much has been done it is difficult for the small plant with limited means at its disposal to know just what to do. The following ideas cover-

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ing this matter may properly be divided into two parts: (1) covering the personal relations between employes and employers, apply to any plant irrespective of size, and, (2) covering such forms of welfare work which do not involve great expense which bring results and which are within reach of the small foundry.

RELATION OF LABOR TURNOVER TO ACCIDENTS.

At a recent meeting of the Safety and Health Section of the National Association of Corporation Schools, held in Buffalo, statistics were presented showing that from 50 to 60 per cent of accidents which occur are due, either directly or indirectly, to employees employed less than six months. These accidents are due either to the carelessness or inexperience of the new man, in either injuring himself or some one else. It is evident, therefore, that if a system can be developed for holding workers in employment for longer periods or decreasing labor turnover to reasonable proportions, accidents will automatically be reduced 50 per cent. In addition to heavy accident rates, we find in plants with a high labor turnover much restlessness, poor *esprit de corps*, little initiative and efficiency.

In plants where some thought has been given to this problem it has been found that while wages and hours of work have a bearing, the personal factor also has considerable weight. In a smaller plant, where the manager is personally acquainted with practically all of his men, there should be a better relationship between executive and worker. In larger plants where this co-operation between executive and worker is practically impossible.

Commenting on this point, Mr. E. W. Rice, President of the General Electric Company, wrote, as follows, in the *General Electric Review*: "There is, today, a serious lack of mutual understanding between the manufacturer and the wage earner, and considerable progress has been made in bringing about more harmonious relations, the situation leaves much to be desired. This lack of understanding and confidence is largely due to a lack of knowledge of each other, and the knowledge is lacking in the manufacturer as well as the wage earner."

It is evident that interest must be mutual and the desire for co-operation must exist to an equal degree in order to obtain maximum efficiency. If an employer makes unusual efforts to educate his employes—to protect them against accidents, sickness, old age, to stimulate thrift, initiative, give them a fair wage, etc., and

his employes indifferent, taking things for granted, without any attempt at reciprocal co-operation, there is something wrong. There must be equality of interest, and if this interest cannot be brought about there are certain wrong policies which are being followed by subordinates. As an illustration, few in industry realize the importance of little things of a personal nature, whereas it is usually the little things which cause the most trouble. A foreman may have an employe who is clever, who is popular with his fellow employes, and who, perhaps, has rather positive ideas. Rather than use, to advantage, this latent energy and originality which the employe possesses, the foreman may resent the characteristics in the man, and even though he is an excellent workman, doing his work probably with care and with greater efficiency than other employes, will discharge the man for some slight infraction of rules. Such actions not only arouse great bitterness in the discharged workman, but also a feeling of resentment creeps in among the remaining workers. Where, before, there was some loyalty in the department, a feeling of dissatisfaction starts, resulting, in time, in demoralization of the department.

FACTORS WHICH INFLUENCE CONTENTMENT.

There is no factor which means quite so much to an employe as the factor of stability. Where attempts are made to regulate production, so that employes are not periodically out of work, a better condition is created than in those places where a continual feeling of uncertainty exists. High labor turnover is the cause of more ills than it is ordinarily given credit for. Employers are doing much at the present time to minimize labor turnover. Service bonuses and pension systems have been introduced, besides the practice of some corporations of making it imperative that every executive must come up through the ranks. Where the employes in an organization are frequently changing, the new employe does not have time to become acquainted with the human side of the business before he is off seeking employment with a new concern. With a view to bettering conditions, some companies have taken from their foremen the privilege of discharge, and when an employe does not fit for some reason in a particular department, he is given another trial in another department. In this way, the longer an employe remains the better opportunity he has of understanding the service of the particular organization in which he is employed.

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CHARACTERISTICS DESIRABLE IN SOCIAL WORKERS.

A welfare worker's success at the present day depends upon his ability to understand people. In business this also applies, which is the reason why so few people become executives. Some people call it a knack, others say he is a good mixer, but it is some combination of the ability to get results and a certain nature. It seems to take a certain amount of push to put it across, and in doing this it is difficult to keep from treading on some one's toes. It requires, therefore, in a successful welfare worker, considerable caution and diplomacy, besides steadiness and common sense at critical moments under pressure, in order to handle unusual situations as they develop.

As few social workers possess all these qualifications, the only successful, as a rule, to a degree. Primarily, a welfare worker must give his life to his work, otherwise he is useless in meeting the continual strain on his sympathy, enthusiasm, energy and initiative which is constantly made. He soon learns to compromise, and progress can be made only in slow, easy stages. For this reason, many must have several matters under development at the same time.

Where an activity is once started it must be given time to grow. A plant which is dug up and its roots examined every few days soon dies. So it is with social activities constantly meddled with. Then, again, organizations can only grow just and assimilate at a certain rate, and it is better to spend enthusiasm and energy in more thoroughly investigating and preparing a new activity in its preliminary stages than to spend much time creating an endless chain of new methods and new organizations which have not been thoroughly thought out and adapted to the organization.

Things must fit; they may require some adjustment, but they must be a real need for them. They must have a personal appeal; there must be permanency or stability to them. They must be organized so that they practically run themselves, and so that they will not require constant attention, expense and support.

WHAT COUNTS IN WELFARE WORK.

We can always trace some good in any form of welfare work depending upon the angle we view it from, but the question naturally arises as to what counts the most. At the present time much is being done, and to weigh this matter properly we should place

selves in the position of the average employe and ask what really counts the most and what things in emergency we could dispense with. It is evident from this viewpoint, with the present high cost of living and with war conditions, that things which bear a direct relation to the employes' salary are the things which count the most. These are the things which necessarily exert the greatest holding influence. Company gardens, bonuses, selling articles (such as coal and insurance) at cost, have the greatest weight these times. Where we get employes in the habit of saving their money and purchasing in bulk, at the proper season, we are not only establishing the fundamentals of thrift, but at the same time we are solving many of the problems of labor turnover. The average workingman has a large amount of free time at his disposal which should bring him in, if properly used, a fair revenue, and when fall comes, if this man has his cellar full of winter's coal, wood and vegetables, and is in good physical condition as a result of his out-of-door activities, his whole viewpoint towards life and his company will change and he will stick to his job.

SERVICE BONUSES.

These bonuses, as the name implies, may be offered for varying degrees of service, such as five, ten or twenty-year periods. The bonuses are usually paid in cash, although some companies give stock or part cash and part stock. The bonuses vary from 5 to 20 per cent of the individual's salary, and are paid annually or semi-annually. The same idea has been worked out in connection with apprentice courses, where a bonus is given for the completion of the course. It is found that such bonuses have a restraining influence. On the other hand, when labor trouble occurs, these bonuses, as well as pension systems, have very little restraining effect.

COMPANY GARDENS.

This idea also is not new, as many steel companies, for some time, have taken part of their land, plowed and harrowed it, and arranged for watering and policing. Such an arrangement is equivalent to creating a medium whereby the employe can use his spare time to advantage and obtain a revenue which considerably reduces his living expenses. The employe benefits considerably by being in the open air, his spirits are better, his health is better and he is more cheerful and contented. Usually it is well to delegate some





STATE SUPERVISOR INSTRUCTING EMPLOYEES' FARMING COMMITTEE.



EMPLOYEES INSTALLING 800 FEET OF TEMPORARY PIPELINE.

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single individual to be responsible for such an activity, and when the gardens have been assigned and are under cultivation it is important to have a committee of employees take general care and to have an exhibit at the end of the season.

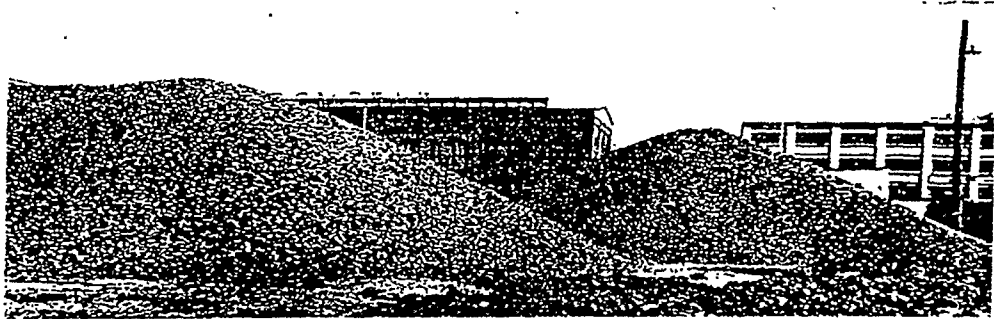
The photographs shown in this paper illustrate our gardens at the Pittsfield Works of the General Electric Company. One hundred gardens were assigned; dimensions, 50 by 100 feet. A gardener signed an agreement stating that he would take care of his garden. The gardens were adjacent to the work and their use was offered by the widow of the late William Allen.

Out of the entire plot only one piece has not been cultivated. This was very stony and was assigned late. It was necessary to build 800 feet of temporary fence and run 1,000 feet of water line into the property. A "raising bee," therefore, was held on Saturday afternoon, the company supplying old lumber and tools. It took just forty minutes to complete the work. Care has been taken to check these 300 plots, and with the exception of one employee, who was dropped, every one has remained with the company and taken good care of his plot. While it is true that this covers only a small percentage of our people, and refers to a period of only three months, the unusual interest which has been shown in this proposition shows that it is a form of welfare work which benefits the employee considerably and does bear a definite relation to labor turnover.

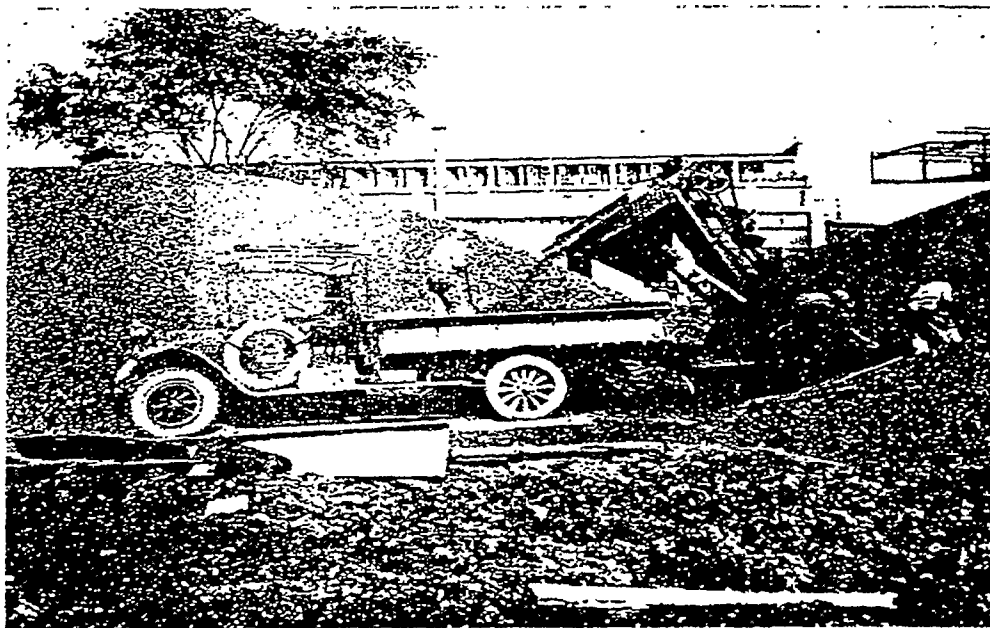
SELLING COAL.

Coal was difficult to secure during the past winter, and the price was high. Some companies have tried the experiment of cooperating with their employees in selling coal at cost. At the Pittsfield Works we formed a coal club and sold 2,000 tons of coal at cost. This coal was screened with an automatic loader, as shown in the illustration, and delivered with motor trucks and teams. In securing the coal about one-half of it was purchased at a low figure and the other half was secured at a somewhat higher figure, as it was purchased on a rising market and it was necessary at that time to buy fancy coal or take nothing. Nevertheless, the employees supported the proposition exceedingly well, and it has had the effect of steadying the local market, due to increasing the amount of coal that would normally have been received. As before stated, when

coal and vegetables, it is going to give him a chance to catch up and accumulate. This sort of welfare work reaches the men. Many



2,000 TONS OF COAL FOR GENERAL ELECTRIC EMPLOYEES.



AUTOMATIC LOADER AND SCREENER--MOTOR TRUCK FOR
HAULING COAL.

of our other forms of work are desirable and the men are generally interested in them, but they exert a holding influence to a lesser degree than the grouping discussed.

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CHAIRMAN BENNETT: We will proceed to the next paper "Mechanical Safeguarding of Electric Traveling Cranes." Mr. Smith is the Safety Director of the Inland Steel Company.

MECHANICAL SAFEGUARDING OF ELECTRIC TRAVELING CRANES.

J. C. SMITH, SAFETY DIRECTOR, INLAND STEEL COMPANY, INDIAN HARBOR, IND.

Mr. Chairman and Members of the National Safety Council: At this critical period in the history of our country, when it is extremely important to conserve the resources of the nation, of which the human element is the most valuable, it becomes the patriotic duty of every employe to throw every possible safety protection around industrial workers and to thoroughly safeguard every machine which includes electric traveling cranes.

I am pointing this out specifically, as at this time it is extremely difficult to get deliveries, and the anxious manufacturers are inclined to be inclined to cut out all frills—which many seem to consider safety devices to be—and to get the machine on the job as soon as possible. A little thought will convince anyone that this is a shortsighted policy, as the average machine manufacturer has recognized the advantage of safe machines and is prepared to furnish machines equipped with safety appliances just as quickly as those without. There is also a great advantage in having the safety features incorporated in the machine as it is being designed and constructed; the guards are then made an integral part of the machine and are far superior to those afterwards installed.

After being invited to address this section, I wrote to all the leading crane manufacturers, sending them a copy of a paper prepared on the subject of cranes and inviting criticism and suggestions. Their replies indicate that there is a tendency to trim too much on the safety features and that the purchasing agent, who is inclined to keep down costs, is a more important factor than the safety engineer with the average buyer. Cranes, as well as all machines, cost more now than ever before, but profits are also more than ever before, and it is more economical to buy a safe machine than to buy an old-type crane and then have the factor

most, besides having the risk of accidents, higher insurance rates, high accident costs and disorganization.

Our chief engineer has always done everything he has been able to do to get cranes with all safety features incorporated in the designs, as his experience indicates that such a crane is the most efficient type from an operating standpoint. Safe, easy means of access, and safety features in general encourage frequent inspection and lubrication, which means few delays and breakdowns.

The Standardization Committee of the National Safety Council covered the subject of Crane Construction and Safe Practices so thoroughly in Safe Practices Pamphlet, Volume 1, No. 4, that it seems to me that every member of the National Safety Council should be thoroughly familiar with the subject, but as your Program Committee considered it of sufficient importance to be presented again at this Congress, I have gone over all the specifications I could locate and added that which experience has indicated to us is necessary.

CRANES.

ELECTRIC TRAVELING CRANES.

Detailed plans of all cranes purchased shall be submitted for approval before a crane is constructed and furnished. Such plans, as well as calculation sheets, shall be submitted to the plant at which the crane is to be installed.

GENERAL CONSTRUCTION.

Proper provisions shall be made for all parts subject to impact and rough usage. Journals and shafts shall be of sufficient size to bring pressure and deflections within safe and practical limits.

Structural work shall be of open hearth steel, and physical and chemical properties shall be governed by the Manufacturers' Standard Specifications for medium steel.

All apparatus shall be designed throughout with not less than the following factors of safety under static full-load stresses, based on ultimate strength of material used.

Gears, drums, blocks, hooks, shafts and other parts, except ropes and girders, ten (10).

Ropes, not less than eight (8). (See American Steel and Wire Company's catalogue for ultimate strength of rope.) Six strands, nineteen wires, plow steel.

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Crane girders, not less than five (5).

Calculations shall be of what is known as "all steel construction;" no cast iron shall be used except for minor parts, such as drums, bearing brackets, etc., where strength is of minor importance. No wood or other combustible material should be used.

All bolts shall be through type, bolts to be suitably secured by turning and equipped with approved lock nuts or lock washers. Bridge motor bolts shall be accessible from above bridge walk.

Steps or stairs with hand rails are to be used, wherever required, in preference to ladders.

FOOTWALKS.

Footwalks shall be placed in the following locations:

Entire length, one or both sides of crane runway to give access to cranes, reached by one or more sets of stairs to give access to crane or reach it at any place on runway.

Entire length of bridge on both sides and across the ends.

Where there is only one walk it should be on the drive side.

Across the ends of the trolleys at right angles to the bridge.

A safe and adequate means shall be provided to get from walk to walk, and walks shall not telescope.

Footwalks shall be of substantial construction, rigidly braced as to eliminate vibration, and built entirely of steel.

Width of main walks shall be not less than 30 inches from edge of walk to web of girder.

Width of walks on end of bridge shall be not less than 15 inches and on trolley shall be not less than 12 inches.

Each walk shall have a standard railing and toe guard at all exposed edges.

Railings shall be of riveted structural steel with two horizontal members and not less than 3 feet 6 inches high; toe guard shall be at least 6 inches (net) in height; lower half between center rail and toe guard preferably covered with wire netting.

Floors of walk shall be of checkered steel plate not less than 1/2 inch thick; flooring shall extend from outside toe guard to web of girder; and be fitted neatly where any irregularities occur, so as to leave no openings through floor.

CLEARANCES.

Wherever possible all walks shall be so arranged that there

over head trusses or other structural members; clearance between railing on bridge walk and nearest part of trolley shall be not less than 18 inches.

Footwalk shall pass around, instead of over bridge motor, and may be reduced to a width of 20 inches (clear) at point where it passes motor.

Not less than 12 inches actual clearance shall be allowed between highest point of crane and roof chord, and preferably at least 6 inches but not less than 3 inches between any other part of crane and building column or other stationary structure.

Where there are more than two crane runways in parallel there shall be a clearance of at least 18 inches between the extremities of the cranes and a footwalk provided.

OPERATOR'S CAGE.

Operator's cage shall be securely fastened to bridge girders and well braced to minimize vibration. It shall be large enough to allow ample room for equipment and operator.

The cage shall also be supported by not less than four vertical through stay bolts, having the nuts and plates under the bottom of the cage.

The cage should be as low as consistent with safety to give operator as good a view as possible.

Floor shall be of non-combustible material, preferably asbestos.

Cage shall be enclosed to a height of 3 feet 6 inches above floor with non-combustible material.

Stairs should be provided as means of access to bridge walk from cab platform.

Steel sash and wire glass should be used in crane cabs. Cab door should swing out.

Controllers should be arranged so operator can see hoist hook from any position.

There should be a locking device on controller handles and clear indicating marks placed on controller as to how to move handle for certain movements. When there are controllers with external resistance the external resistance units shall be placed outside of the cage.

An approved foot or hand operated gong of the rotary type shall be placed in a convenient location and securely fastened. A tray or other suitable guard shall be placed under gong to prevent gong or parts falling.

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Ladle and other cranes subjected to heat from below shall have a steel plate shield not less than $\frac{1}{8}$ inch thick and placed not less than 6 inches below bottom of floor.

All cages on hot metal cranes shall be arranged so as to give ample protection to craneman in case of spilling or dropping ladle of hot metal. Each crane shall have a sheet-iron, closed lined with asbestos, to be used by cranemen in case anything wrong with machinery when hoisting hot metal.

Provisions shall be made on hot metal cranes so that no man shall be confined in any crane cage, or in any other place, where it will be impossible for him to escape to some place of safety, in case of a spill of hot metal.

GEARS, COUPLINGS, ETC.

All gears, including trolley gears, shall be completely enclosed but so guarded as to afford easy access for inspection or repair.

All driving and driven gears shall be tied together in the steel casting.

No overhung gears, except armature pinions, and no split gears shall be used.

On old types of cranes where there are overhung gears, shaft shall extend at least its diameter and key and locking device provided.

Couplings shall be entirely enclosed, the covers being so designed that they are readily detachable, and supported in such manner that they do not revolve with the shaft.

Keys shall be secured in approved manner to prevent possibility of gears working loose; unprotected keys shall not be left projecting from ends of shafts; they shall be covered or otherwise guarded. Flanged washer with cotter pin projecting through flange and nut should be provided to prevent trolley power wheels working off.

It is preferable that short shafts be used for trolleys, and trolley sides should be connected with solid cast-steel separators instead of structural to gain permanent alignment of trolley.

Dynamic braking should be used.

Ladle cranes shall have interlocking gears on hoist drums, safety cables.

SWITCHBOARD AND WIRING, ETC.

The installation of switchboard, wiring and all electrical equipment must fully comply with the requirements of the National

With the exception of trolley conductors, all apparatus carrying electric current must be thoroughly insulated, enclosed or guarded in such manner that there will be no danger of accidental contact with live wires.

Unless otherwise specified, switchboard shall be placed in rear of cage, and contain the following equipment:

Two pilot lights.

One D. P. main line switch.

One D. P. magnetically operated circuit breaker, with an individual D. P. overload relay and fuse for each motor on crane; circuit breaker to be so designed that it will open automatically if current supply fails and remain open until closed by operator.

In addition to the one on crane switchboard, there shall be a main line switch mounted above cage, where it can be conveniently reached from footwalk; this switch must be so constructed that it can be locked in open position.

All wiring must be placed in approved conduits, which should be continuous to switch boxes, etc., so that there are no bare terminals exposed.

Unless otherwise specified, trolley conductors are to be soft steel bars or other suitable rolled steel sections, with tinned joints and good mechanical supports; they should preferably be located outside and above bridge girder, on side opposite bridge motor, in convenient relation to footwalk; in no case shall their location be such that they may be brought into accidental contact with hoist cable.

Open-type controllers to have asbestos-lined steel guard over the movable contact parts.

Rheostats and resistance units to be protected from accidental contact or mechanical injury, by suitable enclosure—adequate provision being made for ventilation.

An approved hoist limit switch shall be provided for each hoist, preferably the "Youngstown."

Switches should be arranged so that safety locks may be applied to same.

BRAKES.

Suitable brakes shall be provided for the hoist and bridge travel. There shall be two brakes for each hoist, either an electrical and a mechanical, or two electrical. Magnetic brakes shall be encased, so that none of the parts can fall to the floor.

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HOIST MECHANISM.

Cables—All hoists shall be equipped with a proved steel rope chain being used. Six strand, nineteen-wire rope of extra strong plow steel shall be used. Hemp core may be used for ordinary service, but core shall be of soft iron when subjected to excessive

Extra Cables for Ladle Pouring Cranes—Where existing conditions will permit, ladle pouring cranes shall be equipped with a duplicate set of cables and shackles, of the same factor of safety as the other cables and shackles. Under normal conditions, this set of safety cables and shackles is not to be under stress.

Drums and Sheaves—The pitch diameter of hoist drums and sheaves shall be as follows: Hoist drums and sheaves at least four times the diameter of the cables.

Equalizer Sheaves—At least sixteen times the diameter of the cables.

The drums to be so designed that there will be not less than three full wraps of hoisting cable in the grooves when hook is at its lowest position called for in specifications.

Hook block shall be of an approved enclosed type, so arranged that it will lift vertically without twisting.

Bottom sheaves must be protected by close-fitting guards to prevent rope from becoming misplaced, also to prevent foreign objects from falling into block.

PREVENTION OF SHEAVE PULLING OUT.

A safeguard shall be provided in such a way as to prevent the load from dropping in case sheave block pin should break.

BUMPERS.

Crane bumpers shall be at least one-half of the diameter of the truck wheel in height. Both truck wheel and trolley bumpers shall be fastened to the girder and not to the rails. Bumpers shall be built up of plates and angles, or made of cast iron. The bumper design shall be optional with local plants.

TRUCK FENDERS.

Extending below top of rail, and projecting in front of all bridge and trolley track wheels, shall be rigidly attached to carriage or frame. They shall be of a shape and form that will tend to push or raise a man's hand, arm or leg off rail and away from wheel.

CRANE SLINGS.

It is recommended that in place of using a short chain on auxiliary hoist for dumping a ladle, a cable fitted with a ring and hook to be used for this purpose.

Cranes continuously used for pouring in mixers should have auxiliary hoist equipped with a hook which can be attached by the cranemen, to tip ladle after the ladle has been hoisted to the pouring position.

HOOKS.

All crane hooks (other than on cranes handling hot metal), all hooks on chains and on tackle blocks, and all tackle hooks shall be made of forged soft basic open-hearth steel of the following: Forged for heavy duty: Car. .25-.35, Sul. and phos. not to exceed .04, Mang. .40-.60, Sil. not over .20. Forty per cent discard to be made from top of ingot; utmost care to be used in the open hearth to obtain good, live steel.

Hooks shall be annealed after forging in order to remove all hammer strains.

Forged for light duty: Same as above, except that .15-.20 carbon shall be specified.

LAMINATED PLATE HOOKS (HOT METAL CRANES).

Flange steel quality, special open-hearth, Car. .16-.20, Sul. and Phos. not to exceed .04, Mang. .30-.50. Make 40 per cent discard.

Hot-metal stirrup hooks shall be provided with locking device to fit in trunnion of ladle to prevent ladle being accidentally tipped.

When necessary a fender should be placed near the lower part of the bridge girder to prevent contact between the trolley wires and the hoisting cable.

MISCELLANEOUS.

Heavy safety lugs or brackets shall be placed on trolley frames and end carriages, to limit drop to one inch or less if a wheel or axle should break.

A capacity plate showing the rated capacity of each hoist in pounds shall be placed on each girder in such a manner as to be clearly legible from the floor.

Sand boxes shall be provided, controlled from cab, wherever necessary.

Tool box or other receptacle shall be placed on the cage or on the runway in which to keep oil cans, tools, etc.

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Trolley frames shall be completely floored over.

Platforms on trolleys for repairing trolley shoes, etc., v practicable shall be installed on all cranes and made part of trolley, with sufficient space cut out to avoid interference with cables.

Provision shall be made for platform to be used when repairing power lines.

Repair platform shall be provided for repairing crane truck seat provided for jack.

Wedges used on trucks shall have handle and flange to fit rail.

CRANES IN OUTSIDE SERVICE

The following additional provisions shall be made:

Floors of footwalks to be so constructed as to drain through openings of floor.

Cage shall be enclosed and of fireproof construction; there be windows on three sides of cage, windows in front and side opposite door to be full width of cage.

Floor of cage on outdoor cranes shall be extended on entrance landing to be equipped with handrail and toeguard, of same construction as bridge walk.

Where there are no members over crane suitable for attaching blocks, a structural steel outrigger shall be arranged on the end of sufficient strength to lift heaviest part of trolley.

Rope should be provided in cage for use of crane operator in raising or lowering articles to or from crane cage.

Framed "Rules to Cranemen" should be placed in each crane cab.

ACCIDENTS CONNECTED WITH OPERATION.

Even after we have a perfectly safe crane and other equipment we may have accidents connected with the operations to be performed by the crane, and, in fact, most overhead traveling crane accidents occur in connection with operations and are not due to lack of safety devices.

There are five groups of workers whose safety is directly concerned with the operations of cranes, and these are:

Crane operators.
Crane hookmen

Crane inspectors.
Crane

We might include all persons who have any occasion to work around crane runways or underneath crane runways and cranes.

The hazards to which crane operators are subjected may be classified as "General Operating," "Electrical," and "Special," handling molten metal, etc.

Just as we specify that the crane shall be a first-class and safe machine, so in order to obtain safety, we must specify that the crane operator and the hookers are safe men. They should be carefully selected for the position they are to fill. A crane operator should have mechanical inclinations. He should be young, active, quick with his thoughts and movements, yet cautious and careful; agile, yet surefooted; keen of vision; even-tempered, and conscientious.

Hot-metal cranemen require at least years of experience before undertaking such dangerous work. To promote safety and avoid accidents, crane operators should comply with the rules promulgated to direct their work and should use every possible effort to exercise due care and caution at all times.

When coming on duty a craneman should carefully inspect his crane; see that all working parts are oiled, including the sheave blocks; hoist chains and cables should be lubricated daily; empty grease cups should be filled and oil passages kept clean.

REPORTING OF ACCIDENTS.

Loose or dangerous gears, keys, ladders, runways, brakes, etc., should be reported to crane foreman on "Daily Report Blank." Each craneman is responsible for the condition of his crane, and he should never fail to include all defective conditions in his report.

Cranes must be kept clean, free from dirt and grease. Crane-man should assist repairman and see that all guards are replaced and all loose material removed before crane is put in operation. Footbrake and limit switch should be tested at beginning of each turn.

Look over all switches. If main switch is found open, be sure all controllers are in "off" position before closing switch. - If safety switch is found open, do not close it until you are absolutely sure no one is in a position to be injured. Look on trolley, all parts of crane and crane runway.

Fire extinguishers must be kept in cabs at all times. Report when same have been used so they can be refilled.

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When hoist cables are being repaired or replaced, crane operator should always see that there are at least two full wraps of cables on the drum.

If crane is located outdoors, when leaving crane, operator should block or lock crane in position so it will not be blown by wind. This applies especially to gantry cranes.

Where it is necessary to sand tracks, it should be done by means of sand boxes. Cranemen should never sit on truck in direction crane is moving and attempt to sand track from bucket, as he is liable to get caught between truck and column of building.

When any work is being done on hoist, such as removing attachments, shafts, etc., operator should always have burden block low as possible.

No one, except authorized persons, should be permitted to enter crane cab, and then only when absolutely necessary, as in case of repair work, etc. When such persons are, crane operators should be held responsible to see that they are in a safe position before crane is moved. No one should be permitted to ride on trolley.

When notified men are working on or near runway, crane operator must keep a careful lookout to avoid accidents.

Never go, or permit anyone else to go, on top of crane with opening switch on top of crane and locking it open or protecting it by means of "Danger—Do Not Move" sign.

OPEN MAIN SWITCH AND LOCK IT OPEN.

Cranemen should remain on duty until relief appears, unless excused by proper foreman. They should not leave crane except in case of necessity, and when leaving should open main switch and lock it open. Under no circumstances should crane operator permit anyone except authorized persons to operate crane.

When crane runways are parallel, crane operators are forbidden to cross from one crane to another over the runways. It should be a rigid rule that all persons get to and from cranes by means of regular stairs or ladders. No one should be hoisted up on the crane block to get on crane.

Cranemen should not smoke, eat, read or sleep in crane cabs, and should not be permitted to operate crane unless in good health. Their work concerns the safety of many men, and they must always be on the alert, giving their individual attention to their duties at all times.

Under no circumstances should cranemen be permitted to throw articles at men on floor to attract their attention, nor for any other purpose.

Operators should avoid running into blocks at end of crane tracks, as they might give way. Cranes should never bump into other cranes unless other operator has been warned and no one is in a position to be injured, and then only in case of urgent necessity, as operations of this kind are liable to damage equipment.

Cranes should not be used to move cars. Side pulls should not be made with crane unless absolutely necessary, and then only with the approval of the superintendents. Where side pulls must be made provision should be arranged to prevent hoist cables coming in contact with trolley power wires.

Where two or more cranes are used in combination to lift one load, the several operators must be extremely careful to lift and carry load evenly.

Peculiar problems arise where there are high and low crane runways in buildings, but as this is not a universal arrangement, I will not attempt to discuss it today.

ELECTRICAL DANGERS.

We have now come to the electrical dangers connected with crane operations, and while very few accidents occur from this source, all should be avoided.

Cranemen should not use controllers to supply heat for cage. In case of electrical short circuit, or if a controller should stick, it is advised that operator immediately throw all controllers, except the one that sticks, into "off" position, then open the main switch with a rapid motion. Power must always be off when repairing controllers, or any other electrical apparatus, or when screwing light bulbs in sockets.

Operators should never reverse controllers by throwing them all the way around, as it will burn controller.

Handles of controllers should be moved from point to point to gradually increase the speed of motors. Speed should be restricted until slack in chain or cable has been taken up.

If power goes off, all switches should be pulled out and controller moved to "off" position promptly. As soon as pilot lamps light up (when power is on again) motors may be started.

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OPERATING INSTRUCTIONS.

Operating instructions for cranemen are included under following:

Cranemen are to do all work required by foremen on floor, directing operations in the department, except such things as by their judgment, be liable to injure men or damage crane or apparatus.

Under no conditions should an operator permit his crane bump into another crane until he is positive that no one on the crane is in a position to be injured. Orders from any one to the contrary are to be disregarded.

Loads improperly hooked, or in such condition as to be dangerous, should not be handled, unless absolutely necessary.

No one should be permitted to ride on load or crane hook on top of trolley. Refuse to move.

Chains, slings, and loads should be carried high enough to avoid striking men on floor or catching in machinery, etc., on the floor. Hookers should hook up hooks.

It is not good practice for operators to run more than two cranes at one time.

Loads should not be hoisted, lowered or dropped from main until operator is positive every one below is out from under the load.

Signals should be received from one man only, and no work should be made without a signal from the proper man.

Before starting to hoist trolley should be placed directly under the load to avoid swinging load against workmen. Never jerk swing loads; hoist gently, handle carefully and lower slowly.

Operator should see that hookers walk ahead of loads carried by cranes and warn men on floor to get in the clear.

Bell should be rung before starting to hoist, before moving, and rung frequently while moving.

When hoisting especial attention should be paid to the block to avoid tripping limit switch or running block to drum. In case block gets near limit switch, don't shut off power, as current is necessary to operation of limit switch.

When pulling chains out from under loads, see that no one is in a position to be struck by chain.

When loading material in car, great care must be exercised to avoid injuring hooks. Load should never be swung against car or straighten same.

metal. Ladles of molten metal should never be carried over men working below.

When handling heavy loads, particularly hot metal, test the hoist brake by throwing the controller in "off" position after load has been lifted a few inches: if brake does not hold, do not move load until it has been adjusted.

When handling molten metal it is advised that operator run only one motor at a time.

Crane hookers should exercise great care to avoid accidents. Hookers should never ride on any burden being carried by a crane. He should never take hold of crane cable above sheave block, as his fingers might get crushed between cable and sheave.

Hookers should ever be watchful of loads carried by cranes, or suspended in the air, and keep out from under them at all times. He should walk ahead of loads being carried by cranes and warn men on floor to get out of the way.

When loads are being hoisted or carried, no one should stand between the load and other objects, as load may swing and strike them.

Hookers should learn how to make safe hitches and should study table of stresses on slings at various angles.

When working in cars care must be exercised so as not to get caught between load and side of car.

Great care should be exercised when getting in or out of cars over which magnets are being carried, as they may strike you.

Hookers should never attempt to operate cranes, or go on crane for any purpose. Neither should they meddle with electric wires attached to magnets.

Cables, chains, slings and hooks should be carefully inspected. Never work with defective appliances.

In case hooker thinks load is too heavy for crane, he should notify foreman.

Hookers should never lie down in dangerous position in cars while waiting for crane, as load may be brought and lowered on him.

When hooking handles on chain, hooks should always be used, as they are provided to enable you to keep your fingers out of danger.

Chains or cables should not be held in hands while craneman is taking up strain. A hook, preferably a long-handled one, should be used to guide chain.

Hookers should never stand near piles of bars, or other material, when same is being hoisted from ground, as pile may tip over on you.

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A block or pad should be placed between sharp edges of load cables so cable will not be cut.

Load should be carried high enough to clear all material on

Hookers should exercise great care when placing blocks on loads and never get under the load. Use a block to shove load under load or toss them under.

Stand at a safe distance in a safe position when chains are pulled out from under load so same will not fly and strike you.

Chains or cables should be hooked up when about to be closed by crane so they will not catch on anything.

Guide hooks when being hoisted after being unhooked so they will not catch on load and tip it over on you.

Repairmen working on overhead cranes have peculiar dangers contend with and must exercise great care at all times.

They should make provision so that other cranes on runway will not run into crane being repaired. This can be best accomplished by repairing crane at a point which is most accessible and will interfere least with other cranes and operations below. In order to fully protect crane, blocks should be placed on crane rail.

Before starting repairs it should be ascertained that all controls are thrown off; that main switch and safety switch are opened, removed and locks or signs placed on switches.

"Danger—Workmen Above" signs should be placed under crane and where the job is a big one space under crane should be roped off.

A repairman should never, under any circumstances, go on crane without notifying operator.

Where a number of men are working on crane, each member of the gang should place his padlock on the safety switch.

When men are compelled to work on or near crane tracks, crane must be blocked and operations cease at that point while work is in progress.

Care should be exercised so that no loose parts fall to the ground.

Before removing any part which may release hoist block, block should be lowered to floor, or when this is not possible gears should be blocked or wedged so they cannot move.

When hoisting materials on crane, have man above give signals and never permit anyone to stand in a position to be injured should something give way.

Upon completion of repairs, remove all blocks, loose parts, tools, etc., and replace all safeguards before crane is put in operation.

Men tightening down rail clamps should be careful.

strike their tools on power bars and wires. Tap handles of tools used in doing such work.

This, I believe, covers the subject quite thoroughly, and I am absolutely positive if these things are done innumerable lives will be saved in American industry. I know that thousands of fatal accidents have occurred due to a violation of these rules or lack of the safety appliances which are herein specified. I thank you.

DISCUSSION.

CHAIRMAN BENNETT: Gentlemen, the hour has passed in which to close, but I have an announcement to make: The next order of business is the report of the Nominating Committee, but due to the reorganization of the activities of the National Safety Council this Section will become a part of the Metal and Metallurgy Division. The report of our Nominating Committee will be incorporated with that of the Iron and Steel Section at tomorrow's session of that Section at 9:30 o'clock.

We cannot get accommodations for a session this afternoon; so if there are any questions you want to ask the speakers we will be glad to hear them now. Mr. Smith's paper is a masterpiece on crane specifications and protection. There are three papers we have not discussed, Mr. Smith's, Mr. Ashe's and Mr. Shepard's.

MR. BONSB: I would like to ask Mr. Shepard two things in regard to his moving picture exhibition. Whether he gives purely a safety picture, or does he work in comedies and dramas? Also if the men rather resent—if you give these movies at the plant—having entertainments arranged for them? Would like to arrange their own entertainment? Just how do you work the moving picture exhibition?

USE OF MOVING PICTURES.

MR. SHEPARD: We are on the regular Y. M. C. A. circuit. I suppose you are familiar with the fact that the Y. M. C. A. has a moving picture circuit and a change of films twice each week. We also secure safety films, some from the National Safety Council. Advertising firms also furnish pictures—Pyrene has one—and we run these in. We have a camera making pictures at the plant, and we intermingle these, but the regular circuit is a five-reel film twice a week from the Y. M. C. A. Does that answer the question?

MR. BONSB: I would like to ask whether or not the shows are attended largely by the men?

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MR. SHEPARD: Yes, we have 'good crowds.

MR. BONSB: Do you give tickets or may anyone that attend?

MR. SHEPARD: Admission is free to employes. We charge cents to an outsider.

MR. BONSB: How do you tell your employes—do you give tickets?

MR. SHEPARD: No, sir.

MR. BONSB: You know them?

MR. SHEPARD: We have a secretary of the Y. M. C. A. at the door and the most of the men have their Y. M. C. A. card for identification. If the secretary does not know them all they have to show their Y. M. C. A. card; that admits them.

MR. BONSB: In regard to your paper: Do you charge a cent? Is it entirely supported by the Company?

MR. SHEPARD: It is entirely financed by the company.

CHAIRMAN BENNETT: Are there any further questions?

REGULATION OF HOURS FOR CRANEMEN.

MR. FRANCIS FEEHAN (Supervising Inspector, State Department of Labor, Pittsburgh, Pa.): May I ask Mr. Smith if taken into consideration the question of proper regulation of hours of labor for cranemen as affecting safety?

MR. SMITH: That undoubtedly is a phase in accident prevention but I have never found, in my experience, that it has really had an important bearing upon the number of accidents. In the steel plant a craneman's hours are quite long—generally a twelve hour shift and at times when they are changing it may be long twelve hours. But from our experience we have never found to any large extent, that the question of hours had any bearing upon accidents with cranes. We find that practically 7½ per cent of the total number of accidents recently analyzed in the first half year were hoist accidents. Of the 7½ per cent practically all the men injured were hookers. It is very difficult, in an accident of this kind to place the responsibility. The hooker blames the crane and the craneman blames the hooker. Most of the fellows get their fingers caught, in our opinion, through their own negligence—half of them. It is very difficult to place the responsibility. We cannot say that the hours worked by the craneman have really had a noticeable effect upon the number of accidents.

MR. FEEHAN: I have charge of the inspection force of the State Department of Labor in the western part of the State of Pennsylvania and upon investigation, found that a large number of accidents occurred because of the shortage of crane operators. When one was sick the operator was required to work overtime and as a result he frequently admitted, after the accident occurred, that he took naps in his cab. and his awakening depended upon some noise or some method of communication. Several accidents have occurred which were attributed to the excessive hours of employment.

The craneman's work is a great strain on him, especially when working overtime. No less than four fatal accidents occurred last year in the Pittsburgh district due to what we consider excessive hours of employment of cranemen.

CHAIRMAN BENNETT: The Secretary desires me to make an announcement that all members are requested to attend the exposition at the Grand Central Palace. They have a very good exhibit, and you will be well repaid if you attend.

The Section then adjourned.

National Safety Coun

Automotive Sectional Meeting New York

Sept. 14, 1917

W. ERNEST WILLIAMS, Chairman
Safety Engineer, Packard Motor Car Company, Detroit, Mi

R. R. RAY, Secretary
Dodge Brothers, Detroit, Mich.

FRIDAY MORNING SESSION

THE Automotive Section of the National Safety Coun
called to order at 9:30 o'clock by the Chairman.

CHAIRMAN W. ERNEST WILLIAMS: I will ask Mr. R. of Dodge Brothers, Detroit, to accept the position of ten Secretary.

It usually requires about a year to organize a new Section National Safety Council and to perfect a program of activiti we are a new Section and the program for this meeting was a on short notice it is my opinion that a round-table discussion best course of procedure for our initial session.

The first order of business will be the reading of a tentativ of our by-laws. "This organization shall be known as" —? it has been called the Automobile Section. In my estimation t is not broad enough to cover the activities of a Section of t ture and I propose that we call it the Automotive Section, t may be able to take in automobiles, tractors, airplane manufa —anything where a motor product comes in, even to accessori the same.

AUTOMOTIVE SECTION, NATIONAL SAFETY-COUNCIL.

NAME.

Section 1. This organization shall be known as the Automotive Section of the National Safety Council.

OBJECT.

Sec. 2. The object of this Section shall be to promote the purposes, objects and activities of the National Safety Council as the same more particularly applies to the special problems of the members of this Section.

MEMBERSHIP.

Sec. 3. Membership shall include all members of the National Safety Council who shall be interested in the activities and purposes of this Section and who shall signify to the Secretary of the National Safety Council or to the Secretary of the Section their desire to affiliate with this Section.

OFFICERS.

Sec. 4. The officers of this Section shall be a Chairman, Vice Chairman and Secretary, who shall have the usual duties of such officers and whose terms shall extend to the annual meeting of the Section following their respective election or until their successors are elected.

ELECTION OF OFFICERS.

Sec. 5. Nominations of officers shall be made by a Nominating Committee of three appointed by the Chairman of the Section, which committee shall report at the annual meeting its recommendations of officers, which report shall be followed at said meeting by the election of officers for the ensuing year. Other nominations for officers may also be made by any members at this meeting.

MEETINGS.

Sec. 6. There shall be an annual meeting of the members of the Section held during the period of the Congress of the National Safety Council, notice of the time and place of which meeting shall be posted at the information desk of said Congress. Other meetings of members may be held on due call and notice by the Sectional Executive Committee.

Automotive Sectional Meeting

COMMITTEES.

Sec. 7. The affairs of the Section shall be conducted by the Executive Committee of the Section which shall be composed of a Chairman, Vice Chairman and Secretary of the Section and a Secretary of the National Safety Council, who shall be ex-officio member thereof, and the Chairman of the following four standing committees, which committees shall be appointed by the Chairman of the Section.

1. Membership Committee,
2. Standardization Committee,
3. Committee to study causes and remedies of hazards in the Section's field of activity,
4. Program Committee.

Sec. 8. The Executive Committee of the Section shall appoint such other officers or committees and amend these By-Laws or other By-Laws and do such other acts and engage in such activities as may be needed to wisely further the objects of the Section.

SUPERVISION BY NATIONAL SAFETY COUNCIL.

Sec. 9. This section shall be under the direction of the Executive Committee of the National Safety Council.

All By-Laws and amendments thereto, activities, expenditures, literature, bulletins and published data of this Section shall be subject to the prior approval of the Executive Committee of the National Safety Council and all publications of the Section shall be published in the name of the Section as a Section of the National Safety Council.

Gentlemen, you have heard the reading of the by-laws. What are your wishes regarding future meetings? Do you, as a body wish to be affiliated with the National Safety Council as an Automobile Section, or as a Section to be given a name later? Shall we call it the Automobile Section or the Automotive Section?

CHOOSING A NAME FOR THE SECTION.

MR. R. A. SHAW (Ford Motor Company, Detroit) : I think we ought to broaden out and take in as much as possible. I feel that it ought to be the largest or next to the largest Section in the Council. The word "automobile" seems to be somewhat limited and we should take in a bigger field, so I move, if it is in order, that we adopt the suggestion of the Chairman and ask to be recorded as the Automotive

MR. BARRATT (Michigan Bolt & Nut Works, Detroit, Mich.): I second the motion.

MR. BEGLEY (Willys-Overland Company): In a Section of this kind we might, with all reason, include all manufacturing of gasoline and gas engines, the hazards of which are somewhat similar. All manufacturers who might become members of the National Safety Council could then join this Section.

MR. SHAW: Does not that cover all the points? Would not that take in every machinshop that is making an engine?

CHAIRMAN WILLIAMS: That is in line with my idea; the reason why I suggested Automotive Section, Mr. Shaw, was to take into our Section any concern manufacturing motors.

MR. SHAW: Why not call it the Motor Manufacturing Section?

CHAIRMAN WILLIAMS: That would conflict, to a certain extent, with electrical manufacturers. Do you think we should take those in, too?

MR. SHAW: Electric motors, no.

CHAIRMAN WILLIAMS: That is one thing we will have to consider.

MR. SHAW: My remarks applied only to gas and gasoline motor manufacturers.

CHAIRMAN WILLIAMS: What would you suggest as a name for our Section? What do you think would be appropriate?

MR. BEGLEY: It might be called the Gas and Gasoline Engine Section; it might include all manufacturing of that kind, where there is a similarity of hazards or construction.

CHAIRMAN WILLIAMS: Do you make the suggestion in a form of motion?

MR. BEGLEY: I think some of the gentlemen present would like to speak upon the subject before a motion is made.

MR. BURKE (Cottrell Company): It has been suggested that we extend our activities and take in all manufacturers of gas and gasoline engines. It is well known that we are looking for other power, such as denatured alcohol. I anticipate different classes of engines and before our 1918 session something of that kind may develop. In order to encourage membership it would be well to plan a wide range of activity, confining ourselves, of course, to our own or allied industries.

MR. SHAW: Shall we add the word "Accessories?" The word "motor" means an engine or something that is being propelled.

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CHAIRMAN WILLIAMS: You could take in a steam car cared to broaden the scope of the Section. It seems to me that going to have a Section worthy of the National Council.

This Section was planned for automobile industries—that is, it was intended to cover. We thought automobile and allied manufacturers—some making airplanes, some automobile engines; others motors and accessories—had various methods of meeting accident hazards that could be applied to other plants, and accordingly reduced or eliminated. I have been able to pick up splendid suggestions and applied them to our own plant by making a few minor changes. The thought is to form a clearing-house for safety suggestions and offer the combined experience of the Section to all interested manufacturers. To cover this field I made the suggestion of using the term "automotive power," believing that it fairly describes the scope of our proposed work.

MR. A. H. FAY (Bureau of Mines): I am not in the automobile business. I am interested in safety for the lighting industry; I trust you will pardon me for speaking here. The name of the Section I think should be short. Do not make the name too long; your suggestion of "Automotive" would cover about everything you need in your particular line. "Automotive" takes in alcohol engines as well as gasoline engines; it would take in kerosene-burners; any other type of engines mounted on wheels, flying, or otherwise. It seems to me "Automotive" would be a very suggestive name for the Section—one easily understood and one that would not be cumbersome in program work.

"THE AUTOMOTIVE SECTION."

CHAIRMAN WILLIAMS: Thank you.

MR. COLEMAN (Pierce-Arrow Company): I believe a motion was made to call this the "Automotive" Section. If so, I second the motion.

CHAIRMAN WILLIAMS: The question before the meeting is whether we call this the Automotive Section of the National Safety Council. (Being put to a vote the motion was adopted.)

We will now take up our program. Unfortunately we were unable to secure a license for a moving picture apparatus in this room. Our friends from the Ford Motor Company intended to show the pictures they have accomplished along safety lines in testing out their engine ovens. I have seen the ovens and I assure you they are excellent.

show you the pictures, but our friend, Mr. Shaw, will tell you about them in his paper.

AN ENAMELING OVEN DESIGNED WITH RELATION TO SAFETY.

R. A. SHAW, SAFETY ENGINEER, FORD MOTOR COMPANY, DETROIT, MICHIGAN.

Mr. Chairman and Members of the National Safety Council:
It is a great honor to be the first speaker at this meeting. The idea of a safety clearing-house appeals very strongly to me, although its application to the automobile industry did not present itself until the new section was proposed.

We make rubber tires, bodies and so many sections it is hard to give a comprehensive review of our activities and difficult for a speaker to review the safety work of so large a plant. If you visit the Railroad or the Iron and Steel Sections you will hear speakers talking about ladles and how to get hot metal out of the furnace. The papers are very interesting and next year I am sure our Program Committee will plan our work on somewhat similar lines and make this the biggest meeting of the whole Congress.

Many of you know from experience and all from reports that the explosion of enameling ovens has been one of the greatest hazards in the automobile industry. I have in mind six large automobile plants that have had experiences with oven explosions in the past two years. Fatalities resulted in each case.

In most of the cases that have come to my attention, I am sorry to say, nothing whatever seems to have been done to prevent a repetition of such experiences, and several further explosions, with added fatalities, have been the natural result. Other manufacturers have been conducting experiments with a view to overcoming these hazards. I am glad to say that the Ford Motor Company has been among this number and I truly feel that considerable progress has been made.

CAUSE OF EXPLOSIONS.

Enameling oven explosions may be divided into two classes: First the explosion of gas furnished from an outside source and used to heat the oven; second, the explosion of gas formed inside the oven from the enamel and other internal sources as the parts to be enameled are heated.

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In the first case, that of the gas used for heating the oven, several comparatively simple mechanical devices have been worked out to remove the danger. Among these we may mention (a) the use of a thermostatic device which automatically shuts off the supply of gas from its outside source immediately the fire is blown out; (b) the installation of a device similar to an automobile spark-plug over one of the burners within the oven and so connected that the supply of gas is temporarily cut off and later turned on so that it can instantly be lighted at the burner. In many cases electric ovens, that is, ovens equipped with electric heating units—have been used instead of gas-heated ovens, the idea being that in using electricity as a source of heat, the hazards of the gas-heating system would be eliminated. This is largely true. But the second hazard, the explosion of gas formed inside the ovens, still exists. In this case the problem is not so easily solved as was the problem of handling the gas used in heating the oven. Yet there are what we may term certain precautionary measures which, if carried out, will tend greatly to reduce the possibility of an explosion from internal sources.

Take, for instance, the stacks. Ovens are equipped with stacks primarily for the purpose of removing smoke, vapor and the various forms of residue resulting from the heating of the parts to be heated, but there is no reason why the gases formed in this process should not, in a large measure, pass out of the stack, provided there is an opening at all times in the stack.

While circumstances surrounding many explosions have not been entirely clear, still it is generally believed, in a number of instances, that explosions would have been avoided if the damper in the stack had not been entirely closed, thus giving no direct means of outlet to the gases being formed. To make an outlet in the stack certain and mechanical certainty at all times it is strongly recommended that an opening in the damper be provided equal to at least one-tenth the cross-sectional area of the stack. This is a law in the State of New York, I believe, and it should be a law in every State. With a means of outlet provided, as suggested, the gas forming in the oven cannot be forced under pressure and consequently the possibility of an explosion is considerably reduced.

STEAM CONVEYOR OVENS.

In passing I should like to mention the fact that the Forney Company is now experimenting with a steam conveyor oven, in which a temperature of 400 degrees can be secured from steam with-

about the walls of the oven, while the parts to be enameled move slowly on a traveling conveyor. It is our intention to use this type of oven wherever possible, the idea being that there will exist small chance either of fire or explosion when steam instead of gas or electricity is used to provide the necessary heat.

This paper has dealt very largely, thus far, with efforts being made to eliminate the possibility of enameling-oven explosions. We all realize that there is still a possibility that something may go wrong. The construction or maintenance of the oven may be faulty or the oventenders may become negligent and not keep the safety equipment in proper working order. The result is an explosion. To find an ample means of outlet in case an explosion actually takes place has been the reason for the Ford experiments.

The case of the steam boiler is in many ways analogous to that of the oven. We still hear of boiler explosions, but the number is constantly decreasing. There are two principal reasons for this decrease. The first is that stringent laws have been enacted to require careful construction and inspection of boilers. The second is the use of low-water alarms, safety plugs and automatic safety valves. Under these conditions with reasonable care and attention boilers are now regarded as practically safe.

To my mind there is a lesson here for us—a lesson that may be applied to the problem of making ovens safe. When there is an explosion, within an enameling oven the force of the explosion is applied equally to all sides of the oven and the result in the past invariably has been that the latch on the oven door breaks, the doors are hurled open and almost certain death awaits all who happen to be within reach. If not actually struck by the doors, the workmen nearby are very likely to be thrown forcibly against the walls or other obstructions and killed or at least severely injured.

Our idea has been that the least damage will be done if the force of the explosion is allowed to pass out at the top of the oven and we believe that the Ford experiments have proved this point. We have had the tops of all Ford enameling ovens entirely loosened.

Even though the doors may not be very firmly locked, experience has shown us that with the top fastened down the oven is very likely to be wrecked by an explosion, for the reason that no immediate outlet is provided to neutralize the effect of the explosion. With the doors firmly secured as ours are, and with the top loosened so that it will lift instantly when the force of the explosion is felt, the force is largely dissipated and very little real damage is done.

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LOOSE TOPS TO OVENS.

At first we tried to use holes, or vents in the tops of the making these holes perhaps thirty inches square and providing for each oven, with a plate laid over the opening, but it was proved that these would be entirely inadequate, whereas with entire top loosened no trouble was experienced, the area thus being so large that no serious harm was done.

In conclusion I may say that I firmly believe that if enameling ovens are designed and equipped as has been outlined in this fully 90 per cent of the hazards of their operation will have overcome.

Gentlemen, I thank you. We have a moving picture and big room is at liberty later, and you wish to see this experiment I think it could be shown on the screen.

DISCUSSION.

CHAIRMAN WILLIAMS: Gentlemen, before you go away I you would register with the Secretary your name and the corner that you represent.

We all, I am sure, appreciate the paper Mr. Shaw has given. I am sorry that we cannot have the moving pictures at this time. I have been in the automobile business for some time and we manufacture what we think is the best car in the country, still we hand it to the Ford Company for their experiments. We have Mr. Shaw's paper and its discussion should be very valuable. I trust the delegates present will go into the matter thoroughly.

MR. LINGERMAN (Hudson Motor Car Company): We have a conveyor system, and we have the old enameling ovens with automobile spark plug. When the gas goes down the plug is sparking. We are using this conveyor system and it eliminates explosions. If you will visit the Hudson Motor Company I will be glad to show you our system.

MR. SHAW: Are the tops of your ovens loose? We are experimenting with the long conveyor but still prefer to have the tops in case of formations of gas or chemical fumes.

MR. LINGERMAN: Ours are not open at the top. They are

CHAIRMAN WILLIAMS: I have just been informed that the Public Safety Section are having a talk by Mr. Little of New York on the electric testing laboratories for headlights. They seem to think it would interest every one in our Section. The primary idea is the enactment of laws really governing the use of headlights. They would like us to attend in a body. What is the wish of the Section?

INVITATION FROM PUBLIC SAFETY SECTION.

MR. C. E. TALBOT (St. Louis Public Safety Commissioner): May I say a word? We are trying to organize a Public Safety Section. Mr. Campbell has been its head heretofore. He is in Chicago now but we have fifteen or twenty people interested in the proposition. Our work runs right into automobile activities, particularly in traffic and headlight regulations. We would like those interested to join with us for a few minutes. If you so desire, I will ask Mr. Little to wait until you can meet with us. He is going to talk on "Standardization of Tests," the idea being to secure a standard measurement. The paper will not be technical and can be read in about fifteen minutes. We are trying to get somewhere in standardizing that particular phase of our work.

MR. LINGERMAN: I think we ought to go on with the work of this section.

MR. TALBOT: I had no thought of interrupting. We will be glad to wait until you are at liberty to join us.

CHAIRMAN WILLIAMS: We will be glad to join you a little later on. Is there further discussion on the subject now under consideration?

MR. BEGLEY: I would like to say a few words on the subject of ovens. We are all interested in learning how these gentlemen arrived at the conclusions they did as to safe methods in operating ovens. I am very much interested in what Mr. Lingerman said about the conveyor system in the ovens in their plant. I am also interested in Mr. Shaw's statement regarding the construction of their ovens. One has an oven that is open at the top, the other an oven with no ventilating openings other than those required for the entrance and exit of materials. I would like to ask either or both of them, particularly Mr. Lingerman, after arriving at this automatic system if any tests have been made to determine whether or not there is any protection from gases which will explode without ignition of a spark or a flame? I understand there is a hazard in

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chemicals which are used for enameling certain parts of automobiles.

MR. LINGERMAN: No, we have not made any real tests and are not figuring on any. In our new ovens, equipped with the conveyor system, one man hangs on a fender on one end and it goes through an opening something like a chute about six feet square. An endless chain pulls it through. There may be a rise of about five or ten feet and it travels for a distance of fifty or seventy-five feet along this big chute. There is another incline where the product comes out. The heat is all up in the top and there are openings at both ends, so if there was an explosion it would naturally be blown down.

We do not have any ventilators because we use steam heat and there is no chance of explosion unless there are gases I do not know about. The engineering department figured it out and our plant department assisted in the work. It is our own design of oven. The technical description can be had from our heads of department and they will be glad to explain how it works.

A SERIOUS OVEN ACCIDENT.

MR. SHAW: I think we ought to profit from the experience of the past. I am going to speak of an accident at Cincinnati. It does not come under the head of our plant because we never had a gas explosion there, but at Cincinnati an oven blew up about a year ago and it killed four men. It was a square oven, electric heated. They figured that it could not blow out and the operator had been instructed to turn the damper off twenty minutes after he first started his heat. It is thought the operator closed the damper a little too soon and did not let the gas out or that gas formed from paint was being used. An explosion took place but it is not known what caused it. It was a terrible explosion.

In our own experiments with a steam oven we have loosened the top and have installed little vents and an air pipe to supply air to the furnace, but with all these precautions we had a blow out. We have holes every twelve feet, so that if air comes in it will be blown out again. This system has prevented several explosions, because we have had the air pipe blow out. Gas and air, as well as the fuel, are pretty hard things to deal with.

CHAIRMAN WILLIAMS: We will now take up the next topic for discussion "Sheet Metal Work."

SHEET METAL HANDLING.

R. R. RAY, DIRECTOR OF SAFETY, DODGE BROTHERS, DETROIT.

Mr. Chairman and Members of the National Safety Council:
The subject assigned to me seemed to be about the driest sort of subject that could be discussed. Occasionally our office gets accident reports showing that men are cut with tin. We do not use tin in our cars, but that is the way the first aid report reads.

In the construction of most automobiles, especially those of the so-called pleasure types, sheet metal is used extensively, and naturally it presents a distinct hazard to all of us who are manufacturing automobiles. I will try to express views that have been formed through association with plants in Detroit, and more particularly that of Dodge Brothers. We consider our punch presses our most hazardous department. In that department, and in the sheet metal stores department, we employ about 650 men, and while we have other departments equally as large, it seems that we always find the sheet metal department and the punch press departments heading the list each month with the total number of accidents. For the most part these accidents are trivial. In the last six months we had 153 accidents coming from those departments. Eleven of which were lost time accidents. Those were the men who drew compensation, and about that number—153 would be about 25 per cent of our accidents for that period.

RECEIVING SHEET METAL.

The sheet metal, as we receive it, comes in half a dozen different grades from the different mills and in different types of cars. We unload it from the cars into our large steel storeroom, a room about 400 feet long by 100 feet wide. We have three cranes operating the full length of the building which handle the metal. It is stacked in neat and orderly piles by means of specially designed slings. We have three types of slings which handle all the sheet metal. The slings have been in use for more than three years and we have had only two cases where loads fell from the slings, no one being hurt in either instance. Of course that was a matter of good fortune. The largest sized sheet that we handle is 47 by 114 inches and our gauges range all the way from twenty-two up to one-quarter-inch plates.

We attempt to pile the sheet metal in a neat and orderly manner. Of course it all presents a ragged edge, more or less, but we try to

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give sufficient aisleway; in fact, down through our main par room, where we have an industrial railway, I think we have fifteen feet aislespace, and in other parts of the room we have eight feet aisles. Of course I do not mean between every refer to aisleways or passageways. Occasionally we have accidents caused by men running against corners of these sheet metal piles. I do not think it is feasible to build guards around the piles, but they have to be moved too often.

We do not have any trouble with the sheet metal, as it is through the stock falling over, but as some of the piles are or as the sheets are being trucked about or stacked, occasional fall over, due to the faulty piling. All this work has to be carefully supervised in order to safeguard against accidents of this character.

We operate 118 presses in our department. They range in capacity all the way from No. 2 Toledo to No. 268 Toledo and No. 1 Bliss. Like most plants, where there are a large number of presses operating, they are arranged in series, so that a job is blanket pressed on in a sort of continuous fashion until it is completely finished to avoid as much trucking as possible. Our presses, for the part, are safe-guarded. We give all our operators pliers and for inserting the sheets and for removing the stamped parts; we provide gloves to those that are handling the rougher metal.

DUTIES OF SAFETY INSPECTORS.

Our greatest factor in preventing accidents in the sheet metal department has been a safety inspector who devoted his full time and attention to the press and sheet metal departments. This man has a lot of experience and he understands thoroughly the operation of every type of punch press. It is his duty to instruct every new man that comes into the department about the different hazards of the job; as the jobs are changed on the presses he observes the men in which the men work and sees that they perform their work in a careful fashion. We are fortunate in having a thoroughly experienced foreman that believes in safety at the head of our punch press department. We have acquired excellent results in the punch press department and have eliminated accidents.

The removal of scrap from the presses presents the greatest hazard and I think that is the probable source of the greatest number of our accidents. As it is now, our scrap is placed in large piles mounted on jack-trucks. They are moved about under crane

ship a great deal of it away. All the men who handle scrap wear gloves.

A number of our punch presses are provided with Jones' guards. It is not possible to guard every press—we know that. I have not yet heard of a guard designed to take care of every sort of punch press job. Safety men are hoping for one and we will be very glad when it comes along. We are constantly experimenting with the different types of guards produced by the manufacturers but we have not been able to find anything that suits our particular purposes better than the Jones' guard, even though its use is limited.

SPECIAL PLIERS FURNISHED MEN.

The specially constructed pliers we furnish to the men have been the means of preventing a number of accidents. The pliers are fashioned in a rough manner in our blacksmith department and we see that every man having a dangerous job is provided with them. We know they have been the means of preventing a lot of accidents, because hardly a week passes that we do not have two or three pairs that have been cut under the dies sent up to the safety department. To us they represent fingers, or the saving of fingers.

We employ about 150 night men in the punch press department. Throughout the plant we have about 2,500 night workers and night work is considered by everybody to be more or less of a hazard. We have a night safety inspector, chosen from the punch press department. He is an experienced man and he devotes the major part of his time to that department.

We have been experimenting with different types of gloves for our workmen. We do not know whether it is advisable to furnish these gloves entirely free, or to charge the workmen a small amount for them. Of course, there are arguments in favor of both methods and I would like, at the conclusion of this informal talk, to hear the experiences of other companies with reference to providing their men with gloves.

LAYOUT FOR PUNCH PRESSES.

The new layout of presses we are just now installing might be of interest to you as I think it will be the means of preventing a number of accidents in our plant. We are mounting eight presses in a row, and at first all of the dies will be changed uniformly. I mean that when a job comes through that calls for enough parts for 20,000 cars, then all the dies will be set up for the job on those presses.

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First will come the blanking operation, from there it will go to the drawing press, from the drawing press to the finished part, and then fall on a conveyor immediately back of the press and pass to a rotary furnace located behind the wall about eight or ten feet back of the press. It then goes through the furnace and falls out at the other end on another conveyor which takes it to the cooling tank located underneath the crane. Another conveyor from the cooling tank brings it back to the next press, where the next drawing operation is performed. The finished part again falls on a conveyor and is taken to a furnace and then through a cooling tank. We believe that system is going to prevent a number of accidents. At present, is now, the different parts have to be trucked about a great deal, though our presses are laid out as nearly as possible in a series. In the new type of construction we will have the conveyors take up all the scrap from the presses. We are hopeful that we will be able to make the new system effective, as far as the conveyors are concerned, because we know that in the removal of the scrap we counter our greatest hazard.

ONE PAIR OF GLOVES EACH DAY.

Information was requested with regard to the protection afforded by the distribution of gloves for handling sheet metal. We made quite a lengthy study of the proposition about a year ago. I do not remember the exact figures, but it required from twenty to twenty-four pairs of gloves for each man in the department per month. That was a very high percentage. Half of the men in the department were welders, not strictly handling sheet metal, and the material came to them in all forms, ready for them to make up. The cost of such a large number of gloves was considerable and we attempted to remedy the situation. We secured several different types of gloves: gloves with riveted metal palms, with composition palms, and with leather palms.

We tried them on under different conditions in that department both with what we call our "tar babies"—the welders who generally burn their gloves, and the sheet-metal handlers, the latter interested us mostly. We finally decided that the tire men and the sheet metal handlers should be the only workmen to receive gloves and changed our method of distribution. Formerly a clerk could get a pair of gloves on the regular storehouse requisition. We changed it so the gloves for the whole department were in personal charge

We adopted the cheapest glove on the market as being the cheapest in the long run.

The reason for giving out one pair of gloves each day was on the basis that a man who could wear out a pair of these cheap gloves in a day was working on a job that required the use of gloves. We took the issuance of gloves out of the storehouse keeper's hands and put it in the hands of the sheet-metal department foreman because he knew all about the job, where a man was handling a press with ragged gloves, and whether he needed gloves or not. The entire proposition has worked out very satisfactorily. It was pretty much a matter of personnel with the foreman.

SLINGS AND MAGNETS.

As to our method of handling sheet metal: We have experimented with slings and with electro-magnets and have come to the conclusion that the nearer you can keep the metal sheet to old Mother Earth the better—probably more so in our industry than in others, because our gauges run 12, 14 and 16. Most of our tanks are 12 and 14 gauge.

We use Matthews traveling conveyors to carry the metal from the cars to the storehouses and men have only to handle the material in changing it from a truck to a revolvator. In some cases the latter can be used at the end of the Matthews carrier and it piles square sheets near enough to the exact part to be elevated without very much trouble. Our large sheets—the 12 gauge—are about fourteen inches wide and 148 inches long and require about three men to lift them. We let them come off a traveling conveyor onto a heavily constructed truck, pull that truck to the elevator, and put it up by the revolvator to the men. Slings place considerable responsibility on your safety man, in that they have to be inspected or you will have your metal slipping, resulting in accidents.

DISCUSSION.

CHAIRMAN WILLIAMS: Can anyone else give us real facts with regard to gloves, that is, actual experience? Has anyone experimented with armored gloves?

MR. JOHN G. SHIRLEY (Assistant Works Manager, Gilbert and Barker Manufacturing Company, Springfield, Mass.): It might be interesting to know of our experience with riveted-palm gloves. The men object to wearing them, in some cases, because the glove is so

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heavily constructed that it does not allow for perspiration from hands. If you ask a man to take off his gloves his hands are wet and the inside of the gloves are very slippery. From their point of view it is a very unsatisfactory glove. It is hard to get anything with wet hands inside of slippery gloves. If you wear rubber heels on your shoes and go through a factory and step on a wet place it has the same result.

MR. W. H. CAMERON (General Manager of the National Automobile Council): May I contribute? Have you corresponded with the manufacturers of gloves and presented that problem to them? The Goodyear Glove Company is intensely interested in proper kinds of gloves. There ought to be some means of ventilation, and if you would suggest that to the manufacturers I am very sure they would study it and produce a satisfactory glove. I think I was one of the first in this country to use those studded gloves—in 1910—and I know the problem of sweating hands. There has been a tremendous development in the making of gloves within the last half a dozen years, and this leads me to believe if you need a glove of a certain character and if you present the problem to the manufacturer you will get the results. He studies it and is interested in filling the demand.

CHAIRMAN WILLIAMS: I think Mr. Cameron would like to say a few words on another subject.

THE FORMATION OF AUTONOMOUS SECTIONS.

MR. CAMERON: I am very sorry to interrupt your meeting with a little matter of business. We had more complications this morning than can be imagined and I wish to speak about the organization of your Section. Perhaps the program is not very complete. In 1915 we started to serve our members by forming Sections. Iron and steel members and foundry members wanted to get together at our annual meetings and confer about their particular technical problems, so we devised what we call our sectional organizations. Any member of the Council who is interested in iron and steel problems has the privilege of participating in any of the activities of an autonomous organization. I say autonomous, because it was the opinion of our Organization Committee that we ought to consult the people in the industry in forming Sections.

Last year there was a tendency to organize a great many sections—little groups with four or five members each. I will give you an illustration. Take the rubber industry. There were

form a Section. We thought it would be much more advisable to have them grouped in a subdivision of an industrial Section, as we have a group of miscellaneous manufacturers.

We are planning a re-division of our Sections. This does not mean that you do not have all the privileges of the old system. The Automotive Section can organize perfectly and have its own meetings and bulletins and any other activity you desire. Other Sections will have the same privileges. Our plan is for you to meet with other members and elect officers for a Miscellaneous Manufacturers Division.

In other words, the automobile members and car builders should have a joint meeting, elect a Chairman, Vice Chairman and Secretary, and those three officers should arrange for the activities of your Automotive Section. Your activities can be carried on through committees. Your officers can arrange for committees, for a program, for membership, for bulletins and so on for this particular group. In other words, you will have all the activities and all the service you want, but at the same time you won't have a lot of superfluous officers. The Chairman of this particular sub-division of the Miscellaneous Manufacturers Division becomes automatically a member of our Executive Committee.

The routine of forming this Section is very simple indeed. If you desire to have this kind of representation or service I will see that it is done. I believe we can help our automobile members a good deal more through this activity than we have been able to do in the past. It is just a question of signifying your interest. We will arrange to have a combined meeting with the car builders later in the afternoon and when assembled together we can organize and select a nominating committee and elect officers.

A NEW DIVISION OF ACTIVITIES.

I would suggest something like this: That we agree, in this particular instance, because we have only the two groups in the Miscellaneous Division. That we agree to have the Chairman or the Vice Chairman an automobile manufacturer's representative; then the Vice Chairman or the Chairman representing the car builders. The Health Section and the Employees' Benefit Association have combined in the Health Section. The Chairman this year will be a representative of the Health Service Section and the Vice Chairman will be a representative of the Employees' Benefit Association; we will have proper representation from the various groups in these officers.

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The activities of the Section are very simple. So far they principally been at the annual meetings the preparation and distribution of special bulletins relating to industrial and technical hazards and the preparation of the Safe Practices pamphlets. I hope there will come when we will have pamphlets treating every particular. All the departments in your industry can be worked out through your officers. It is a simple yet effective plan. It is a question of meeting with the other groups, determining on the organization necessary, selecting a nominating committee, electing officers and instructing your officers to take care of the routine work of the Division. I do not know whether I have made myself very clear as I talked very hurriedly.

CHAIRMAN WILLIAMS: This meeting, Mr. Cameron, has authorized the formation of an Automotive Section. I would like to talk about the grouping of this Section with the car builders. It seems to me as though that is not the exact thing we want, owing to the fact that our proposition would be entirely different from that of the car builders, providing the car builders are going into nothing but car building proposition—street railway car building and that kind of work.

MR. CAMERON: I can answer that question very readily. There will be absolutely no connection between your Automotive Section and the Car Builders' Section. We have 150 different lines of industry represented in the National Safety Council. I am not intending to say that your particular industry is relatively less important than some other, but for the present, at least, our committee thinks we ought to have our groups subdivided under these miscellaneous heads.

You have no particular connection with the car builders, there will be three officers who will supervise the activities of what we call the Miscellaneous Manufacturers' Division. Let me explain. The medical association after twenty years' experience, has adopted this plan. It is folly to have a great many sectional organizations with a lot of officers. It is difficult, as it is, to get direct organization. You meet jointly to elect officers and arrange for proper representation; then your activities separate, and you have your own committees and interests. You will see that answers your question, Chairman. I will arrange for the meeting this afternoon, go through the necessary procedure, then we will go ahead and elect officers and carry out our program.

RESPONSIBILITIES OF SAFETY WORK.

I would like to say, in conclusion, gentlemen, that I do not think any of us realize the responsibilities we have in these pioneer days. We now have a considerable organization; you know we have over 3,400 industries in our National Council. We are growing very fast, but whenever I visit the first meeting of a new section I think of a new baby being born, and wonder if it will grow up to be President of the United States. There is a tremendous responsibility in organizing and taking the initiative in new safety work and there is a tremendous lot to do. We have to do it carefully and resolutely. We are attempting to create and organize for a particular subject, and to my mind all the details are not yet fixed. We will have to work a good many years before we have absolutely established the permanency of the safety movement and I hope you will all work with us. Ours is a voluntary organization, but it is a body in which you can meet one another and accomplish results. My idea is to initiate the work in our headquarters, through our staff. We will do the preparatory and research work, but you men will have to criticize and edit the plans before we send them out. This service is yours. It is controlled by the membership. Why not have it? I believe there is a real need for it. Thank you.

SAND BLASTING.

CHAIRMAN WILLIAMS: The next subject is "Sand Blasting." Will some member favor us with a brief description of his method of sand blasting?

MR. LUMBY (Cadillac Motor Company): The method we employed before adopting our new system was about what everybody else was using—anything we could get hold of. After a great many experiments we decided the only way to do the work safely was to keep our men out of the dust and in order to do that we had to change our operation. We put a sliding door in front of the confiner and swung an apron around it. Fresh air is forced in to the man. In that way he is breathing fresh air all the time and he is not in the dust. It cuts out the handling of sand, which is used over and over until finally it is carried away in the exhaust system.

We have had this system for a year and a half and have had no serious difficulty. Several men have died from the effects of sand blasting and it is a hard matter to secure workmen. It is very hard

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to keep tab on actual results for a year and a half, but several have been engaged on the work for that period and they show serious results.

CHAIRMAN WILLIAMS: How do your men see their work: they look through glass, celluloid, screen, or what?

MR. LUMBY: They look through a screen. It is the same as they have always had. This screen is made extra large and the rent of air cleans it. It does not clog up with dust like the old. There are two lights inside the booth and the men see better than did before. There is not so much dust because it is carried constantly and a man can inspect his own work in the booth.

CHAIRMAN WILLIAMS: Are you giving no head protection all; do you not supply helmets or anything of that description?

MR. LUMBY: The workman wears a helmet. It is all made a one-piece suit.

SECRETARY RAY: Screen or glass for the eyes?

MR. LUMBY: Glass or very fine screen for a man who is working there all day—depending on how clean you keep the floors. The more dust stirred up the more he will breathe. Our exhaust system draws the air out. If there is any dust mixed with the air it lodges on the workman's face and for that reason we still allow him to wear a respirator.

SECRETARY RAY: You allow him—that is good.

MR. LUMBY: It is not a case of allowing—I should make correction. I am sure we find it better to have the respirators than so that we are sure of the efficiency of the glass.

CHAIRMAN WILLIAMS: I understand you have an exhibit here in the city?

MR. LUMBY: There is a small model here. It is in the Museum of Safety at the Grand Central Palace.

SAND BLAST FOR SMALL WORK.

MR. H. D. CHRISTIAN (Willys-Morrow Company, Elmira, N. Y.) We have a sand blast for small work on gears and things of that class. We have a booth, possibly five feet square, that goes through the roof. There is a suction system at the top to take fine dust. Down in front is a slanting window the workman can look through. Underneath that are two arm holes, where he puts his work in. There are iron bars across the plate, so that as he works the sand is carried through a conveyor. A man can stand there a

CHAIRMAN WILLIAMS: Have any of you tried a sand blast for bodies before putting on your prime coat? If you have, how do you carry out your method of sand blasting?

In the Packard Motor Company about nine months ago we started to sand blast bodies instead of scrubbing them with sand paper. We put the man in an enclosed room and gave him a complete change of air every thirty seconds. This, to a limited extent, eliminated the dust. We also provided the man with armored clothing. When I say armored, I mean padded. The man wears a helmet, the helmet being supplied with a compressed air tube, brought from an air-washing system. It is put in the helmet up to one-ounce pressure, the tube fastening onto the back, right on the shoulders, extending to the top of the helmet. The air enters directly in front of the man's mouth, blowing downwards, not directly into his face, but straight down in front. I have a photograph depicting the helmet, and also showing the sand blast room. Please pass the photograph around.

We have found that our system worked out very well. We have not had a man quit on that particular job for nine months; whereas, in the sandblasting rooms in other parts of the factory, we have had the men quit on an average of every three months for the past five years. Now that we have this installation, we have had no trouble whatsoever. In one of our departments we use steel shot, in the other place we use sand. Where we used the sand was really the worst and we had to combat a lot of antagonism from the men with the new system, but they are working and there seems to be peace in the family.

MR. SHAW: How often is the air changed?

CHAIRMAN WILLIAMS: Once every thirty seconds; two complete changes every minute.

SAND BLASTING AT PULLMAN.

MR. JOHN G. SHIRLEY (Gilbert & Barker Manufacturing Company, Springfield, Mass.): Instead of using an ordinary ceiling we removed the ceiling and put in one of glass, we placed strips across, sliding the glass in. It has solved our lighting problem. Is there a representative from the Pullman Company at the convention? They are very well posted generally, on sand blasting as their entire car is sand blasted. I witnessed an interesting feat in sand blasting where they took an entire car, right down from the paint shop, and sand blasted it both inside and out. Their problem is a very difficult one, because you cannot put a railway car in a cabinet. It is an outdoor

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proposition and a heavy one. The scale is hard to remove and use a heavy pressure. It might be interesting to know that the old plan a great many accidents were due to hoses getting and even very strong men lost their lives by not playing the hose. It is the same as a high pressure fire system when the hose got out of control.

A small foundry in the vicinity of Springfield, Mass., lost within the last few months through the hose getting away from him and hitting him in the face. Before he could get it under control it filled him full of sand. He was a very husky Swede but he had no chance whatever.

CHAIRMAN WILLIAMS: Is there anything further on sanding? If not we will take up our next topic, "Lead Poisoning Automobile Industry."

LEAD POISONING IN THE AUTOMOBILE INDUSTRY

CHAIRMAN WILLIAMS: Here, again, gentlemen, I will give what little experience we have had. Before using respirators in one section of our plant, we used to put the priming coat on a large hood. It was supposed—you will notice I am using the "supposed"—to carry off the fumes and the lead. We had a man go on the job—a big, husky chap—and he started to lose weight after he had been on the job a little over two and a half weeks finally he went to the hospital. Our doctor got hold of him and found that he had lead poisoning. As a result we took the man off the job and shut down that section of our plant. We were sprayed but we went back to the old method of putting the priming on with a brush until we could remedy the defect.

We cannot have our men covered up to such an extent that they cannot get around the car. Our entire chassis frame and body are sprayed finish, priming coats and everything, so the problem we were up against was to be able to get around the material, to spread it conveniently, and at the same time safely. We finally had to adopt a helmet for the men, using a respirator and building the system down to the floor in a separately enclosed room. We ripped out our old exhaust system and put in one of just about five times the capacity. I do not know whether or not we have totally eliminated poisoning, as we have only had it in operation this summer, so there is really no absolute data on it. I would like to hear if the

LEAD POISONING.

MR. SHIRLEY: We have had considerable trouble along that line. We also spray our paint. It has been brought very forcibly to our attention, through the state inspector having reported the matter to the Bureau of Labor. We were called upon to remedy the condition and we went at it in this manner:

We replaced our factory physician with an expert on the skin diseases, Dr. Harriman, giving him five cases. We were not sure whether the cases were lead, zinc or turpentine poisoning. The doctor was unable to ascertain whether it was any one or all of them, but we had reason to believe that the majority of them were turpentine—it being difficult to get first class turpentine, we were using a second-class article.

The method we used in combating the trouble was this: We transferred the men from the paint shop to the assembly machine shop and to other work outside the paint line. We tried, in connection with weekly and daily treatment by this expert, to eliminate the rash which had broken out on their arms where their sleeves rolled up. Some of the men had their entire bodies covered with this rash, or skin irritation. It was most irritable on their thighs, where their belts rubbed them. In every conversation I had with the men they told me they could not sleep at nights and therefore they were not of very much service to us in the day time, so we were only too glad to have this skin specialist come in and assist us.

We cured the men through a combination of his treatments and by transferring them to other departments. The men have not been back in the paint shop long enough for me to be able to tell you what the results of this experiment are going to be. The physician examines them every Saturday morning, on the company's time. We hope to get some valuable information along the line of poisoning and skin diseases in the painting industry, something that the State of Massachusetts today has been unable to fathom because they worked on it before we tackled it.

MR. J. R. ANDERSON (Michigan Workmen's Compensation Mutual Insurance Company): I would like to ask Mr. Shirley if occupational diseases come under the compensation act in Massachusetts?

MR. SHIRLEY: It does. Massachusetts is an ironclad State in regard to laws regarding labor.

CHAIRMAN WILLIAMS: If there are no more questions we will take up the next subject.

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USE OF GOGGLES FOR ISOLATED GRINDERS

CHAIRMAN WILLIAMS: In our plant we have been quite successful along every line of safety work except in the use of goggles for isolated grinders. I would like to hear if some one has had real success along those lines. If so, I am sure we shall be glad to hear about it.

I was assured that a representative of the Marmon Company would be on the job and discuss this subject. Is there no one here who can tell us about goggles being used on isolated grinders? The old proposition of putting a pair of goggles alongside a grinder, in my estimation, is nothing but sheer suicide. I would not tolerate it for one minute; it is the finest way of passing around contagious diseases that man ever found, especially trachoma and diseases of the eye or skin. We used to have it in our plant—they thought it was a fine proposition—but when we had four cases of trachoma in the hospital out of one department, the proposition was not successful; they could not see it, and so it was eliminated. It is not a successful proposition, gentlemen. You can not put a cabinet alongside emery wheels and expect a man to go there and get a pair of goggles, because he won't do it. I have been trying for two years, but even partial success has not been secured. It has to be a success or it is not a success at all.

MR. SHAW: On every emery grinder in our plant, small grinders, we put a glass. We have tried this for two years. At the present time, in the grinding room—and I presume we have it throughout the plant—is a motor-driven emery tool grinder which has a special pump that keeps the water on the wheel, more than any other type we have tried. We have not had a man here with an eye lost, and we have twenty wheels in the plant. I am watching them closely. My idea is if we could get a special type, with water flowing over the wheels, the possibility of the little pieces of emery flying out would be very remote. It is an experiment worth trying. I would like to know how the rest of you feel about it.

ADJUSTABLE GOGGLES.

MR. JOHN FORBES (Willys-Morrow Company, Elmira, N. Y.): Each of our men is given a pair of goggles, and they are signed to him. He has to return them. They are inspected, pro-

Our men wear goggles all day long. The best goggles that can be bought have rubber over the ears. They can be adjusted and made to fit. Our tool department is all equipped in the same way. Any man that is grinding must sign for his goggles and must wear them. We have very few accidents. I think we had one case in a month that went outside of the shop.

MR. SHAW: There is one thing that comes to my mind at this time: The drills in the grinding room, probably two or three hundred; we do not try to keep water on those drills, but the men all wear goggles. The problem in an automobile plant is the problem of the fellow that walks from a machine in one department and goes to the grinder without goggles. What can we do in that case?

MR. FORBES: A fellow goes to the Safety First room to have something taken out of his eye. We ask him what he is doing. Even if he is only running an elevator we supply him with goggles. If he refuses to wear them we follow him and say to his foreman: "Talk to that fellow. He is a young fellow and he has been to the Safety First room twice this week to have something taken out of his eye." We encourage him to wear goggles. They do not hurt his eyes.

MR. W. W. ROACH (Dodge Brothers, Detroit): I would like to ask Mr. Shaw how he keeps the glass plates in front of the grinders clean. We tried that in our screw machine department, where the machines are covered with oil. We found that the glasses soon become dirty. It is very close work and they have to get pretty close to the wheel. How do you keep the glasses clean, so that the men can grind their tools?

MR. SHAW: I think Mr. Roach has struck a point that is profitable for discussion. In the automobile department if you have to grind a formed tool it is very close work and difficult to use a shield. On the other grinders they have to clean the shields every so often, and that is a problem I have attempted to remedy.

CHAIRMAN WILLIAMS: I think I can probably throw a little light on the subject. In our plant—especially in the automatic room, which covers the third floor of one building, 60x260 feet, and the floor of another building, 60x365 feet—we have installed twenty-two isolated grinders. Each one is equipped with a wired glass shield—probably you can see it in this photograph. The photograph shows one of the shields attached to an emery wheel, with wire embedded in the glass. That is all that we could photograph. We had an accident and a piece of metal came through the glass, caught

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the man on the check, and cut him. It was a new glass that just been put in.

In general practice I do not believe we have more than thirty or forty specks from the emery wheel on the glass before the glass is replaced.

EDUCATING APPRENTICES IN SAFETY WORK.

In that department we are up against it, as Mr. Shaw said in the oil proposition. We have an apprentice working along with the emery wheel; as soon as oil gets on the glass plate it is his duty to put it in a pail of gasoline and wash it off. We are educating our apprentices to be our future safety men in every class of work in our plant, regardless of where it is located. They are drilled in safety before they are taught the actual use of the machine. They are taught the right and wrong way of doing things and you will not be surprised at the wonderful results that we are getting.

I call to mind one apprentice who practiced the safety lesson that was taught him. One of our old hands was working overhead and was using a defective ladder. The rungs were cracked and one on the bottom was loose. The apprentice went up to the man and said: "You should not use that blamed ladder; it is not fit for a pig to stick on." The man answered: "I did not ask you to go on it."

"You may be killed," said the apprentice. "You are not to get on that ladder if I can help it." He went back to his work and got a hammer and smashed four rungs. His act was reported to the safety department, showing that the ladder had been destroyed. The department investigated and found why the ladder had been destroyed. They told the foreman that if he did not take care of his ladders in the way we would charge them up directly against his department instead of charging them, as we do, to the overhead cost of the plant. Now if we charge a thing right up against a department because of negligence on the part of a foreman it cuts the bone out of the department and when you do that (they don't want the bone cut) you get results.

JANITOR CLEANS THE GUARDS.

Where we have direct grinders, without the oil condition, the janitor cleans the shields every morning when he goes through the department. It is one of his duties. He is through the department

in the afternoon, he does it. When the glass requires replacing the janitor does it; it is part of his duty. I think that system could be put into effect in any plant. What is required is one who is personally responsible, some one to whom you can say: "Why did not you do that job?" You have only to get after a man once or twice on that proposition, then he will carry it through.

MR. W. H. URQUHART (Michigan Bolt and Nut Works, Detroit): We do not have automatic grinding of tools that have oil on them, but I have been wondering what means you have taken to wash the oil off the tools before you grind them. I should think if your tools were in proper condition you would eliminate considerable trouble on the grinder. Gasoline might answer the purpose.

CHAIRMAN WILLIAMS: That is a good point. We tried it in our plant, but after we had a man burned to death the gasoline was banned. We are trying tetra-chloride. It is put up in a small container, about eight inches in depth, six inches wide, and approximately three-quarters of an inch thick, so that a man can get his fingers in and out in cleansing off the oil. With regard to the oil, if you leave it to the man in nine cases out of ten he will never wash the oil off. If you leave it to a man to dip the tool into a cleansing fluid he will not do it, and no amount of pressure you can bring to bear is going to prevent some of them putting the tool right on the grinder.

MR. SHIRLEY: Although we do not use gasoline in our plant, I have noticed the use of gasoline elsewhere. How would you avoid its use?

CHAIRMAN WILLIAMS: We do not allow more than one pint of gasoline in a department. It is kept in an airtight or sealed can. We use a can that you can build a fire around, practically, and it will not explode. Only enough is put into the cleaning tank to accommodate the plate to be washed.

GOGGLES AND THEIR USE.

MR. J. B. ANDERSON (Detroit, Mich.): What is considered the best goggle? Many men object to goggles because they say they are too heavy. The tendency of manufacturers, I believe, has been to use increased safety flanges and heavier glass, so that if the glass is struck it will not shatter. I would like to learn the experience of other members and get their views as to what is considered the best goggle. Inspectors for the insurance company are visiting different plants and they ask what kind they should recommend. We do not

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like to recommend any particular make. The next thing I want to know is what we are getting on them. We would know what the manufacturers themselves regard as the best.

MR. D. R. LIVINGSTON (Safety Director, Reo Motor Company, Lansing, Mich.): My experience has been that an A glass is the best article. We require our men to wear heavy only on the heavier work. Then the question arises as to st tion and re-using. We are working on a dry solution to t place of the wet method.

SECRETARY RAY: Is that the aluminum?

MR. LIVINGSTONE: Yes.

SECRETARY RAY: Do the men object on account of the I

MR. LIVINGSTONE: We have only found one objection to t safety glass. The men claim that sweat from their faces wi on the glass and form a mist or steam and they cannot see, so trying another set of larger spectacles.

SECRETARY RAY: I attended the safety meeting of a ch company in Michigan some time ago and they spoke of using of that type, ventilating them at the top. They said they had heard of a particle entering the eye over the top of the glass. anyone here had experience in ventilating goggles by cutting in the top of the frame?

MR. LIVINGSTONE: We have cut a slot at the bottom of sc our goggles and I have heard of no complaint.

SECRETARY RAY: I understand the top is the best plac it seems reasonable, too, because it would be harder for a part get in from the top than from the bottom.

SECRETARY RAY: I do not believe Mr. Anderson had his tion answered. Let us hear what type of goggle you use Forbes.

MR. FORBES: I could not tell you that. Our safety en is here, and I will see he explains our system to Mr. Anderson

SECRETARY RAY: I think there are two or three recog kinds.

MR. FORBES: We had an awful time; tried all makes of go in trying to get a satisfactory kind. We buy our goggles, but I not tell you what kind they are except that they are something n

CHAIRMAN WILLIAMS: I have tried practically every ma goggles except a new one I saw described the other day. One cern is puting out a light goggle—grinding two lenses and fast them together with a roll of it

sition, it seems to me that it should be the best goggle, owing to the fact that the celluloid will hold the lenses together, even though the outer lens is shattered. We are using the Merry Optical Company goggle at the present time, although I believe the King goggle is very good. I took a pair of King goggles out of boxes we had on hand and subjected both kinds to a careful test, so as to strike an average. I even increased the test on the Merry goggles because I wanted to find their possibilities, and in my opinion the Merry goggles were the best.

SECRETARY RAY: How do you spell the name?

CHAIRMAN WILLIAMS: M-e-r-r-y. They are made in Kansas City, although I cannot tell you the name of the maker. I ordered half a gross and am testing them out. If they stand up as well on the average, all the way through, as the King goggle, we will use them in our work. We believe in nothing but the best and we are willing to go to any expense to get it.

MR. LIVINGSTONE: What was the nature of your tests?

SAT DOWN ON HIS GOGGLES.

CHAIRMAN WILLIAMS: Actual wearing conditions was one; another was a pressure test on the lenses and frames. One test I made I think was rather out of the ordinary. We took a pair of King goggles and subjected them to what I would call a sitting test. The majority of our moulders stick them in their hip pockets and often sit down on them. We have had this happen time and time again; in fact, most of you gentlemen have been up against the same thing. The side guards would bend up so that you could not straighten them out without breaking them to pieces. I tried that with the King goggles—tried to straighten them out. I consider that I have considerable patience, but after I worked at it for three-quarters of an hour I pitched them into the waste basket. I tried the Merry goggles in the same way and straightened them out in exactly seven minutes, so that they were pretty close to what they were before I sat on them. I took the cable on the King goggles and bent it right back. When I straightened it out it snapped off where the heavy section is welded to the straight stem. I did the same thing with the Merry goggles and straightened it out without a break, although there was a little kink. I took the goggles and bent both back face to face. The King goggles I got pretty straight, but I noticed they started to crack right alongside the lens cups. I did the same thing with the Merry and succeeded in straightening

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them out. That partly convinced me that I was right in ch but I was not altogether satisfied. I said to Mr. Goodwin goggles look pretty good; it seems to me you have got a good but I am not satisfied." He said, "Not satisfied after a test like I said "No. The goggles have to go into actual wearing on the everyday proposition before I am satisfied that the goggles are better than the one I have always had. If you are willing to let us samples to undergo a thirty-day test alongside the other goggles under the same working conditions, I will give an order for a dozen goggles, but not otherwise." "Why," he said, "I will let you have all the goggles you want for a test. If they are not as good at the end of thirty days as the other goggles are at the end of thirty day give them to you."

I thought that was a pretty broad statement, but I said, "Send me a dozen pair and we will pay for them." I got a dozen pair and put them into working conditions, alongside the other goggles, and found sure you they are standing up better than the King goggles, although I have always believed in the King goggles. When we get a new goggle than the one we are using, why, that is the one we would do not know the experience of any one else, but that is the experience.

MR. URQUHART: Our main complaint about different goggles is in their having different effects on the eyes.

USE OF AMBER LENS.

CHAIRMAN WILLIAMS: I can answer that easily. In some of our sections we use different types of goggles; that is, different colored glasses. In our tool-grinding room, where the wheels are not thoroughly guarded, we use a light goggle. Where men are grinding close limits we do not figure on the breakage of the wheel. We use a light goggle with an amber lens. We had to do that, for our workmen absolutely refused to wear heavy goggles. I asked a question at the Health Service Section the other day about the hiring of men for our foundry floor that had hernia. I was told if we did not hire them we would have to do without them. That is the substance of the reply I received, and what we must tell them who refuses to wear goggles.

MR. RAY: Why the amber lens?

CHAIRMAN WILLIAMS: There is no particular reason for the amber lens, except that it cuts the excessive light from the spark to a certain extent.

MR. SHAW: I have just ordered 600 pair of glasses. On shapers and lathes in fine cutting every so often a man will have a chip slip in and will probably lose the sight of his eye. Just imagine that with two or three hundred shapers! We buy goggles but it is a problem to keep them. I have seen advertisements of little glass shields. We have one that you place in almost any position, but it seems to me a man on a planer is looking at all angles and he cannot make the movement with his eyes. I have worked this out with the Eider—I don't know the make of it.

I am ordering 600 pair of goggles and they are for the men on the shapers. This seems to be a new field for goggles in machine shops. We have three other types of goggles, the King, the Dustsafe and the little Albax. I buy dustproof goggles. If you give your men a heavy glass, not a dustproof, that cement cannot break, such as the King glasses, the men will wear them. I think there is a great field for goggles, but you have to pick them for your particular line of work.

CO-OPERATING WITH INSURANCE COMPANIES.

MR. J. R. ANDERSON (Detroit, Mich): Would the gentleman buy 600 pair of goggles if some insurance company was carrying their proposition? Most of the talk here has reference to what they are doing in their particular plants—what do they do if a man is injured? I know many of the companies represented here carry their own insurance but would they help the insurance company if it helped to cut down their rate, that is what I would like to know? The insurance companies do not get the co-operation they think they ought to receive.

CHAIRMAN WILLIAMS: That is a case for co-operation between the insurance companies and the managers of large or small plants.

MR. SHAW: You might have to buy the goggles fifty-fifty.

MR. JAMES J. LINCH (Chevrolet Company, Michigan and New York): We are co-operating with the insurance companies and will share the expense of procuring goggles and installing extra medical work. At our plant in Michigan we employ an extra doctor and a couple of first aid men to co-operate with the doctors supplied by the insurance company. We feel that in time we will reduce our rates and if the state insurance rating boards make it so that we cannot insure at a figure suitable to us, why, we will carry our own insurance. In the meantime, we will so shape our organization that we will be able to handle our own insurance if we desire. At the

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present time we are incurring a great expense to assist the insurance companies in carrying out the work.

MR. SHIRLEY: I received a letter from a gentleman interested in insurance and that is why I am here. The letter asked our representative to be present on behalf of Gilbert & Barker Insurance Company on the basis of that letter.

CHAIRMAN WILLIAMS: Will you read the letter?

MR. SHIRLEY: It is addressed to the Gilbert & Barker Manufacturing Company, and is as follows:

LIBERTY MUTUAL INSURANCE COMPANY, 185 DEVONSHIRE STREET
BOSTON.

August 30, 1917.

W. T. Rayner, Esq., Treasurer, Gilbert & Barker Insurance Company, Springfield, Mass. Dear Sir: The need of keeping the workmen on the job is becoming more and more acute under war conditions. The cost of compensation insurance is gradually mounting as the benefits provided by compensation laws are extended by the legislatures. These are two reasons why safety work is more important this year than it has ever been before.

The National Safety Council holds an annual Congress at which 2,000 men from all over the country meet and discuss their accident problems. The next meeting will be in New York, Sept. 11 to 14, and we are enclosing a copy of the program. You will notice that the hazards of many specialized industries, such as textile, woodworking and iron and steel will be discussed in detail. The men who attend these meetings always go home with new ideas and enthusiasm for their own safety work.

We believe it will pay you to send one or more of the men who are responsible for accident prevention in your plant to the Congress, as they may receive suggestions there that will save many times the cost of the trip, through the prevention of a single accident in your plant. Why not take this opportunity to get in closer touch with the national safety movement? Yours very truly,

(Signed) DAVID S. BEYER,
Manager, Safety Engineering Department.

CHAIRMAN WILLIAMS: It seems to me gentlemen, some one is showing co-operation with the industrial boards and also with the accident prevention people.

DISC GRINDERS AND EYE ACCIDENTS.

MR. LIVINGSTONE: Do the gentlemen present consider a Merry disc grinder as an emery wheel? What experience have you with emery getting into a man's eyes?

MR. SEAW: I know our doctor was very much put out last week. A man at the disc had an accident and they could not get hold of the particle; it was a little behind the eyeball. The doctor said: "If we cannot draw that out with a magnet it will be another eye lost." We have been making our men use goggles when working on discs. The man must have been walking past the disc grinder when the accident happened. There is a substance they put on an ordinary disc, that if it gets behind the eye, the cornea, is hard to draw out unless a magnet is used. I believe the disc is a dangerous machine.

CHAIRMAN WILLIAMS: We have never had any of our disc grinders in the hospital with particles in their eyes. When I say we never I mean that as an absolute fact, covering a period of two and a half years. I attribute that largely to a guard made by ourselves for our disc grinders. I have a photograph here which you can pass around and get our idea. The idea is to make the opening opposite the grinding surface of the disc large enough to take care of all the particles but not larger than the area the pipe will accommodate. When the dirt is thrown from the periphery, it goes directly into a small channel, and you get the same pressure of air all around the dirt and air is taken right away. I attribute that good record just to that guard. It is a simple guard and I will be only too glad to furnish patterns so that you can make them in your own shop.

MR. LIVINGSTONE: What do you do with your emery buffers?

CHAIRMAN WILLIAMS: Our emery buffers are handled differently. We have them enclosed, to a certain extent, so that the air is circulated right around with the wheel.

MR. LIVINGSTONE: Do your men get any emery in their eyes?

CHAIRMAN WILLIAMS: No. We have them wear goggles.

MR. LIVINGSTONE: We take the precautions to make them wear goggles anyway.

MR. LINGERMAN (Hudson Company): We make our men use goggles on this grinder.

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A MOLDER WITH CELLULOID GOGGLES.

CHAIRMAN WILLIAMS: We employ a lot of colored help to the fact that we cannot get what in the North we call labor." In going through the foundry I found one of the men wearing a pair of goggles with celluloid rims and celluloid flange the side. I immediately called the attention of the foreman to the goggles. He said: "Say, why are you wearing those?" "By boss, I have to wear them to cut down the refraction (*meaning refraction*) in my eyes." "You cannot wear those," said the foreman. "You must wear goggles we will fix you up with a safe pair." I called me over and I asked the man: "Do you realize the danger you are running?" "Danger!" he said, "I won't run any danger as my eyes are protected." I took some celluloid over to where the metal of the flasks had been poured. The metal in the pouring hole was almost cold, there was just enough heat to make the celluloid melt up. I showed that to the man and said: "That is what would happen to your eyes if you were wearing those goggles and hot metal splashed on them." He said: "Lord, I never thought of that!" That is the proposition—they never think. That man may need goggles, but we are perfectly willing to furnish them without cost, but they will sooner bring in something from the outside and run risks. In our industries we should not allow any one to bring in goggles from the outside unless they are made from a prescription for that man's eyes. I think it is the duty of every manufacturing concern, where there is grinding to be done, to supply the goggles. It is a simple matter. You don't have to sell them, make them deposit a check and receive the check when they leave your plant.

SECRETARY RAY: I would like to inquire what companies require their men to wear goggles to prevent injury by sitting down to work?

MR. CARRIGAN (Remington Arms Company): We have had a lot of trouble. Our polishers wear goggles, but they are too heavy and the glass is too thick. If a man wears heavy goggles all day long they cause undue eye strain, so we have been forced to use a light goggle. We furnish the workman with either a leather or metal case.

I want to ask whether anyone here has experienced trouble with polishers who are elderly men and wear glasses? You cannot expect them to wear goggles if they have to wear glasses to see.

SPECIAL LENSES.

MR. ANDERSON: I have in mind a plant where they have sixty men, a number of whom are well along in years. We had their goggles made with their own lenses, so that they did not have to wear two pairs, and in that way they had absolute protection. Any number of plants through Michigan have done that.

MR. LUMBY: We have several cases of that kind. Where we find a man that wears special lenses we send them to an oculist and have them properly fitted. Formerly we had them bring their prescriptions to us, but we found some of those fellows were running into a jewelry store and getting their eyes tested. It was not a good practice.

SECRETARY RAY: Where that is done, Mr. Lumby, do you take the precaution to have the special lens covered with a white-colored lens, a thicker lens? That would be a good plan.

MR. LUMBY: No, we do not. It would be hard to fasten a cover lens over some of the goggle lenses on account of the spherical surfaces.

SECRETARY RAY: Your special lens will get pitted up with the flying emery, and it would cost a lot to renew them, at least \$1.50 a lens.

MR. LUMBY: I know it costs more than that.

SECRETARY RAY: I say at least that; whereas, the covered lens could be bought for 25 cents or less a pair.

MR. LUMBY: We have not tried that. It might be a good thing. I might say that we furnish cases for all goggles. We changed from the Eyesafe about a year ago to the Dustsafe type, and we have had less trouble in getting the men to wear them. We use the rubber padded kind and we have had only one trouble, that is, the rubber melts. They are rather objectionable in hot weather.

In some types of shops, especially with air hammers, oil flies and there is perspiration, and we find it hard to keep the men in goggles. Some fellows said they would not wear them. You cannot let them go for that reason so I ordered several pairs of goggles with a wire screen in place of the lens. I do not think that is advisable for iron casting, but on aluminum, where the chips do not fly so awfully hard and generally it is a soft, dry chip, a lot of our men wear that type. I think they are beter than none at all.

SECRETARY RAY: Have you had many accidents from aluminum chips?

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MR. LUMBY: We have just started an eye record, it has been running about a month, and I have not gone over the list as yet. I will know more about it in a short time. I do not know what happened in the aluminum work.

SECRETARY RAY: Aluminum does not seem to fly like iron.

CHAIRMAN WILLIAMS: Has any one else had trouble in getting men to wear goggles? That is a vital point, the actual conditions under which men are working, and why they refuse to wear goggles.

WILL HOLD FOREMEN RESPONSIBLE.

MR. W. R. ROACH (Dodge Brothers, Detroit): Mr. Shaw is talking about equipping men working in tool rooms. Are you getting highclass workmen to wear goggles? What are you doing to get those men wearing goggles? We find that the lower grades of men will wear goggles but the high-class men are mighty hard to bring around.

MR. SHAW: Every toolmaker—there will probably be 400 shopmen—will have to wear a pair of these little specs or get a pair of goggles for himself. We will hold every foreman responsible. I worked out with the head superintendent of the Ford plant; he said that was the thing to do and he will back me up. We have had too many toolmakers injured because of a nasty, mean red hot chip burr hitting their eyes. Toolmakers are valuable workmen and they have to get close down, to the block, almost directly in front of it. If a man could grind on a mill for a while and would learn to stand to one side it would not matter, but the average fellow gets right in front of the wheel. That has been our problem all along. We are going to get them to wear goggles when the right time comes.

MR. SHIRLEY: We have that problem; I think every factory has it. Last month we reported 123 cases of eye trouble, due to emery dirt and so forth. We consider that a high percentage as we have 1,200 employees. We started a campaign of re-education—you might call it that. We put new posters on the bulletin boards, some of them were pictures supplied by the state, and others were just notices signed by our officers, but the factory men were not in a mood to respect and follow them as closely as we thought they should. We post notices and renew them as often as necessary on all grindstones and emery wheels. We write letters to all foremen and caution them to provide glasses. The men go to the foreman for glasses.

SEVERAL UNUSUAL ACCIDENTS.

MR. ROACH: We have had three serious accidents in the last few months where eyes have been lost from very unusual causes. One was that of a man who hit a piece of wood an unusually hard blow with his hammer, and the piece broke and hit him in the eye. We had about twenty-five such cases. You can hardly post a rule that men doing that work shall wear goggles, because it is very unusual to use such hard wood. Another case was that of a man tapping a die. It seems a small scale flew and hit him in the eye, lodging in such a way that the doctor could not extract it with a magnet. The third case was that of a millwright chipping a key in a shaft. I do not know whether the chip came from the steel or the hammer. These three were unusually isolated cases. Can you give us information on peculiar cases like that?

MR. SHAW: Those are peculiar cases and it is a problem to know what to do with them. We had a man who hit a half-inch pin with a large hammer. The pin broke and the man lost an eye. A sweeper was at work about six feet from a drill press. The drill broke and he lost an eye. You cannot ask everyone to wear glasses all through the plant. I wish I could solve these problems.

MR. LUMBY: One man lost one eye in our body department—he was using a hack saw to saw off a rough edge around a door. The piece cut off struck the man next to him and he lost an eye. We had a case where a belt snapped and a flying piece struck the eye of a man passing under it. You cannot guard every belt in the shop, but we have guards on the heavy drive belts. We have trouble in getting men to use guard shields on grinders. We tried putting a little boss on the shield, so that it could not be raised up. The last thing we tried was a special shade between the wheels on small tool grinders. It is possible to put in a small shade and fasten it there—the light is below the glass and there is really no glare. If you plan something that will make the work easier the men will adopt it.

How about repairing goggles? Has anyone here found that it does not pay? We are repairing and keeping them going as far as we can within reason, but I do not know whether or not it pays.

MEN MUST PAY FOR DESTROYED GOGGLES.

MR. LIVINGSTONE: We repair all of our goggles. We make each man, when he is given a set, deposit a dollar at the office. That tends to make him more careful with them. If they are wilfully

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abused he has to stand the payment of the dollar before he new pair.

MR. LUMBY: Do you meet with any objection in the depreciation of the dollar?

MR. LIVINGSTONE: No, that is understood.

MR. LUMBY: I do not think we could work a proposition of that kind.

APPOINTMENT OF NOMINATING COMMITTEE

CHAIRMAN WILLIAMS: If there is nothing more on this I will appoint our Nominating Committee: Mr. F. Bayer of the Pierce-Arrow Company, Buffalo; Mr. J. Forbes of the Willys Overland Company, of Elmira, N. Y., and Mr. R. R. Ray, of the Packard Company, Detroit. These gentlemen will represent this Section and act with the Nominating Committee of the Car Builders' Section in suggesting officers for the coming year. Please report this afternoon.

The final paper on the program for this session is by your man.

COÖPERATION.

W. ERNEST WILLIAMS, SAFETY ENGINEER, PACKARD MOTOR COMPANY, DETROIT, MICH.

Mr. Chairman and Members of the National Safety Council: Now that we have decided to have this section, known as the Automotive Section of the National Safety Council, it is but fitting that you devote some little time to make it a great success.

We have several things in our plants that you will find in other industries, and yet there are so many little things to contend with along safety lines that we can help each other with, that this section should form a clearing-house for ideas pertaining to the automotive part of the industries.

Some of you will no doubt have little troubles to solve that you would like some assistance with. Your sectional committee is ready to help you all they can.

It is our duty to eliminate all the accidents possible, and if we have developed something new along safety lines pass it along. It will only take a few minutes of your time to send us your suggestions, and we will all benefit by them. Remember, one good idea deserves another.

I believe we can develop a spirit of brotherly feeling in this section. We can keep in touch with each other through correspondence, say, once a month, thereby getting real coöperation, rather than the spasmodic variety created by meeting once a year.

You may have a large plant or you may have a small one, but, no matter which you have, you can do your share toward helping to make this world a safer and, therefore, a better place in which to live.

Have you a foundry? What good idea have you put into effect which will eliminate accidents?

Have you a forge shop? What particular hazard have you eliminated here?

You probably have railway switches and sidings or an industrial railway system in your plant. What have you done to eliminate the accidents there?

How many conveyor systems—surface, overhead or underground—have you that are made safe?

What ventilation have you, and how satisfactory is it, especially in the motor testing rooms?

How do you handle your traffic when congested conditions prevail?

Your sheet metal, stocks, dies, coal, etc., have to be handled. How do you do it safely?

What kind of goggles do you use? How do they stand up under ordinary conditions? What color of lenses do you furnish? Do your men wear them?

What rules have you to enforce your safety program?

These and hundreds of similar questions are being asked daily. To which of them can you give a satisfactory answer? Now is the time for every man and woman to rally to the help of their country by safety coöperation.

Are your workmen pulling with you, or do you have to drive safety into them? If it has to be driven into them, you are doomed to failure. You can show a man and ask for his coöperation and you will likely get it, but there is somewhat of the mule in us that balks at being told "You must do this."

SECURING THE GOOD WILL OF THE WORKERS.

In this age of enlightenment the workmen are becoming more sensitive to the compulsory method of doing things, and they resent the fact that they are looked on as automatons. All they ask is a

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square deal, and if they are met half-way in any proposition you find them only too willing to coöperate. I have found in practically every case where it has been necessary to remonstrate men for doing their work in a decidedly hazardous way that they did not thoroughly understand the extreme danger to which they were subjected, and when they had pointed out to them the benefit they would receive if it were done the safe way their coöperation was assured to the extent of seven cases out of every ten. I have received a good many safety suggestions from our workmen, and without having to reward them materially. All they receive is a letter thanking them for their coöperation and asking them to conform with their suggestions. Is it not better to do this than to have a man lose his position or even have him laid off temporarily? If you will say: "We have from 6,000 to 7,000 men in our plant. How can we reach every man?" In our plant we employ 10,000 men, and though it is impossible for me to reach every man I am in personal touch with a representative of each department besides the foreman and his assistants. In some departments we have two safety inspectors whom I come in contact with at least twice a month and often every week, depending on conditions in their departments. When the men see me talking to their foreman or employees they are naturally inquisitive, and ask who I am, what I wanted to look at their machine for, and also what I had to point out about their particular work. These and many other questions are asked the departmental safety inspector. The answer he invariably gives is: "If you want to know I will have the safety engineer talk to you and he will tell you all he told me." The safety inspectors have been trained to do this, so that I shall be able to get hold of a man who wants to know what I think of his method of doing his work.

One particular instance I have in mind is that of an employee who was wearing an apron tied with leather thongs around his waist and neck. He was working on a lathe and the feed screw had been adjusted to cut oil grooves in a long shaft. The safety inspector in that department, who is a machinist, gray-haired and about 60 years of age, had spoken to the man and pointed out what might happen if he ever had his apron caught in his machine. The young workman, a young man of about 24, said: "I guess I am old enough to take care of myself, grandpa." The old man said: "Probably so, young man. That is what I thought when I was your age. I found that I did not know it all. You don't seem to want

advice of an old man who has been through the mill, eh? All right, that is your lookout. But say, did you notice that young fellow I was talking to yesterday? I am going to have him talk to you some time. So long."

In his way to his bench the safety inspector called up my department and asked me to come over and see him as soon after lunch as possible. After hearing his story, I walked, apparently unconcerned, up to the young man and stopped to watch him work. I made a remark about the shafting he was grooving and got him interested in describing the work he had done before. Gradually I turned the subject onto the way he was doing that particular job and showed him the danger he was running by wearing a heavy duck apron, tied with heavy leather thongs, and how he might get his apron caught in the feed screw. I also called his attention to the trouble he would cause his family if he should get hurt, how his wife and two kiddies would suffer through his neglect to take a simple precaution. I also showed him a few photographs of accidents that had happened in our own plant on that particular class of machine, and finally convinced him that he was in danger of being the victim of a similar accident.

USE OF PHOTOGRAPHS.

I find that by showing the workmen the photographs taken around our own plant, of men who have been injured, and describing the way the accident happened, the danger is brought more forcefully before them than by simply talking. If any of you would care to see some of the photos I use, you will find them on this table. After seeing them you can judge for yourselves how convincing they are.

This young man is now a safety inspector in his department, along with Mr. Rader, the old man whom he called "grandpa." I assure you there is considerable rivalry between them, their objective being in their words, "No lost time on account of accidents and the safest department to work in." They certainly are well on their way to success, through real coöperation with the safety department.

I might state here that this room is 60x320, holds 155 employes, and is divided into two sections by a tool crib, and has one inspector in each section. On this table you will find a copy of their reports, which prove the spirit they display, after having worked together on the job for over a year.

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Our management wants the safety movement carried on successfully and are lending their aid in a material way. The president of manufacturing is chairman of the central safety committee, and the administration, or executive heads, are represented at every monthly meeting. The superintendents of all divisions are members of the central committee. Suggestions are brought to meetings for discussion, and if they are good we adopt them; if they are not practical, the workman who sent in the suggestion is notified by letter, telling him why his suggestion was not used, and also thank him for the interest shown and ask him to continue sending in his suggestions. We do not use the ordinary query for these letters, but use the regular company stationery. This has been appreciated by the men, and has resulted in a great number of suggestions. It has stimulated interest in the safety movement and brought greater cooperation with the safety department.

PRIZES NOT NECESSARY.

To get the confidence and cooperation of your workmen it is necessary to bribe them with prizes. Use a little tact and judgment and learn to understand the different classes of men working for you. Do not jump at a man. If he is not in a good humor, jolly him into one. If he is in trouble, try a little sympathy; you will find a little goes a long way towards getting his cooperation.

If you have a shop paper, spend a little money and have photographs of your real assistants along safety lines—namely, workmen—published in your paper. It pays.

I could quote several instances where we have had little accidents get us real cooperation, but you would be here for hours if I cared to listen to them. To misquote our friend Harry Lauder you are likely "Fu' the nu'" with what I have said, and in conclusion, just let me ask you again to cooperate to your fullest extent. We automobile men build cars that show speed, so let us speed also through cooperation into high, and we will hang up records that no other section will be able to touch.

Our thousands of horsepower of energy can easily be turned into marketable safety work if we use gas mixed with common sense. See that your timing is right when you advance your spare interest. Oil of carefulness, used judiciously, will keep any car turning smoothly, and by having control of yourself you will

CHAIRMAN WILLIAMS: Our time is up. The next meeting of this Section will be called at 2 o'clock. We have an invitation to visit the Public Safety Section and hear a paper on "The Use of Headlights." I trust all will attend.

AFTERNOON SESSION.

CHAIRMAN WILLIAMS: The Section will please come to order. The first subject on our program requires a great deal of study. It is "The Proper Heat-Treating Furnace Design to Eliminate Undesirable Heat Losses and Subsequent Inconveniences to Workmen." This is a big problem and we must consider it carefully. It has given us considerable trouble; in fact, it has taken us approximately four years to get a furnace of about 80 per cent efficiency. I wired to our plants for blue prints but they have not arrived as yet.

Our furnace design entails a double wall, whereby we try to eliminate the heat losses as much as possible—the inner firebrick is backed up with asbestos. We have a dead-air space on the inside of the inner firebrick and that gives us, practically, a vacuum. Back of that is common red brick; then we have a cork-insulating brick back of that, before our final casting is reached; we have double insulation all the way through. Our design may be as good as any, but I would like to know if any one has designed what might be called a really efficient heat-treating oven, and if they have, in what manner is it built? What have you in the Hudson?

MR. LINGERMAN: Most of our work is done outside.

CHAIRMAN WILLIAMS: Mr. Ray, what have you in the way of heat-treating? What is your method of construction?

SECRETARY RAY: The only thing that bothers us is the disposal of the excessive heat that comes from the cyanide furnace. We have the great big hoods, of course, that are connected up with such places. They take off the fumes and heat. We are planning an entire new layout, though, so that the hoods will be supplemented by air in some fashion. Another thing that gives us considerable trouble is the solution tanks. We have a few guards to prevent the work from being splashed but they give us a good deal of trouble.

MR. ROACH: How often do you have to reline your furnaces, Mr. Williams?

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CHAIRMAN WILLIAMS: That is a rather hard question, on the fact that the firebrick we are getting is not as good as we put the ovens in. We did not build our first ovens on the place we use now; consequently, we had to reline them on an average about every second week—floors, slabs, arches and so on. I do not think that we reline the new ovens oftener than once in six months. If any of you gentlemen would like to have them I will be glad to furnish you with blue prints of the construction of our ovens showing cross-sections and other points. These will give you an idea of what we have accomplished.

We are willing to do anything along safety lines and I find the men stay on the job longer than they did before, because they have a better place in which to work. The heat radiation has been 65¾ per cent and that means a whole lot when you are working at temperatures of 1,800 and 2,000 degrees.

On one section of our heat-treating department—where we treat axles—our biggest trouble is with the floor slabs; we have to renew them every four weeks. Our floor slab is thirty-eight feet long and I assure you it does not take the men very long, when they are handling axles, to smash them up in pretty good shape.

Do you care for more discussion on this topic? If not we will take up our next paper.

SAFETY IN CONNECTION WITH CONVEYOR SYSTEMS FOR MOVING CARS.

CHAIRMAN WILLIAMS: This subject applies not only to the construction of cars while they are being erected, but to all conveyors whereby the automobile parts are transported from one section to another, either by overhead or underground systems.

Two of the gentlemen who promised to speak on this subject are not here. To start the ball rolling I will give our experience.

We installed a new productive method of handling rear transmissions; we have been trying to use conveyor systems wherever possible in handling our motors while being built, also the parts that go toward making up the motor, cylinders, cam shafts and everything. A conveyor receives the rear transmissions at one department and carries them across a glass covered court—about sixty feet—to another department on another floor in another building. Poor construction of the conveyor system caused us considerable trouble.

ninety-two pounds, would take a jump while traveling along and narrowly miss someone. After we had had six or seven jumps we started in to find the cause of the trouble. Our construction was done by an outside concern- if we had done it ourselves we probably would have been able to correct it -and the system installed entailed the use of solid-bank chains. Every little while a link would twist a bit, owing to the long distance they had to travel; that would twist the carriers a little bit sideways. They would have a jump, throwing the rear transmission up against one of the rails of the conveyor system; it might not happen the first time, but after a while the transmission would drop through. One such accident broke two toes of one of our workmen.

We immediately got to work and strung a screen underneath the conveyor. The men, instead of taking this material off as they formerly did by reaching from underneath to give it a twist and let it come down on the hoist, now take it off from the side. To help the men handle the material with safety we put in stations every so far, where the screen door will swing open and the men can pull the transmissions off. Imagine yourself in a room 120 feet long, with men working on an average of six feet apart, having to take those cases off. They run the risk of having them drop on their heads. When you are working men six feet apart, underneath one of these conveyors, you have to be mighty careful.

At any rate we got after the proposition and cleaned it up to the extent that we have not had one jump from that section of line since, but we have had jumps where they come across the bridge and drop down on to the plate, before they are picked up by the transmission line. We have had them slide off this plate and, although no one was injured, still there is always a possible risk. This has now been fixed by giving the plate a curved-up surface. If a man wants to take off a transmission he has to lift it out instead of its sliding out of its own accord.

NEW IDEAS IN CONVEYOR SYSTEMS.

MR. LINCH: Is there any guard for a chain conveyor running along the floor?

CHAIRMAN WILLIAMS: In our plant we have in operation a conveyor system built on the concrete, leaving just an iron plate in the center for a transmission chain. At either end, where the sprocket meets the chain, we have completely covered it with a lift latch, so that when the material travels onto the end of the line, instead of it

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being caught, the lift latch picks the latch clean out of the chain and throws it over, locking it in place. As soon as this lift latch is far there is a pole which grips and holds it, and the man cannot pull that down unless he pushes the carriage completely away from the chain before he can drop it. A channel iron slot prevents him from doing it. I have run across this system in several plants—the chain is completely open where it runs on the driving and take-off sprockets. This is a point I think which ought to be taken care of in all cases.

In some of our places, where we are moving cars along the line and working on them the chain runs at the end of the line down to the ground, approximately three and a half feet; it automatically releases the clutch when it gets to a steel plate embedded on the ground that picks it right out of the chain, so there is really no chance of a man getting caught there. Most of our motor power is set into the floor and covered with a steel grating or wooden patches, set flush to the floor. To that extent we eliminate a whole lot of danger.

In the first installation we had the driving motors set right up to the floor; consequently we had to put a guard around them. When they found when they wanted to come around, instead of unloosening the pipe construction all the electrician has to turn is a lever on or off and slide the pipe out. Then he can step over the lower construction which is approximately eighteen inches from the floor, to get around the motors and the chain. We had several accidents happen that way. Fellows got a little careless; on the new system we set them right underneath the floor level, putting a wooden hat over them so that there would be no necessity for a man climbing down the side. That eliminated our trouble, but we had to find out by hard experience what we had to do before we did it. A man's three toes crushed getting in between the sprocket and the chain. I might say that the compensation for that more than offset the cost of putting the system below the floor level.

That is where you must reach your employers. If you show your employers that you are preventing accidents and saving money, they are bound to get results.

Is there any further discussion on the subject? If not we will pass on.

FOUNDry HAZARDS.

CHAIRMAN WILLIAMS: We are all rather careless about our work, especially in some of the foundry work.

other Sections of the National Safety Council, but we have many small things to discuss among ourselves in connection with the automobile industry. Will some gentlemen please start the discussion?

MR. ANDERSON: I think we covered the grinding-goggle proposition very thoroughly this morning, that is one of the big hazards in a foundry. Many foundries carry their own insurance. They insist on their men wearing goggles and leggings and special shoes, but it is pretty hard in a small foundry to get the men to do those things. Where they do not do so the insurance companies raise the rates and they have to pay higher insurance premiums.

There are an awful lot of accidents with rattlers. Men sometimes lose their arms through the premature starting of rattlers. I have in mind one foundry with 100 rattlers; they had a very efficient guard in front, you could not knock it down.

CHAIRMAN WILLIAMS: When we put "Foundry Hazards" on our program we had in mind not only the handling of pigs but everything coming to the foundry. Your method of turning out cores, and core oven problems, foundry floors and their layout; methods of handling hot metal: grinding proposition, tumbling barrels, chipping: what kind of screens do you use, if any, and where do you use them? Do you put your chippers face to face or do you isolate them?

The grinding proposition, so far as goggles were concerned was covered pretty well this morning. It is not the big things we are after, it is the little things that count—the little things that are sending a lot of our men to the hospital at the present time. We have already taken care of the big things. One of our men aptly said: "Any fool can see to guard against ninety-nine out of a hundred things, but it takes a smart man to guard against the hundredth things."

Possibly we had better pass on to the next topic.

FORGE SHOP HAZARDS.

CHAIRMAN WILLIAMS: The hazards in a forge shop are distinct. How do you protect your men?

MR. MICHAEL BARRETT (Secretary, Safety Committee, Michigan Bolt and Nut Works, Detroit, Mich.): We have board hammers and most of our accidents come from flying boards. We had a lot of work for automobiles, airships and shipbuilding, and we protected our men against flying boards by erecting steel guards. When a floating board splits or breaks it does not fly up through the pulleys any

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more. They used to get in the belts and caused a serious accident. We designed a guard—a shield—which runs up in a steel tube and protects the men.

Our next worst hazard was caused by not using props. When our men were changing dies on the drop hammers they would use the props and one of the helpers might start the hammer. The hammer would fall and crush the man's fingers. I think these are the worst hazards that we have in our forge department.

MR. CARRINGTON (Remington Arms Company, Bridgeport, Conn.): I do not know whether or not I am telling you anything new, but perhaps it will help some one. In the early days of our plant (it is now two years old) we did not have a rule as to the condition the hammers should be left in at the end of the day's work or at noon time. One Italian was carrying a box of bolts from one side of the shop to the other; he stepped back of one of the hammers and reached in to change the two dies. The upper one was not resting securely on the block. It fell off, hit the treadle, and tripped the hammer. The Italian lost three fingers. We made a rule that whenever the hammers were shut down for any reason the forge man should release the latch and let the top hammer rest on the bottom. They are all in that condition when they are not in actual use.

CHAIRMAN WILLIAMS: That is a very good point. In the shops at the end of the day you will find steam hammers left up in the pistons. If the rule just mentioned was universally applied it would eliminate accidents.

MR. ANDERSON: Quite a number of serious accidents have occurred on straightening hammers.

MR. ROACH: I would like to ask Mr. Anderson what he

MR. ANDERSON: Straightening hammers for malleable cast

SECRETARY RAY: I think the Michigan Malleable Company came that, to a certain extent, by installing a hand trip.

USE OF PLIERS.

MR. ANDERSON: We had a workman lose four fingers, so we fixed the trip so that he could not reach it with his feet. He tried to reach back, and we thought he could not get his other hand in, so we showed us that he could and we had to pay for it. There was no business on that particular hammer. He ran out of mate for the hammer he was working on, he stepped over to this one, picked up a casting and threw it in. He tripped and put his hand

and if he had been an experienced man he would know how to use them. We thought we had fixed it so that a man could not get hurt in this particular foundry.

MR. LIVINGSTONE: We have a couple of striking hammers and we installed two hand levers on each of them. The men have to use a hammer with a strange man in some instances. This is a great detriment to production, so we cut out one of the levers. We have another hammer, an old well-digging affair, the kind that you have to raise with a rope. That necessitates a man using both hands. The rope winds up a drum, the same as in sinking a well.

When our hammers were installed they had foot treadles; we took the treadles off and put on a lever.

CHAIRMAN WILLIAMS: At the present time we are experimenting with a wire mesh guard. There is a hole for a man to put a stick through and work the die fairly comfortable. How it is going to pan out, I cannot say; I am not going to make predictions, as I am somewhat skeptical. The men are kicking about it. They are working on it from time to time but say it takes longer to get out the work. The redeeming feature of the guard is this: If a man should slip he can put his hand on the guard and it will prevent him going in. On steam hammers we use the foot treadle exclusively.

SECRETARY RAY: I never heard of a man slipping and falling into the hammer.

CHAIRMAN WILLIAMS: We had one fellow have two fingers taken off; his thumb was badly battered and we had to amputate it. This was due to slipping.

SECRETARY RAY: I think almost any sort of screen you put in front of your hammers would interfere with their work, especially if you are handling heavy material, like forging an axle.

CHAIRMAN WILLIAMS: Our axles are all carried on a trolley right back of the die blocks. The man stands away from the machine altogether.

MR. ROACH: Does that work out all right? We have a take-off-man—where you pass the stock from one die to the other.

CHAIRMAN WILLIAMS: Our system works out satisfactorily. We have a take-off man at the back. All the take-off man does is to receive the stock after it has been hammered; he puts it into the trimming die and lays it in the socket; is stamped and then thrown out. While he is trimming it the other operator has a piece in the machine so he is in very little danger except from flying scale. We make

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him wear goggles, asbestos gloves, and an asbestos apron to him against the scale.

MALLEABLE SCALE.

MR. ROACH: I would like to ask if any of the members he worked out a satisfactory guard for malleable scale—that is the or any part of the die breaking off? We had a fatality about years ago. A piece of flash blew off and struck a workman in the thigh, severing the femoral artery. We had another fatality, by a man placing a shim on the die; a piece flew back and hit him in the abdomen. I would like to know if there is any good any sort of a safe practice for that operation?

CHAIRMAN WILLIAMS: Can any one answer that question?

MR. ANDERSON: What kind of a machine?

MR. ROACH: A steam hammer, or drop hammer.

CHAIRMAN WILLIAMS: On our steam hammers we have a swinging guard made of a four-inch piece of tube set four feet from the ground. It has a standard pipe header at the bottom end and also have a pipe that fits inside it with a hanging shield and the men are operating the hammer the shield swings directly in front of the die block. Any scale or flash that is broken or drawn hits this screen and drops directly back of the hammer. Even when work, when a man has finished and passes it through the screen and drops down to the floor. When they wish to change dies all they have to do is to take hold of the screen on one side and throw it out, as it will swing 90 degrees. When taking the stock and cleaning away scale, the guard is swung to one side. Fortunately, we have not had any accidents.

MR. ROACH: Do you attach that to the ram?

CHAIRMAN WILLIAMS: No; the man places it in position. It is not connected with the hammer in any shape, manner or form.

SECRETARY RAY: How far back from the press?

CHAIRMAN WILLIAMS: It stands one foot away from the front of the press; or in other words, you have two feet of clearance between your die block and your screen. The screen, I might say, is made of 10 gauge plate. It is not a screen, but a shield, and it stands a lot of battering—it stands up under the test we are giving it. We have to change the plates about every six months on an average and we have found that it pays. We have not had

least number of accidents in our plant. We employ approximately 900 men in the division, and they hold the best records for eye cases, for serious injuries, and also for total injuries for the last fiscal year, beginning Sept. 1, 1916. But when we do have an accident there, I can assure you it is a serious one—

HOT SAW GUARDS.

MR. LIVINGSTONE: How do you contend with hot saws and how do you keep sparks from striking operators in the face?

MR. CAREY (Remington Arms Company): We have hot saws; the hack saws have shields on them, just as they come from the manufacturer. We leave an opening at the bottom and put a tank of water underneath to catch the sparks. That does not absolutely eliminate fine sparks: some fly out, but not as bad as before.

MR. LIVINGSTONE: We took off the guard the manufacturer put on and put in a two-inch piece of channel iron. We made an indentation with water in it to catch the sparks. It has worked out pretty well, but I would like to have something better.

MR. BURKE (Courell Company): We tried to prevent sparks flying into the fellows' eyes by guarding one side of the drop hammer with a piece of sheet metal. That prevents men walking back of the hammer from getting the sparks, but the helper works in front. We have tried all kinds of goggles, but they are unsatisfactory; the men cannot wear them and run the hammers. The furnaces are so hot the glasses become heated. There is no protection at all for the men operating the hammers, so they have to take their medicine. We do not get many accidents from the sparks, but occasionally we have one. We used to have accidents from men walking back of the hammers, but we have prevented that with the sheet iron guard.

CHAIRMAN WILLIAMS: One thing here we have not touched on is your heating ovens—the furnaces. What have you done to eliminate heat from your forges? That seems to be a pretty heavy proposition at the present time, especially during the summer when the temperature alongside your forges runs to about 160 degrees.

MR. ROACH: We have a water system in front of the furnace.

MR. LIVINGSTONE: We use what is called a water door. One of our foremen invented it. It keeps a spray of water constantly in front of the door and the furnaces and the sheet metal back on to it. The water is in between and runs off into an outlet by the furnace. We find it very satisfactory.

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MR. SHAW: Is the water running down in front of the successful? Our superintendent equipped several furnaces that way; he also tried a partition in front of them and the heat got through. I noticed they were cool. A solid plate right in front of the oven is better than the running water.

CURTAIN OF AIR.

CHAIRMAN WILLIAMS: I will tell you our experience at Packard plant. At the present time we are trying out four different methods. We have been trying them for nearly a year. One experiment is using a curtain of air, twelve inches in front of the furnace. We installed a two-inch pipe and it shoots a column of air directly up into the hood. For our second experiment we have a water jacket already referred to. A third system consists of chains hung in front of the furnace. The chains are placed out a foot and a half from the furnace door. The fourth: we use entire front castings of the furnace, placing them about ten feet away from the regular furnace, with a filling of asbestos or pareil cork brick—just leaving the opening the way it comes from the furnace and using in connection with it the air blowing directly upwards into the hood. All our furnaces have hoods that carry heat to the ventilator stack.

I am unable to say which system is working out to the best advantage, although the men seem to give preference to the curtain. Whether that will pan out for our main operators in that section of the shop I am not in a position to say as yet; that is, what we will finally get. As soon as we get results and determine which one is the best we will send the results of our experiments to the National Safety Council for distribution to the members.

Is there any further discussion on large shop hazards? Has anyone had any trouble with industrial systems? Crane stock or handling of sheet steel in bulk? If not we will take up our next subject.

PROPER VENTILATION OF MOTOR BLOCK TESTING

CHAIRMAN WILLIAMS: A majority of men connected with the automobile industry test out their motors, whether they use a dynamometer method, which, in my opinion is obsolete, or whether they use a block test. We would like to hear from you.

MR. LIVINGSTONE: Our block testroom system, from our factory engineer's point of view is the best in the state. I am not prepared to discuss it because I have not been able to enter other places and pay particular attention to their block testrooms, but we have never had a case of men complaining of headaches.

In our testroom we have large pipes coming down from the roof, to within about five feet from the floor. These pipes are probably five feet in diameter; and are distributed along the room. They bring fresh air in and the gas from the exhaust is stirred up enough so that suction fans placed on the side take it out. Our room is not at all smoky—it is in absolutely good shape. An engineer told me that the only other concern he knows of that has worked it out successfully is the Chandler Motor Car Company.

SECRETARY RAY: What do you use for running your block test, gasoline or artificial gas?

MR. LIVINGSTONE: We use gasoline.

SECRETARY RAY: We use artificial gas for the block test. Our fans are located on the outside of the building, just at the end of the exhaust pipe; this distributes the fumes as they pass out of the building. We do not have any fumes or smoke inside the block testroom.

MR. LIVINGSTONE: We had some sort of suction system but it was claimed that the gas was too heavy. We had a complaint from the men about it, but since the other system was put in it has been No. 1. We run all the way from 90 to 100 motors at a time.

CHAIRMAN WILLIAMS: What is the rate of the change of the air in your block testrooms? How often do you change it per minute or per hour?

MR. LIVINGSTONE: I cannot tell you the capacity of the fans, Mr. Williams. The fans are quite large, about 60 inches or something like that.

SECRETARY RAY: Mr. Anderson, is the Continental having any trouble with their block testroom?

INSTALLED AN EXHAUST SYSTEM.

MR. ANDERSON: Very little.

CHAIRMAN WILLIAMS: We had considerable trouble for a while with our block test system. We did not seem to be getting the results we should; in fact we went to the expense of putting skylights in each block testroom. Now each motor that is running under gas power is in an individual room. We are having considerable trouble;

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we cut ventilators in the top before we used what grey mat gave us. If we had figured it out in the first place that gas heavier than air we would probably have built the skylights of our fellows said, "in the floor." At any rate, we put an system through the entire block testroom, or series of room an opening located three inches from the floor.

We made good use of the skylights we put in before t by drawing the fresh air through the skylights over thro front, so that it has to make a complete circulation underne motor to get to the exhaust openings near the floor. Well the time we did this, we had several pretty bad accidents—caused by men getting a little bit dopey. In fact, we could no men more than two hours, without having them afraid of the when the motors were running. We give our motors approx a twelve-hour test.

Since we put in the new system we have not had a man hospital or having to be sent home, complaining of a bad he or because he could hardly see. We have not had any lay-speak about—our lay-offs are about 5 per cent of what the before.

Altogether we seem to be in pretty good shape. The m their work better than they did before. One of our fellows was just like stepping out of a grimy city into the country month's vacation. "We would hate to go back to the othe ditions," was the way he put it. He does not have to go back old conditions, but we had a severe jar before we could effe changes.

We had seven men burned in one day, through coming i tact with exhaust pipes. When we asked them how it hap they said: "Well, I don't know. I got so darned sleepy I hardly keep my eyes open so I started for the door." Th been eliminated and I am mighty glad to say that we have accidents in that section than formerly.

Any more discussion on that topic? If not let us pass on next.

TRAFFIC HANDLING INSIDE THE PLANTS.

CHAIRMAN WILLIAMS: Here is a subject all of us ought able to say something about. I am not going to start the disci this time, someone else will have to lend a hand. Mr. Shaw can probably give

When I say traffic, I mean everything from the time your motor cars enter your plant carrying stock—even outside wagons or anything you like—until they go out; from the time you start your trucks in the morning until the men quit in the departments, out in the street, or anywhere else.

MR. STRAW: In every large plant there is developing the question of how the inside traffic problem must be handled successfully to prevent serious accidents. The problem of transporting the material through any large institution, without hurting people is a serious one. First, it is absolutely necessary that you have aisles established throughout the whole plant: that in itself means the moving of equipment throughout the first floors, where it is the most congested. The superintendent in the Ford plant, when I first asked him for a wide aisle, knew we had to have it, and yet he would not sanction it.

After I showed him where twenty-five or more men were losing time in one place, he told me to have the fellow that lays out the shop look into it and we started to plan a twenty-foot aisle. I suggested we had better go from post to post and in our two large buildings, that is in the main hall, we established the twenty-foot aisles. Soon after this we established eight-foot aisles in the other buildings. Our old plant was equipped with mono-rails, set down in the aisles. We used to have them blocked but we saw we could not depend on them, because some one else had to deliver the material the rest of the distance. We then installed Ford tractors to deliver the work to the different sections. Finally, they thought they would throw out the mono-rail and try a system of hauling the work to the part of the shop where it had to go. This is being developed and it is to be improved on until it is a regular railroad system.

WORKING OUT A NEW COUPLING.

Last week one of the tractors came through. It was an awful busy time and every one seemed to be excited, so I suggested to the man in charge that we establish a little booth—like the railroads have—and every truck should receive orders so the driver would know where everything was to go. We are working on a system of this type, so that sooner or later transporting the stuff through the plant will be similar to a regular railroad. We are hoping for big things. The minute you give a man power he is liable to exceed the speed limit. We have to note these troubles and look them over, the same as we do with green operators and elevator men. We require our men to sign a paper that they understand the safety rules and are

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willing to live up to them. Mono-rails that used to run along the ceiling are not used any more. I think the day is coming when we can load a truck, electric or gas, and deliver your goods. It will be by special trucks with special trailers behind. We draw ten and twelve trailers.

For six months, since it has started, we have worked on the new trailer. I was watching a fellow coupling trailers; every time he did so he had to get in just right to put the pin in. I suggested to the superintendent of the division, that he do something to get away from the old coupler. He ordered a lot of long pins, the old ones were too short and would jump up and leave a load standing. We tried to make a coupling similar to a railroad car, so we could couple the trucks together and make them uniform. We tried a dozen different hooks, but could not work out anything like a railroad coupling. Now we have a hook that holds well. As you run your iron in the coupling of the truck it will drop and lock itself in. The idea is to give the men something very efficient and also safe. When a man gets up he reaches over the top and lifts it.

I think the new coupling will be placed on every power-truck throughout the plant. We make it a rule, to avoid straining the men, to have everything power-driven that has got to be done. That is another feature that will soon come to the front. I do not know whether or not our system is practical in most plants. It started well in our plant.

Another hazard results from loading trucks too high. I think everybody has to contend with that. The stuff falls off. We have cylinders from the foundry, and if they are not piled carefully they fall, and as a result we have crushed toes.

MR. LIVINGSTONE: We use an electric tractor. We have a big hook on the tractor that is attached to the truck. Each truck carries a hook on the back end and they come together and are fastened. The pin that goes into the iron is made on a degree that (indicating) approximately 30°, so that it stays right in and does not jump out. We pull as high as fifteen or sixteen trucks through the plant from the stock room over to the main building. Our trucks are hauled to a department and are left there; they are picked up by the different department tractors and distributed around the plant.

WIDE ALLEYWAYS.

In our new plant we are planning fifteen-foot alleyways. I

congestion to deal with and it is rather hard on the foreman to keep the alley cleaned up. We do not plan to make any alleyway where any traction is done smaller than eight feet, but the little cross alleyways will probably run five or six feet.

CHAIRMAN WILLIAMS: Did your foremen object to giving you the extra room when you asked for it or did you compel them to give it to you.

MR. LIVINGSTONE: Sometimes they objected so hard that, we backed down. Our old buildings were started twelve years ago and we are still working in them. They have become congested and the machinery is disarranged; but in the entire building we do not meet with any objection. We are planning a new tin shop. This is being reorganized and the machinery has been arranged to try out the new system. We are putting two by fours along the alleyways, and leaving enough space at every opening to run in their trucks. We make them keep inside that two by four, and I think they will pay more attention to that than the white line some factories are using. They were experimenting with it when I left.

CHAIRMAN WILLIAMS: Possibly some of you have your shops laid out the way we used to have ours; that is the benches were around along the outer walls, so that the men would get the daylight. We used that system until about three months ago. We found that when we were trucking through the aisles we would hit some of the men, no matter how careful the drivers were. They would blow their horns and the men would step in, but before the truck had gone by they would step out and get caught. To eliminate that all trucking is now done on one side of the building and the benches are on the other side. Our truckers are allowed eight and one-half feet in which to operate. When you see those electric trucks whizz around and turn practically in their own length, we figure we have given them ample room. Since the change we have had very few accidents from trucks, but there is always this trouble: Have you gentlemen ever had your inside trucks exceed the speed limit? You probably have if you set a speed limit. I would like to hear from some one before I say anything on that point.

SPEED LIMITS.

A VOICE: Seven miles an hour.

SECRETARY RAY: We do not have a speed limit of miles per hour. The man exercises his discretion.

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MR. LIVINGSTONE: We do not have a speed limit on our they all run about the same speed. That is, they are geared all same and have about the same pulling capacity. When running they have all their power to go with, but we make the men use horns a good deal. We have what you might call traffic cop inclines, where there is danger; in fact, we have one crossing we kept tab on one day of all vehicles going through—the trucks, tractors—and there were something like 5,400 in nine We kept track of the wheelbarrows, and we found something a thousand; foot passengers, not counting the men at noon, but during the ordinary working hours, numbered something like It is quite a busy corner and we keep two men there. We have to go ahead and to stop.

SECRETARY RAY: Inside the plant?

MR. LIVINGSTONE: From Washington avenue to what the Platt street is a street running through our plant; it takes you through to the other side. To get our work to the machine shop we have to use trucks and that is where the traffic is the worst.

MR. BARRETT (Secretary, Safety Committee, Michigan Bell Nut Works, Detroit, Mich.): We are restricted to five miles an hour and we have signs all along the way to that effect. We also have an illuminated sign: "Go slow!" You can see it from both ways aisles are not very wide and the men had narrow escapes from machines and motors.

MR. LIVINGSTONE: I think we sometimes lose sight of how quickly electric tractors can be stopped. Even when going at a pretty good rate they can be stopped practically within their own length. I was complaining about exceeding the speed limit and was called to my attention. It was tried and a driver stopped before anyone imagined it could be done.

BRAKES FAILED TO ACT.

CHAIRMAN WILLIAMS: Let me say a word: We have electric trucks and I raised a kick about the speed limit. They tried to persuade me that there was really no danger as the trucks were going to run approximately twelve miles an hour. Then we put a governor on them, now they cannot exceed a limit of eight miles an hour. Some of our fellows had a habit of coming right to the elevator gate relying on his brakes to stop suddenly. I assure you that is one of the most suicidal practice any man can have. One day he was

Fortunately he was on the first floor and only fell five feet. The electric truck did not go over into the pit, owing to the fact that it had a heavy load on the back end, but it threw the operator into the pit and he sustained some pretty severe bruises. He received a broken nose, which I think will teach him a lesson about running up to elevator pits. It was a case of where, as the foreman said: "Well, if they are going to do that you might as well put a governor on the machine so that they cannot run in too fast."

I tell you, gentlemen, you cannot make a thing too safe, regardless of what it is. Electric trucks are just as liable as any other machine to go wrong, especially when you are depending on brakes to stop that machine. You don't know, when that brake is going to fail in its function, therefore, I had them switch over to an eight-mile limit.

The cars going through our plants on the avenues, regardless of who is driving them, are not allowed to exceed a speed limit of ten miles an hour; this applies to automobiles, testers and everything. Inside the plant, where they are handling material through the different divisions, we have a speed limit of four miles an hour. Any man who exceeds the speed limit inside the plant is warned for a first offense, is laid off for a week for a second offense and for a third offense he hunts for another job. An amusing incident happened the other day. It was not amusing at the time, but I have since had a good laugh. Our Chief Engineer, Mr. Vincent, has been working on the Liberty motor for the government. He was going through the plant with a party of French and American government representatives and his car was going approximately twenty-two miles an hour. As ill luck would have it, I stopped them. I cautioned the driver, in a courteous way, and told him that regardless of who it was the speed limit of ten miles an hour must not be exceeded. Mr. Vincent was piqued at the time, because he was in a hurry to get to the office. Naturally, when a man is in a hurry and worried, you cannot blame him for being a little out of sorts. I got a letter from the engineering department saying it would be a good idea for me to use a little judgment as to whom I stopped and when. That put me on tenter hooks and I sat down and wrote a fairly hot letter, stating that regardless of whom the person was, even though it were President Wilson, he had to obey; that it was my duty to enforce the rule and that I intended to do so. I have not received a reply to my letter, but I expect to when I get home, as the incident occurred just before I left.

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You see, gentlemen, it is a matter of governing the speed. If the men do not observe the rule you must make a firm statement and make them do it. It may seem drastic at times but it is the only way to get results.

A "RECKLESS" FOREMAN.

MR. CARRINGTON (Remington Company): What we call going and incoming stations are reserved in each room of the plant and marked out with white lines. The work is piled on skids and trucks pick it up and take it to the different departments. We have a speed limit but a foreman is in charge of the trucks. He has a peculiar name, Reckless, and that is his general characteristic. At several of our foreman's committee meetings it was reported that he was driving pretty fast around the plant and we had quite a number of complaints on the trucking situation so we determined to go after him. We told the foremen to report every instance they saw a truck being driven at what they regarded as a reckless speed. After a few days reports continued to come in and we had to discharge him.

The fact that we discharged the foreman had a good effect. We have had very little trouble since; in fact, we have had no serious accident—truck driver hurt himself in turning a corner too fast. He depended on his brake and the brake did not work. He jammed into the wall and broke his leg. That is the only accident we ever had on our trucks.

SECRETARY RAY: I would like to inquire if any one here has had any experience with an internal traffic department, that is, a company where they handle their traffic entirely through one department—not having it done by representatives of the different departments.

MR. COLEMAN (Pierce-Arrow Motor Car Company): We have handled our work through the traffic department for the past three years. It has worked out very satisfactorily. The superintendent of transportation uses the electric type of tractor and a transfer truck as a trailer. We have sectional containers—individual members or boxes are about six inches deep, braze on the ends and are built to stack together. We use boxes in the stock room and transfer them to the loading platforms. The system works out very satisfactorily. We have not had an accident in our transportation department.

BOXES AND CONTAINERS.

MR. COLEMAN: The transfer platform is approximately three feet wide and four feet long. The top is made of 1½-inch material. The bottom rail, perhaps, is half an inch higher than the lower limit of this Cowan truck. We use a small truck designed primarily to be drawn. We have two types, one three and one four wheeled. They are shoved under the loading platform by lowering the lever that raises the load. When the truck is in operation the bottom lever of the platform is perhaps a half or three-quarters of an inch from the ground. They are simply hooked on to the electric truck. We can draw four or five, but usually two are sufficient for our purpose.

The entire plant is routed and each truck has certain territory to cover, beginning their run in one direction and returning to the stock room from another. Every job is routed from the central office. When the trucks are loaded the transfer platforms are left on the machines.

SECRETARY RAY: That sounds like a pretty good system. I have heard something of the work you are doing along that line. We will have to get together and talk it over.

MR. COLEMAN: Very glad to have you.

SECRETARY RAY: I shall be very glad to avail myself of your offer.

CHAIRMAN WILLIAMS: How do you handle the material from your storerooms to your workmen at the machines? Do you send the boxes to them?

MR. COLEMAN: Goes right to the machine in the box, is taken out of one box at the machine and put into another box on the other side.

CHAIRMAN WILLIAMS: All you have to do is to bring the material to the men and transfer it out again?

MR. COLEMAN: There are two boxes to each machine.

CHAIRMAN WILLIAMS: It sounds like saving labor.

A MEMBER: Are they wooden boxes?

MR. COLEMAN: Wooden boxes. We installed that system at a time when we were employing approximately 100 truckmen. After installing it we found it was possible to lay off thirty men and handle the same trip.

SECRETARY RAY: And get better service all around? I think we have more fights in our plant owing to the fellows scrapping over trucks than from any other one thing.

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MR. COLEMAN: The foreman has absolutely no jurisdiction over trucking, it is handled from the traffic department.

SECRETARY RAY: He complains to the traffic department, is he satisfied with his service?

MR. COLEMAN: Yes.

SECRETARY RAY: You have some kind of push trucks?

MR. COLEMAN: We use a few of them. They are used more in the inspection department than any other place.

SECRETARY RAY: They are always a source of accident, the fellows overloading them and getting in front and pulling them

TROUBLE WITH POOR BOXES.

MR. COLEMAN: Our trouble in the transportation department is from poor boxes. All sorts of nondescript material is placed on trucks and the boxes break up and dump the stuff on the floor. Sectional bins entirely obviate that.

CHAIRMAN WILLIAMS: Did your stockroom handle the work before you put in that system? That is, as far as transportation stock was concerned?

MR. COLEMAN: Previous to the time this particular system was installed the stockroom delivered the work to the department which machined it; then that department delivered it to the next.

CHAIRMAN WILLIAMS: We are having considerable friction at the present time. When I say considerable friction, I do not mean it is extra bad, but there is a little friction current between the stock department and the traffic department. The stock department and the traffic department all they have to do is to mind their own business and bring the stuff to the department. That is a communication problem between the stock and traffic departments. It seems that by changing our system to what you have we might eliminate the friction. It is a good point.

ONLY SAFE MEN WANTED.

MR. COLEMAN: We had that trouble and we found it best to get a new stockroom man. We found that to be the best cure. A man does not want to play our game we get one who will.

CHAIRMAN WILLIAMS: Are you able to secure all the men you require at the present time? If so you are pretty fortunate.

MR. COLEMAN: We can always get men of the type we want. If a man holds an executive position and has charge of other

if he has not brains enough to do as he is told we let him go and get one who will.

CHAIRMAN WILLIAMS: At the present time in our own plant we are experiencing a shortage of labor. We cannot get the type of men we want. We have to put fellows on that do not know the first thing about their job. We have had to break them in and I assure you our accidents have jumped, but that is to be expected.

MR. CARRINGTON: We prefer not to have a man rather than employ one who is absolutely unsafe. We do not want him to hurt himself and we object strenuously to his hurting others.

CHAIRMAN WILLIAMS: That is good. If any of you have a problem, let us have it and see if we cannot thresh it out.

MR. C. A. BRIGGS (Toledo): We have had quite a lot of trouble with our flat trucks, carrying side rails and sheet metal. The stakes would break off and the men would put in soft wood or anything they could get hold of. The stakes broke and the load spilled off. Finally we had all of our stakes made of a standard size and stretched a chain with a square link on the end from one stake to another. We found this system cut down our breakage a whole lot. We are not breaking as many stakes or dropping so many loads.

CHAIRMAN WILLIAMS: Mr. Briggs, have you had any experience with sheet metal slipping off the chains?

MR. BRIGGS: We have a binder which we use on sheet metal. We place a chain around the load and the binder on top of it tightens it up.

WOODEN BLOCKS FOR FLOORS.

CHAIRMAN WILLIAMS: That seems to be a good proposition. You can load your trucks heavier with sheet metal and get away with a good load by using that system.

MR. SHAW: There is another thing. As transportation departments are established there will be new construction or different construction of the cement those trucks pass over. I imagine we have torn up two or three miles of cement drive because the iron wheels keep cutting into it making holes here and there. It was a big problem. We tried fixing the holes on Sundays and putting a metal plate over the patches. On Monday the trucks would run over the new cement and it would not set. It was a big expense, but we dug up the old base and put in a new one, using paving brick. If one of the bricks break or there is a hole you can put in another brick without much trouble. We have installed several miles of that ma-

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terial and hope to have every drive rebuilt in the same way. the day is coming when we will get rid of cement floors in the It costs an awful lot of money.

MR. CARRINGTON: We had the same experience. We r creosote blocks.

CHAIRMAN WILLIAMS: That has come into general use there is considerable traffic. We had practically the same exp with the wooden floors in our departments. We took up th floors in the aisles and put in asphalt. The asphalt has st pretty well for two years, but I am afraid we will have to re within the next few months. Instead of being on a level v floor, in some places it has raised.

MR. CARRINGTON: Above the ground floor we have cove cement with boards.

SECRETARY RAY: Wood flooring?

MR. CARRINGTON: Yes.

SECRETARY RAY: I notice the Ford Company has a lot of flooring.

MR. SHAW: I think we will have to put in the block cement is hard to repair.

SECRETARY RAY: Do you have very much trouble wit wheels breaking? Do you use malleable iron wheels or steel Our wheels seem to be continually breaking.

MR. CARRINGTON: We have very little trouble. I think a steel cast wheel. The wheel we use comes on our particu of trailer truck. Once in a while we order fifteen or twer wheels.

MR. SHAW: We are starting to build a standard truck plant. Our trucks are pretty heavy and at different times v had a lot of wheels break. We are changing to a heavy type iron wheel.

CHAIRMAN WILLIAMS: I think it is standard on the nev ment of trucks to furnish cast steel wheels. Very few manuf are turning out the old cast iron wheels. Manufacturers wer sales and are now making a far better truck than they formerly out. Of course we are paying for it, but from a safety stan think we are making great strides in our methods of truckin

EMPLOYES' BENEFIT ORGANIZATIONS.

MR. LINCH: What is done about death benefits?

CHAIRMAN WILLIAMS: In what way?

MR. LAXEN: If an employe dies as the result of an accident is anything done in the way of insurance?

MR. LIVINGSTONE: We have what is called a benefit association in our plant. The men pay 10 cents a week or 20 cents every pay day. The scale of benefits is fixed in this way: After a man is off seven days, he receives \$1.00 a day for sixty days; if the lay-off is caused by an accident, he receives benefits from the start, but for sickness (we do not pay for venereal diseases), he receives \$1.00 a day for sixty days for the time he is off. As death benefits, the association pays \$50 to a man's wife or his beneficiary. Any child up to 10 years of age receives \$25 on his death. That applies to a man regardless of the length of time he is employed. If he has only been with us two weeks he receives that benefit.

A VOICE: Is that run by the employes?

MR. LIVINGSTONE: That is run by the employes.

MR. BARRETT: We have our own benefit association. A man pays 75 cents to join and 25 cents a month in dues. In case of sickness they receive, I think, \$5.50 a week for seven weeks; in case of death we give \$100. That is paid to whoever he names as beneficiary.

SECRETARY RAY: Is membership in that entirely voluntary?

MR. BARRETT: Yes.

SECRETARY RAY: About what percentage of your employes belong?

MR. BARRETT: I could not say exactly; they are now making a campaign and offering the different department collectors a \$10 prize for the one who gets the most members in any one month.

CHURMAN WILLIAMS: We have a somewhat similar plan in our plant, only we don't pay initiation fee. When you join you pay your quarter; if you are ill, after the first week, you receive \$7 a week or a dollar a day. In case of death, if there are any dependents, \$100 is paid to the wife and \$20 for each of the children. When a man is sick he is not expected to pay dues. When he gets well and comes back to work he is not expected to make up dues accumulating while he has been receiving the benefit; but immediately he gets back to work and draws his pay it is up to him to pay the same as he did previously. I think we have at the present time an average of 27 per cent of the men in the plant belonging to the society. It is entirely voluntary and the welfare department is now conducting a campaign for more memberships, both for the co-operative store and for the welfare department.

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MR. URQUIHART: Our company is responsible for our aid. A man pays 30 cents as an initiation fee and 30 cents per dues. The benefits are \$1.00 per day or \$7.00 a week for ten. That comes out of the benefit association fund. On the death of an employe the widow receives \$100—\$50 from the benefit association and \$50 from the company. The company goes half on all paid. Our benefit association is open to employes after they have been with us for six months.

MR. CARRINGTON: We have such an association. Our men pay 40 cents a month and out of approximately 10,000 men we have something over 8,000 members. It is purely voluntary. At first week they get \$6 a week benefit for thirteen weeks and next thirteen weeks they receive \$3 per week. We pay \$100 in benefits to the beneficiary, but no benefits are paid for the death of a wife or children. About three years ago we allowed this association to start what we term a candy stand. As a matter of fact the candy, cigars, cigarettes and all that sort of thing in the basement of the building where the lavatories and washrooms are located have accumulated a surplus of about \$40,000 and are wondering what to do with it. They expect to start a branch savings bank to take care of the surplus.

GUARDING SAWS.

A MEMBER: I would like to hear a discussion of the subject of guarding circular saws.

CHAIRMAN WILLIAMS: That is a proposition that I think will go on for years to come. We have attempted it and have been partially successful, but in my opinion a partial success is no success at all. I would like to hear from the members as to what they have done toward guarding circular saws. We need all the experience we can obtain on this subject. Will some gentleman start a discussion?

MR. LINCH: We put guards on but the men turn them off. We put them on because the state makes us do it, but we have found them guarding.

MR. LIVINGSTONE: We use the Jones' guard on our circular saws and find it very successful. There have been some objections to it, but we have overcome that by saying that if the men do not use it we shall get men that will. We watched one carefully for several weeks and every time I went up it was off. Finally I thought

why he did not use it. He said: "It is not any good. Suppose I wanted to take a 2 by 4 and slot the end of it how am I to use that guard?" That was no objection. I simply put it up to him that he either had to use the guard or we had a man that would. We have had no trouble since.

CHAIRMAN WILLIAMS: We are having considerable trouble with circular saws in our construction department. In the first place we have the wrong saws. We have pattern-makers' saws and I have yet to see an efficient guard for a saw of that kind. We have experimented for over three years and we have tried no less than thirty-seven guards, bought from dealers and home made, and what we can use on one job we cannot use on another. To give you an idea of the position that the construction department is in: We are building and putting up a partition and want a dado at the end of a board. There is not a guard in the market that will cover that dado head. We made one. A man will come along and say: "Bill, I want this board ripped." "Take it down to the other saw," is Bill's reply. They go down to the other saw, which probably has a standard guard on it; that is, one we bought. It works fine for that job. Another man comes along and says: "I have to get a tenon cut." Away goes the guard because he cannot cut the tenon with that guard on. He shifts out the fence. The next man will turn from a rip to a cross-cut saw. One of the men wants a dado head. The man in charge of that department is not going to keep switching his dado heads. He switches the guard off the saw and starts to cut on that.

It is a very serious proposition to get a saw guard that is absolutely A-1. I have yet to find one and I have been hunting for one for the last four years. You can get away with the old type saw, where you have a one-cylinder mandrel, especially if it is a rip saw, by putting a splitter back of the saw. In my opinion that is the best safeguard we have. Eighty per cent of accidents on rip saws occur when the workman puts his hand back of the saw to get the material away. The material may bind a little bit, his hand slips and away goes a finger or two. There have been guards tried for kick-backs from the saw. I can look back on my efforts while trying one. I had a heavy spring counter weighted with a 10-gauge sheet disc put on the head of the rip saw. As long as the board laid on its edge you could put it through, but when it got past it would automatically lock. One of our old men on the job asked: "Think that will be efficient?" "It might be, I am trying out the experiment." He said: "I want to tell you it looks good, but I do not think it will hold the board. I am

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perfectly willing to do all I can to make this a success. We need We got through with the experiment rather rapidly; in fact days after putting the guard on, it hurt the man on the saw, although the board did not touch him at all. It sheared a three-eighths bolt that was holding it on to the machine.

"I TOLD YOU SO."

That is just the proposition we are up against. The piece of material wedged itself and rode the saw. It came back with enough to shear a three-eighths-inch bolt. I talked to the man in charge but he said: "I told you so!" That is the attitude the men have when you are conducting experiments that really are not practical. We have instructed our men in safe practices when ripping material and we have supplied the best safeguard that we can possibly get. We have consulted our best workmen and have done all in our power to make our saws safe. One of our workmen said: "When you are cross cutting there is no danger unless you get on top of the saw, your position is on the outside of the saw, when ripping, between the saw and the time clock." That is the way he put it.

The question of saw guarding has been a bone of contention for a considerable length of time, and all honor will go to the man who really solves it. He will be a hero that industry will be proud of.

MR. BRIGGS: How about woodworking manufacturers?

CHAIRMAN WILLIAMS: They have tried; the Oliver people have been trying for over two years to get a satisfactory guard. They have been told by their representative that they are still up in the clouds, but one day they may come down. When manufacturers are up against this, we have a proposition on our hands that requires a lot of gray matter and backbone to pull through to a successful conclusion. It is worth the effort of our efforts to try and solve it and I am going to ask you gentlemen to do the very best you can to help. It will help not only the Automotive Section and the Woodworking Section, but every section where any wood is used, and that is every industry in the United States.

Another difficult proposition is that of wood shapers. Is there a man in this room who has a really efficient shaper guard that will take all classes of work? Work on forms, straight work, curved work, internal and external cutting?

SECRETARY RAY: You spoke of a dado saw. We had an accident the other day caused by a man letting his hand slip. You spoke of the impossibility of making a satisfactory guard for a dado saw, so we made a form for the man to work through. We can do a lot of

along accident prevention lines by arranging forms and giving men proper push sticks for handling the work that is going through the saw.

CHAIRMAN WILLIAMS: There is one concern, in Grand Rapids, I believe, that have a sliding section on their fence. When they take hold of a handle and push it over it clamps this section on the back of the board, so that when a man pushes the work through he pushes a section of the fence and carries it through. How satisfactory it is I do not know as I have only seen some of their literature.

SECRETARY RAY: The Westinghouse people have quite a good exhibit of circular saw guards at the Grand Central Palace.

MR. BRIGGS: We had a Surety guard on some of our saws, but we found that they logged up the plant. They put a block on the rear end guard and the Surety slides back from the saw about 45 degrees, but it is rather frail. We found it pushed into the saw and cut through the hood. I think it is more satisfactory than any other guard we have tried: it conforms more nearly to the State laws which say the guard must be automatic.

CHAIRMAN WILLIAMS: We all agree with you, but the new aluminum hood, with one side that will drop on tilting tables, is about the one we have oftenest run up against. Even that is not satisfactory for it is not stabilized enough to make a really successful saw guard. I am designing a new type of guard; in fact, the castings were coming through the factory when I left. If it proves successful—notice I am putting in the little word "if"—we will give the design to the National Safety Council. If it does not work you will never hear a word about it.

QUESTIONNAIRES.

It is in this manner that we hope to profit by somebody's experiments, finding out somebody else's mistakes and our own mistakes. That is one thing I would like to have this Section do. If you have anything of value in the safety line give it to us. Let your committee have it, or send it to General Manager Cameron. Let him give it, not only to a few, but to everybody, and we will see that the Automotive Section or whoever sends it in, gets credit for it.

MR. BRIGGS: How about the questionnaires sent out by the Council?

CHAIRMAN WILLIAMS: I think the answers have been tabulated. There is another innovation the Council has attempted, Gentlemen, and that is the sending out of questionnaires. I am going to be

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egotistical enough to say it, I am going to take some credit for my suggestion. About two years ago I started sending questionnaires to every safety inspector in each department. You would be surprised at the variety of answers we got. One week we would get one class of grinders; another week, another grinder; another week, the interchange of ladders. The questionnaire started out like this: "You are requested to answer all these questions to the best of your ability and experience, for any suggestion you may make will be given due credit. We want you to co-operate to the maximum extent." The first one I sent out read something as follows: "Do you get the co-operation from your foreman that you should have? We leave a blank line, then: "If not, why?" "Do you get the encouragement to check up all machines for safety from your foremen and subforemen? If not, why?" "Do the men take action on your suggestions?" "What co-operation, on the whole, do you get in your department?" "Are machine guards placed where they ask for them?" "Do you get floors repaired?" "Do you get working conditions when you ask for them?" "How long does it take to get them?"

That was about how the first questionnaire read. You would be surprised at the answers we received. We received 167 answers to that questionnaire. The answers were all tabulated under different headings and it was found that we were getting approximately 40 per cent of the work done. That set me thinking. I could not get 40 per cent on a thing like that, so I went after some of the cases, where the men seemed to be a little lax. I got after the foreman and said: "Did you see the questionnaire I sent out?" One of the foremen said: "No, probably the safety inspector got it." I said: "I don't care a continental about the safety inspector. Go ahead and answer the questionnaire yourself and send it in immediately. I would like to have it in a couple of days." When I got his answer it was totally different from what the inspector had said, so I got the foreman and the safety inspector together and started talking to them. I did not let one know what I had received from the other, but I had a good talk with that foreman and inspector and told them just exactly what they were expected to do.

The next questionnaire that I sent out was somewhat similar, but not exactly along the same lines. I got different answers altogether. The number of answers jumped from 40 per cent to 63 per cent. You can get your foreman with you if you will only explain

jump on a man nowadays; he won't stand for it; but any man is perfectly willing, when you go to him on the level and say: "You are not doing what I think is right; maybe you feel hurt by my telling you that, but still I do not think you are doing it." Have something specific and explain it to him. Take him out to the job, if necessary, and say: "Here is something you have not done. If you want to be well liked by the men working under you and you want to get results that bad condition should be remedied." I will tell you, gentlemen, there is not a foreman in our whole plant that we cannot get results from by going after him in that way. Treat a man as a man and you are bound to get results: when they see you are on the level and try to give them a square deal in ninety-nine cases out of one hundred you will get the same kind of treatment yourself. In fact, I can truthfully say in some of the departments I am getting 150 per cent. Foremen come to me with propositions that honestly I do not think ought to be fixed up right away. Still, they have that spirit—they don't want it tomorrow, they ask for it today, they wanted it yesterday.

Is there anything else on circular saws you want to discuss; any specific point you want brought out? Have we anything in common that you would like to have taken up?

GUARDING PUNCH PRESSES.

MR. BARRETT: I would like to get the opinion of the meeting on the most effective means that can be found for guarding punch presses. I think that is a hazard that is present in almost every factory.

The reason I ask is this: We have equipped all our punch presses with two-handed trips, but I find the Benjamin device is not a guard against all accidents. Most of the presses that come from the manufacturers are not equipped with positive stops. The mechanism is worked by springs, and springs cannot be trusted. We have not tried any other device and we rather hesitate now to go deeper into it. Have you any ideas on that?

CHAIRMAN WILLIAMS: A concern in Grand Rapids is putting out a guard for punch presses wherein they totally eliminate dependence on the trip-rod or clutch. They put a special dog on the clutch, trimmed in such a way that their guard operates directly on the clutch itself. How satisfactory it works out I do not know, but I gave them an order two weeks ago to install one in our plant. I refer to the Grand Rapids Novelty Company. It is a new concern.

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SECRETARY RAY: I was not favorably impressed with the but told them they could send one down. Have you seen the guard? That works on a positive switch and we have been it out. We have not made up our minds about it. You know operation of the Jones' guard, of course. Guarding punch press a big job and ought to be assigned for our next meeting.

MR. UIQUHART: Punch presses complicate one another. have so many kinds of operations that you can hardly get a that would apply in two cases. Mr. Ray probably recalls my out one. It worked out all right on a few jobs. Punch pressing is like the saw guard proposition; it is impossible to solve.

SECRETARY RAY: That is almost universally agreed.

CHAIRMAN WILLIAMS: It is a never-ending experiment.

MR. BARRETT: Laws ought to be passed forbidding any facturer putting out a punch press without a positive clutch. dangerous to depend on a spring. If a punch press is equipped a positive stop and a Benjamin safety device I think it is a fool-proof as any press can be made.

CHAIRMAN WILLIAMS: Heavy presses are all operated with electric stops, magnetic action. The operator has to put both above to press two buttons before the press will move. It is actuated through an electro-magnet.

SECRETARY RAY: The same principle applies to the Benjamin device. You have to take both hands. It is not a positive protection because there is an opportunity with a slow moving press man to get his hands under the dies after he has tripped the

GUARDING NEW MACHINERY.

CHAIRMAN WILLIAMS: Along the line of getting men things I might "spill a few beans." I happened to be one Committee on Safety and Sanitation of the National Manufacturing Association. At our last meeting we adopted a resolution that manufacturers be asked to alter the design of their machines to incorporate safety to the full advantage of the factory to their benefit. We also went on record that we would advocate legislation by the House of Representatives to compel every manufacturer in this country to send out his machines with all guards attached; no open gears; all movable parts enclosed, wherever possible; leaving only an opening sufficient to get the belt on have not heard from them yet, but I can assure you that we

stating that he was heartily in favor of it; that it was a fine thing, and that he would do all in his power to pass such a law. So, gentlemen, you can see the trend is toward making everything as safe as possible, and when we get the House of Representatives interested in the matter I think we are on the road to success.

MR. BARRETT: We wish you every success.

CHAIRMAN WILLIAMS: Thank you, Mr. Barrett. Is there any further discussion?

AIR HAMMER GUARDS.

MR. D. R. LIVINGSTONE: I wonder if any of you gentlemen have used air hammers for riveting frames? A lot of them are suspended on trolleys or cables. We have had the weights break off. We got away from that by putting a yoke on the trolley with a balance weight on one end and only running a cable down. If that breaks the only thing that can come down is the hammer.

CHAIRMAN WILLIAMS: We use a floor stand made of pipe fittings, which is adjustable in height and made of pipe with a clamp to it. We have been getting fairly satisfactory results. One of our men is working on a drum with a spring control, so that when we move the hose away from the connection it is automatically released. We found that would be the only solution in getting around our truck frames to rivet them together.

GENERAL MANAGER CAMERON: You have a splendid opportunity in the Automotive Section for real, constructive work and I am sure the Section will grow and prosper. Your success is assured if you have the earnest co-operation of your membership to that end.

CHAIRMAN WILLIAMS: The meeting stands adjourned. I hope we will all meet at next year's Congress.

OFFICERS OF NEW SECTION.

Immediately following the adjournment of the meeting the Nominating Committee appointed by Chairman Williams conferred with the Nominating Committee of the Car Builders' Section and elected the following officers for the ensuing year: Chairman, W. Ernest Williams, Safety Engineer, Packard Motor Car Company, Detroit, Michigan. Vice Chairman, G. A. Orth, Chief, Claim and Safety Departments, American Car and Foundry Company, St. Louis, Mo.; Secretary, C. P. Bender, Welfare Director, Ralston Steel Car Company, Columbus, O.

National Safety Council

Chemical Sectional Meeting

New York City

September 12, 13 and 14, 1917

J. R. de la TORRE BUENO, Chairman
Editor, General Chemical Co., New York City

I. V. KEPNER, Vice Chairman
Pennsylvania Salt Manufacturing Company, Philadelphia, Pa.

R. A. MEDINA, Secretary
Independence Bureau, Philadelphia, Pa.

WEDNESDAY AFTERNOON SESSION

THE meeting was called to order by Mr. J. R. de la Torre Bu the Chairman, at 2:15 p. m. One hundred and fifty delegates were in attendance.

REPORT OF THE CHAIRMAN.

CHAIRMAN J. R. DE LA TORRE BUENO: Gentlemen, the annual meeting of the Chemical Section of the National Safety Council will please come to order. I wish to welcome those members of the Section who come from other cities to New York. New York is a very great city; it takes every one to its heart, but it takes them as members of a family, it takes them very much as a matter of course; you will find that to be the case.

When we held our last session our country was at peace. We were just finishing a political campaign, waged on the plea that we had been kept out of war. Today sees us in the midst, or rather the beginning, of a very great war, which threatens to last for a long period.

Safety is more necessary than ever to preserve men in industry and to make up in some measure the terrific losses in battle. It is, therefore, a patriotic duty to keep our safety efforts at the highest pitch of efficiency; to conserve the power of the nation to the full by wise counsel is as patriotic a service as any other, whether in the field or in the councils of our country. I need say no more on this because you are all familiar with our purpose.

I wish to express my appreciation and thanks for the ever ready help of my colleagues in the Executive Committee of the Chemical Section, Mr. L. A. DeBlois of the DuPont Powder Company, Mr. I. V. Kepner of the Pennsylvania Salt Company, Dr. F. D. Patterson and Mr. R. A. Medina, our Secretary. Mr. Medina was formerly with the Independence Bureau, but is now on the high seas on his way to Spain.

I would like to emphasize one point to all members of our Section. The officers are not the Section and they cannot be the Section. The members are the Section and the officers simply work under their direction; therefore, every member of the Section should do all in his power to co-operate with its officers in making the Section all that it should be as a co-operative helpful institution.

RESIGNATION OF SECRETARY MEDINA.

Mr. Medina having left for Europe, we have no Secretary and I will, therefore, appoint Mr. R. G. Griswold of E. I. duPont de Nemours & Co. Secretary pro tem.

You have received attendance slips at the door; please fill them in as they will be collected during the course of the meeting.

Our program states that twenty minutes will be allowed for each address and its discussion. As a matter of fact, addresses are limited to ten minutes and the discussion to twenty minutes. There is a time limit of three minutes on each person arising to discuss any given paper. That was done for the very good reason that by adopting a hard and fast rule no one would feel that he was discriminated against if at the end of three minutes, when he was going strong and good for another half hour, he would be called off. There will be no hard feelings. It is automatic and it applies to every one without any exception, unless, of course, the assembly at large wishes a person discussing a paper to continue his remarks.

I would also call your attention to the fact that we will try and run this meeting on schedule time. We are fifteen minutes late in beginning, because it was not understood that we would run like a

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railroad time table here, but the speeches will be at the hour and the discussion will start at the time set.

ANNOUNCEMENT OF BANQUET.

A banquet is to be held this evening and I would like to call to the attention of those who have not secured their tickets to the Chairman of the Banquet Committee will be here shortly with a supply. This is a very important event of the Congress and one who is able should make it a point to attend.

MR. DEBLOIS: What time is it to be held, Mr. Chairman?

CHAIRMAN DE LA TORRE BUENO: The banquet is at 7:30 in the large ballroom. Your tickets should be secured promptly and the stub exchanged about 4 o'clock for your seating accommodation.

The officers of the Section, in order to save time, have had their reports printed. You will find in the advance sheets handed out at the door the report of the Program Committee, the report of the Chairman of the Safe Practices Committee and the various reports. Unfortunately the report of the Secretary was not printed. I will have Mr. Griswold read it:

REPORT OF SECRETARY.

Meetings of the Executive Committee were held Jan. 16, May 11, 1917, and June 25, 1917. Business transacted at these meetings was chiefly confined to work on the program for the Congress, campaign for additional members, and the work of the Committee on Safe Practices.

The program for the 1917 Congress will speak for itself.

Twenty-three new members were secured during the year. A few small chemical companies have cancelled their memberships. It should be noted that over 75 per cent of the members of the Manufacturers' Chemists' Association are now members of the Council and of the Chemical Section.

As regards the Committee on Safe Practices to date, it has been well organized and the work of devising a proper accident classification as regards causes of accidents is well under way.

It is an interesting fact that the *Journal of Industrial and Engineering Chemistry* reprinted the proceedings of the Chemical Section at the 1916 Congress, thus informing many interested people of the good work of the Section.

of the Section, as they grow more and more informing, will receive more of this kind of publicity.

With this report the Secretary wishes to tender his resignation, in view of the fact that on Aug. 1 he is severing connections which have for a number of years kept him in close touch with accident-prevention work. It has been a pleasure to serve as Secretary during the past year. Best wishes for the continued success and upbuilding of the important Chemical Section.

P. A. MEDINA, Secretary.

SAFE PRACTICES COMMITTEE.

Mr. Chairman and Members of the Chemical Section, National Safety Council: This is the second annual report of your Safe Practices Committee and as Chairman of this committee I report progress.

You are all aware of the pressure under which the Chemical industry has lived and moved during the past three years, and the end is not yet in sight. For this reason it has been very difficult to do much more than organize the Safe Practices Committee and outline plans for further activities in our sectional work, establish safe practices from the standpoint of general safeguards, and the specific hazards of the various processes of the Chemical industry.

At present, this committee is made up of the following members:

Mr. Ira V. Kepner, Chairman, Pennsylvania Salt Manufacturing Company.

Mr. G. C. Furness, Union Carbide Company.

Mr. Leo M. Rossi, General Bakelite Company.

Mr. Harry C. Slade, Hooker Electrochemical Company.

Mr. J. R. de la Torre Bueno, General Chemical Company, *ex-officio*.

The willingness and enthusiasm of these members are known to all, but on account of their many present problems no meeting was called of the Safe Practices Committee during the past year.

The chemical industry has always been considered one of the greatest fire and accident hazards, and, while this may be true only in part, it is probably the most hazardous to the workers. Other industries contain one or more of the industrial hazards, but the chemical plant has them all, for it is full of perils to health, limb and life. To the dangers of machinery are added those due to vats, pans and caldrons, extremes of temperature, excessive humid-

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ity, suffocating fumes, dust and poisonous gases. In proportion to the extent of power driven machinery and the number of workers in the chemical industry shows a far greater number of accidents than any other industry.

To achieve the maximum of results in preventing accidents in the chemical industry it was necessary to first learn what caused these accidents. The Safe Practice Committee believed if it could determine the causes it would not be very difficult to find the proper remedies.

Briefly, I shall tell you what the Safe Practice Committee has done and what we have tried to do during the past year. On March 31, 1917, on behalf of the Safe Practices Committee of the Chemical Section, I submitted to each member of the Chemical Section a letter and draft form entitled "Classification of Accidents." A classification was prepared from the best data available at the time, but before recommending that it be printed for distribution for use by the chemical industrial members of the Council each member was asked for a criticism of it. After some time a number of criticisms were received and the classification changed, reprinted and set out. A number of answers came back to the second classification. Only a few stated that they kept an accurate record of their accidents. The majority of concerns answering the letter and accident classification stated that prior to receiving this classification they kept no record of what caused their accidents, so at this time no real classification of accidents in the Chemical industry can be made. The plan of the committee was to prepare the best form possible for recording data, as to causes of accidents, so that the members of the Section, if they wished to do so, could keep uniform records and be placed in a position to compare experiences and records, the Safe Practices Committee acting as a clearing house for this information, which in time will be one of the greatest benefits to the members of the Section—getting experiences compared with another in our efforts to prevent needless accidents.

This committee is working with the end in view of issuing Safe Practice leaflets covering the various processes or departments of the Chemical industry, so that within a year or two's time we would have a book of advice for this industry, relating to safe practices in every process. However, this can only be accomplished by the co-operation of each and every member of the Section. As Poor Richard said: "Let us be up and doing, and doing it."

During the past year a number of the members of the Chemical Section have written to the Safe Practice Committee for information with reference to their safety problems. In every case this information was gathered and forwarded as soon as obtained.

Many accidents resulting in injury to the eye are happening daily in the Chemical industry and all progressive plants have taken up this problem and are making it compulsory for the employes to wear goggles, masks and hoods whenever their work is of such character that it may result in injury to the eye.

In most chemical plants there are large numbers of high tension electric wires located about the plant. Atmospheric conditions often causes these wires to become insufficiently insulated. Stray currents from such wires sometimes make a pole or carrier to which they are attached dangerous for any person who would attempt to touch them. The National Safety Council's Universal Danger Sign at such places would not only be desirable but should be so placed as a proper protection to workmen who might be unconscious of their danger.

Many other accidents and much loss of life have resulted during the past year from accidents occurring only from carelessness—the greatest number of these probably have occurred in the handling of acids, explosives and inflammable materials. The great danger in handling these materials seems to be due to the fact that "familiarity breeds contempt" and persons after handling this material for some time grow careless. Accordingly the use of the National Safety Council's Universal Danger Sign and the words "DANGER, KEEP LIGHTS AND FIRES AWAY" may be the means of instilling the necessary precautions for safety.

Safety signs and rules are not for ornament, but for use. Cleanliness and order and a place for everything are essentials of safety. Well-kept working places pay bigger dividends than well-kept hospitals and cemeteries. Humanity demands safety. Safety insures success—everywhere, always.

IRA V. KEPNER,
Chairman, Safe Practices Committee.

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COMMITTEE ON THE STUDY OF ACCIDENTS AND
PREVENTION.

CHAIRMAN DE LA TORRE BUENO: The Chairman of the committee on the Study of Accidents and Prevention, Dr. Francis Patterson, writes: "I am so frightfully busy with my work for the state at present that I am afraid the only report I can make at this meeting will be one of progress."

APPOINTMENT OF NOMINATING COMMITTEE.

At this point it is customary to appoint a Nominating Committee. This Section has adopted the practice of appointing a Nominating Committee in advance, to give them an opportunity to meet and consider various possible candidates for offices. A meeting of this kind was held some three months ago. The gentlemen appointed were Mr. L. A. DeBlois of E. I. duPont de Nemours & Co., Mr. G. Harris of the National Aniline and Chemical Company and Morris F. Crass of the Grasselli Chemical Company. They will make their report at the conclusion of this meeting.

It is very delightful to be able to say, although we started fifteen minutes late, that we are now seven minutes ahead of our schedule. If any one wishes to make any remarks or comment on the report we would be glad to hear them now. Mr. Secretary, have you anything to say?

SECRETARY GRISWOLD: No, I have nothing to add to what has been said.

CHAIRMAN DE LA TORRE BUENO: Has the Chairman of the Nominating Committee, Mr. DeBlois, anything to bring before the Section?

MR. DEBLOIS: I do not think so, Mr. Chairman.

CHAIRMAN DE LA TORRE BUENO: Mr. Kepner?

MR. KEPNER: No, I thank you.

CHAIRMAN DE LA TORRE BUENO: That being the case, we will now take up our program. I take pleasure in introducing Dr. J. S. Bates of the Imperial Munitions Board of Canada, who will speak on "Manhood Conservation in Munitions and Chemical Plants in Canada." Dr. Bates:

MANHOOD CONSERVATION IN MUNITIONS AND CHEMICAL PLANTS IN CANADA.

JOHN S. BATES, PH. D., IMPERIAL MUNITIONS BOARD, MONTREAL, CANADA.

Mr. Chairman and Members of the National Safety Council: In responding to the invitation of the officers of your section to present a paper covering some of Canada's experience in conserving man power since the outbreak of war, it is a privilege to have a share in the exchange of ideas, which is the fundamental basis of the National Safety Council. Unfortunately, the writer is not in a position to discuss the subject in the comprehensive way it deserves, but trusts that the following notes, which bear mainly on health and hygiene, may be of interest.

It should be remembered that the aim in a long war is to liberate men for active service at the front, and the remarkable thing is that this can be done with increased industrial production by proper organization and faithful work on the part of the men, women and children who remain at home. In a large sense the greatest results in manhood conservation come by reason of a united and loyal spirit in the people.

CONTROL OF WAR MATERIALS.

In Canada the control of war materials—such as explosives, chemicals, metals, shells, etc., is in the hands of the Imperial Munitions Board, which is responsible to the Ministry of Munitions of War in England. The success of this new Canadian organization in handling a volume of business now greater than that handled by the Dominion Government has been largely due to picking keen business men and technical experts who are qualified for their particular work. A number of national explosive plants have been built to serve as a balance to the privately owned plants and the board has had a great deal to do with the development and support of new processes. The board has authority to take chemists from the military ranks for munitions work and has also exercised control of exports of chemicals and metals essential in warfare. I cannot do better than refer you to the Director of Explosives, Imperial Munitions Board, Ottawa, Ont., Can., for further information on subjects coming under the heading of chemicals and explosives.

The discussion which follows is for the most part limited to

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explosive plants making trinitrotoluol, nitro-cellulose and co and to chemical plants making acetone, sulphuric acid and acid.

MERCURY POISONING.

The experience with mercury poisoning will serve to illustrate the general methods of combating occupational diseases. In a plant where acetone is manufactured synthetically from calcium carbide, mercury is used in large quantities and is present in the air in vapor, sludge and dust form. Absorption into the system is not only by inhalation of mercuric oxide and mercury vapors through the mouth and nose, and to some extent through the pores, but also through flesh wounds. The mercury becomes fixed as an albuminate in the blood system. The symptoms are mouth inflammation, swollen and puffed gums (stomatitis), with characteristic silver-blue discoloration, excessive mucous secretion and salivation, fetid breath and the skin becoming dark or discolored, and loose or sometimes actually falling out. Mercurial rash is found only occasionally. The gastrointestinal symptoms are loss of appetite, sleeplessness, irritability, nausea or constipation, and excessive loss of weight. The effect on the nerves is shown by anæmia and tremors. In the advanced stage albumen is usually found in the urine.

The remedies are potassium iodide to dissolve the mercuric albuminate in the blood and magnesium sulphate for its neutralizing effect in the intestines. Hot water baths or sulphur baths are used. An astringent mixture of potassium chlorate, myrrh and glycerine is used as a mouth wash to dry the gums and keep them tight. Anæmia is treated in the usual way with iron salts.

PHYSICAL EXAMINATION.

The protective measures were developed gradually and have given very good results. There is now physical examination of the plant doctor of every new employe and the man is located in the plant according to a physical schedule. For instance, every man working in contact with mercury must be free from heart trouble or other congenital or organic lesions. His teeth must be in good order before starting work. All employes in the dark buildings are examined semi-weekly, mainly to watch their teeth and their apparent physical condition. A regular system for transferring to other buildings and for at least one day off per week.

in a separate building, well equipped with doctor's office and laboratory, first-aid room, one set of steel lockers for street clothes, another set for working clothes, lavatories, wash-room, shower baths, lunchroom and laundry. The uniforms include washable suits and caps, woolen underclothes, rubber soled boots with elastic sides, rubber gloves and respirators.

VENTILATION.

In the plant itself a number of alternations have been necessary to lessen the danger of mercury poisoning. The floors and some of the platforms, etc., have been covered with asphalt, so that they may be washed down frequently. Trouble has resulted from open handling of dry mercury sludge and it has been found to be good policy to employ closed systems and mechanical handling as far as possible. Ventilation has been applied with a view to the nature of the materials concerned. For heavy vapors down-shaft ventilation is the proper scheme. This has given excellent results in buildings where mercury vapors and mercury dust are present. Another application of down-draft has been for carrying away water vapor and spray containing caustic soda from electrolytic cells for the preparation of mercuric oxide. It has been found important to avoid handling mercury mixtures in basements or other quarters where the humidity and temperature are high and ventilation difficult.

Although there is no feeling that anything wonderful has been accomplished in combating mercury poisoning, the results of the various precautionary methods mentioned above have been very encouraging. For the first few months of plant operation without such control there were a considerable number of cases, some of a rather serious and persistent nature. It was soon found that this danger was causing a loss of men and was giving the plant a bad name. However, since the present system was started in May the number of mercury cases has been greatly cut down. One important result is that chronic poisoning has been pretty well eliminated and the trouble is caught in the milder acute stage which yields much more quickly to treatment.

T. N. T. POISONING.

It will not be necessary to discuss this subject in detail, as there is another paper on the program devoted thereto. In the Canadian plants poisoning by trinitrotoluol has been most troublesome in the

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flaking and packing houses. Triton rash usually yields in a two to treatment by bathing in sodium bicarbonate. The direct antidote for T. N. T. poisoning; milk, magnesium and heart stimulant are the usual remedies applied.

The protective measures are very much the same as for mercury poisoning. Cleanliness is the first essential; requires uniforms, locker-rooms, shower baths, etc., in the plant. The standard regulations for the change-house include the supply of one quart of milk per man per day to operators in danger. Something is done in the way of ventilation in the plant and mechanical devices for collecting dust and getting rid of fumes. Medical inspection is a necessity for the examination of new employees and old employees every two weeks, at least. Men with weak lungs are not allowed on this class of work, but lung trouble seems to be all right. Young men are often affected quicker than older men but usually recover quicker, and, fortunately, some men develop immunity. In the early period of the war there was considerable trouble with T. N. T. poisoning, but bad cases are now very rarely encountered.

ACID BURNS.

Acid burns occur in the handling of sulphuric acid and other acids. For flesh burns dressings loaded with an excess of dry sodium bicarbonate are kept on hand and applied after the wound is washed with water, the dressing being kept wet for twenty-four hours to neutralize all acid. To remove sluffings the wound is irrigated by the Wright saturated salt solution method. Excellent results have been obtained with paraffin mixtures as used so successfully at the front. Split plaster of paris casts are usually applied for wounds near the joints in order to prevent contraction. Wounds are not washed with antiseptics but only with sterile water. The X-ray is used for treatment of keloids.

IRRITATING FUMES AND VAPORS.

In acid plants the men are sometimes gassed with nitrous oxide and to some extent with sulphur trioxide. In a T. N. T. fire, especially a mono fire, considerable carbon monoxide is liberated. In one of the acetone plants the irritating vapors of crotonaldehyde and acetaldehyde are encountered, as well as occasional ammonia.

In the case of nitrous fumes, as with most other acid vapors, the effect is a local corrosive action on the tissues. The dangers of nitrous fumes are well known, being more serious because the symptoms may not develop for some time after gassing. The ordinary treatment is applied by giving the patient spirits of ammonia, chloroform and bromoform to breathe, apomorphine hypodermic if necessary, and keeping the patient fairly active in order to recover natural respiration. Devices for inducing artificial respiration have been found to be rather dangerous on account of possible permanent injury to the lungs and the usual practice is to use such apparatus for oxygen inhalation only.

In attempting to find breathing devices suitable for irritating fumes the writer has had occasion to try out a variety of apparatus. The respirator helmet of the type now used at the front by the British forces has been found very effective for vapors of acetaldehyde, crotonaldehyde, acetic acid, ammonia and nitrous fumes. This type consists of a face mask connected by a flexible rubber tube to a respirator box packed with animal charcoal, soda lime or other absorbents.

The simple helmet of the "P H" type used at the front in an earlier period of the war consists of a double layer of flannelette shaped as a hood over the head and supplied with eyepieces and mouthpiece. For use in gas attacks at the front the cloth is soaked in a mixture consisting of phenol, caustic soda, hexamethylenetetramine, glycerine, etc., to absorb the poisonous gases. By soaking in caustic soda solution and glycerine this helmet worked nicely in strong acetic acid vapor. The same helmet was treated with a strong solution of boric acid in glycerine and was very effective for use in ammonia fumes. A number of these helmets have been obtained for certain plants for emergency use. There are many chances to apply such helmets in industrial plants and there is need for regular manufacture of such simple, comfortable and cheap helmets properly designed for use in irritating fumes.

In many cases the alternative is the use of expensive oxygen breathing apparatus. This whole subject has been fully covered in the recent publication of the United States Department of the Interior, Bureau of Mines, Technical Paper No. 82, "Oxygen Mine Rescue Apparatus and Physiological Effects on Users," by Henderson and Paul.

It is also surprising how hard it is to find suitable mouth respirators for use in chemical plants. Rubber or aluminum respirators

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fitted with sponges have been more or less satisfactory for vapors and dust, manganese acetate dust, acetic acid fumes, nitrous fumes. Some of the plants claim that the best shield against nitrous fumes is a thick woolen cloth folded over several times and tied at the back of the head to cover the nose and mouth.

Goggles must be designed for the particular service encountered. In some cases tight-fitting goggles are necessary for croton vapors or for other gases which irritate the eyes particularly oxyacetylene welding and other high temperature work. Scientifically colored lenses appear to be valuable in preventing injury to the eyes. There are, of course, standard types of goggles for use in flying particles of metal and grit.

LABOR.

It is obvious that manhood conservation is accomplished to a large extent by organization of a staff for close supervision with a view to stabilizing labor. Some of the munition plants have their own special labor departments and help is received from government labor departments. There is special provision for returned soldiers. Female labor is employed in a variety of functions, including blending and packing cordite, loading fuses, chemical laboratory, and at one plant with excellent results in operating fermenters and stills. Careful attention should be given to the possibilities of employing women in the plants not only to replace men for active service, but also to improve conditions of operation in certain departments.

GENERAL.

It has not been the intention in this paper to discuss the question of accidents, fires and safety precautions in general. As a matter of fact very few of the plants in Canada have safety engineering or control safety precautions in an organized way. However, a great deal has been accomplished under pressure of necessity and use of common sense in protecting the plants which are of such importance in the present war.

In closing, it may be of interest to this section to know that a considerable share of the conservation in munitions plants has been due to the chemists. During the present war, as never before, research departments, works laboratories and testing departments have been called upon to develop new processes, improve plant operation and test old ones.

DISCUSSION.

CHAIRMAN DE LA TORRE BUENO: Does any gentleman wish to discuss this very valuable contribution?

MR. DEBLOIS: In very dense nitrate fumes, is it found that the helmet or respirator is entirely safe to use; in other words, can you depend on it or must you depend on the oxygen or air supply breathing mask, for instance, on entrance to tanks that have not been thoroughly cleaned of nitric fumes?

DR. BATES: I have not personally been around nitric acid plants very much, and I do not know that any satisfactory helmet has been applied, other than the oxygen breathing apparatus. I am sending one of the helmets to an explosive plant to be tried out, but I cannot vouch that it will work. It seems to me, though, that a simple helmet or cloth treated with an alkali should be all right.

MR. W. A. RIDDELL: I would like to ask Dr. Bates whether any indication has come to his notice that the vapors of acids are overcome by these helmets?

DR. BATES: I suppose I have breathed about as many acid vapors as anyone in the plant and the helmet seems perfectly all right.

MR. NIMS: I would like to ask Dr. Bates whether he found the up-draft or the down-draft the most efficient type?

DR. BATES: I really do not know, Mr. Chairman.

MASKS AND RESPIRATORS.

A MEMBER: I would like to ask Dr. Bates if he believes in mechanical means of respiration—the pulmotor and such apparatus?

DR. BATES: The opinion seems to be there should be a shut-off oxygen inhalation only, not for forced breathing in and breathing out, on account of possible strains on the lungs. That is according to the recent bulletin of the Bureau of Mines. A special paper on that subject is in another section.

MR. JOB: I would like to inquire of Dr. Bates as to whether he considers the use of a cloth over the mouth and nose in nitric acid plants as sufficient protection against nitric fumes? The only proper method we have been able to discover, that would allow freedom of movement on the part of the men and at the same time prevent condensation of moisture upon any such thing is glass goggles, which seem to prove rather ineffective and I was wondering what the general practice was in the use of cloth?

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DR. BATES: I am sorry, Mr. Chairman, I do not know about nitrous fumes. I really cannot give an authoritative statement. I do know in one of our plants they use a woolen cloth tied over the mouth and in another plant all I could see was a few respirators soaked in water. I would like to get information on that point. It seems to me that something better than that could be devised.

CHAIRMAN DE LA TORRE BUENO: On nitrous fumes, Dr.

DR. BATES: Nitrous fumes; yes, sir.

CHAIRMAN DE LA TORRE BUENO: Mr. De Blois, have you anything to say?

MR. DE BLOIS: In nitrous fumes we have had some success applying "See Clear Compound" on some of our goggles. I think "See Clear" is merely glycerine. It is rubbed on very lightly. Some of the plants claim a good deal of success through it. Otherwise I do not think there is very much you can do to make goggles efficient, except by ventilation, and when you get sufficient ventilation you also sacrifice the goggles as a protection against splashes on the nitrous fume respirator. I think Mr. Griswold probably give you better information because he is right in the situation.

NITROUS FUMES.

MR. GRISWOLD: The question of protecting the lungs and mucous tissues against the attacks of nitrous fumes is a very serious problem with us and we have had to meet it for about two years. I was just going to ask Dr. Bates the extent of the permeation of the atmosphere with fumes in the plant with which he is connected. With us, at times, especially on a very damp day, our atmosphere is very heavily laden with these fumes, but curiously enough a large number of the men working in these buildings resist any effort to get them wear any form of protection.

The average form of protection used in our plant for men in nitrating houses, where they are breathing fumes for eight hours on a continuous stretch, is several thicknesses of cheese cloth wrapped about under the nose, but that seems to be more for the protection against the densest fumes when they have to go into them. Ordinarily they will enter buildings and will remain for quite a considerable period without any protection and without any apparent discomfort. It is a very peculiar thing, the degree of immunity achieved by men associated with that class of work. However, when a fire occurs

and when very dense fumes are given off, it then becomes very essential that the men get out of the building, and get out quickly, and breathe a pure atmosphere as soon as they can get to it. I have known a number of men that have worked in such buildings for a long time who have entered buildings when the fumes were so dense that you could not see three feet ahead of you. Yet they went in there and did whatever work was necessary without any apparent physical discomfort. On the other hand, we may have men who are not familiar with the work who will attempt some such thing, or who are not able to get out as quickly as they should and apparently a very small dose of fumes will cause a very great strangulation and almost all the symptoms of mild oedema of the lungs. They are taken to the hospital and after the chloroform treatment and fresh air they recover inside two or three hours and go on their way, apparently unaffected.

SYMPTOMS OF OEDEMA.

There is one danger that we are constantly watching: While the symptoms of oedema may not appear at the time of inhaling these fumes—and may not cause any greater physical discomfort than a choking sensation, such as you get from any pungent fumes—the symptoms of oedema will appear within twenty-four hours. We have had cases where very serious symptoms have put in their appearance within twenty-four to thirty-six hours. In going into vapors where a man must continuously breathe or must work in an atmosphere that is too heavily laden with the fumes, the use of an oxygen helmet is required. The men of our plant have been familiarized with the use of this helmet and no man is allowed to go into a plant until he is trained in its use. We have a great many men, but we have been very cautious in all of our work and we are very insistent that men shall become perfect in the use of that apparatus. We consider the oxygen helmet is the only safe device to permit any man to use in an atmosphere heavily laden with nitrous fumes. We have tried respirators with solutions of caustic and many other things, but they are not entirely satisfactory—in other words, they are not dependable. When a man goes into any conditions like that he must wear something he can absolutely depend upon for protection—this you cannot do with an ordinary type of respirator. That is why we cling to the form of oxygen helmet used.

CHAIRMAN DE LA TORRE BUENO: Mr. Jones, of the General Chemical Company, might say something on the subject.

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VALVE RESPIRATOR QUITE EFFECTIVE.

MR. JONES: The only thing I have to suggest is a general valve respirator, but I do not believe it is on the market patented and made by a man named Max Sterin, of Jersey. It is a very small, light rubber affair which a man can put in his mouth and at the same time it has two small passages leading to the nostrils, so he cannot breathe in any way except through the apparatus. The intake is simply an air tube of rather small diameter, probably half an inch, and it can be left outside the tank or the room, if it is not too great a distance. This particular apparatus has something I have never seen on similar apparatus—the suction intake closes the discharge valve, so that it works almost perfectly without any effort of the man using it, and for that reason we have purchased a few from the patentee. He charges rather a large price when you come to think of the small size of this little valve made of hard rubber and it is held between the teeth with the tubes in the nose. He charges something like \$25.00 each for it, but I have found them worth the price. It is not like wearing a helmet, that is very objectionable. We use it in a great many places where you cannot use a heavy apparatus of that kind.

MR. DE BLOIS: Does the device depend on a filtering process for clearing the acid fumes from the air?

MR. JONES: No; you get your air from the outside.

MR. JOB: We have tried the system of obtaining air from the outside to a limited extent and so far found it satisfactory; more particularly in sulphur dioxide fumes, but not so much in dioxide

VALUE OF FORCED VENTILATION.

MR. CHESTER (Semet-Solvay Company): In our plants we use a little apparatus, the plug of which is put in the mouth to breathe through. Air is taken into the mouth and returned through the nose, soda, in this system, and the supply of oxygen goes with it. It is very effective and very light. I would like to ask if Mr. Griswold has been in ventilation in nitrous fumes? That question of up and down-draft is very interesting.

MR. GRISWOLD: We have tried practically every system in our plant. In one group of houses we found the most effective was to use a twenty-five horsepower motor, fitted with an air propeller; it is started at the time of the explosion.

mendous volume of air that is swept through that particular floor when the motor is started. That, of course, is the only system that can be used in that particular case. Some time ago we conducted a series of experiments and tried out different forms of ventilation to get rid of fumes. The down-draft system was used with very good effect; that is, the fumes were taken away from the operator without allowing them to rise. The operation upon which the men were engaged at that time took place at or near the level of the floor and instead of allowing the fumes to rise to the level of the nose the air was drawn away from the apparatus by a down-draft system—a suction system. Consequently nothing but fresh air was drawn from the outside and the operator naturally stood in this access of fresh air. Those are the only two systems we have had. Our greatest difficulty comes from the sudden permeation of the atmosphere in a confined locality—in a building where one of these fires, as we call them, takes place. The sudden discharge of a great volume of fumes naturally fills the confined space very quickly, and that is the reason we use this system and this propellor. As soon as the men are out of the building there is no danger, and it is only the matter of a very few seconds to get them out.

MR. SNYDER: Is there anyone in the audience who has used what is known as the Garnet face mask? It is a small mask which fits over the nose and eyes: it is chemically treated, a felt proposition, and they claim a great deal of success with it. We have experimented with it slightly and find it quite reliable for a short period. I am wondering whether anyone has used it and whether I could find out anything concerning it?

CHAIRMAN DE LA TORRE BUENO: Can any gentleman answer the question?

EFFECTIVE USE OF FACE MASKS.

DR. BATES: We have a Garnet face mask, although we have not thoroughly tried it out. The one fault with all respirators is that they do not give a tight fit with the line of the face, and there is no special mechanism for removing poisonous fumes. Furthermore, the Garnet face mask has no method of removing the breath after respiration—it is let back into the face of the mask. It does not seem very good to me. I am sorry I did not bring along some of the types of helmets used at the front. They are based upon practical experience with poisonous gases and the latest type of respirator box is very effective. It is based on the effect of using chemicals for absorbing the gases, namely: On passage of the air or gas through chem-

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icals in tubes. Animal charcoal is placed in this box, which is on the chest. It is very effective in absorbing almost any gas or fumes. If that general type of simple face mask, connected by a tube to a respirator box, could be supplied with the chemical necessary to absorb the particular gases met with, it seems to me to be a very effective type. The advantage is simplicity and ease of wear and lightness, but also of cost. Oxygen helmets cost over \$100.00 apiece, the ones they use in front costs a few dollars.

MR. DE BLOIS: Mr. Bates has touched on a point that I like to enlarge on for just a moment to the gentlemen who are interested in respirators. He spoke of a leakage around the face of any of the commonly called snout-type respirators, cut a hole in the face and insert a tube in that hole and connect that tube onto an inverted U-tube of glass with water in it—the U-tube commonly used for testing, they are perhaps eighteen inches long. Try your respirator in normal position, that is, measure the difference between the columns of water with the respirator applied normally. Then take a piece of paper over the snout of the respirator and again connect the U-tube and you will see what you get is really a leakage through around the face. In addition to that your test gives you a good indication of the impediment to the breathing that the medium introduces. Notice one of the respirators that is supposed to have a moistened sponge. Try it with the sponge dry and then wet. I think you will find very surprising results. Some respirators on the market are not worth a cent. You will find a type that is supposed to introduce a filtering medium which has been treated chemically and you will find that practically no gas comes through the filtering medium—that is, all comes through leakage around the face. This is just a suggestion. We have some rather surprising things today and I should be glad to have a discussion on this.

MR. DILL: I am very much interested to know where the mask can be obtained (if they can be obtained at all in this country) in which the absorbing medium is contained in a tube which can be removed?

DR. BATES: I think the speaker is referring to the ones that cost a few dollars. We have been able to obtain a few from the munitions board. It seems to me there is scope for some manufacturer to turn out respirators of that general type at a few

CHAIRMAN DE LA TORRE BUENO: We will now hear from Mr. R. G. Griswold, of E. I. Du Pont de Nemours & Co., on "General Dangers from Strong and Mixed Acids, from the Safety Man's Point of View."

GENERAL DANGERS FROM STRONG AND MIXED ACIDS,
FROM THE SAFETY MAN'S POINT OF VIEW.

R. G. GRISWOLD, SAFETY ENGINEER, E. I. DU PONT DE NEMOURS
COMPANY, CITY POINT, VA.

Mr. Chairman and Members of the National Safety Council:
The latent possibilities of an acid burn place strong and mixed acids almost abreast, if not above, the explosive hazards in the scale of danger from the safety man's viewpoint, and the dangers arising from the manufacture, handling, storage and use of strong and mixed acids in technical processes of manufacturing plants may be grouped under two general headings, viz.: Mechanical equipment hazards and the personal equation of the operating employee.

Referring particularly to sulphuric and nitric acids and their mixtures, one is met with the practical necessity of using materials in engineering construction that will resist the attack of these acids during the process, and the materials may be roughly classified as follows: Cast iron, cast steel, wrought steel, lead, glass and chemical earthenware.

Certain dangers arise in the use of these materials in the presence of strong and mixed acids, partly as a result of the chemical action of the acids upon the structure of the material itself, the fracture of a container made of such material by strains imposed by internal or applied stresses, or the sudden impact of a foreign body, causing rupture. Such ruptures may be instrumental in releasing suddenly a quantity of acid in a manner that may bring it into contact with operators who must necessarily be in attendance upon the various units, and who are thus subjected to serious burns although they use great care in their methods of operation.

SUBJECT TO GREAT INTERNAL STRESS.

For instance, cast iron, when used either as a retainer for sulphuric acid or as a conductor for strong sulphuric acid vapors, is subject to great internal stress as a result of inter-molecular chemical change, resulting in an expansion of the inner shell of metal, and

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this stress in time becomes sufficient to overcome the tensile strength of the iron, which gives way suddenly. This sudden rupture results in a crack that opens to a greater or less extent, depending upon the diameter of the vessel or pipe. In one case of an 18 inch cast iron pipe, a crack opened three-sixteenths of an inch for a longitudinal distance of thirty-six inches, and the acid contained was ejected with considerable violence by the internal pressure maintained in the system. Another cast iron pipe ten inches in diameter failed from the same cause for a distance of four feet, the crack opening one-quarter inch. Transverse cracks have also been observed, especially near flanges, but in several instances in the length of the pipe and apparently starting at a chaplet or some other point of weakness.

Microscopic analysis of a cross section of this ten-inch pipe showed a decided change in the nature of the material to the depth of three-eighths inch, the wall of the pipe being three-fourths inch in thickness and the expansion of the inside layer, in which the chemical change occurred, caused the wall of the pipe to expand when the pressure was released by fracture in a manner similar to that of the tube in a steam gage. The only practical protection that can be afforded in cases of this character is surrounding such conductors or vessels by a continuous shield to prevent flying acid from coming in contact with the operators.

Wrought and cast steel does not appear to be subject to the same difficulty, or, at least, our experience to date has not shown a similar result. This may be due in part, however, to the great tensile strength of this material.

WHY FAILURES OCCUR.

Lead conductors may fail as a result of a hole being worn through the material, but the action of sulphuric acid has not shown results similar to the above. Strong acids will, however, attack the metal slowly, and, as the salts are washed away, a hole will gradually appear in the wall.

Glassware generally fails as a result of stress due to expansion and contraction under the influence of varying temperature, and chemical ware may fail from the same causes, or liquids may permeate the material through a crack in the glazed surface, and thus subject the container to a stress that will result in a crack. The quality of the ware is very important. Temperature changes will also cause cracks in the material.

The safeguarding of these materials may be done in a practical manner by surrounding them with shields, but the inherent dangers are usually recognized by the operators and they should exercise care and watchfulness for self-preservation.

ACCIDENTS CAUSED BY CARELESSNESS.

The majority of accidents that may be attributed to the use of strong and mixed acids, however, arise from carelessness on the part of the employes in the performance of their duties. Many men seem to disregard warnings issued for their safety in the handling of such materials, seeming to have no appreciation of the serious results that may arise from contact with strong acids. Nor does the knowledge of injuries that have been sustained by others from the same cause, with the attendant suffering, and, in some cases, death, seem to instill in their minds the necessity for particular caution and care on their part.

Pipe fitters frequently either acquire a contempt of these dangers, born of their familiarity with their work, or show a disinclination to take sufficient time to provide themselves with the necessary safeguards, which may be responsible for many of these accidents. Repeated accidents have occurred as a result of breaking a flange union in a pipe line conducting acids, even in face of repeated warnings, examples, and instructions as to how the work should be performed.

Men working on acid lines should first be positive that the line contains no acid, and this fact should be ascertained from the man in charge of blowing acid through the line. After the line has been emptied, the valves on either side of the section upon which work is to be done should be closed and locked. If possible, the pipe at the valve should be disconnected and a blank flange and gasket bolted over the pipe, so that should an error be made and acid admitted to the line it could not reach the section upon which the men are working.

In all cases where acid is driven through the pipes by means of air pressure, great care should be exercised to see that the air pressure within the pipe has been relieved, so that when the flange joint is broken, the acid which remains in the small pocket between the flanges and gasket, and between the ends of the adjoining pipes and the threads, may not be forcibly blown out into the faces and onto the bodies of the workmen.

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PIPE LINES AND DRAINS.

Pipe lines are rarely supported on a uniform grade, and may be low sections which will retain a considerable amount of acid even though there is sufficient space above the acid to permit passage of air, and, when work is necessary upon such a trap particular care should be used in separating the flanges so that the acid may drain off quietly into a vessel provided below the joint.

In no case should workmen stand below the pipe and the pipe should be covered with a piece of old rubber belting wrapped around it and secured by a piece of wire, a hole being cut on the underside for the escape of acid. The bolts holding the flange together should then be loosened gradually, the lower bolts first and the upper last. No bolts should be removed until all acid has drained from the line. In the event of its being necessary to pry the flanges apart this should be done very cautiously by the insertion of a tapered wedge between the flanges and inserted through a split in the covering strap. As soon as the joint has been broken any residual air pressure will be allowed to escape, but splashing of acid will be prevented by the covering strap.

Before doing any work on a joint, however, every workman should provide himself with rubber goggles to cover the eyes, a mask to prevent any possible contact of acid with the skin, and rubber gloves to cover the hands, preferably with gauntlets, which may be placed over the sleeves of the shirt, and over which should be buttoned the sleeve of the jumper to prevent a drop of acid falling into the gauntlet and thus running down over the hand. If these safeguards cannot be secured, then the exposed skin should be covered with a film of vaseline, which will reduce, to a great extent, the probability of a severe burn, but under no circumstances should a man be permitted to work on an acid line without goggles to protect the eyes.

SHOWERS OR WATER BUCKETS.

All acid areas should be provided with satisfactory showers under which a man may stand and be deluged with water in case of an acid burn, and if the work is to be done in a place where showers cannot, or have not been provided, then several buckets of water should constitute a part of their working equipment, so that relief may be given in case of an accident.

valves in acid lines, which has enabled acid to flow from the open end of a pipe onto men whose duties might require their passing the particular point at the time. The foremen having the handling of acid through pipe lines should invariably satisfy themselves that all valves have been properly closed before leaving the spot. Additional protection can be afforded by locking these valves, so that they cannot be opened by any one other than those authorized to operate them.

MEN SHOULD WEAR RESPIRATORS.

In operations requiring the use of nitric acid, an additional hazard is presented by its fumes, which have a very pronounced caustic action upon the mucous membrane lining the air passage of the nose, throat and lungs. All workmen in such areas should be cautioned not to breathe deeply when they find themselves in an atmosphere laden with nitric acid fumes, and should be taught to inhale as little as possible of these fumes while seeking fresh air. Men working in buildings where fumes are continually given off should be provided with respirators, so arranged that all air drawn into the lungs must first pass through some filtering medium kept moist with water, or some absorbent fluid which will absorb the fumes. Men who have been engaged in this work for a protracted period are prone to believe themselves immune from fume dangers and frequently take risks that subject them to very serious results. The action of nitric acid fumes upon the delicate lining membrane of the lungs is similar in result to the searing of a hot iron on the outside skin, in which case a blister forms filled with watery fluid. When this action takes place inside the lungs, this watery fluid is exuded by the tissues to such an extent that it soon clogs the air passages, oedema of the lungs resulting, and the victim is drowned in his own fluid.

These same precautions apply in the case of strong sulphuric acid, especially fuming H_2SO_4 , as these fumes are so pungent that death may result from strangulation.

Particular precaution must be exercised by operators whose duties require that they enter tanks that have contained strong sulphuric or strong nitric acid or mixtures of these acids. Especially is this so in cases where the steel tanks have been lined with a shell of brick set in some form of acid-resisting cement. Mere washing with water will not clean these tanks thoroughly of nitric acid and fumes will be given off quite copiously from the small interstices between the brick and where the cement is not joined to them, and if a man enters one of these tanks without the proper protection,

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such as a Drager air helmet, by which fresh air can be led from outside by means of a pump, he places himself in grave danger and several cases have been known where death resulted within a few hours after a man had exposed himself to the fumes on the inside of what was supposed to be a thoroughly clean tank.

ESTABLISH POSITIVE RULES.

Inasmuch as it is almost impossible for a man to tell whether a tank has been properly cleaned from a physical examination, it is deemed it most essential that a positive rule be established and reinforced to the effect that no man shall under any circumstances enter an acid tank unless he is provided with a Drager air helmet and a life line, the free end of which is held by an attendant on the outside of the tank.

This also brings up the question of training men who work in the acid areas to wear the Drager air helmet and adjust the oxygen supply in the proper manner. All men whose duties necessitate their working in acid areas should be thoroughly trained in this particular work, so that when it becomes necessary for them to use the air helmet they can do so without the slightest uneasiness without subjecting themselves to mishap owing to their unfamiliarity with the operation of the apparatus.

Particular care must also be exercised in the case of by-product in the manufacture of nitric acid, and several cases have occurred where serious accidents have resulted from men stepping on what appeared to be solid nitre cake, which had only hardened in a crust. The crust broke through with their weight and they dropped into a pool of extremely hot, soft nitre cake containing approximately 10 per cent of free sulphuric acid. Burns inflicted by this material are very deep and take a long time to heal. The greatest safeguard in cases where this material must be disposed of in large quantities is a high and tight fence around the entire deposit bed, so that men cannot step onto the surface in any way. Careless men will take risks and be met with accidents when attempting to take short cuts across a nitre cake dam instead of going around.

DISCUSSION.

CHAIRMAN DE LA TORRE BUENO: You have heard Mr. G. W. Wold's very interesting and helpful remarks. Is there any discussion?

DR. A. J. RISTEEN: Where it says that the free end of a life line should be held by an attendant on the outside of the tank,

want to make the suggestion that two attendants should always be provided at such a place, because it is almost impossible for one man to raise a man who has become unconscious.

CHAIRMAN DE LA TORRE BUENO: Mr. Jones, will you discuss Mr. Griswold's remarks?

MR. JONES: I would rather hear further discussion first.

CHAIRMAN DE LA TORRE BUENO: Is there any other discussion, any other question in regard to this paper? Dr. Bates?

DR. BATES: No.

CHAIRMAN DE LA TORRE BUENO: Mr. Fiesinger, do you want to say anything?

MR. FIESINGER: No.

CHAIRMAN DE LA TORRE BUENO: Mr. Kepner?

MR. KEPNER: No.

CHAIRMAN DE LA TORRE BUENO: I am afraid, Mr. Jones, you will have to be the victim.

SAFETY IN ENTERING TANKS.

MR. JONES: I approve of the entire paper. It is a very fair criticism, the reference to two attendants on the outside. We always insist that the man in charge of the department enter all tanks before anyone else goes in, but that leaves the ordinary attendant at the end of the line with the foreman of the section close by, or any number of men, so that it is not so necessary for us to specify particularly that two men be right there. We have the foreman in charge of the department with an ordinary man at the end of the line, so I think we have the thing very well covered.

As to the remarks in reference to the action of strong acids on various metals: Of course, it largely depends. I had one rather curious experience recently. We have mixed, in steel, sulphuric and nitric acid for a great many years. The main effect has been largely on the top of the tanks. Contrary to that experience, nitric acid and sulphuric free from water, we have found rather an aversion; instead of the tank giving out at the top we find it gives out at the bottom. I never had an explanation of this and I do not know how to explain it. It is perfectly obvious why a tank should give out at the top, because moisture and the humidity get in and corrosion takes place very rapidly. I can see why the top of a tank should give way when it contains a nitrous mixture, because there are greater avenues for the moisture in the tank to overcome any condensation that might take place, but why you have greater corrosion in the

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bottom of an anhydrous mixed tank rather than at the top, I can quite understand. I would like to have someone that is familiar with the subject give his explanation. We all know, of course, when it comes to tanks containing oleum or mixed acids with lime, that iron gives way and cracks, just as has been explained, and for this reason it is very important to have all your materials of steel. Of course, cast steel is better if you can get it. It requires (even if you get it) tight, fairly large bottom outlet discharges. It will get away. Sometimes I have almost been inclined to get a really good, sound casting, rather than use steel. If you could use forgings or if you could get the steel forged in any way, then you would have something that would really last. I presume, in time, the steel foundries in America will improve their method of casting, but today they do not seem able to equal foreign foundries. I have had a steel cast that lasted just as well as a forging. It was made for automobile purposes, but happened to fit my particular case. I presume this is rather a new art in this country and the founders have not really gotten it down as fine as they have abroad.

CASTINGS RECOMMENDED FOR TANKS.

Foreign steel castings are not obtainable today, and you cannot buy them, but the danger of any kind of fittings around a mixed acid tank is very great, and I think it really pays to use a forging wherever possible. That is where your big, serious accidents may occur, especially in tanks of large capacities, and when they occur they are very serious. You cannot get near the tank. You must install proper means of draining the tank, so that it will not be a hazard to your entire plant. I think it more than necessary to see that the materials used in your mixed acid tanks are of the very best, regardless of cost, in order to remove hazards from the attendants.

MR. JOB: One point that might be of interest in regard to handling mixed acid, particularly of strong variety 97 per cent and 98 per cent, and that is the danger of the introduction of water through condensation in air lines. We had the case of a tank which was filled with a strong mixed acid blown partly out one night, four or five inches from the top of the tank, and left standing. From subsequent events it was obvious that water had been standing in the air line and the tank was eaten through in the course of the night, with the result that on the level of the top of the acid there was a crack fully three inches long on both sides.

an inch in width. If air pressure had been put on the tank before this crack opened out there is no question but someone would have been hurt. As it happened there was not, but some means of drying air lines should be provided.

SERIOUS ACCIDENTS AND THEIR CAUSES.

SECRETARY GRISWOLD: I think a very important feature of our work is in instructing men how they should perform their duties. We have had a great many very serious accidents. They have not resulted in loss of life or anything of that kind, but they have been very painful and have held the men away from work a long time. Most of them have been due to some negligence or ignorance on the part of the men operating. As safety men we cannot afford to let men work in ignorance. We bring in a workman from the outside and he does not know nitric acid from sulphuric—how could he? An experienced man in our plant, some time ago, washed his hands in a jar of nitric acid. Some time prior there had been a jar of soda solution in that spot for the immediate relief of slight burns. Who changed it? No one knows, but it was changed, and this man, not knowing anything about the change, dipped his hands into the pot and, of course, received very serious burns. They cannot do it any more; we have removed that possibility.

We had another case where it was necessary to drain a small tank of sulphuric acid, or mixed acid, rather. There only was a small quantity, and it was drained from the bottom before the mechanic was ready to work on it and the acid was put into aluminum pails near the wall. The foreman of the next shift, coming on at 3 o'clock, was standing with his foot against the wall. Two shift supervisors were also standing by the door and the foreman of the shift was standing with his feet braced against the bricks. A mechanic came along and placed the pails of acid along the wall, near this man and between him and the door, a distance of probably two feet. All four men saw those buckets of acid. When the whistle blew the foreman made a movement, putting his foot down, but instead of putting it on the floor he put it in the bucket of acid. Result: Twenty-one days to get over a very serious burn.

MEN MUST BE TAUGHT TO BE CAREFUL.

What are we doing to educate the man to look out for himself? We cannot have a safety supervisor and a life preserver alongside of every man in the plant. Yesterday morning we lost a lot of time

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at a meeting when the subject was "The Education of the Sub-man" by devoting a portion of the time to a discussion of how he should use a shillalah on the men, from the manager down. We cannot get safety results by browbeating any man, we have to get them in sympathy with the movement. From the sub-foreman the way up the line to the supervisor men must be so heartily in to the safety proposition that they will keep their eyes open all the time looking for things. Without this what good is the safety man? He can walk around and pick up the thing that caused an accident last week because he knows some man did have an accident as the result of that condition, but he must also look forward and visualize what a man may do in case he comes in contact with a particular condition. That is the description of a safety man that is in my mind, as it is in the minds of a great many men who are following that particular class of work. We will accomplish real safety work just as soon as we get the foreman and the supervisor and the superintendent to look at the ceiling of a department and notice something peculiar about the insulation of an electric light wire, that it is high enough not to strike the head of a man 5 feet 2 inches, but that it may hit the head of a man 5 feet 6 inches, and he warns the foreman not to allow men to go near it until the electric department makes it absolutely safe.

PERSONAL EXAMINATION OF DANGEROUS PLACES.

When your sub-foreman, instead of looking at a ladder a hundred feet away, goes over and examines the rounds to see if they are nailed, or if they are secured by bolts and finds out whether the rounds are secure or not; goes to the top of it and sees whether the proper fasteners are secure for the descent: then you are getting somewhere. It is not enough for a foreman to bid his boys to go through the plant and examine some of the bolts holding the floor timbers. You have heard of accidents occurring because the bolts were eaten out inside, not where the nuts are. It is not a visible defect. I can show you a number of cases where three-quarter inch and seven-eighths inch bolts have been eaten off and corroded until they gave out and dropped the platform. No power under heaven except common sense can tell a man whether a bolt is strong or not—it is necessary to try it. You do not know whether your assumptions are being absorbed by the structure and by the bolts in the wood unless you get a brace and bit and bore in to find out. That

nor a dozen. It is necessary for the men in the building to look after such conditions. I wish we could have some discussion as to the method of educating men to look for these things, because these are the things that are contributing to so many of our serious accidents.

CHAIRMAN DE LA TORRE BUENO: If we have time to spare from the discussion of the next papers we will go more at length into this subject. It is now the appointed hour for Mr. E. Fiesinger's address, "The Hazards of Caustic Soda, Manufacture and Use." Mr. E. Fiesinger, of the Semet-Solvay Company, Syracuse.

THE HAZARDS OF CAUSTIC SODA MANUFACTURE AND USE

E. FIESINGER, SEMET-SOLVAY COMPANY, SYRACUSE, N. Y.

Mr. Chairman and Members of the National Safety Council: Soda ash and sodium bi-carbonate do not attack the skin or flesh and present no risks peculiar to themselves. The main chemical hazard in the alkali industry is from caustic soda. Solid caustic soda and caustic soda liquor of moderate and high strengths, especially if hot, attack the clothing quickly and attack the flesh. Caustic soda is especially active in contact with the delicate structures of the eye or the interior of the mouth. For these reasons it is necessary to avoid its contact with the skin and to adopt means for immediate treatment in case such contact occurs.

All employes should wear goggles if they work where there is exposure. With this protection, however, injuries to the eye may occur and these are mainly due to carelessness in using the goggles or to liquor which spatters and comes between the goggles and the eye.

RUBBER PUTTEES AND LEATHER CLOGS

Repairmen and men on manufacturing operation should wear rubber puttees or else the ordinary leather shoe should be protected with a cotton canvas covering to resist the attack of the liquor, which rapidly eats leather.

In the final step of the caustic soda manufacture, which is boiling the liquor to finish it as commercial caustic soda, a high final temperature is reached. The resulting full-test caustic soda is cooled and bailed out of the boiling pots by hand with long-handled dippers.

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From these dippers it is poured into steel drums, where it so The men employed in this final process wear leather clogs to the feet against the excessive heat of the furnaces and against caustic soda which may fall on the floor. The soles and heels of the clogs are of wood about one inch thick, with a small strip of leather around the edges. The uppers are of heavy leather, with two buckles, and extend well above the ankle. The two-buckle high top is necessary to avoid caustic getting into the top of the clogs.

For immediate first aid treatment of caustic soda burns, dilute acetic acid is used. It is prepared from good quality commercial acetic acid by diluting it to an exact content of 2 per cent acetic acid. If the commercial acetic acid be of 30 per cent strength, one quart of it is added to fourteen quarts of water to give 2 per cent strength. After this dilution the acid is analyzed to make sure that its strength is 2 per cent.

When an employe receives a caustic burn this dilute acetic acid is applied immediately. It instantly neutralizes the caustic soda and converts it into harmless sodium acetate and the injurious action of the caustic upon the flesh or clothing is stopped.

With serious burns, application of dilute acetic acid is immediately followed by carron oil, which has a soothing effect. Carron oil consists of equal volumes of freshly prepared filtered or strained limewater and raw linseed oil, thoroughly shaken together to form a homogeneous emulsion.

Throughout the caustic soda manufacturing building, on each supporting column, there should be a cabinet containing two or three bottles of dilute acetic acid, so that it is always at hand for immediate use. In case of eye burn the eye is thoroughly washed with dilute acid and then sweet oil is applied.

It is important that no absorbent cotton be used for cleaning the burn because fibres of the cotton become imbedded in the wound. They interfere with the healing and present danger of infection.

COLOR SOLUTION - RED

In order to identify the dilute acetic acid as a first aid material, a small amount of cochineal solution is added to color it red. If this be not done, the workmen may develop the habit of drinking the dilute acid. The red color is sufficient warning to prevent them from doing this.

In general the manufacture and handling of caustic soda

or liquid, must be guarded against. It attacks the flesh quickly and is most active upon such soft tissues as that of the eye.

The best protection against accidents from caustic soda is substantially built apparatus designed to eliminate leakage and spills. In addition, all reasonable precautions must be taken against spattering caustic soda liquor and against chips of solid caustic soda which may fly when the packages are opened or when the solid caustic is broken into smaller pieces.

The best safeguard against all conditions of caustic soda burns is to have a supply of 2 per cent acetic acid solution always at hand in clean bottles close to every place where caustic soda is handled.

With these precautions and with workmen trained to use the acetic acid immediately, serious burns from caustic soda need rarely happen.

DISCUSSION

CHAIRMAN DE LA TORRE BUENO: Any questions on this paper?

MR. HARRIS: I would like to ask Mr. Fiesinger if he had any experience with helmets?

MR. FIESINGER: In caustic soda?

MR. HARRIS: Yes. We have the goggles and the men use them, but they complain that the caustic soda burned the other parts of the face. I saw a man one day with a pair of overalls wrapped around his head, so I suggested helmets. We bought some very thin rubber helmets, but the men refused to wear them because they were so warm.

MR. FIESINGER: The only thing we use is ordinary glass; and in addition to that we have a goggle with a very large lens—about two and one half to three inches in diameter. We have the same trouble you have had.

MR. DE BLOIS: I suggest the gentlemen try our style of mask, the Ridgeway-Pickwell. They are very easily made and are quite cheap. We use a woolen cap, on account of acid fumes; we also put small automobile curtain fasteners inside of the band and run it down to give protection to the neck; they will stick out on the side of the sweat band; then make the side so that you can treat it with some kind of protective compound, depending on what your conditions are; or you can make it of a piece of material carried over this way, and if necessary a piece carried over the top; put your little fasteners on the side of that, cut apertures for the eyes—you can

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glaze that with a glass and frame, which are pretty heavy, can use a piece of isinglass, which is non-inflammable, or w medium you can use under your condition. That type of h light and it protects the entire front of the face. You can apron on it to protect the chest, and when not in use it can be back over the head. They do not cost very much to make think you will find them quite effective.

ACETIC ACID SOLUTION.

MR. VAN GELDER (Hercules Powder Company): I wou to inquire why 2 per cent is specified in the acetic acid soluti what the results are above and below that?

MR. FIESINGER: That is taken care of in our laborate cannot give the reason.

MR. VAN GELDER: Do you know why you could not use cent or 1 per cent?

MR. FIESINGER: I do not.

A DELEGATE: I believe the reason is that it could not co ably be put in the eye. At one time, I believe we tried it as 10 per cent, one fellow had a strong eye and wanted to see he he could go. But if you use more than 3 per cent the workme not use it.

DR. RISTEEN: I would like to ask Mr. Fiesinger if he has carron oil—I do not know just what is the usual name—pe I might say, a condensed form, something like vaseline. It is a that you rub on. If so, I would like to know what he thinks

MR. FIESINGER: No, we have never used it. I understand is a zinc sulphate for the treatment of caustic burns.

USE OF ZINC SULPHATE.

MR. SLAYDEN: We have used zinc sulphate for the past years. In that time we have had 1,500 burns, but I do not thir have lost the sight of a single eye. We use a 4 per cent solutio we distributed it in the caustic house, the same way as we do ar solution. The men not only use it in the eye, but they pour it all themselves, and we do not have very much trouble with the burning their skin. We use all cotton clothing—we insist upor—and the burns the men receive are immediately washed with solution and we have no further trouble. We do have trouble men that do not wash their burns. We have men that

hours afterward that they feel a stinging sensation and find they are seriously burned. We have secured the best results from a mixture of zinc silvol—Parke-Davis & Co. You can make it into a paste. You can also get the silvol in tubes and mix it in water—I do not know just the proportion we use. It heals caustic burns very rapidly. The main thing with a caustic burn is the scar you get; it leaves a very bad scar and takes a long time to heal. Our mask is nothing but an ordinary cotton or light canvas mask to which is sewed an ordinary pair of 10-cent goggles. This the men put over their ears. The rubber bands are tight around the eyes and the canvas loose over the face.

DR. RISTEEN: Do the men wear these masks continuously?

MR. SLAYDEN: No, just in packing; half an hour at a time.

ABUSE OF FIRST-AID BOXES.

MR. GRISWOLD: How do you provide this solution? In what form do you provide it for the men to use? Where do you keep it and how do you keep it? We have had a great deal of trouble getting the men in our plant to respect first-aid boxes. At one time we kept them with all the things that were necessary for the treatment of burns under first-aid methods, but I suppose we have supplied every house and family for miles around with all the bandages and scissors and various little things that they will use for a good many years to come. Finally we had to cut it out. Many of our cabinets were plundered within half an hour after being filled, and we had the same difficulty over again. I am interested in finding out what you do to get men to respect first aid material and also what you did in showing them how to use it. In the case of foreign labor the men (and very frequently the foremen are not much better) might put ammonia—if you have ammonia in your case—in his eye instead of the zinc-sulphate solution. I would also like to know what you do in case a piece of solid caustic gets embedded in the eye? That would cause a very serious condition. Every kind of method is used as a first-aid remedy, but what do you do in that case to relieve your man? Who does it, and what means are taken to prevent infection?

MR. FIESINGER: The acetic acid, as I said before, is placed on every other column. We have two bottles there and they are inspected twice every eight-hour shift by an attendant in the room. We have had no trouble. As far as the first-aid cabinets are concerned, we have removed all of them from the plant. We found that

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we were supplying the homes instead of the men. Solid caustic in the eye is taken care of by the foreman. Our foremen are Americans, but the men are Italians and Austrians. As soon as we get a caustic burn there is very little trouble in finding out who did it; someone will be there quickly and the foreman or sub-foreman will take care of the man.

MR. SLAYDEN: I might suggest that in solid caustic burns not liquid caustic, our plan is to supply the department office with a large syringe, holding, perhaps, half a pint. The man is laid on a table—this is the hospital treatment I speak of—and his eye is washed out with this water, using a strong force. Then we apply zinc sulphate for about half a minute, then we apply cocaine, and then we apply zinc sulphate, and repeat the operation for about two minutes. The man is sent to the eye hospital, wherever he wants to go.

WATER TREATMENT BEST.

MR. SLAYDEN: Hose and large pails.

In the use of first-aid cabinets in the plant, of course, our complaint has been the same as yours. The department office has a large supply of zinc sulphate, perhaps ten gallons, and in the morning zinc sulphate is distributed to all the boxes, which have a large cross on them. The workmen are expected to keep these boxes full, and they are filled every day. We use immense quantities of it; they throw it all over their faces, but the best treatment for caustic burns on the body is plain water and large quantities of it.

MR. GRISWOLD: What method do you use in applying water?

MR. SLAYDEN: Yes, the hose is all connected. It washes the place?

MR. GRISWOLD: Do I understand that you have those all around caustic right out.

MR. GRISWOLD: Do you have a system of inspection to let you know that the water is always at hand and that the pipes are not clogged in any way?

MR. SLAYDEN: We never inspect the hose lines because they are used for other purposes in other parts of the plant.

MR. GRISWOLD: I would like to know the immediate effect of cleaning the eye. For instance, if you had a drop of rather strong

effect in healing? How long does it take the eye to heal? What is the effect on the cornea? To what extent does the question of permanent disability enter into it? Have you had a case where a man's eye has been permanently injured?

EYE BURNS CAUSE INTENSE SUFFERING.

MR. SLAYDEN: When caustic is splashed it burns over the pupil itself and gives it a veil-like appearance. We have had very few cases of serious burns. I assume that if a man went around for fifteen minutes or so before he found treatment he would be apt to lose the sight of his eye. The effect of a burn on the eye is intense suffering; it feels as if the eye was being burned out of its socket. The hospital treatment, I suppose, is the regular treatment. I think they use no special treatments there.

MR. GRISWOLD: You do not require your men handling caustic to wear masks?

MR. SLAYDEN: Absolutely yes. We use the ordinary cotton mask; that is the most satisfactory article we could find. The material does get into the eye, but in very small quantities. We cannot use goggles. The discussion at our last meeting in Detroit was in regard to a suitable goggle for that purpose. We cannot find a suitable goggle, so we use the best type we can secure and take a chance of small burns rather than of intense splashes.

LECTURES AND PRACTICAL DEMONSTRATION.

MR. STANLEY: I would like to tell you of the system we have in England and also the system that we adopted in Canada, to a certain extent, in connection with first-aid treatment. Every year we select from our factories a certain number of the more reliable and better class men—we even go as far as taking them from the laboratories. We provide a first-aid course, consisting of a series of lectures and practical demonstrations in first aid, not only to deal with acid burns and that sort of thing, but also dealing with making splints, etc., and accidents resulting from explosions. In different parts of the plant we have little offices or bureaus fully equipped with everything that is required for the treatment for an accident that might happen in that particular area. In the acid plants we keep bottles of solution and plenty of tanks of water, but our serious accidents go immediately to the first-aid office in that area and the man there sees to the man or men who were affected by the accident. We find that a

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particularly good system both in England and in the United States. We found that when we had first-aid cabinets in the plant we were always missing stuff, so that system was abolished.

I find our system quite a good one. I have no doubt it is in use elsewhere to a large extent, but I have not been able to find first-aid lectures and practical demonstrations given in this country. I really think they are good things and it might be well to initiate and organize such courses. I suppose every plant has its own doctor and medical men, and these are the men who give the demonstrations on the other side.

DR. ROOS: I listened very carefully to the description of the application of zinc sulphate to the eye. For a great many years zinc sulphate has been used in diseases of the eye. When zinc sulphate was used under the direction of physicians they were always cautious in applying it and always cautioned their patients to put it in the eye in drop doses. It seems to me that using as strong a solution of zinc sulphate 4 per cent in large quantities that the cure might be a great deal more severe than the actual condition, as, if it is applied in the right way, zinc sulphate is a serious thing to handle especially around the mucous membranes and in the eye. I feel that if it is used indiscriminately and used in large quantities it might affect the eye a great deal more than the original condition and that perhaps acetic acid in a small solution, 2 per cent, might be a great deal better than the indiscriminate use of zinc sulphate. I would like to know whether results have been found among men where this percentage of zinc sulphate has been used where it has affected their eyes?

NOT ONE EYE LOST IN ONE THOUSAND CASES.

MR. SLAYDEN: We have had over 1,000 cases of eye burns in the last five years, and we have never lost an eye. The men have come back in perfect condition, except in a couple of cases where the men were burned with solid caustic, and that necessitated a scoria to refocus their eyes. Outside of that we have never had any trouble.

DR. ROOS: With a 4 per cent solution?

MR. SLAYDEN: With a 4 per cent solution, yes. In fact, I think our record will stand against the use of acid.

CHAIRMAN DE LA TORRE BUENO: We will now hear a paper by Dr. R. W. Chaffee, Staff Physician, Semet-Solvay Company, Syracuse, N. Y. Dr. Chaffee is not here, so Mr. Chester, of the Semet-

PREVENTION AND TREATMENT OF CASES OF POISONING BY TRINITROTOLUOL AND PICRIC ACID

DR. R. W. CHAFFEE, STAFF PHYSICIAN, SEMET-SOLVAY COMPANY,
SYRACUSE, N. Y.

Mr. Chairman and Members of the National Safety Council:
Prevention of poisoning by trinitrotoluol should begin with the selection of the men who are to work in the plant. Employees should preferably be between the ages of 20 and 45 and should undergo a thorough physical examination. Applicants with heart, blood, lung, kidney and some forms of skin affections should be rejected. Some employers reject all cases of hernia, while others will accept a man with a proper fitting truss. Undoubtedly the best solution of this problem is to advise the man to have an operation for complete cure, when it is usually safe to accept him.

PHYSICAL EXAMINATION OF EMPLOYEES.

Old eye injuries and the presence of partial loss of vision should be carefully noted, as many cases of loss of sight claimed to be due to fumes and similar causes crop out shortly after employment. As a matter of record for future comparison, an examination of the blood should also be made at this time.

Rejections on account of deformities due to previous injuries are made as the employer or medical examiner elect. The employee having passed the physical examination is now ready to assume his duties. At this time he should be instructed as to the nature of the products with which he may come in contact, the dangers of carelessness in handling, their effects on the human system, the advisability of reporting to the foreman or plant physician of any illness, even if apparently simple, and the proper procedure in case of injury. In addition, each employee should be given a book of rules covering these points. Indulgence in alcoholic beverages should be prohibited as far as possible.

Washrooms with shower baths and individual lockers should be provided, where the employee can remove his street clothes, putting on clean underclothes, stockings and overalls. The shoes should be in good condition and have thick rubber soles with no nails. Better still, wear rubber boots and rubber coats. While at work rubber gloves should be worn; if possible, allowing nothing to come in contact with the hands while in the plant.

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KEEP PLANT CLEAN.

Eating food in any of the buildings is, of course, prohibited. Before eating, the hands should be thoroughly washed. The plant itself should be kept as clean as possible, none of the products allowed to accumulate on the floors, walls or beams. All apparatus should be so constructed as to allow the escape of a minimum amount of fumes. A thoroughly efficient system of ventilation is necessary to remove fumes and this is important in winter when windows are closed and in hot weather when the men are perspiring freely and more susceptible to absorption. The air blown in should be warm in winter and cold in summer.

It is also advisable in hot weather to shorten the working hours instead of lengthening them, as has been done in some cases when working on rush orders.

Allow the men to get all the fresh air possible. Daily inspections by the plant physician, noting any conditions detrimental to health, also watching the men on each shift lest one man show symptoms of illness which has not been noticed by the foreman, the physician should also be ever alert to detect symptoms of illness.

HEARTY CO-OPERATION NECESSARY.

Hearty co-operation between the different departments, the foreman, and the physician means better conservation of health.

When the day's work is done, the men should go at once to the washrooms, which should be located outside the building, remove their clothing, take shower bath, using plenty of soap and water, and change into their street clothing. The clothing which has been removed should then be thoroughly washed, dried and made ready for him when he returns the following shift.

While an eight-hour shift may be permissible in cold weather it should be shortened to six in hot summer months. Needless to say, all clothing should be plainly marked for hygienic reasons.

TRINITROTOLUOL POISONING

Treatment—At the first symptoms of trinitrotoluol poisoning the employee should be taken out of the plant and in mild cases given outdoor work. Garden or farm work is an excellent solution to this problem and the men enjoy the light outdoor work, and speedily return to normal health, when they seem to be anxious to return

Blood examinations at this time are a very important item in the treatment, as thereby we have a valuable index of the progress of the case. After returning to work in the plant it is advisable to watch the man carefully from day to day lest a relapse occur during convalescence. Easily digested and nourishing diet should be given and the bowels kept loose. Fume poisoning is probably best treated by chloroform and aromatic spirits of ammonia. Some advise the lung motor, drawing the air over ammonia vapors. Personally, I have never used it. Early treatment is important and the frequent delayed action of fumes should be understood by the workmen.

FLESH AND EYE BURNS.

First-aid remedies for the treatment of flesh and eye burns should be conveniently located about the plant.

In the manufacture of picric acid the same rules should be followed in regard to good housekeeping, ventilation and cleanliness on the part of the workman as in the trinitrotoluol plant. Here again a strict examination of new men, frequent re-examinations, and plant inspections is necessary. Special attention should be paid to all apparatus and retorts, having them as near fume tight as can be and ventilation so arranged as to carry off all fumes possible.

When fumes are present men should be instructed to take short, shallow breaths and get to fresh air as quickly as possible.

There seems to be considerable difference in opinion as to the relative merits of different types of respirators. Personally, I feel that several thicknesses of gauze or cheese cloth, frequently changed, and saturated with sodium bicarbonate will give as good end results as any of the devices usually used. The respirators so commonly used are most frequently found hanging on the workman's chest.

SEND EVERY CASE TO PLANT PHYSICIAN.

Picric acid should not be allowed to accumulate on the person, although many men who have worked in it for years, with the exposed skin continually stained, exhibit no symptoms of poisoning. In the drying plants, where the air is saturated with fine dust, some device should be used to prevent its entering the respiratory tract. Gastro-intestinal symptoms which are sometimes due to picric acid must be differentiated from symptoms of digestive disorders having no relation whatever to industry.

The dermatitis or "itch" which sometimes follows contact with picric acid is usually speedily relieved by a few days' change of work

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combined with a soothing ointment or lotion. Some men are susceptible to this skin affection, and, if it recurs, it is advisable to transfer them to some other part of the plant.

First-aid remedies should be near at hand and the workmen instructed in the proper use of them, yet every case should be sent to the plant physician for further treatment.

DISCUSSION.

CHAIRMAN DE LA TORRE BUENO: Any discussion or question on this paper?

MR. HARRIS: I would like to mention one thing we use for dermatitis: We use alcohol. I do not know how it was discovered but one of the chemists found it out and we use it all the time. It has a very soothing effect and sometimes neutralizes the burn immediately.

MR. CHESTER: Alcohol is a very good remedy for carbolic acid burns.

CHAIRMAN DE LA TORRE BUENO: Dr. Bates, can you add anything?

DR. BATES: Trinitrotoluol, or TNT, is used very extensively in Canada as a standard British high explosive. Most of the trouble in Canadian plants has been due to inhalation of dust and fumes through the nose and mouth, chiefly in the flaking and packing houses and to some extent in the nitrate rooms where TNT fumes are encountered. There is also absorption through the pores of the skin giving a rash. The effect is a local irritated condition, not on the whole system as a whole. The symptoms are headache, nausea, constipation, trouble in breathing, loss in weight, feeling of weakness, blueness of the lips and jaundice in extreme cases. Sometimes TNT is found in the urine, the bile is affected and fatty degeneration of the liver takes place. All these symptoms are not found, of course, in the milder cases. The skin rash is usually relieved in a day or two by bathing in sodium bicarbonate. Salts are given internally and the usual remedies are milk and a heart stimulant, magnesium sulphate for heart disease. There is no direct antidote. Medical inspection by the plant physician is very important, both for new employees and old ones.

MEN WITH WEAK HEARTS NOT EMPLOYED.

Men with weak hearts are especially susceptible to TNT.

ing with lung trouble are not dangerously affected by the process. Young men are affected oftener than older men, and some seem to develop immunity. Employees are examined by the plant physician at least every two weeks. Cleanliness is a precautionary method, and included in this are change-rooms, locker-rooms, and so on. Regulations by physicians in TNT plants in the change-house, in addition to cleanliness, washing, washing the teeth, etc., are one quart of milk per man per day, supplied by the company to the operators in the danger houses. Milk seems to be one of the best remedies in cases of TNT poisoning.

In the early days of the war there was considerable trouble with TNT poisoning in Canadian plants, but doctors have been working on this subject and practically eliminated the trouble. One of our most prominent doctors is preparing a paper covering the whole subject, so that anyone interested should look for it. You may refer to the Munitions Board at Ottawa for further information.

Dr. Roos: A most elaborate pamphlet on TNT poisoning has just been issued by the British Munitions Board. It goes deeply into the symptoms and treatment of TNT poisons. I think it is far the best thing that has appeared. In the treatment of dermatitis as a result of Trinitrotoluol and benzol poisoning we have found that various plants use various remedies. The National Aniline Company in Buffalo uses a solution of 1/1500 bichloride of mercury very extensively, with two ounces potassium salt added to each pint of the solution. They also use a solution of soda ash, where a man is able to stand it. Soda ash in a stearate form burns quite freely, but if the parts are bathed in a solution of soda ash, after the original burn of the soda ash is gone, the itch practically disappears. You will find that in TNT dermatitis cases they will lay off the men for long stretches of time. I looked over the reports of a number of complaints and found there were lots of cases in which the average lay-off ran from two days to over two weeks. At the plant of the National Aniline Company in Brooklyn they are simply using alcohol and the soda ash. They have discarded the bichloride of mercury.

COTTON WASTE AN EXCELLENT RESPIRATOR.

We have found, in going about the various plants, that the respirator which is cheapest to use and which gives the best results, especially where there are nitric fumes, is simply old-fashioned cotton waste, fitted close to the face. A handful or two of cotton waste

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soaked with bicarbonate of soda and placed over the face of employe will fit right down on his mouth and give him freedom breathe—in some cases the men chew tobacco, going right along with their work. This plan has been used very extensively. I remember in the plant in Brooklyn it was almost impossible to get the men to wear any kind of a respirator, but after showing them how easily cotton waste could be worn and how it did not irritate the face around the nostrils and mouth, and how it could be changed so easily, every workman in the plant is now using it. The waste is given to him in the morning at the beginning of his work and at the beginning of his work in the afternoon.

The question of instruction of employes is a very serious one. In some of our large chemical plants foremen are supposed to be of a slightly higher grade of mentality than the average workmen, but in a plant not far from this city, where they were making methyamine, at the end of a shift a workman was permitted to go into the monger and stay in there over half an hour without giving him a protective helmet. Within half an hour after he came out he was found unconscious. He was sent to the Kings County Hospital where he almost died. It was not until after he had two blood transfusions that he made an eventual recovery. The manager, the superintendent and the chemists all felt as if the man had gone into the monger of his own volition and it was only when the foreman was finally asked whether he had directed the man to go into the monger or not that he told that he had. The foreman was well acquainted with the dangers of MNA, but he disregarded all dangers and deliberately told the man to go in and stay there until it was thoroughly cleaned out.

If your foremen in the chemical industry are not picked from a higher type of men than your workmen are there is no reason why you should not have trouble, but if the foreman is picked with the idea that he can be the things that which the average workman cannot be, a great many of these dangers will be obviated. We see that all over this State—in the Hooker, in the Niagara, in the Nation Aniline and all of them—sufficient attention paid to the education of foreman. When the foreman is educated you will find that accidents and industrial disasters will soon diminish to a perceptible degree.

MR. GRISWOLD: Will Dr. Clements say something to us about TNT poisoning? He has had a great deal of experience and I know

CAREFUL SELECTION OF WORKMEN NECESSARY.

DR. CLEMENTS: I do not know that I can say anything to the magnificent paper we have all listened to so attentively. The treatment and prevention that has been given us almost corresponds with the one I have been using for the last three or four years. Some time ago one of our chemists left to take charge of another plant, and he wrote asking if I would give him in a letter some of the symptoms and some of the preventive methods of treating TNT poisoning. I picked up my reply as I came away and slipped it into my pocket, and if you will allow me I will read a few extracts, as I think that will cover about all I might say. It is personal, of course, to the chemist: "Owing to the systemic poisoning of triton by rigid preventative measures we have to a marked degree decreased the number of cases as well as the severity of same (substantiated by statistics noted for several years). Our present system begins with a careful scrutiny of the new man, carefully selecting those that apparently present a strong, robust, sinewy and active constitution—of active mind and mentally alert. This last feature we consider very important, as they will more readily recognize the necessity of personal cleanliness as well as the gravity of neglect in their new work. All blonds are rejected, for we are firmly convinced that they show a decided susceptibility to triton poisoning.

"The new men selected are subjected to a close examination, chiefly in respect to heart, lungs, nose and throat, and an urgent inquiry to ascertain any previous or present disorders of digestion. Special stress is laid on constipation, also eliciting any information as to the tendency and history of any inflammatory skin troubles, such as eczemas, acne, ulcers, etc.

"The newly employed man is now advised by the examiner that should he be negligent in his personal care, sick headache and constipation will soon follow, moreover, if he should at any time feel sick, or if his movements became sluggish, he should immediately go to the hospital, where he can secure advice and relief. With these instructions the new man is gradually initiated into the work, either by placing him on a truck between the various houses or on outside work in the open air. Thus, these men are daily gradually coming more closely in contact with triton. All the men, both old and new, are watched by their foreman for the development of preliminary symptoms, also the whole of the triton area is irregularly, but daily, visited and each man is inspected by one of the plant physicians

Should a patient be discovered in the preliminary stages, he is immediately sent to the hospital.

SHIFT MEN TO OPEN-AIR EMPLOYMENT.

"Occasionally a man will develop symptoms in the beginning of his work, but, by shifting him to and from the outside work, he will develop a sort of immunity. This is rare, however.

"All triton workers are required to wash before lunch and strip and take a bath at the end of the working hours, using rough sand soap and water.

"We are using the differential blood count, and, should a lymphocytosis of 30 per cent or more be present, together with broken and fragmented red cells, the man is immediately changed to outside work. He remains there until the count approximates normal.

"*Treatment*—The first symptoms of triton poisoning present frontal headache, irritable stomach with nausea and futile attempts to vomit, general weakness, torpid liver and constipation. My usual routine is to give a saline at once to start elimination, preferably effervescing phosphate of soda and epsom salts combined, given in two glasses as follows:

One ounce Epsom salts dissolved in one-third glass of water.

One ounce effervescing phosphate soda dissolved in one-third glass of water.

"Dissolve each and pour backward and forward several times and drink during effervescence. As a general rule, this remains in the stomach. The patient is sent home and commanded to rest in bed, giving one-quarter grain calomel every half hour until ten are taken, followed by a further mild saline, such as a Seidlitz powder. He is further advised to eat nothing until he desires, which should not exceed twenty-four hours, after which time he should be fed soups, milk, barley water and effervescing drinks, excluding all coffee and tea and fats of every description. Gradually add solid foods as indicated and continue the use of effervescing phosphate of soda three or four times daily. Repeat calomel in a couple of days, as indicated. Tonics containing iron during convalescence."

CHAIRMAN DE LA TORRE BUENO: We have one minute for further comments.

MR. SHATTUCK: I would like to hear about the practical method of periodically re-examining employees.

MR. SHATTUCK: Yes. I would like information as to how many doctors, and so forth. We have no experience, and we would like a practical method.

MR. GRISWOLD: That matter comes up before the Health Section. A paper will be delivered before that body.

CHAIRMAN DE LA TORRE BUENO: Mr. N. A. Laury of the General Chemical Company, who was to have read the next paper on "Packing and Plant Handling of Hazardous Chemicals," is not here. The secretary will read his paper.

PACKING AND PLANT HANDLING OF HAZARDOUS
CHEMICALS. WITH SPECIAL REFERENCE
TO RETURNED EMPTIES

N. A. LAURY, SUPERINTENDENT, CAMDEN AND EASTON WORKS,
GENERAL CHEMICAL COMPANY, CAMDEN, N. J.

Mr. Chairman and Members of the National Safety Council: Many have sought for a safe and economical package for the transport of the convenient quantity of one or two hundred pounds of acid or other corrosive liquid, but nothing has yet been suggested for general use that equals the standard form of wood-packed glass carboys. This has weak points and is the cause of occasional accidents, but if the requirements of the Interstate Commerce Commission as to quality of material and construction and testing are faithfully followed, and certain precautions in handling are taken, the present package can serve at least safely until the arrival of a more practical substitute.

The mechanical appliances in use for handling carboys are nearly all economical and much safer than the simple picking up of the carboy by one or two men when a loose stopper or defective box may cause injury. The successful use of conveyors, roller skids, derricks with ice-tong grips or the various forms of trucks, depends on plant arrangements and the intelligence of the workmen. Two sticks passed under the side cleats and handled by two men may, at times, be the cheapest way, and all are safer than direct handling. Full carboys should never be moved unstoppered. If nothing else is available, an inverted tin can may prevent dangerous splashing.

THOROUGHLY DRAIN CARBOYS.

The use of compressed air to empty glass carboys is dangerous. The bottles often burst or some acid is invariably left to be returned

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in a supposedly empty package. This has caused many accidents and, as it is also to the consumer's advantage to keep all of the contents, he should see that returned empties are thoroughly drained. It appears that otherwise the Interstate Commerce Commission require that empty carboys be washed before shipment.

Breakage of carboys is sometimes caused by partial crystallization of the contents. For example, sulphuric acid of strengths between 60° and 66° Be. and glacial acetic acid easily freeze and on warming, contain part of the acid, as a large, floating solid mass which easily breaks the bottle unless it is handled with unusual care or first thoroughly thawed out.

The use of hand hooks is a quick and safe way for men on platform or the tail of a truck to receive carboys handed to them from the ground but by far the safest manner of raising carboy short distance is by roller skid.

SAFETY STOPPERS.

A stoneware stopper and plaster of Paris tied down with cord the latter sometimes coated with tar or paraffin is now the usual method of stoppering carboys. If the plaster is mixed in small quantities and applied fresh, it holds so solid that one may move the carboy about by the stopper. The safest practicable stopper in use consists of a glass or stoneware plate held on by a wire clip like a fruit-jar. The joint is made tight by grinding the upper surface of the clip and using a tar paper, asbestos or rubber gasket according to the acid shipped. The best form of clip is that in which the wire end grip into holes in the sides of the bottle neck. These holes may be molded in new bottles or ground into old ones.

Carriers forbid the return of empties unstoppered. Customers therefore, return empties loosely stoppered and vibration of the stopper in transit chips the bottle necks so that many cannot be refilled. This cannot happen with the fruit-jar style of stopper.

The familiar form of hand truck in use at freight stations does very well for barrels, but if a carboy with an old-style stopper is picked up with it, the bottle must rest on its side while the truck is laid down to be unloaded. Leaks are thus often started with bad results. The fruit-jar form of stopper is proof against this risk.

Of course, the latter stopper is a hermetical seal and the bottle is under a pressure which depends on the temperature and the

sealed may develop a dangerous pressure if stored in a warm warehouse but a 10 per cent air space safely covers even this extreme.

LIFE OF CONTAINERS.

The greatest danger in the handling of carboys is the sudden giving away of the bottom or sides of the box due to the corrosion of the nails or weakening of the wood by acid, especially after long storage. This danger can be just about eliminated by the use of wood preservative. It has been observed for some years at one plant that carboy boxes last two years under normal conditions. During this period the box has to be renailed three times and requires one new bottom and one new cover. Somewhat over two years ago several hundred boxes were treated with different preservatives and put into service along with some untreated boxes and records kept of their repairs. The treatment consisted of merely dipping the new box in the cold preservative.

It was found that all the preservatives tried made the boxes wear better. The materials used were ordinary coal tar creosote at 25 cents a gallon, Avenarius Carbolineum at 80 cents a gallon, S. A. wood preserver at 60 cents a gallon, and Preservol at 50 cents a gallon. The latter proved to be the best, as it dried in a few minutes and left a water-proof coating on the surface of the wood, while the others were deeply absorbed.

The carboys treated two years ago are still in service and very few of them have required renailling and none have had new covers or bottoms. This is due as much to the protection of the nails from rust as to the protection of the wood from acid. These treated carboys should easily last two years longer.

STANDARD LEAD CARBOYS.

All of the above applies largely to the standard lead carboy for the transport of hydrofluoric acid. Steel drums are used for this purpose in Europe and are said to be safe and cheap, but they are not yet accepted for rail shipments in this country.

The lead carboy is subject to a pressure test prescribed by the Interstate Commerce Commission before each filling and it must also come up to other requirements as to material and construction, and if properly handled it is safe but not economical.

These carboys sometimes burst due to high pressures which are unexplainable under the normal conditions of their use. The cause has often been traced to the presence of foreign matter. It is a

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package that is particularly hard to wash and if a consumer put to other use in his plant and returns it uncleaned it may pass usual washing before filling and still retain all the foreign matter necessary to generate a bursting pressure.

Owing to the very serious nature of hydrofluoric acid burns, the rubber stoppers should be replaced and the cap securely hooked down before returning empties. When a carboy is received with a leak it should be thoroughly washed inside and out before return

(The names of makers of materials recommended may be obtained from the author at River Road, Camden, N. J.)

DISCUSSION.

CHAIRMAN DE LA TORRE BUENO: Any comments or questions on this paper?

MR. VANDERBILT (General Chemical Company): I should like to augment the use of roller skids. The General Chemical Company has taken up this suggestion. They are rather high in price, but we find them very useful in connection with our motor trucks; of course everyone finds the same thing. Even where a truck arrives at a certain destination and has to wait a considerable time for the unloading these roller skids have helped us out very materially. They are made of strips of wood with a dozen or more rollers on each side. The rollers extend both above and below the platform of wood. The men carry one of these skids around with them and, putting it at the back of the truck, can slide the carboys down to the ground. If a customer has an unloading platform the same level as the truck body we use the skids as a truck. Five or six carboys are loaded on the skids and rolled to their destination, so we find them very useful all along the line.

DR. RISTEEN: The last sentence in this paper states that when a carboy is received with a leak it should be thoroughly washed inside and out before returning. I have not had practical experience with the handling of acid carboys, but it seems to me that if there is a leak due to a fracture in the carboy that it would be very much safer to destroy it; or, if there is an objection to that, to notify the owner that the carboy is held in a fractured condition rather than returning

CHAIRMAN DE LA TORRE BUENO: I think that is an explicit way of putting it. I think what the author of the paper refers to is a leaking stopper. Am I right, Mr. Lovejoy?

MR. LOVEJOY: I think that is what he means.

REPORT OF NOMINATING COMMITTEE.

CHAIRMAN DE LA TORRE BUENO: If there is no further discussion on this paper we will have the report of the Nominating Committee. Mr. De Blois is Chairman of the Committee. I hope all the gentlemen will stay and vote for the candidates for office.

MR. DE BLOIS: Your Nominating Committee, after carefully canvassing the list of members present, has made the following nominations:

For Chairman—Mr. E. H. Fiesinger, of the Semet-Solvay Company.

For Vice Chairman—Mr. E. B. Mitchell, National Aniline and Chemical Company.

For Secretary—Mr. R. G. Griswold, of the E. I. Du Pont de Nemours and Company.

CHAIRMAN DE LA TORRE BUENO: You have heard the report of the committee, what is your pleasure?

DR. RISTEEN: I move that the report be accepted. (The motion was duly seconded and unanimously carried.)

CHAIRMAN DE LA TORRE BUENO: Any further nominations? If not, I would suggest a motion that the Secretary cast the vote of the assemblage for the candidates.

MR. DE BLOIS: I move that the nominations be closed and the Secretary cast the vote of the Section. (The motion was duly seconded and unanimously carried.)

CHAIRMAN DE LA TORRE BUENO: The Secretary has cast the ballot of the Section for the candidates and they are hereby declared the elected officers for the coming year.

There being no further business, this Section stands adjourned until the next annual meeting.

National Safety Council

Car Builders' Sectional Meeting

New York City

Sept. 14, 1917

G. A. ORTH, Chairman

Chief, Claim and Safety Departments American Car and Foundry Company
St. Louis, Mo.

FRIDAY AFTERNOON SESSION

THE meeting was called to order at 2:30 o'clock, Mr. G. A. Orth in the chair. After a brief informal meeting, Chairman Orth addressed the members of the new Section.

ADDRESS BY CHAIRMAN.

Gentlemen and Fellow Delegates to the Sixth Annual Safety Council: Our Council is to be greatly congratulated on the continuous progress that is being made toward the goal which is set, at to which eloquent testimony was borne by the convention Chairman at the opening of this session.

The new Section of our work, which we inaugurate today, is a vivid illustration of this advance and serves to remind us that we as an organization, conform to the law controlling all living bodies. The law of life is growth, the increasing power to take care of new needs and still newer developments. This is what makes our organization a living factor and a progressive society. It continues to grow.

The car building plants of the United States play such a vital part in the trade and transportation problems of the country that we are not surprised that the time has arrived when they should receive a more detailed attention to each particular function of their operation in a Section exclusively devoted to their consideration. Much has already been done to organize them as a whole and to introduce safety methods and safety appliances, but we all recognize that there remains still more to be accomplished by intelligent, united and continuous efforts.

This is our specific and at the same time our congenial task. We propose, therefore, to carry into this Section and its discussion the same breadth of view toward the complete whole, and the same keenness of vision to detail, as have characterized our work in the various plants we have the honor to represent.

WORK OF THE NEW SECTION.

If there are peculiar dangers and imminent hazards immediately associated with the operations of these various plants, and there are, it will be our aim to reduce these to a minimum by more specific, precautionary safety methods. This will be realized, I would judge, by standardizing not only as many as possible of the operations in connection with car building, but also standardizing the tools and appliances employed in such work.

Other departments of our Council show that accidents in the various occupations decrease in exactly the same ratio that safety organizations for prevention of these accidents increase. The more perfect the organization for safety, the fewer the accidents in that department of trade or manufacture. We may strive to perfect such an organization in this particular Section and may pleasantly reflect that the reflex influence of our best work on other sections will be very considerable. We will help to raise the standards all around by raising our own standards to their highest points of efficiency.

For the sake of convenience we have arranged the subjects to come before us under several headings, as announced in our program. They seem to cover the ground very thoroughly.

The particular subject assigned to me is the "Handling of Materials, which I have divided into two parts. The first I will deal with on historical, descriptive and technical grounds. The second, I have asked my friend and colleague, Mr. George W. Bowie, to deal with under the heading of "Rules and Regulations."

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HANDLING OF MATERIALS—(a) CRANES, (b) CABLES, (c) AUTO TRUCKS AND ELECTRIC

G. A. ORTH, CHIEF, CLAIM AND SAFETY DEPARTMENTS, AMERICAN
CAR AND FOUNDRY COMPANY, ST. LOUIS, MO.

Mr. Chairman and Members of the National Safety Council. "The Handling of Materials" may seem a very prosaic subject but when viewed in the light of human achievement and technology becomes fraught with profoundest interest.

When you read a magazine, periodical or newspaper; when you travel by sea or land; incidentally, when you take a journey as an aviator, you read of or see all around you interminable railroads, vast buildings and engineering enterprises, such as dams, reservoirs, bridges, huge ocean-going steamers, canals, and cities being built. Your first thought, probably, is one of adulation at the progress of civilization and the cleverness of the human race, and more particularly of your own nation, which has demonstrated its ability to compete so successfully with the older civilization.

Let us, for a moment, revert our thoughts to the conception of those mighty works, their evolution from the breaking of ground to their completion. We see and hear the operations of men who are mere pygmies compared to the vastness of these works of engineering magnitude, using excavators, boilers, engines, pumps, transportation facilities, such as locomotives, cars, conveyors, transmission cables, etc.; in which all the known ingenuity of the human race is concentrated to overcome the obstacles of Nature, and make Nature subservient to the needs of the human race, is at work.

SYSTEM, EFFICIENCY AND SAFETY.

Is it not wonderful that man's mind can enslave the mighty forces of Nature, till they, like the famed genii of Aladdin's story, obey his bidding and create the finished product of his conception for our comfort, pleasure and use? One of the basic necessities for the doing of such work is plainly the handling of material. The handling of material has come through a process of evolution as gradual as the development of man himself from the stone age to our present one of advanced civilization.

Consider the building of some of the first known engines

Hanging Gardens of Babylon, the Temple of Diana at Ephesus, the statue of Jupiter by Phidias, the Mausoleum of Artemisia and the Colossus of Rhodes; the details of the handling of the material on these seven ancient wonders are buried entirely in obscurity; the methods of handling such masses of stone and the appliances with which it was accomplished, are matters of which posterity knows nothing.

Coming down through the centuries to the building of the seven wonders of the Middle Ages, the Coliseum of Rome, the Catacombs of Alexandria, the Great Wall of China, the Stonehenge in England, the Leaning Tower of Pisa, the Porcelain Tower of Nankin and the Mosque of St. Sophia in Constantinople, we are still wondering how they did it, because, regardless of the magnitude of these works, the equipment for handling material still seems to have been restricted to the rope and block and the inclined plane. Unquestionably, however, they had the use of vast numbers of men, who supplied the power for the transportation and elevation of those masses of material.

Contrast, if you will, these bygone ages with this, the present year of our Lord, with information of all engineering projects reaching us at least once a week, informing us of high and long bridges being built of stone, concrete or steel; towering buildings and smokestacks which overtop the Pyramids in height; majestic ocean steamers which reduce a voyage from three months to almost as many days.

To utilize a few of the great watersheds of the world, the Assouan dam on the Nile, the Roosevelt dam in Arizona, dams and locks of Sault Ste. Marie have been constructed; the stored-up force, through the aid of power-houses, containing hydro-electric power which can be disseminated for power and lighting, to be used in grain and coal elevators, as well as for many other purposes.

Can our pygmy minds grasp what "Handling of Materials" really means?

MODERN METHODS OF APPLYING POWER.

Let us consider for a moment the development of the mechanical arts in relation to our subject, and in analogy with it, the development of "Safety First" methods as applicable to this particular branch of industry.

The invention of the steam engine is no doubt the foundation rock upon which is built the mighty monument of modern progress. Transportation as it is today had its inception in this source. Elec-

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tricity as a motive power also had its origin and usefulness, but James Watt evolved a steam engine, which made rotary motion possible in large and powerful producing units. The same applied to compressed air and its manifold uses.

These three methods of application of power enable the industry of today to create and erect those countless monuments of human industry which we have all around us, and which indicate the advance of civilization.

In order that we may treat our subject with specific regard to this particular Section of our Council, let us confine our consideration of applied power to those marvelous exhibitions of utility—traveling cranes—including the necessary equipment of chains, cables for the safe hoisting of large masses of material into place.

You will all agree with me that the subject of "Crane and Crane Practices" is, indeed, a comprehensive one and in the time that has been allotted me, I shall be able to touch but briefly upon it as a whole. It is needless to tell you that I cannot present anything on this line that you have not already read of or heard about, so my purpose now is simply to refresh your minds concerning the facts already in your possession and to urge upon you the necessity of constant and intelligent use of these facts.

There are doubtless few among us who can boast of the distinction of having in operation in our respective plants, many new standard crane equipments. Yet I would caution even these fortunate ones, if any there be, not to become too boastful over good fortune, remembering the old adage, "Pride goeth before fall," etc. For, as long as there is the human element with which we must contend, we know that we cannot eliminate all accidents from our equipment ever so well-guarded and up-to-date.

Traveling cranes as used in car shops, based on the maximum amount of safety while operating, are indispensable in modern material.

For the wonderful development of these mighty monsters of strength—the overhead traveling cranes—we must undoubtedly credit to the great iron and steel industries. The magnitude of tasks accomplished by these veritable giants of industry, calls for ever-increasing complication in machinery, which results in likewise increasing danger in operation. They have become, therefore, a subject fraught with deepest interest to the safety engineer. Let us consider them with special reference to safety equipment. Should cranes have guards? I would say "Yes." most emphatically. The

is no sufficient reason that can be advanced to negative this conclusion. I do not propose in this brief time to enumerate all the safety appliances with which your cranes should be equipped, but take it from a safety man that he who does as "little as the law allows" always pays dearly for his shortsightedness. It is wise, I say, to guard not only the accessible dangers, thereby conforming to the various State laws, but also the inaccessible—always keeping in mind those who have such an insatiable thirst for "knowing things" that sometimes we cannot help agreeing with the old theorist who always insisted on choosing our ancestors for us.

LESSON TAUGHT BY MONKEY.

This recalls to my mind a visit I paid to a "zoo-illogical" garden—do you get that? I was looking at another simian, unhappily confined in a cage, and I observed that this monkey (not myself) was endeavoring patiently to make plain to his limited comprehension how a door on his cage was possessed of the interesting peculiarity of swinging open and shut. He sat in front of it causing it to swing, then he would run from one side to the other trying evidently to understand how the hinge worked. Once in a while he would stretch out his paw and feel the action of the hinges, which inquisitiveness finally resulted in the catching of his digits in the hinged part of the door. His rage and astonishment were grotesque, but he returned after a time to the same form of amusement, showing what simian curiosity is. There was much that was human in this monkey's actions. I have seen human beings who put their fingers, limbs and even their lives in jeopardy with about the same amount of forethought as this unfortunate little simian brother displayed.

All guards and precautions mean protection, and any idea advanced that they may conceal dangerous conditions is founded on sophistry. All gears should be covered, so that those whose business it is to repair or inspect cranes may not be injured; ample platforms should be erected wide enough for workmen and provided with railings and toe-boards; bumpers for collision purposes, and strong rail steps to prevent traversing carriage from running over rail ends.

These kinds of guards, when not installed properly, have been very productive of accidents. On one occasion in our Detroit plant, when a traverse carriage struck the end stops it broke the stops off, and a large fragment, falling, alighted on the hand of a workman, and severed several fingers.

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On another occasion a man who was looking for employment stood just inside the door; a piece of a broken bumper, released from a collision during the night operations of the cranes, became loosened and fell to the ground, cutting off some of the man's foot.

Leaving spaces between the planks on platforms has caused serious and fatal accidents, due to the falling of tools on the men beneath the crane.

The trains of gears on every crane ought to be protected and guarded, so as to prevent gears, which get broken or loose, defective or loose keys, from falling on the men below. Box bearings ought to be properly rebabbitted and aligned to protect them from wearing out of mesh, as constructively their wear is frequently downward and is a prolific cause of accidents when the teeth get the load and strain on their points. The brakes on cranes are also important, if you wish efficient and safe service.

BRAKES AND THEIR USES.

The common band brake, actuated either by hand or foot, should always be in first-class shape. The band lining and rods should be examined regularly to see if they are effective. In hoisting, both mechanical and electrical brakes, frequently a combination of both, in addition to the stop pawls, which are constantly in operation to hold a load safely. In lowering a load with a crane actuated by electricity, means must be employed to retard the speed descending and to hold it after it has been brought to a state of rest. This has in the past been most generally accomplished by use of mechanical and electrical brake combined. At the present time, dynamic braking used in connection with a holding brake is unquestionably the most desirable and safest method of controlling a descending load.

Probably the most important piece of equipment on a traveling crane is the limit switch, and which is responsible for numerous accidents on account of neglect in keeping it in proper working condition. A foolish and frequent practice indulged in by operators is the putting of the circuit breaker in contact and holding it so as to be able to hoist another foot or more higher. There is usually four feet from automatic cut-out to drum allowed, but with the latest device manufactured, this fool practice known to the industry as "plugging the crane" is entirely obviated.

During the month of July in one of our large plants two employees had a piece of machinery delivered and put in place.

were engaged in pushing the buggy the crane operator had "plugged" the crane and under the impression that he had the handle on controller to move crane sideways, his hook block ran clear up into the drum, when the cable suddenly parted and hook blocks came down on the two machinists below, injuring one seriously and instantly killing the other. The underlying cause for this accident, and many others similar to it in nature, is the fact that skilled crane operators are scarce, largely due to war conditions, and many men now engaged in car building operations who are less than 50 per cent efficient. This accident is a sad commentary on the caliber of the average man we are now compelled to employ, and is responsible for the accident and death toll which retains such undesirable volume in the face of all attempts to make traveling cranes safe.

REGULAR AND FREQUENT INSPECTION.

Traveling cranes certainly require not only regular inspection, but frequent inspection, to counteract the effect of wear and tear, collisions, neglected lubrication, and also to keep track wheels one diameter, so that they will travel parallel on their tracks.

Overhead traveling cranes could easily have a good-sized volume written about them concerning what should be done and what should not be done.

The following recent incident came to my notice: Some men were sent up to change worn-out rails on which cranes run in a steel car building plant. This shop had three aisles. No. 1 aisle was shut down entirely so as to be safe for the workmen, although the next aisle, No. 2, was in operation. All the men were told in Polish and English not to put their hands on the rails of No. 2 aisle. In addition to this, a man familiar with the hazards of the job accompanied each gang as a safety precaution. The cranes on No. 2 aisle had passed up and down several times without mishap to anyone, when one of the men put his hand on rail track of No. 2 crane. His mental and physical condition seemed impervious to the thunderous noise and vibration of the approaching crane and this lapse of mental activity cost him four fingers; another example of sluggish mentality; or should I say stupidity, on a dangerous job.

Can you visualize what it would mean to our car building industry, and incidentally to the safety movement, to have traveling cranes, perfect mechanically and electrically, performing their everyday duty with a minimum of accidents? A code of signals should be used constantly in crane service, preferably gongs. Street cars

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are run through crowded cities with these, and the citizens always look out for the cars when they hear a gong. This should correct the seemingly common impression that workmen would become familiar with this signal and would neglect its warning sound.

WHEN WORKMEN FEEL SECURE.

With all these safety appliances attached to cranes men will work under them with a feeling of perfect safety, thus increasing production. Mentally and physically they will be free from that nervous apprehensive feeling of danger which so detracts from the amount of work that men are capable of doing.

It is gratifying to note that the safety movement is so engrossing the attention of these great industries, that they are demanding cranes which largely incorporate the ideals of their safety engineers and through this co-operation with progressive crane manufacturers rapid strides are being made in the direction of our material of efficiency and safety.

The initial cost of these cranes is, of course, greater than that of cranes not equipped according to the safety specifications of safety engineers, but here we insist that the rule—"the best is cheapest"—is indeed applicable. Sooner or later all States will compel the complete guarding of these machines, and it has been proven that safety devices for safety are more expensive and are not as satisfactory as those which are made an integral part of the machine when properly designed and constructed.

Tentative standards for overhead traveling cranes have been prepared at length by the Committee on Standardization, of the American Society of Mechanical Engineers. These are considered most comprehensive, as they embody all the newest and best ideas.

They are based, I believe, upon the United States Steel Corporation specifications.

CHAINS, CABLES AND SLINGS.

Chains, cables and slings are the mediums by which loads of material are suspended and transported through shops, and should always have a safety factor of five at least. All hooks and connecting rings on slings should be made larger than the link diameter of the chain. Chain should be proof-tested and all connecting rings and shackles made of Swedish iron; nothing can equal it.

Great care should be exercised by foremen to see that chain and hook-on use the right slings for the loads; in fact, it is better

have a rule that only one size chain be allowed for use on traveling cranes, and it should be at least eight feet from floor to bottom of hook.

The consensus of opinion is that annealing of chains should be done at least once a month. We all know that annealing will not injure a chain, even if it should be annealed twice a month, which may be advisable especially if a car shop is running night and day.

Literature pertaining to chains, slings and cables should be furnished each shop, gratis, and put into the hands of cranemen and hookers-on at the time of their entry into the service. A committee should be appointed to formulate specifications on chains, cables, hooks and connecting link and rings; also to write short and effective leaflets dealing with conditions, under which loading and slinging should be conducted.

ELECTRIC TRUCKS.

Electric trucks for the handling of material have a use in any shop; in car building, possibly their use may be limited by reason of the limited number of pieces, owing to size and weight, that could be handled with dispatch. Floors would have to be laid in the aisles to reduce amount of current used, so that a rough floor would not interfere with their movement. Where material had to be transported some distance they would be very effective for rapid transit from department to department, especially in the distribution of bolts, nuts, washers, paints and store supplies, etc.

It is not worth while spending thought and time on safety suggestions applicable to certain existing plants which are remnants of the stone age, with their cheap-screw managements, but which still exist in not a few places in this country, and where real, live human beings are required to work about and beneath antiquated cranes, operating on flimsy structures, with gears and machinery unprotected, without platforms, with defective and dangerous wiring, no safe and convenient means of access, operated by immature and incompetent employes, and all subjected to no inspection whatsoever. Of course, we all know there is now no excuse for such conditions and the only safety service suitable for these plants is that of absolute condemnation by State factory inspectors. Our observations apply, therefore, only to plants where constant effort is being made to install such devices for the moving of objects which in design, material and workmanship exhibit strength and durability, having the latest tested types of lifting, holding, lowering and

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braking apparatus, with moving parts protected and all places where human beings are required to go, equipped with rigid forms. Such equipment can now be obtained new and cheap from all reliable manufacturers, and old cranes and hoists can easily be brought up to this standard. With such equipment, experience in large plants has shown that a total number of injuries resulting from the handling of material 4 per cent is due to defective parts of crane or breakage of crane parts and 96 per cent result from material falling from loads, breaking of chains, hooks, cables, slings, etc., and carelessness and incompetency of crane operators and hook-men.

These figures clearly point the way in which our safety effort should be directed. It is very evident that the human element in the movement of material should be brought to a higher state of efficiency, and in seeking to develop this condition we would recommend a more united, constant and vigorous campaign of education of cranemen, hoistmen and chainmen. In fact, all who have to do with the movement of material and then a rigid demand that workable rules be carried out.

DUTIES OF CRANE DIRECTOR.

All of this training and teaching could be done by the various department heads, at least in small plants, and for the larger plants it might not be an unwise policy to appoint an experienced and competent director, a sort of a material-transferring engineer, who would have considerable to say in deciding as to the competency and mental fitness of crane operators and chainmen; also in determining the safe and efficient methods of handling material; in seeing that all cables, chains, hooks, etc., are kept in perfect condition; that lifting apparatus is never overloaded; that cranes and hoists are regularly inspected; that all employees who have anything to do with the moving of material be kept informed as to the safe and speedy method of doing work, and insisting that his instructions be obeyed. This engineer should make a study of efficiency and safety in the handling of all material and then constantly by "line upon line, precept upon precept, here a little and there a little," seek to educate all men who have anything to do with this phase of service. In carrying out such a policy, I believe injuries from this source will be greatly reduced, perhaps eliminated almost entirely, thus enabling us again "Out of the black nettle danger, to pluck the white flower of safety."

Unfortunately, the time has not yet arrived when we can equip each workman with a standard system of self-precaution. Like the poor, whom we have always with us, we always have the chance-taker, the absent-minded, the curious, and upon these rests the responsibility for a great percentage of industrial accidents. It is this discouragement, which we as safety men must face and must meet with renewed zeal, firm patience and strong faith in the efficacy of the safety movement. Now, as never before, in view of the great struggle in which our country is at present engaged, are we called upon to conserve to the highest degree the life and limb of each workman, for the call to the Colors has meant not only a scarcity of labor in factory and shop, but a speeding up in the industrial world: a constant changing of forces, which places such unusual stress upon the Nation's productive energy, that we as true Americans must feel it our patriotic obligation to stem the tide of needless accidents and to this end we must reconsecrate ourselves to the welfare of humanity, thus doing "our bit," that our country may not fail in this, her righteous stand for liberty and democracy.

CHAIRMAN ORTH: We will now hear from Mr. George W. Bowie, M. E., of the American Car and Foundry Company, Detroit.

RULES AND REGULATIONS FOR TRAVELING CRANES.

GEORGE W. BOWIE, M. E., MASTER MECHANIC AND CHIEF OF SAFETY, AMERICAN CAR AND FOUNDRY COMPANY, DETROIT.

(These rules are written in the imperative mood, i. e., to instruct workmen as if reading a book of guidance in safety.—G. W. B.)

Mr. Chairman and Members of the National Safety Council: There are three conditions embraced in management or operation of overhead traveling crane service, and which form the basis of all rules governing the crane operations. They are as follows:

OPERATING RULES ON TRAVELING CRANES.

1. Crane service as related to proper placing of material in the various aisles and allotted to machines. This should be entirely under the supervision of the general foreman and those subordinate to him in shop management. This method would be classed as operative efficiency.

2. Crane service as related to who should have charge of crane operators, regulate their acts and keep cranes in proper and safe

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working conditions. Crane operators should be responsible foreman of electricians, who should have charge of working condition of cranes, which is largely electrical, but mechanical defects should be remedied by machinist or millwright repair gang. All those departments under a master mechanic, who can combine safety, general repairs and efficiency in one executive head, making a flexible repair gang for promptness in repairs.

3. Crane service as related to who should be responsible overloads and correct method of slinging material when loads of material are being handled and transported to the various stations. The crane operator should have authority to refuse to lift any load that may in his judgment be excessive or incorrectly slung by chainman or hooker-on. The crane operator should and will naturally be a man of sounder judgment and superior caliber to the ordinary chainman and in the event of an accident the crane operator suffers more mentally, as he frequently considers himself contributory to the injury. When he is unable or not allowed to refuse a load which he knows is dangerous he is under a serious handicap. Therefore the crane operator should have authority to refuse to carry a load if in his judgment he considers it an overload or not properly and securely slung. If the crane operator is in error he ought to be dealt with leniently, as his intentions are for the company's interest. If any dispute arises the safety inspector should be immediately called by ringing a large gong or flashing a red light to prevent shop operations being held up, whether he is right or wrong. The load ought to be reduced until the matter is decided.

This is no doubt the most important consideration toward eliminating accidents or death to workmen who are engaged in the tasks below. Their knowing that precautions are being taken for their safety will give them confidence in attending to the allotted work. By giving the crane operator this authority you create a powerful factor for safety, as he will feel that the safety of the men around him is dependent on his carefulness.

TRAVELING CRANE SERVICE.

(General Regulations to Insure Safety for Crane Operators, Chainmen and Repairmen.)

i. The above employees whose duties are outlined by the following rules, are required to keep copies of same in their possession while on duty and are likewise required to familiarize themselves

with each rule. A violation of any of the following rules must be reported immediately to the safety department or master mechanic.

2. The fact that any person enters or remains in the service of this company will be considered as an assurance of willingness to obey its rules. In case of difficulty or doubt concerning the meaning of any rule the employe should at once have this rule explained by either of the undersigned.

3. Employes before coming on duty or while on duty must not use intoxicating liquors.

4. Employes will not be permitted to smoke, read or sleep on the cranes.

5. All crane operators are to report to electrical department by phone from crane landing stage when ready for duty each morning.

6. Crane operators must be ready to begin work when whistle blows and remain until whistle blows to cease work.

7. If crane operator desires to be absent, he must inform his foreman the day before. If unable to come to work in the morning he must do his best to inform his foreman.

8. Crane operator is required to keep crane subject to his control, free from surplus oil, accumulations of dirt and grease. Disorder and dirt indicate laziness and incompetency.

9. Crane operator must be a man of intelligence and good judgment and be able to demonstrate to foreman of the electricians his capability to handle crane.

10. Crane operator will be under direct control of foreman of the electricians.

11. Crane operator must report condition of crane daily to his foreman and safety department on duplicate form provided for that purpose, sending one to each of the foregoing either night or morning, or as occasion may arise necessitating repairs.

12. Crane operators when working two shifts per day or twenty-four hours must personally make inspection of all mechanical and electrical parts of crane, viz.: Examine gears for broken teeth, arms and hubs of gears; tap keys with hammer, observing if they are tight; see that all caps on journals are properly fastened by holding-down bolts, examine bearings and see that they are not unduly worn or loose. Some bearings are so located that gears will wear out of proper mesh, this is liable to break the teeth and a train of accidents may follow.

Provisions are to be made in construction of guards to allow easy access for daily inspection in addition to usual inspection by

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safety department. Examine frame or checks of trolley, see pawl pins used to mechanically hold load are in good condition that mechanical and electrical brakes are working to their capacity, see that no bolts are giving trouble by working loose. that all crane equipment under his personal care are inspected, Platforms, ladders, runways, stops, oil cups are filled, and run parts lubricated. Do not leave loose boards which have been used repairs lying around.

13. Crane operators coming on duty morning or evening must be absolutely sure that limit switch is in proper working condition at that time and at any period during their shift. This is an extremely important matter, many accidents having resulted from neglect of this rule.

14. Crane operator must report for work thirty minutes before whistle blows in the morning (6:00 a. m.) to examine and oil crane. Crane repair man will oil and examine crane at lunch being allowed one extra hour for this service.

Operator should remember that the crane is his special responsibility and should interest himself in its condition. He should know how long cable has been in service, keep a constant lookout for defects in crane, examine pins in hoisting block if he suspects they are dangerous, report them on form, and see that hoisting sheaves are oiled daily. These inspections are in addition to the inspection by safety department.

CARRYING LOADS—SAFETY FIRST.

16. General foreman, foremen and chainmen and hookers-on must distribute loads and route them to the various machines and locations provided for material.

17. (a) Crane operator will, if in his judgment he considers load to be excessive or unsafe, flash a red light to notify chainmen that they must reduce the load.

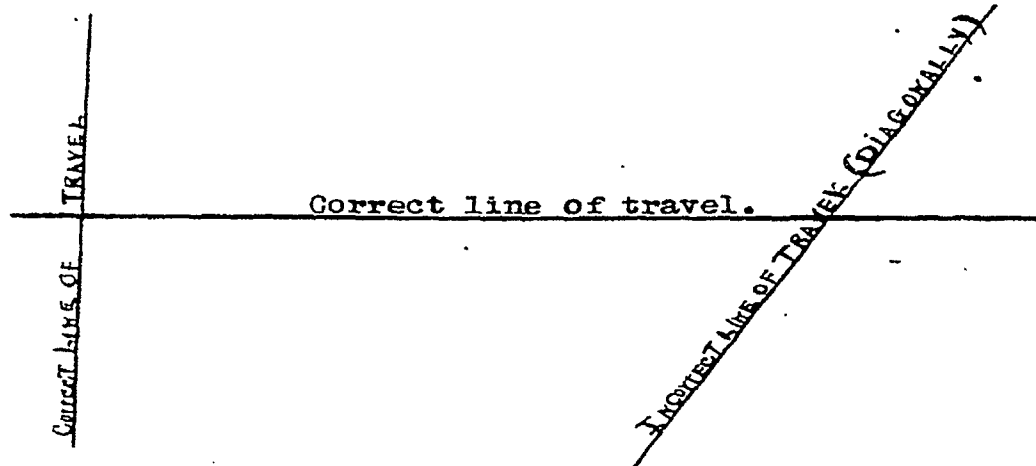
(b) If chainmen have not slung load safely with chain, crane operator will flash red light.

(c) If chainmen refuse to obey orders in this matter from crane operator he will immediately pass the word for the safety inspector to strike triangle, which will call the attention of some member of safety committee, who will act immediately in relieving the situation.

(d) All chainmen when hired will be instructed that they must, under the before-mentioned circumstances, obey the request of crane

operators. If they refuse, it is at their own peril of being dismissed from the company's service.

18. Crane operator in hoisting loads, will first lift his load to sufficient height; second, direct load to lanes of travel with least danger to workmen below. No carrying of loads diagonally allowed, this is imperative.



19. Riding in crane chains or on the sheave hook or any part of crane is strictly forbidden, excepting operator or repair men when necessary to work thereon. Repair work should be done, if possible, only when crane is out of service.

20. Loads of material too short for slings will only be loaded and carried in buckets and boxes provided for that purpose. These vessels must not be loaded higher than the sides of same. *A flush load is a full load*, and same must be stencilled on boxes and buckets.

21. Crane operator must not at any time run his crane across the shop to tip a load. If a movement of that kind is necessary, chainmen must be present and take precautions to prevent anyone from being injured.

22. Operators must not throw water, refuse or any other matter out of their cage. Regular cleaning must be done at landing platforms or when crane is at rest in unoccupied part of shop.

23. Crane operators on outside cranes must take precautions against the possibility of their cranes being blown off structure when they leave at night by leaving their brakes set and anchored by sling chain to two columns.

24. To prevent accidents to repair men working on cranes operator will act as follows: *First*, he will take fuse out of switch,

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retaining same until crane is again ready for service. *Second* will place a sign on switch which will read: "Danger, Repair on Crane!" *Third*, he will accompany and assist repairmen repairs are completed.

25. Crane operators will, if called upon by safety department attend meetings and rehearse these rules with the object of familiarizing cranemen with them until they are proficient in the ideas bodied in this book on behalf of Safety First.

26. Crane operator must realize that in accepting his situation that he is under a moral obligation both to himself and his fellow workmen to be careful and follow the foregoing rules in the interest of Safety First. His adherence to such will be appreciated by the authority over him.

SAFE PRACTICES.

No one should be permitted to ride on load or crane hooks on top of trolley. Refuse to move.

Chains, slings and loads should be carried high enough to avoid striking men on floor or catching in machinery, etc. Hookers should hook up hooks.

Loads should not be hoisted, lowered or dropped from magazine until operator is positive everyone below is out from under the load.

Signals should be received from one man only, and no signal should be made without a signal from the proper man.

Before starting to hoist, trolley should be placed directly under the load to avoid swinging it against workmen. Never jerk or swing loads; hoist gently, handle carefully and lower slowly.

Operator should see that hookers walk ahead of loads carried by cranes and warn men on floor to get in the clear.

When hoisting especial attention should be paid to the block to avoid tripping limit switch or running block to drum. In case block gets near limit switch don't shut off power, as current is necessary to operation of limit switch.

When pulling chains out from under loads see that no one is in position to be struck by chain.

When loading material in car great care must be exercised to avoid injuring hooks. Load should never be swung against car to straighten same.

Especial caution should be exercised when handling molten metal. Ladles of molten metal should never be carried over

When handling heavy loads, particularly hot metal, test the hoist brake by throwing the controller in "off" position after load has been lifted a few inches. If brake does not hold, do not move until it has been adjusted.

Crane hookers should exercise great care to avoid accidents. Hooker should never take hold of crane above sheave block, as his fingers might get crushed between cable and sheave.

Hooker should ever be watchful of loads carried by cranes or suspended in the air and keep out from under at all times. He should walk ahead of loads being carried by cranes and warn men on floor to get out of the way.

When loads are being hoisted or carried no one should stand between the load and other objects, as load may swing and strike him.

Hookers should learn how to make safe hitches and should be provided with a table showing stresses on slings at various angles.

When working in cars care must be exercised so as not to get caught between load and side of car.

Great care should be exercised when getting in or out of cars over which magnets are being carried, as they may strike you.

Hookers should never attempt to operate cranes or go on crane for any purpose. Neither should they meddle with electric wires attached to magnets.

Cables, chains, slings and hooks should be carefully inspected. Never work with defective appliances.

In case hooker thinks load is too heavy for crane he should notify foreman.

Hooker should never lie down in cars while waiting for crane, as a load may be brought in and lowered on him.

When hooking handles on chain, hooks should always be used, as they are provided to enable you to keep your fingers out of danger. Chains or cables should not be held in hands while crane is taking up strain. A hook, preferably a long-handled one, should be used to guide chain.

Hooker should never stand near piles of bars or other material when same is being hoisted from ground, as the pile may tip over on him.

A block or pad should be placed between sharp edges of loads and cables so cable will not be cut.

Hookers should exercise great care when placing blocks under

loads and never get under the load. Use a block to shove blocks under load or toss them under.

Stand at a safe distance, in a safe position, when chains are being pulled out from under load so same will not fly and strike you.

Chains or cables should be hooked up when about to be carried loose by crane, so they will not catch anything.

Guide hooks when being hoisted, after being unhooked, so they will not catch on load and tip it over on you.

Repair men working on overhead cranes have peculiar danger to contend with and must exercise great care at all times. They should make provision so that other cranes on runways will not run into crane being repaired. This can be best accomplished by repairing crane at point which is most accessible and will interfere least with other cranes and operations below. In order to fully protect crane blocks should be placed on crane rail.

Before starting repairs it should be ascertained that all controllers are thrown off, that main switch and safety are opened, fuses removed and locks or signs placed on switches.

"Danger—Workmen Above!" signs should be placed under crane, and, where the job is a big one, space should be railed off.

A repairman should never, under any circumstances, go on crane without notifying operator.

Where a number of men are working on a crane each member of the gang should place his padlock on the safety switch.

When men are compelled to work on or near crane tracks crane must be blocked and operations cease at that point while such work is in progress.

Care should be exercised so that no loose parts fall to the ground.

Before removing any part which may release hoist block, block should be lowered to floor, or, when this is not possible, gears should be blocked and wedged so they cannot move.

When hoisting materials on crane have man above give signal and never permit anyone to stand in a position to be injured should something give way.

Upon completion of repairs remove all blocks, loose parts, tools, etc., and replace all safeguards before crane is put in operation.

DISCUSSION.

CHAIRMAN ORTH: Shall we have a discussion on each paper as it is read, or defer discussion until all the papers have been presented? What is your pleasure?

MR. C. P. BENDER (Ralston Car Company, Columbus, Ohio): I would suggest that we have a discussion on each paper as it is presented, because the subject is liable to be confused, if we let it go to the end. Our minds may become rather hazy.

CHAIRMAN ORTH: I will ask Mr. Guilbert to give us his views in regard to traveling cranes in the handling of materials.

MR. HARRY GUILBERT (Haskell & Barker, Inc., Michigan City, Ind.): I do not think that I can add very much to what has been said. We have the same proposition you have, the same troubles to deal with, and we have all kinds of accidents, from the breaking of cables down to a fellow dropping something on his foot. The paper read yesterday by the American Sheet Plate man, describing an apparatus for lifting plates, which he said would prevent many accidents, sounded pretty good to me. Whether it will be practicable in carrying steel plates up and down the shop I do not know. We have no specific means for doing that, and you know how dangerous it is.

AUTOMATIC STOPS ON CRANES.

MR. W. D. WEBB (Standard Steel Car Company, Chicago): In using the automatic cut-off on cranes the load goes up to certain point and stops if it is blocked effectively. On all our cranes the block cannot go near the winding drum—it will stop within four feet of the crane. We have an automatic stop on the crane and since we have installed it we have not had any trouble.

CHAIRMAN ORTH: What is the name of that device?

MR. WEBB: It is one that we got up ourselves. I suppose it must be on the market.

CHAIRMAN ORTH: For the benefit of the gentlemen present will you please describe it?

MR. WEBB: Not very well, without the aid of a blue print. I will be very glad to send a blue print to any person that wishes it.

MR. GUILBERT: I suppose you are referring to a limit switch. You want to bear in mind that the craneman can fix the limit so it will not interfere with operations. Very often the men do that to suit their own convenience.

MR. COSTELLO: I do not see why the craneman would want to disturb the limit switch for his own benefit. I do not see what benefit it would be to put it out of commission.

MR. GUILBERT: A craneman is like everyone else, he wants to try to make things easy for himself. If he runs his block with the

limit switch on he has to adjust it again. When he "fixes" it does not have to. If he runs his block he does not have to adjust if he has "fixed" it, if he does run the block he can go right ahead. That is the idea the men have in putting it "on the blink." When it is out of commission, if the block is run into, he does not have to stop and fix it.

MR. WEBB: We have conditions, perhaps, that do not exist in other great plants. We have two lines of cranes. The first is about twenty feet from the ground. The larger cranes are for handling material, for instance, in the shearing department. When they need something down in the construction department it is an overhead that takes the material. The low cranes are all confined to their respective departments. With those facilities our crane service does not experience any trouble.

USE OF GONGS.

MR. COSTELLO: I ran a crane for more than three years and during all that time I did not have a limit stop on it. I can see where it stands off the craneman, because when it is on he will never run his block up. Just as soon as it runs up it shuts off the power.

We have experienced considerable trouble with gongs, especially in the steel mills. I do not know whether this would be true in other mills or not. We have to handle a lot of small material that is quite heavy, and we have to keep making trips back and forth all the time. The gong up in the cage does not show one where the load is. When we had an electric bell attached to the block, operated from the crane and the cable wires ran up along the cable—have it operated in that way—I think that would show the men where the load is. When the craneman rings his bell and the man looks up to see where the load is, if he cannot see he does not know where the load is. When he does see it and tries to get out of the way it may be too late. He makes a run to get away, sometimes he stubs his toe and stumbles and gets hurt.

MR. WEBB: I suppose it is the same in our shop as in all other shops. Each crane has two hookers-off.

CHAIRMAN ORTH: These men are sometimes called chainmen.

MR. WEBB: Chainmen or hookers-off. The operator is immediately under the direction of those two men. He watches those two men. They signal when to lift a load and they always know where the load is. I do not know whether electric apparatus would be a good thing or not, because, as you know, it is adding more danger.

which are liable to get out of order. They have to be protected and guarded.

MR. GILBERT: That system is in use in the Ford shop, but conditions are somewhat different there. It is all right where things are in a nice condition, but I do not know whether or not it is practicable in a car shop, where you are making side lifts below the superstructure. That is, to have an alarm on the block right over the men's head. Of course, it gives a much better warning when you have it that way.

PULLING CARS WITH CRANES.

MR. N. B. BASTIAN (Eastern Car Company, New Glasgow, Nova Scotia, Canada): In the matter of using cranes for moving loads back and forth, such as pulling cars: If any of you gentlemen could devise some way to do away with that practice, which I think is one of the most dangerous in car work, you would accomplish something very valuable. We do the same thing in our shop. We have taken one of the cars of our paint shop from one end of the shop to the other, running out one car and pulling in another.

That is the only method we have been able to use, but we have been trying to plan some means which would be more advantageous. I have been wondering whether any of you gentlemen have any way of moving cars other than by making a side pull with an electric crane. It is a very dangerous practice and should be dispensed with if a practical way can be found to do the work.

MR. BANKS (Safety Inspector, American Car and Foundry Company, Madison, Ill.): We had the same trouble, but we overcame it by putting a number of winches on the cable's sheave. We entirely eliminated side pulls with the cranes.

MR. WEBB: I think those conditions are all due to the construction of the sheave. Our cranes go outside and no material is to be brought in sidewise. The crane lifts it from the car. If it cannot be taken into the shop at once and it is necessary to put material on the ground that is done.

MR. BASTIAN: Our shop is a little over 400 feet long and we move from one department to another. The length of the shop would be ample, I believe, for winches. The steel yard is located a little distance from the end of the building and the tendency is to pull the cars out to the steel yard, up to another shop and then pull them in on the inside tracks. On account of the number of tracks it would be impossible to use winches for that work.

I would like to ascertain if anyone has tried out an electric engine for that purpose, and if they think it would be practicable for the moving of freight cars. We have them for using in light work. They are of small railroad equipment and are used around our manufacturing plants, such as our steel works, but they are not large enough and are not adequate for moving freight cars. They are all right for the purpose for which they were intended but they are not suited for moving freight cars.

MR. W. J. JARRARD (Safety Inspector, American Car and Foundry Company, Berwick, Pa.): We have designed a large motor storage battery that will pull a passenger car and four or five freight cars over the yard.

MR. C. E. WILDONER (Safety Inspector, American Car and Foundry Company, Huntington, W. Va.): We have a forty-horse power motor in our oil yard. It is on No. 2 track, and we have sheaves placed on the floor. It is so constructed that we can move four lengths of cars out by this motor.

MR. WEBB: We are just getting ready to install a gas motor of 100 horsepower for the purpose of doing away with the necessity of bringing lumber into our yard car department. We expect to get very good results. It is impossible in a lumber yard to put up overhead wires or rails carrying electricity, so we adopted the gas motor. I think it will be a little better than a storage battery.

USE OF LATCH HOOK.

MR. BENDER: I would like to ask if anyone uses a latch hook more particularly on progressive hoist systems than on cranes. It has been our experience, and I imagine it has been the experience of every other car builder here, that a great deal of material is drawn from the side of your progressive system and placed on cars by means of a simple progressive hoist system. It has been our custom to use a solid hanger bolted to that material.

Not very long ago we had an accident in which a man was killed while in the act of placing a load in an automobile car through the cable becoming slack and the hook becoming disengaged. We insist that our men latch the hook, but this man was in a hurry and did not do so. We have tried out several latch hooks, but the men do not like to use them, and we have some trouble in enforcing the rule. If anyone has anything, or knows of anything, that would work automatically I would like very much to hear about it.

MR. GUILBERT: We have nothing that works automatically; we use the pigtail hook. The car business, I think, is like every other business; you talk about Safety First, but in the final analysis it is production. There are a lot of safety hooks, but I never saw one that was practical unless you pay very big money for it. If you use any method that interferes with business it means delay, which, of course, is very undesirable. The pigtail hooks are the same as used in steel mills.

MR. JARRARD: We have a chain inspector who goes around and looks after things. We have no chains except the ones with the pedal, and they must be bolted.

MR. GUILBERT: We do not use those kind of chains. We are under the impression that the pigtail hooks are very good. The piece is bolted on and it is impossible for it to jump out.

CHAIRMAN ORTH: I should like to hear from someone who has electric auto trucks for handling material in the operation of their plants.

MR. GUILBERT: We have adopted something along that line. It has worked out very satisfactorily and is very convenient. We bought eight chassis and built bodies for them. They have eliminated more than twenty horses. They are running in and out all over the shop and are particularly fast. They pull eight or ten trucks at one time. We saw the Ford device, but as they did not care to give it away, we put bodies on the Ford chassis, and found them very satisfactory.

CHAIRMAN ORTH: In what condition are the floors over which they operate?

FLOORS AND AISLES.

MR. GUILBERT: They are the same as the floors of any other car shop. We had three or four Buda electric trucks, but we put them out of commission in a short time, as it is quite expensive to be charging batteries all the time.

CHAIRMAN ORTH: How are your aisle conditions?

MR. GUILBERT: Heavy timber, built like a walk; just as smooth as this floor, but it is a continual fight to keep the aisles clear.

MR. WEBB: In most big plants the aisles are so full it is a very difficult matter to operate trucks. We have two aisles well boarded with oak. They cover the conduits of all our pipes, wires, etc., but we could not operate a truck on our floor. I believe they would be more economical than the cranes, but we have two lines of cranes and get along pretty well.

MR. GUILBERT: Your plant is different from ours. We take steel from the blacksmith shop to the steel shop.

MR. WEBB: We have a narrow gauge track.

MR. GUILBERT: You save money when you eliminate the handling feature.

CHAIRMAN ORTH: Are there any other gentlemen present who have electric trucks in operation in their plants?

MR. BASTIAN: We are figuring on adopting something of that sort. Our plant, like other car plants, has been very much strewn with material. The floors are in bad condition, but we are reflooring most of it, and we expect in a very short time to use a truck something like the Pierce-Arrow people use at their plant.

We have two reasons for this: We expect to release our overhead cranes and make the handling of the small material safer. There is a tendency for cranemen and others to pull small material from machines on skids and a couple of pieces of timber and to go anywhere through the shop with the cranes.

We have not had any very serious accidents, but we have just escaped several that might have been. We are going to use an electric truck and build skids with rungs that will fit in the ends. You can carry them in slings or pick them by automobile transportation trucks and take them anywhere your floor will permit.

The electric truck needs a mighty smooth floor and it is almost impossible to get that condition in a car plant, because there are so many departments where small material is used. It is now handled overhead, but I think it can be moved with trucks. Skids can also be used in the departments. Where you use trucks you make carrying of the material safer, because you have your material in a carrying box and there is no danger of it falling on anyone in the shop. The trucks open from behind.

I think it is good policy, and it has been found to be a good paying investment to build either concrete or wooden truckways or runways in stock yards and to use this class of transportation and do away with the old methods of wheelbarrows or overhead cranes.

MR. GUILBERT: Your Berwick shop, Mr. Chairman, has the best carrying box I ever saw.

CHAIRMAN ORTH: We now have carrying boxes in use in all our large plants.

I should like to have someone take up a discussion of chains and cables. Mr. Banks, we will be glad to hear a few words from you.

SEE THAT RIGHT SLINGS ARE USED.

MR. BANKS: I am afraid I cannot add very much to what has already been said. I want to indorse the suggestion that great care should be exercised by the inspector and the foremen to see that the chainmen and the hookers-on see that the right slings are used for the loads. We had a very serious accident through the hook coming out. Our men used a three-eighths-inch hook, it straightened out and the whole load dropped. We thought we had gotten away from that by using clips and bolts and for three months we did not have a load drop from that cause. Then, being crowded with work, we put a night gang on. They did not fix the hook properly and it straightened out, causing the load to drop. It broke a man's back.

It is the duty of the safety inspector to see to it that safe hooks and chains are used. Accidents cost more in the way of compensation than the profits of the industry will stand.

MR. GUILBERT: I think one of the most important things in a car shop is to keep the chains that carry thousands of tons over the heads of workmen in a safe condition. We have a man who spends all of his time taking care of the steel shop chains. Each chain has a big metal attached to it and on the tag is marked "Crane 1-A, 1-B, 1-C," and so on. They are not inspected in the shop. I have known a man to go through a shop, let the chain down, look at it, and up it goes again. That is no inspection at all. The man is not in a position to tell whether or not it is a safe chain from a mere casual looking at it.

This is the way we do it: The inspector takes the chain over to the blacksmith shop and lays it out full length on a big, heavy bench and a man who is qualified to examine them takes them in charge and puts them in proper condition. Since we have inaugurated this system we have not had any trouble. We started this system after a couple of men were killed.

CHAIRMAN ORTH: How many cranes have you in your plant?

MR. GUILBERT: I should imagine about twenty in A, B, C.

CHAIRMAN ORTH: How many chains to each crane?

MR. GUILBERT: Two sets; because, if you only get one set, you will never get out of there with your life.

CHAIRMAN ORTH: That is the very feature that I wished to be brought out. How many sets have you?

TAGGING CHAINS.

MR. GUILBERT: I am very strongly in favor of having chains in one set. We have a clear space in the blacksmith shop for the chains. They are all tagged with a steel tag. The same thing done with the steel yard chains and every chain in the shop.

CHAIRMAN ORTH: Since you have inaugurated this system have you had any trouble?

MR. GUILBERT: We never had any particular trouble. The chain that broke in service was due to the fact that they tried to carry fifty tons with a chain that would only hold three tons. They were endeavoring to carry a very heavy load with a light chain.

MR. BANKS: That brings us back to the suggestion of the Chairman: That it is better to have a standard chain on trucks for use generally than to have various sizes, because a chainman would rather handle a lighter chain than a heavy one. If he has just taken up a light load and a somewhat heavier load comes along he is not going to change his chain—he is going to take the chance of carrying the heavier load with the light chain, and, owing to the fact, many accidents have happened, because the light chain is incapable of handling the load which has been put onto it.

CHAIRMAN ORTH: I am going to call upon Mr. Jarrard to say a few words to us in connection with this subject.

MR. JARRARD: Every chain coming to our plant is inspected by the manufacturer. We keep a record of that chain, its service, etc., and we hold the manufacturer of that chain responsible. However, we have to see that it is not overloaded. We have a mechanical engineer to figure loads, and we also have a crane director. Each chain is inspected daily and a record is kept; then they are annealed. We do not buy from every manufacturer, but from two or three manufacturers, and repairs are made from the same material as the chain itself. Mr. Guilbert's idea is all right, but it is not quite clear; if one side of the sling is longer than the other you strain on the shorter one.

MR. GUILBERT: We stretch them out full length on the bench and we see that the chains are perfectly even.

MR. JARRARD: Our chains are all standard—seven-eighths and one-sixteenth over all. That depends very much on the head of the shop, of course.

MR. GUILBERT: I would not give very much for a management certificate—they look like wedding certificates. When they make

test of a chain they often break. We take no notice of these things any more. With the class of men we are able to get just now it would take three years at college to teach them to read and write, so with the class of hookers-on we now have it is very difficult to tell where you are. You cannot rely on the class of men you are getting now.

MR. BENDER: Do your cranemen fix the material they hook on?

MR. GUILBERT: If the hookers-on do not feel like doing anything they sit down and smoke a cigarette. The poor safety man has got to run after them and straighten up the load.

TRouble WITH BAD LIFTS.

MR. BENDER: We had a great deal of trouble with bad lifts, it had been left to the hookers-on to arrange the loads. Our way of getting away from that was by giving the machine operator, on his operation card, the number of pieces of that particular item which would make a crane list in the particular aisle in which he was working. This has done two things: It has gotten away from crane piling and it has given us a great deal more shoproom than when things were done promiscuously. It simply leaves it to the hooker-on to pick it up and take it where it is going, but he does not have anything to do with the piling.

CHAIRMAN ORTH: If there is no further discussion on this subject, I think we had better proceed. We will now have the pleasure of hearing from Mr. C. P. Bender on the subject of Forging and Forming.

FORGING AND FORMING.

C. P. BENDER, WELFARE DIRECTOR RALSTON STEEL CAR COMPANY,
COLUMBUS, OHIO.

Mr. Chairman and Members of the National Safety Council: The constantly increasing demand for steel in the construction of railway cars and equipment has been the cause of developing in every car plant a very important fabricating industry for the manufacture of the steel parts which go to make up the structure of the modern car.

The demands for special shapes created by the ideas of different designers has long since made it impossible for the car builder to depend to any great extent on the use of flat plate and rolled sections in their original shapes, and meeting these demands is daily increas-

ing the importance of the hydraulic press, the bulldozer and the forging machine.

The original hand flange room of yester-year has developed into the press department of today and the old-time blacksmith shop where hammer and anvil were all important has given way to the modern forge shop.

To attempt a recital of a great many of the problems encountered in form and forge work would be both lengthy and tiresome. We shall therefore confine our remarks to citing a very few of the conditions which have been met and conquered along these lines. The Ralston organization, together with their attendant accidents, hazards and methods in force for minimizing the dangers to workmen.

HYDRAULIC PRESSES.

For shaping the heavier car parts such as center sills, bolster doors, etc., the hydraulic press is depended upon entirely, the pressure usually ranging in capacity from 250 tons to 1,000 tons pressure, a place where a great number of pieces of the same shape are required. Elaborate dies and tools have been worked out in order that a maximum amount of the fabricating work might be done with a single operation of the press.

Two of the most interesting of the developments along these lines have come in the manufacture of car doors and heavy pressed bolster doors.

The company manufactures a great number of 100 per cent clearing flat-bottom gondolas, which require in their construction a total of sixteen drop doors per car. Under the original method of making these doors they were first sheared to blank shape, then notched, then punched, flanged and trimmed. These various operations necessitated the tying up of a separate machine for each part of the work and an individual handling between each operation. By a skillful grouping of two dies under a 1,000-ton hydraulic press, one equipped for punching and shearing and the other for flanging, the entire door was completed each time the press platen descended, thus reducing the five original operations to one, to say nothing of the reduction in the number of times the material was transported through the shop, and the corresponding decline of the accident hazard due to this cause.

In the forming of the heavy truck bolsters a problem requiring considerable thought presented itself with an order from one of

steel truck bolsters made of three-quarter-inch metal. As metal of this thickness does not draw evenly when pressed hot it was impractical to blank the plates to shape before pressing and because the top of the bolster was truss shaped after being formed; it was likewise a difficult proposition to trim the flanges at that time. The question then arose: "Why not do it right on the press?" with the result that a shear blade was attached at the outside of the female die on both sides and corresponding blades were designed which were gagged in to work in conjunction with the female die, and after the forming was finished the gags were thrown in and with the second movement of the top platen a complete bolster was removed from the press.

Practically all of the present day car manufacturers are doing work along similar lines and the hydraulic press is coming into greater importance every day as a fabricating agent.

ACCIDENTS ARE FEW BUT SERIOUS.

As to accident hazards connected with press forming work, permit me the statement that they are relatively few and relatively serious, when compared with those of other lines of endeavor. Probably because of the comparatively slow movement of the press platen the occasions are not many where workmen are caught but they are also very few and far between that when men are caught between the platens or dies, fatal accidents or permanent disabilities do not result.

Under ordinary working conditions, when power is plentiful and pressure lines are capable of sustaining the strain put upon them, there is little danger of platens suddenly descending and catching men unawares, but times do come when these important factors fail and tons of solid metal are cut loose on a swift downward path, crushing every one who may be beneath.

With a view to guarding against accidents of this kind two methods have been resorted to. One of these is to always have on hand a number of cast steel blocks about nine inches in diameter and one foot high with the ends planed parallel. The blocks can be placed on top of one another to any desired height at opposite corners of the press, thus effectively blocking the platens apart and preventing the drop of the top platen. This method is only good, however, while repairs are being made or dies changed, as under regular working conditions the work would be hampered by the presence of the blocks. The other plan, more recently adopted, and which is better

under all conditions is to place a check valve in the pressure line which feeds the columns. This valve is open to a flow of water toward the press, but closes against any back pressure which might result from lack of power at the accumulators, or accident to the pressure lines between the power house and the press. It insures the permanence of the water column under the column pistons and can only be released by means of a lever in the hands of the press operator.

In the line of work which it is called upon to do probably no piece of machinery lends itself more to a variety of forming and forging jobs than the bulldozer. Whether it be the forming of a side stake or the forging of a sill step it's all in the day's work to set the dies on the bulldozer, feed on the material, and the machine does the job.

ARCH BAR TYPE OF TRUCK.

Recently, one of the railways, whose principal lading is composed of ore and kindred heavy substances, adopted an arch bar type of truck, the bottom arch bar member of which was pressed to a radius at the base, as arch bars with a flat base had been in the habit of failing under heavy loads. This design meant that the column bolt must pass diagonally through the slope of the bar. To attempt to drill or punch these bars either before or after forming would have been an endless round of difficulties and broken tools. Accordingly a bulldozer was designed which included two removable punches of the proper size for column bolts. The first forward pass of the head formed the bar, on the back stroke the operator threw the punches into position and when the head came forward the second time the holes were punched through. The stripping was done by coil springs back of the stationary die which recoiled and moved the punches out of position as soon as the operating head receded.

Bulldozers, unlike hydraulic presses, present a wider range of accident hazards because of the large number of gears, pinions and shafting which is required in order to obtain the necessary power and their proper guarding is a factor which should receive very careful consideration by all manufacturers making use of this type of machine. Our original conception of proper guarding was to furnish an individual safety appliance for each separate gear train, but later developments have demonstrated the superiority of a single unit guard, built of angle and mesh wire, and bolted together in sections, each section of which is easily removed for repair purposes. All

moving parts are readily visible with this type of guard and the time taken for its removal and reapplication is almost negligible.

BLOCK THE CLUTCH PEDAL.

Another grave danger in this line of work is that of being caught by stepping between the overhang of the base plate as it comes forward and the stationary head of the machine. While to our knowledge we have not had an accident of this nature it was thought advisable to guard against such a possibility and the base plates were accordingly notched out at both ends flush with the outside edge of the housing and back far enough from the front edge to permit the passing of a man's leg without pinching. This gives the operator safer working space and removes from his mind an added danger point to look out for.

It is not our intention at this time to discuss at length the work done by the forging machine or the drop hammer, as their purpose and products are only limited by the capacity of the machine and the nature of the work which can be turned out depends entirely on the limits of size and power. There is one feature in connection with forging machine operation which has been the cause of a number of serious accidents to hands. Unless some device is provided whereby the clutch pedal can be easily and securely blocked, operators are liable to attempt die adjustments without blocking the pedal and if the clutch is accidentally thrown in that portion of the hand which happens to be between the dies is almost invariably lost. It is not a difficult matter to supply proper blocking for the pedal and this should always be done. It might be well also to call attention to the necessity for making guards around the forging machine flywheels in such manner that they will permit ready access to the wheel, as the only way to back the machine off in case the dies stick is to turn the wheel over by hand and it is sometimes of great importance that this be done very quickly.

MEN MUST BE INTERESTED IN SAFETY WORK.

In addition to the accident hazards mentioned specifically in connection with fabrication of steel car parts, there are many others which present themselves with each individual job and the only safeguard that can be thrown around the workman in an attempt to sidestep injury is to make an honest effort to impress him with his personal importance to himself, his family and his employer. There are many occasions of which neither the safety inspector nor the

foreman is aware but which a real up-to-the-minute operator will diagnose immediately as dangerous and an effort should always be made to encourage the man on the job to interest himself in the work both from a safety and efficiency standpoint.

There is not the shadow of a question but that decreasing the number of operations and combining them has greatly decreased the number of accidents. Safety and efficiency are co-relative and when the men on the machines are given an incentive to improve their methods and to make suggestions for the handling of the work, still further progress is made toward greater production, decrease in fatigue due to long and tedious methods and a greater falling off in the number of personal injuries.

DISCUSSION.

CHAIRMAN ORTH: Let us hear from Mr. Guilbert.

MR. GUILBERT: You spoke about guards for the bulldozer—do you use wire mesh?

MR. BENDER: Yes.

MR. GUILBERT: I think that is poor stuff for a guard.

MR. BENDER: It is twelve gauge, not wire mesh.

MR. GUILBERT: The trouble with that material is that when one strand of it breaks it sticks up like a needle. We are using heavy steel crete. It stands up much longer than wire mesh and is much more satisfactory.

MR. BENDER: Wire mesh requires constant repairing.

CHAIRMAN ORTH: Mr. Bastian, have you anything to offer us along this line?

MR. BASTIAN: I think we ought to hear from some of the more experienced first. Mr. Jarrard could probably tell us something worth listening to.

MR. JARRARD: Mr. Bender has well covered the situation from a mechanical point of view and from a safety standpoint, nothing much can be added. Forging machine accidents are largely due to the human element.

REMOVING DIES FROM PRESSES.

MR. GUILBERT: How do you get dies out of the big presses what method do you use?

MR. BENDER: That depends on conditions. I imagine we use

MR. GUILBERT: Don't you find that the big bars are cut?

MR. BENDER: Where the dies are heavy we use steel rollers.

MR. GUILBERT: Even when you use the rollers, the chain makes big cuts in the platen, doesn't it?

MR. JARRARD: Yes.

MR. GUILBERT: To eliminate that we put in a big sheave. We find it works very well and saves the platen.

CHAIRMAN ORTH: Mr. Banks, could you add anything to what has been said?

MR. BANKS: Mr. Bender has covered the situation very well.

MR. GUILBERT: I would like to emphasize the vital necessity of a check valve. If anything goes wrong with the pressure you are flattened out like a piece of paper.

CHAIRMAN ORTH: Do you have a safety device on your big presses?

MR. GUILBERT: We have a check valve.

CHAIRMAN ORTH: In our St. Louis steel plant we also use a check valve.

MR. GUILBERT: They did not have one when I was there two years ago; at that time they had an axle on a swinging arm. The workman has to operate the device himself and sometimes he does not do it. The check valve is an important thing and should be used.

MR. BENDER: I firmly believe that we have only scratched the surface as to what can be done with hydraulic presses. The time is coming when we are going to eliminate many of our present operations and do our work on hydraulic presses with a corresponding reduction in our accident hazards. The tendency is to simplify operation in the handling of material. I think there are greater possibilities in hydraulic press die making than in any other piece of machinery.

MR. WEBB: Did you punch the arch bars of your side frames on the bulldozer?

MR. BENDER: Yes.

MR. WEBB: I think we drilled the holes; that is done in most shops, I think.

MR. BENDER: It would have been impossible to punch that bar if taken off the bulldozer; and it would have been impossible to have drilled a hole through it.

MR. WEBB: Take a diamond-frame truck, would you advocate completing the bar on the bulldozer?

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MR. BENDER: Ordinarily not.

CHAIRMAN ORTH: Our next paper is on "Shearing and Machining of Metal Parts," by Mr. W. D. Webb.

SHEARING AND MACHINING OF METAL PARTS.

W. D. WEBB, SAFETY ENGINEER STANDARD STEEL CAR COMPANY
CHICAGO.

MR. CHAIRMAN: In the shearing and machining of car equipment the work is more or less of a special nature. To the manufacturer many devices are used to which the word Safe is not prefixed. Among these are the double-nut, the cotter, the strap and the hanger. To the employer careful consideration of the problems presented in every-day operation means making the shop as foolproof as possible and this is accomplished only by safeguarding all operations, whether it be on the floor or overhead. Following in line to the O. K. track, have been assigned to other speakers, so I will confine myself to the shearing department and more especially by referring to the safety devices installed in that department at the Hammond works of the Standard Steel Car Company.

START WITH A SAFE FLOOR.

Starting at the foundation the company realized the first requisite was a good floor. This was taken care of with an eight-inch layer of concrete, assuring with reasonable precautions the uniform piling of material. The chainman, or hooker-on, whose duty it is to place the chains around material to be moved, works more rapidly and with greater confidence when he knows piles and floors are safe. In handling large sections, such as center sills, side sills and cover plates, we use two cranes for safety, wrapping the chains with three feet or four feet of each end, clamping the material with the chains.

For small parts, such as gussets, fillers, etc., cradles and buckets are provided, with the idea of preventing material falling while being moved with cranes. This system has the additional advantage of avoiding rehandling at machine and point of delivery. The buckets are five feet long, 4 feet wide and 2 feet deep. Some have hooks placed at the four corners and others have lugs at both ends. The latter are used more especially for handling small parts.

more readily dumping of the material either on cars or bins provided for the same. The cradles are assembled out of diamond arch bars. Three arch bars are used and they are lined with steel plates. The cranes are equipped with twenty-four-inch steel gongs. These are used to attract the attention of those below when placing or moving material from shearing machines.

SHEARING OPERATIONS.

We all realize that guarding the shearing operations is a very difficult proposition. For instance, I do not believe it is practical to place finger guards in front of power machine blades of 100 inches or thereabouts, as the shearing marks on the material must be clearly visible to assure accurate work. In shearing material on rapid running machines that can be gauged, finger guards should be used. In shearing medium and small pieces, clamps are used, varying with the thickness of the steel. For large plates requiring variation in shearing a clamp is not necessary. The weight of material holds it down to the table.

The gears on the double end coping shears are covered with sheet steel guards and have sliding doors, giving access for oiling, inspection and repairs. These guards were installed before the wire netting was adopted as the standard in our shop. We found the latter the most successful guard, permitting the millwright and operator to inspect the machine without removing the guard. In shearing small pieces on these machines a shearmen is liable to get his fingers under the knife. For this class of work a finger guard is provided, allowing a maximum clearance of one-eighth inch. This is an ordinary guard made of angle iron, with one short and one long leg, bolted securely to the knife block of the machine.

FINGERS CAUGHT BETWEEN STICK AND LUG.

Accidents usually occur when least expected. In shearing a plate one of the shearmen at this plant held a short stick in his hand with which he was holding down the plate. His hand, on top of the stick, inclined toward the housing. As the ram or sliding head descended his fingers were caught between the stick and a projecting lug. This resulted in a serious accident, which later necessitated an amputation. An accident of this nature cannot happen again as it was immediately taken care of in a very inexpensive way. Starting at the projecting lug, there have been provided oak blocks, twelve inches long by eight inches wide, with a taper from two and one-

half inches to one and one-half inches attached with counterscrews filling in the space on the face plate from the lug to the knife blade.

From the safety standpoint, we found it an unsafe practice to have the trip extend clear across the front of shear. At the Hammond plant of our company the trip is at one end, entirely under control of the shearman. This method was forcibly impressed upon us by an experience at a neighboring plant, where the shearman made his cut and reached under the knife to remove the piece after being sheared. His foot slipped, striking the trip which started the machine, resulting in the severance of his hand.

The treadle shaft on most shears is placed behind the lower knife block, running from housing to housing. The accumulation of scrap, bearing a pressure on this shaft, is liable to prevent the clutch stop to engage, causing the shear to repeat or run continuously until such pressure is removed. Many accidents have been caused by machines repeating. To avoid this class of accidents in our shop, particularly on shearing machines, arising from the accumulation of material, we covered the shaft with a plate of sheet steel.

In certain operations, such as running sills through the knife and getting too close to the shearing machines, a workman is likely to be caught. This is remedied by placing a guard extending beyond the side of the machine, necessitating walking around instead of taking a short cut. These guards are made of wood, four feet high by six feet long in the shape of a trestle and when not in use are removed for safekeeping.

As in the shearing department, as in every department of the shop, we have developed proper safety appliances for the various machines and equipment. These guards have been decided upon by the safety committee, consisting of the heads of each department of the plant. All guards recommended by this committee have been approved and installed by the company.

DISCUSSION.

MR. WILDONER: If I understood Mr. Webb correctly he has eliminated the treadle shaft running from housing to housing behind the lower knife block. He uses only one treadle, located on the machine operator's side.

MR. WEBB: Only on one side.

MR. WILDONER: You only use it on the machine operator's

MR. WEBB: The machine operator runs the machine.

MR. WILDONER: Did you ever try the treadle referred to by the National Safety Council?

MR. WEBB: No.

MR. WILDONER: Do you know anything about its use?

MR. WEBB: I noticed a circular describing it, but I do not know very much about it.

MR. WILDONER: Does it interfere with the production of the machine, having a single door on the machine operator's side?

MR. WEBB: Not that I have noticed.

CEMENT FLOORS.

MR. JARRARD: Cement floors have been referred to. We have wood blocks in a portion of the plant, but we are contemplating putting in floors. I would like to ask if it is not a fact that oil on the cement will cause a machine operator to slip?

MR. WEBB: The concrete absorbs the oil and naturally gets a little rough, but there is not much chance of an operator slipping. The main reason we have adopted cement is because the soil is of a sandy formation. You can go down twenty-five feet and strike a very small layer of harder matter. The moisture comes to the surface and it eats lumber very quickly. Orders were issued over a year ago that no wooden walks should be put down and as a consequence we are using concrete exclusively. We find it is very satisfactory.

MR. BENDER: In answer to Mr. Jarrard's question about floors, more particularly with reference to punching shear shop floors, our floors are of wooden blocks. We are not troubled very much with moisture, notwithstanding the fact that our plant is built over a swamp. If we go down two feet we strike water.

WOOD BLOCK FLOOR PREFERRED.

I prefer wood block flooring in a shop where machinery, especially the type of machinery you have in a punching shear shop, is operated. A slip on the part of the operator, for instance on your 120-inch or your 100-inch shear or on one of the big multiples, may throw the man's arm right in under the machine. I am opposed to anything that may cause a man to slip.

There is this to be said in favor of wooden floors: After you put them down and especially if you put the end of the wood up, it is only a matter of a short time until you get an accumulation of hard

dirt and grit on top of the blocks and it is almost impossible to slip. I believe the wooden blocks in a punching shop are the things to have.

MR. GUILBERT: I think Mr. Bender is right regarding wooden floors. Concrete may be all right in certain shops, but I do not think it is practicable in a steel shop. The surface of the concrete gets slippery and accidents are liable to result to employees.

CHAIRMAN ORTH: I would take it from Mr. Webb's remark that the reason they have adopted the concrete floors is on account of the moisture in the soil.

MR. WEBB: Wooden blocks around a car plant are plentiful. We have some in use. I do not know whether conditions at Michigan City are the same as down our way, but I know that you have immense sand hills piling up from the lake. I saw them twenty years ago and I think if you took away 100 cars a day there would still be plenty of sand left.

In regard to moisture we use a water combination; I guess we do not use the right kind because there are three or four feet of water continually in the deep gaps. You will strike water if you go down two and one-half feet all along the south end of Lake Michigan.

MR. WILDONER: Our plant is located a long way from Lake Michigan; it is on the Ohio River. You do not have to go down two feet to find water. We are not in favor of concrete floors, because we always have dampness and find that concrete attracts it. We are in a low lying lumber district and it only takes a little rain to make conditions very unsatisfactory. We find the wooden blocks are much better around our machines.

MR. WEBB: Those conditions may prevail in your plants, but I know our floors do not show any moisture. We have finished several thousand square feet of cement flooring in our passenger department. We tried flooring it with two and one-half-inch blocks, but we took up every foot of it and put down concrete. It is perfectly dry.

MR. GUILBERT: The sand hills referred to by Mr. Webb are a couple of miles away from the shop. We will see that some of it goes to the Hammond people.

SHEARS AND MULTIPLE PRESSES.

MR. BENDER: In connection with the clutch-starting mechanism on shears and multiple punches on large machinery, where there are two or more operators working, we are experiencing some difficulties.

sides of the machine, connected by a rigid rod. I think it will work out nicely and if it does I will be glad to send drawings to any one interested in its use. It is designed to make both operator and helper use the starting mechanism, so that there will not be a chance for either one having his hand under the shear blade. There is a device on the market operated by compressed air, but the cost of air compression makes its use almost prohibitive.

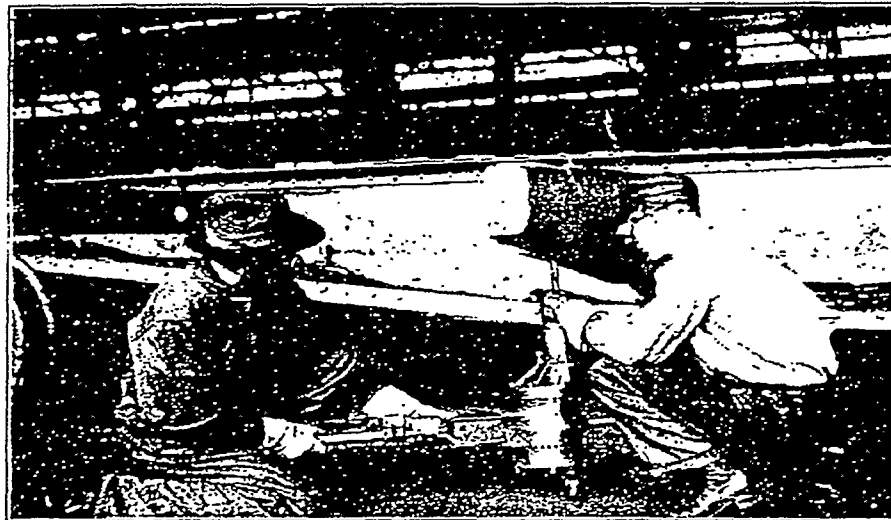
CHAIRMAN ORTH: The next subject is "Fabricating—Drilling, Reaming, Riveting," by Mr. Harry Guilbert.

FABRICATING—(a) DRILLING, (b) REAMING,
(c) RIVETING.

HARRY GUILBERT, MANAGER, SAFETY DEPARTMENT, HASKELL & BARKER, INC., MICHIGAN CITY, IND.

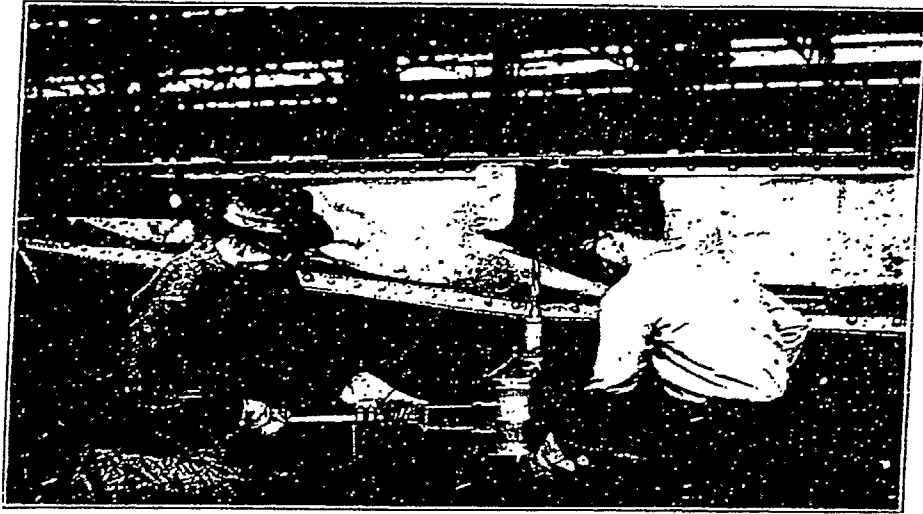
*Mr. Chairman and Members of the National Safety Council:—*When it is taken into consideration that a reaming machine weighs approximately eighty pounds and makes 700 to 1,100 revolutions per minute, it is very obvious that the greatest care should be exercised in handling them.

The pictures I am about to throw on the screen will show you some of the most common hazards in connection with reaming and the way to avoid them:



1. Guiding bit into hole by holding same with gloved hand has been the cause of many horrible accidents.

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2. The proper way to guide it is by holding the handle, or, some men do, by holding the spindle.





4. Unsafe method. Observe reamer bit (same is revolving) between man's arm and body.



5. Unsafe way of carrying reamer.

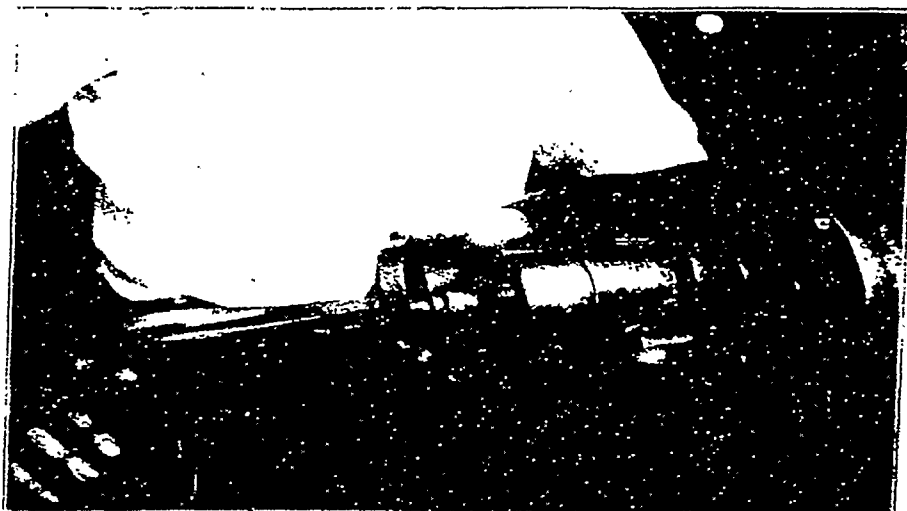
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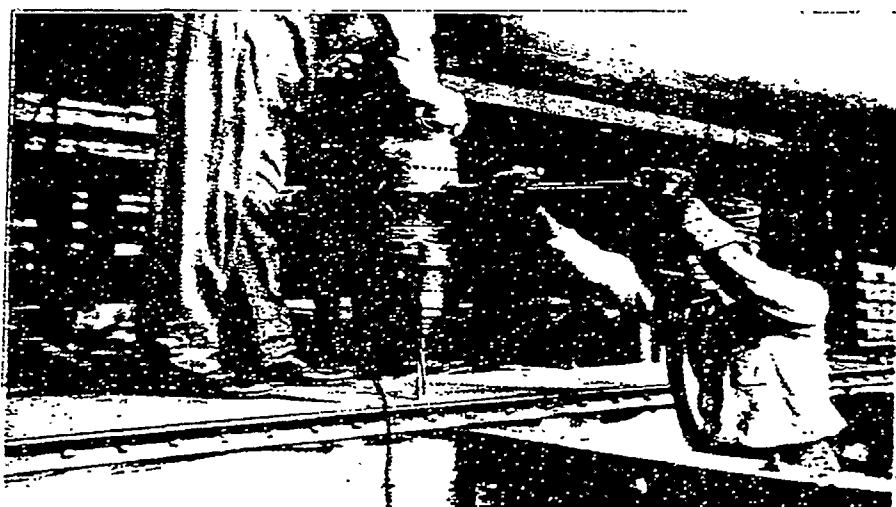
6. Proper way.



7. In order to get into the corners, for instance, reaming a de-
bolster diaphragm, an extension bit is used. In guiding bit in
hole, operator gets hold of extension shaft and I know of many
serious accidents due to revolving shaft catching man's gloved hand
and twisting his arm and sometimes his body around the machine.
To avoid accidents of this nature, some men place an ordinary piece
of rubber hose around the shaft to prevent the hand from getting caught.

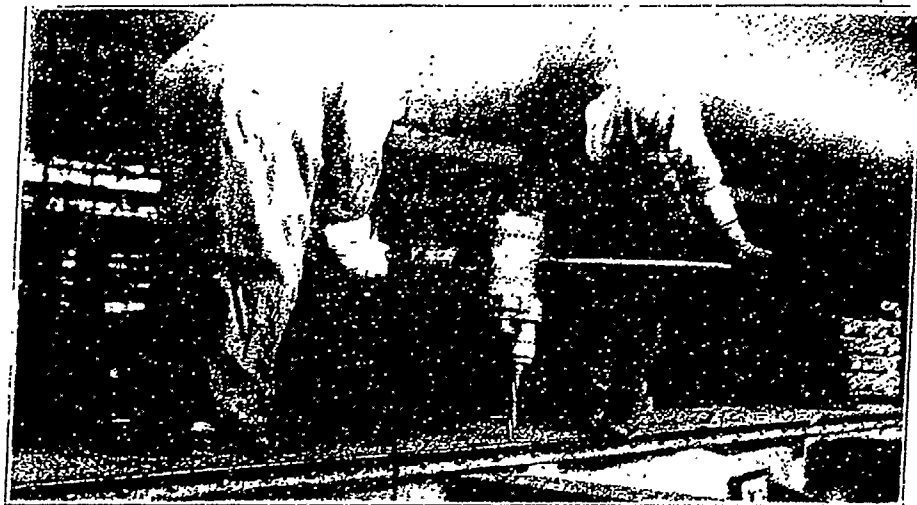


8. Some men, when changing bits, will run the keeper onto shank by turning on the power instead of tightening the keeper by hand. I know of one accident which was caused by man's glove being caught between keeper and shank.

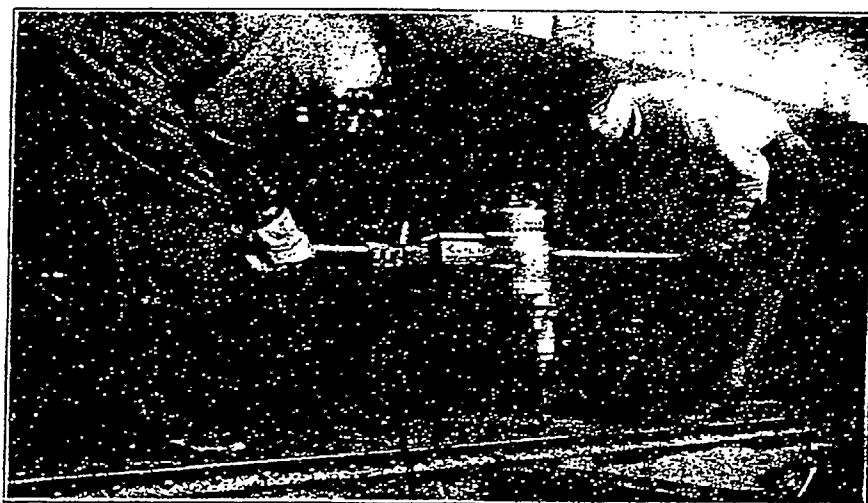


9. Shows dangerous method of reaming. You will notice that one man is standing on the ground. In this position he does not have proper control of his machine, and should bit stick both men are liable to be seriously injured.

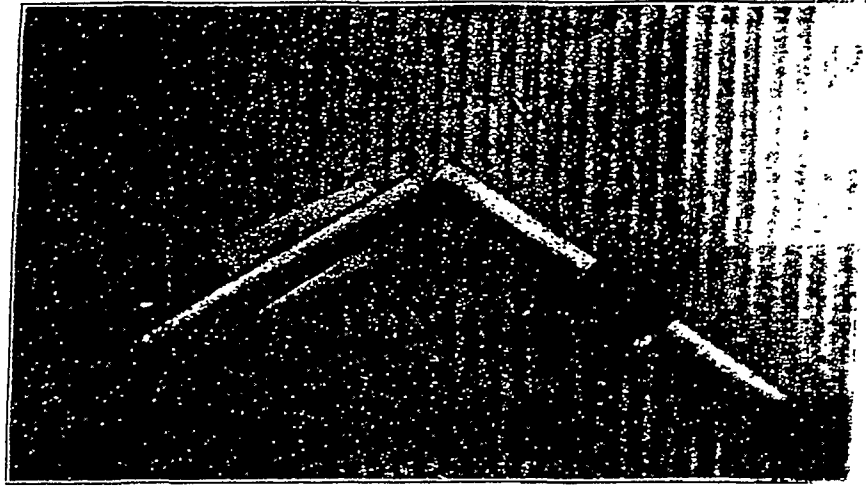
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10. Shows another dangerous manner of holding machine.



11. The proper way. Men standing on opposite corners of handle, should bit stick and machine become uncontrollable, the



12. The hazardous practice of holding switch on the "on" position by means of placing a small piece of pipe over same should be prohibited, for should bit catch man's clothing, he would be killed before switch could be released.

WORKMEN MUST THINK SAFETY.

Men sometimes remove reamers from moving cars. This dangerous practice has often resulted seriously.

When through reaming, men should be taught not to leave machine laying on cars; the vibration of air hammers will cause it to fall.

Bits should be ground perfectly; that is, flutes should be uniform. If one is longer or deeper than another it will cause bit to stick, thereby rendering reamer uncontrollable.

It is important that wires leading to reamers be thoroughly insulated. Great care should be taken to keep machines free from dirt and reamer chips. Some shops have racks placed alongside the tracks on which to hang their machines. Where these racks are not supplied men sometimes keep their reamers in an empty nail keg.

Feeding a machine too fast will also cause bit to stick. Many serious and fatal accidents have been caused by men having their clothing caught by reamer bit after the current has been turned off. The only way to eliminate an accident of this nature is to equip reamer with a practical braking device.

HAZARDS IN CONNECTION WITH RIVETING STEEL CARS.

1. When hammer man is driving upper cut rivets, bucker should always turn his face to one side, as shown on the picture, because



sometimes the valve in the hammer will stick or break and when hammer is removed from rivet plunger will fly upwards and may strike bucker in the face if he doesn't take the precaution shown here.



2. Sometimes the bucker will only cover half the rivet head with his dolly bar, expecting the jar of the hammer to bring the dolly bar over the rivet head completely. Bucker should see that he has rivet head entirely covered, as this will prevent it jumping out of hole when riveter applies his hammer. By neglecting to cover the rivet head bucker stands a chance of being shot.

2. Dangerous method of covering rivet head.



attempting to remove drift by the jarring of the hammer. The act of striking the pin with dolly bar causes air hammer to rebound, thereby releasing plunger which will very likely strike bucker.



4. The safe way of removing drift pin is for the bucker to place end of dolly bar against the drift pin while the hammer man loosens same with a jar of the hammer.



5. This shows the proper way to carry a rivet hammer. You will notice that the man has his thumb under the trigger, this prevents accidental discharge. Some hammers have the trigger inside the handle, but this has a drawback in that operator must contend with two opposing pressures at the same time—one of pressing upward on the hammer and the other of pulling backward on the trigger.

Workmen should be taught not to lay hammer on the ground with plunger in it, because passerby is liable to step on trigger and release plunger.

PLANNING THE NEW SECTION.

CHAIRMAN ORTH: Mr. Cameron, our General Manager, has something to say to us.

MR. WILLIAM H. CAMERON: If you will allow me to interrupt your program for a few minutes, there is a little business matter in connection with the organization of the Section I would like to lay before you. I am very glad to learn that you wish to become a pa

activities of the Council and referred to the important work accomplished through sectional activity.

It became apparent in 1915 that the organization of various correlated groups into sections would be most advantageous to members closely allied in the industries. In our efforts to best serve our members the idea was conceived of forming sections which would permit iron and steel men to get together and confer regarding their particular problems. The plan was made effective and excellent results attained not only in the iron and steel section but in the railroad section, the chemical section and among a dozen other groups of industries—we gave each interest an autonomous place in the activities of the council.

At the Detroit meeting, last year, we became conscious of the fact that we were organizing too many groups or sections. Some were composed of only a few members and each little group expressed a desire to have its own separate organization. It seemed at the time a wise thing to divide our activities and you will see from the index page of our program that we provided for a score of sectional activities.

REARRANGING THE SECTIONS.

After a great deal of thoughtful consideration we rearranged our sectional plan and have regrouped our activities into five divisions: The Industrial Division, the Transportation and Public Service Division, the Health and Industrial Relations Divisions, the Public Administrative Division and the Public Safety Division. This new arrangement will enable our members to get closer together and more intelligently deal with their particular problems.

In the Industrial Division you will observe a group of miscellaneous manufacturers and the Car Builders' Section has been assigned a place in this division. This does not mean that you will not have the identical privileges you enjoyed under the old system. The car builder members will have their own section, will have their own meetings and bulletins and any activities they desire. The same thing applies to every other section, but you will meet with other members of the Miscellaneous Manufacturers' Division for the election of the officers of the division. The one hundred and more industries represented by our organization will get together under this new method for the purpose of obtaining the best possible results for the National Safety Council. This is the plan followed by the

American Medical Association, one of the biggest associations in the country.

At the present time we have only two sections in this division—the Automotive and the Car Builders' Sections. The representatives of the divisions are a chairman, a vice chairman and a secretary. These officers, it was believed, should be apportioned between the two sections. The Iron and Steel Section and the Foundry Section elected these officers jointly; the iron and steel members being awarded the chairmanship and the foundry section the vice chairmanship. It has been agreed, the Automotive Section being much larger than this section, that the chairmanship of the Miscellaneous Manufacturers' Division should be awarded to a representative of the automobile industry and Mr. Williamson of the Packard Company has been elected chairman. Mr. Orth has been elected vice chairman and Mr. Bender secretary.

Your activities will be carried on through your committees and your three officers can arrange for a committee on program, a committee on membership and a committee on bulletins. They are also privileged to act in any other way they desire to handle the situation. In other words, you will have all the activities and all the service you care to plan, but at the same time you will not be cumbered with a number of unnecessary officers. The chairman of the Division of Miscellaneous Manufacturers will automatically become a member of the executive committee of the Council.

AUTONOMY OF SECTION.

There are a great many activities you will be expected to arrange for. You are privileged to determine your own time of meeting and you can hold your sessions whenever you desire during the annual session of the Council; you will have your own program and select your own speakers and plan your own bulletin service. The activities of our section are very simple. So far they have principally centered around our annual Congress, together with the preparation and the distribution of special bulletins relating to industrial and technical hazards. We have also prepared Safe Practice pamphlets relating to the industries. We are in hopes the time will come when we will have pamphlets treating every particular hazard and these will be worked out with the assistance of your officers and the office staff at general headquarters.

This section can do anything that any other section can do. You will have your own committee on program, your own committee on membership and your own committee on bulletins.

reamer and in some unaccountable way it became unmanageable. The man was unable to free himself and was very seriously injured.

MR. BENDER: We are insisting upon reamer men wearing goggles. We had an experience where one poor fellow lost his sight. A rivet head or something of that sort flew from the machine and hit him in the eye. One of his fellow workmen took it out. Three or four days afterward he had an infection, the foreman noticed that his eye was in a pretty bad way and he told him to go and see the doctor. As a result he was in the hospital for some time. The accident came pretty near costing him his eyesight, in fact, he only has about one-sixth vision now.

SAFETY DEVICES AND AIR HAMMERS.

MR. JARRARD: What has been your experience, Mr. Guilbert with the safety devices introduced by the various air hammer people? We have had several sent to us but none of them have been very successful.

MR. GUILBERT: We have had practically the same experience. None of the hammers turned out to be what was claimed for them.

MR. BENDER: For the last two years we have been using a pneumatic hammer made in Chicago and after a number of exhaustive tests we have not noticed any decrease in the efficiency of the tool. The die is not very dangerous, the big plunger does the damage. The new device eliminated that entirely, but it prevents grinding the plungers, because the fellows are not going to the trouble to take it apart to grind it. We feel that the efficiency of hammer work has been increased through the adoption of the new plunger; there is no question but what the safety factor is far greater by its use because the plunger piston does not fly out.

MR. GUILBERT: Why should the men want to grind the plunger?

MR. BENDER: They imagine it makes it run faster and makes the work easier for them. It is purely a case of imagination.

MR. GUILBERT: I don't think it is altogether imagination. If you were working all day with a heavy plunger you would not think so. The work is easier when you have ground the plunger. Many times the man on the job knows more about the tool than the man who gave it to him to work with.

MR. BENDER: That is true, but it is hard on the hammers.

MR. GUILBERT: I talked to the committee on that, but they did not look at it in the same way I did.

MR. BENDER: I would like very much to stop until it

is over as I have enjoyed the meeting very much, but I am compelled to leave in order to catch my train. It has been a great pleasure to help to bring into being the Car Builders' Section and I shall do all I can for its continued success.

• CHAIRMAN ORTH: We will excuse you, Mr. Bender.

Our next paper is on "Switching and Transfer Tables," by Mr. N. B. Bastian, safety engineer, Eastern Car Company, New Glasgow, Nova Scotia, Canada.

SWITCHING AND TRANSFER TABLES.

W. B. BASTIAN, SAFETY ENGINEER, EASTERN CAR COMPANY. NEW GLASGOW, NOVA SCOTIA, CANADA.

Mr. Chairman and Members of the National Safety Council:— I trust you will not be too severe in your criticism of our chairman on his choice of a champion of this subject. Mr. Orth had not the misfortune of an earlier acquaintance with me, so you can appreciate how easy it was for me to take advantage of him by accepting his invitation to read a paper on the subject of "Switching and Transfer Tables." I am almost tempted to believe Mr. Hitchcock's saying: "It is only human nature to desire to do that which we are least qualified to do," which accounts for my appearing here today in an attempt to read a paper on a subject that I know next to nothing about.

I am going to take it upon myself, however, to divert from general principles by asking for some information instead of imparting the same, by giving as much of my time as possible to the general discussion, as I am satisfied one specific problem solved will be of considerable more real value than a half an hour of any paper I could offer.

I presume all the car makers represented here have already compiled a complete book of rules, so I doubt if the few that I have in mind will convey anything of value that you do not already have, bearing especially on the subject of switching.

The hazards connected with switching can mostly be traced to the switchmen themselves. It seems to me, then, that one of our first efforts should be directed toward finding out whether or not we had the proper class of men doing this work. Perhaps no work around the car plant will stand more vigilance on the part of the men doing the work than that of switching. Pick the careful and considerate

men for this work and give them careful instructions and proper working conditions and you will be agreeably surprised at the few accidents you will have.

I suppose most of the gentlemen here, like ourselves, have found it necessary that the book of rules be printed in more than one language. While rather expensive, I believe the benefits derive from it are great enough to justify this extra expense.

I have a few regulations that we have adopted and incorporated in our book of rules, which we are just putting into effect. Perhaps they are just the same as the ones you have, but they may suggest something to put before your men.

RULES FOR SWITCH YARDS.

1. Engine must not be started without ringing bell or blowing whistle a reasonable time before starting. Bell must be kept ringing while passing through stock yard and along building openings from which men may emerge at any time.

2. Before attempting the coupling of cars switchmen must examine coupling apparatus and note its make and condition accordingly.

3. Flying switches and drift switching are positively forbidden in stock yards and shops or any place where workmen are liable to be injured.

4. Cars left standing by switchmen must be secured to prevent their starting from any cause.

5. Cars so loaded as to endanger the life and limb of employees should not be moved by switchmen; but their condition must be reported to the yardmaster.

6. No work must be attempted on cars being switched and no one except regular switching crew is allowed on cars being moved.

7. Cars to be moved from unloading stations or from work tracks must not be moved until switchmen have warned all employees of the intended move, and they are sure no one is in a position to be injured.

8. When cars are to be moved from work tracks by workmen or winch, the track warning signal must be sounded by the foreman before such move and he must be certain that all men are safe before giving the starting signal.

9. Engineers must never start without the proper signal from the proper person.

10. Speeding of engines through yards, shops or any place em-

11. Switchmen are forbidden to attempt to board approaching engines or cars from between the rails. Always stand outside of rails when mounting as a misstep or misjudgment of speed of on-coming engine, causing a fall, will invariably throw the employee outside of rails.

12. Switchmen and other employees are positively forbidden to go between cars to pull pins, adjust couplings or do any other work while the cars are in motion.

13. Before entering a building, switchmen must always precede train to see that track is clear and no employees are in a position to be injured.

Doubtless there are lots of other things in connection with switching that you men are more familiar with than I am, due to the fact that you have been in this business longer than I have been, that I have not brought to your attention. I would like to hear from any one who can give us any additional information along this line. As I said, I am new at this work, and I trust you won't expect too much from me.

GUARDING TRANSFER TABLES.

On the subject of transfer tables, it has never been my lot to be employed by any concern that operated tables in their plants. The information which I succeeded in obtaining from different sources was practically none. Even the manufacturers of transfer tables could not give any particular information in regard to safeguarding them.

I favor the shallow type of table, for I think it is a little cheaper to install and if a man is in danger of being caught it affords him an easier means of exit. There may be some disadvantages but that was my opinion.

It is highly essential that all gears be securely protected by steel guards and wiring should be protected as far as it is possible. Perhaps some of you gentlemen have placed specific guards you have worked out on the tables and over the gears. We would like to have your experience in this connection.

Some years ago a railroad company which I was working for had a transfer table at the repair shop and the biggest trouble they had was from backing cars into the table pit. We prevented that by using track skidders, as outlined in the Universal Safety Standard by Mr. Hanson. Another trouble brought to my attention was the backing of engines onto the tables where rails were not properly aligned with the track. I do not know whether or not there is an

automatic stop to prevent this, but the New York Central had some trouble due to an engine being backed into the pit and killing a man at the transfer table, owing to the fact that the rails were not properly aligned.

I would prefer to have the balance of my time devoted to a general discussion of this subject. There may be some problems that we can work out during a general debate and I am sure the opinions of the section are worth a great deal more than my limited experience. If any of the gentlemen have ideas or experiences beneficial to the section I know that we would all appreciate hearing them.

DISCUSSION.

CHAIRMAN ORTH: I will call upon Mr. Guilbert to open the discussion.

MR. GUILBERT: I would like to ask about the shallow pit. We have a big transfer table and we move a lot of cars at one time.

MR. BASTIAN: I am familiar with the construction of such tables, Mr. Guilbert. I understand there are tables built with shallow pit construction that are ample to supply the needs of the railroad and engine people. If such is the case, I imagine they would be substantial enough to handle the cars.

MR. GUILBERT: You spoke about the cars going into the transfer pit. That has happened many times in my experience. We put an adjustable guard on the end of the track and found it of material benefit. You must have it in the clear and place the adjustable block in a position so that the car won't go over it to the pit. A diagram was issued some time ago by the National Safety Council in connection with this matter. We are receiving such bulletins right along. One of the great hazards in connection with tables occurs particularly in the winter time. If they settle at all they do not align up with the track and very serious trouble is liable to result. Two fellows were killed at Chicago because the table did not even up with the track—the whole thing slid down into the pit on top of the men.

MR. BANKS: We have obviated that trouble on one of our tables by sending a rail over the table in a circular fashion. It runs around outside of the table, so no matter what way it is run on it cannot tip. By extending the rail on the turntable two or three inches it prevents that hazard. On ordinary turntables you have a short rail to prevent that. The

MR. WILDONER: We have placed the same size track on the turntable and turned it around, so that it parallels with any angle of the track.

MR. BANKS: We have that, too, but it does not take care of the tipping situation.

MR. JARRARD: On our transfer tables we have four rails, two at the center and one at each end, that run across with the cement floor. For the carrying of the cable we put an electric cable down in the ground, on the same principle as a trolley. The operator sits in the cage while a second man assists in operating it from.

CHAIRMAN ORTH: Mr. Banks referred to a turntable, whereas some of the other gentlemen were discussing the features of the transfer tables.

MR. WEBB: We bring a truck from the shop and right in line with it we have a turntable, probably ten feet in diameter. It is built of corrugated iron and there are no tracks on it. It is perfectly level.

MR. BANKS: No rails on it at all?

MR. WEBB: On the narrow gauge we have a link-plate turn table; there are no rails on it. Right in the center, where the bearings are, the wheels are up against that protection.

RULE BOOKS IN FOREIGN LANGUAGES.

CHAIRMAN ORTH: With reference to the book of safety rules to which Mr. Bastian referred in his opening statement: Our company has published a book of rules and many of the trainmen's rules are found in our rule book. They have been studied by the trainmen and switching crews and doubtless have been the means of eliminating many serious and fatal injuries. The books have been printed in fourteen languages at a cost of about \$6,000.

MR. WEBB: There is not much use to have rules printed in English and to get it into languages ordinarily spoken by the foreign element. These fellows claim that they speak half a dozen different languages, but when you pin them down to facts they cannot do it. I was very much surprised to have one of the Chicago men tell me that there are very few people that really speak the Hungarian language properly in this country.

CHAIRMAN ORTH: Our next paper, gentlemen, is on the subject of "Finishing, Trimming and Painting," by Mr. Arkills, safety engineer of the Pullman Company. Mr. Arkills wrote me several days ago that it would be impossible, owing to the pressure of busi-

ness, for him to be present at this meeting. I have, therefore, requested Mr. C. E. Wildoner, safety inspector American Car and Foundry Co., to read Mr. Arkills' paper.

FINISHING.

M. E. ARKILLS, SAFETY ENGINEER, PULLMAN COMPANY,
PULLMAN, ILL.

Mr. Chairman and Members of the National Safety Council.
That an employe of the Pullman Company should be asked to contribute an article on safety in connection with finishing cars would be quite in keeping with the average employe of that company, so far as his idea of a finished product is concerned, simply because we at Pullman think that if a thing is to be finished right it must be finished at Pullman.

At Pullman the trimmings for cars are practically all made in our brass finish department, which is a small manufacturing plant within the main plant and operated almost independently of the other departments, so far as manufacturing is concerned. It is equipped with a pattern shop, brass foundry, cleaning, machining, finishing, polishing, plating, and bake enameling departments, as well as assembling benches for the smaller parts of the car.

In our pattern shop every precaution is taken in the way of guarding the woodworking machines that has proven satisfactory in this type of shop.

On the molding floor the greater portion of the molding is done by molding machines, while some of the parts which are not duplicated in sufficient quantities are done by hand. This latter process is known as "tub molding."

VENTILATION.

The furnaces are of a special Pullman type, so constructed as to be heated by fuel, oil and air, and will hold seven eighty-pound crucibles at one charging. This room is on the top floor of a three-story building and is so well equipped with tilting windows that in from twenty to thirty seconds after pouring off a heat the room is entirely free from smoke. It is equivalent to any other workroom in the plant for purity of air.

The cleaning of castings is effected by a special process.

ically exhausted, making the sandblasting operation at this point as desirable a job as the department offers from the standpoint of cleanliness.

In the machining of the brass and malleable castings, the machinery and other equipment is fully guarded from one end of the shops to the other.

Fittings are finished by polishing, plating, and bake enameling. The polishing and plating room is equipped with an exhaust system which is capable of sustaining a five-inch water column. This exhaust system is so efficient that there is little dust from polishing and little, if any, fumes from the plating set free in the room. A splendid system of ventilation is installed on both the baking oven and the spray painting. The baking oven is open to outside atmosphere, by a ventilator, and the door partially opens to admit the air from the room when the charge is baked. This frees the bake oven of the strong fumes of turpentine and hot paint before the oven is discharged. Many of the trimmings are assembled within this department on benches, and many intricate parts and trimmings, such as locks, lamps and electrical equipment for axle-lighting devices, are made and assembled in this department.

SAFETY FOR TRIMMERS.

Employees whose occupation gives them the names of trimmers apply these trimmings to the cars. This is an operation which requires a good mechanic and in which some hazards are encountered. As this work requires very small tools the breakage runs rather high. The dangers encountered here are the breakage of tools, reamers and taps, which, on account of their small diameter are very hard to handle without breakage. Through the activities of our safety department, however, the length of life of these tools has been cut down to the least possible degree of shortness that will permit of handling the work. This one change has overcome about 90 per cent of the breakage which formerly occurred in this line of work.

PAINTING STEEL CARS.

The subject of painting steel cars has received a great deal of attention in the Pullman shops, especially from a safety standpoint. In the first place, the surface of the metal must be prepared for the painter's brush. This is done in most cases by rubbing down with benzine and emery paper or by sandblasting, the latter being the

preferable operation where it can be done. Nevertheless, on cabin steel the material is so thin that the heating from sandblasting would produce such severe buckling in the sheets that it would be impractical. Cleaning with benzine has no particular hazards in a well ventilated room.

The sandblasting of steel surfaces is a very desirable method of cleaning as it entirely cuts away all the scale, rust and dirt from the surface to be painted. The principal things here encountered of interest to safety men are the sand in its powdered form (or the dust) and the rebounding sand, in the form of an eye hazard to the workmen. For the latter we provide the men with goggles, and for the former they are provided with cover respirators, and, if they so desire, helmets are supplied for this work.

We early realized the dangers of dry sanding of lead paint and accordingly made some very exhaustive tests of sanding of paint in enclosed cars, with the result that we found, under normal conditions, a man in a single workday would inhale about .00139 pounds of white lead, or, in 300 days, about four-tenths of a pound, which would represent one year's employment.

PLUMBISM.

Plumbism is supposed to be an accumulative ailment and the foregoing shows the slow but sure process of accumulation which takes place in the human system, barring, of course, the ability of the lungs, through the secretion of mucus, to throw off the lead dust as fast as it is taken in. On this quality and the habits of cleanliness of the individual, the speaker believes, depends greatly the ability of a workman to stay in his trade without contracting plumbism. The respiration tests in connection with the sanding of paints were conducted with a special apparatus, constructed by Dr. Lawrie, who was then our chemist, and the speaker. Through the use of respirators, washrooms, showers, baths, tooth and finger brushes, with a close supervision, plumbism has been eliminated.

The application of the paint with a brush or with a spray is carried on with very little hazard to our employes, as the spray painting is done under a splendid exhausting system, taking the fumes or the vaporized paint away from the operator. Painting with a brush necessitates very little hazard to the man doing same, unless he is careless in matters of cleanliness pertaining to his hands. The habit of chewing tobacco is especially objectionable in this department, as

GRAINING AND VARNISHING.

While making cars of steel is perhaps one of the greatest safety measures that has been introduced in recent years, the finishing of the car on the interior with steel has also introduced some very perplexing problems from the standpoint of the painter. I have special reference to the graining and the imitation of the beautiful wood interiors for which so many of our passenger cars are noted. We often find that visitors, in going through our plant, are surprised to learn that the graining of every panel has the personal touch of an individual operator, instead of being "transferred" as they had expected. This work is done by men who have been trained in this line of painting in our own shop. Their ability to produce an imitation of the real grain of natural wood has been developed to a very high standard. We have yet to find any difficulty in the form of an occupational hazard in this line of work, although we have been carrying on this kind of painting for some eight or ten years.

In the varnishing of cars we encounter the same trouble as is always encountered with the handling of varnish—that of the fumes of turpentine. These fumes are especially noticed by the workmen in this trade. They become so completely saturated with it that at times their perspiration and urine will smell of the turpentine and their whole systems seem to be permeated with the drug.

The application of gold leaf for stripes and lettering and other forms of small decorations, as in hand painting, undoubtedly are not attended with any degree of hazard, as those men at Pullman that are conducting this line of work are among our oldest employes and are now along in years and apparently in splendid health.

I certainly thank you gentlemen for allowing me to put the "finishing touch" on the work of the Car-Builders Section.

CHAIRMAN ORTH: Gentlemen, we have now reached the end of our program. If there is no further business to come before the Section the meeting will stand adjourned.

National Safety Council

Steam Railroad Section

New York City

Sept. 12, 13, and 14, 1917

H. J. BELL, Acting Chairman

Safety Inspector, Chicago & North Western Railway Company, Chicago, I

C. M. ANDERSON, Acting Secretary

Superintendent of Safety, Nashville, Chattanooga & St. Louis Railwa
Nashville, Tenn.

WEDNESDAY AFTERNOON SESSION

THE meeting was called to order by Mr. H. J. Bell, the Acting Chairman, shortly after 2:00 o'clock.

ADDRESS BY CHAIRMAN.

CHAIRMAN H. J. BELL: The meeting will please come to order. The President of the United States, in proclamation to the people on the 15th of April last, among other things, said: "To the men who run the railways of the country, whether they be managers or operative employes, let me say that the railways are the arteries of the Nation's life, and that upon them rests the immense responsibility of seeing to it that those arteries suffer no obstruction of any kind no inefficiency or slackened power."

It seems to me, gentlemen, that the President has placed a peculiar

mission for the year ending June 30, 1910, shows that in that year 2,687 railroad men were killed and 160,003 were injured. I think you will agree with me that we cannot afford, in view of our duty to the government, to have any such casualty record as that for if we go on at that rate, and assuming that the war continues for three years—which Heaven forbid—we will have lost either permanently or temporarily from railroad service a total of over 400,000 men.

The Executive Committee of the Railroad Section earnestly hopes that this meeting will be more than a success. We want every one to take an active part in it, so the meeting will stand out as a milestone in our lives. We want to be inspired and enthused, so we will go away from here with a bigger, a better and a brighter understanding of the wonderful opportunity we now have of serving not only our companies and their men, but the country we all love so well, and humanity itself.

THE "WILLS" AND THE "WON'TS."

It has been said, you know, that the world is made up of three kinds of people: The "Wills," who do everything; the "Won'ts," who oppose everything, and the "Can'ts," who do nothing. I am going to take the responsibility of vouching for the fact that every man in this room belongs to the "Will" class. We want everyone to do his share in taking part in the discussion, so that we will derive from it the maximum of good. Remember, the meeting does not belong to the Chairman or to the Secretary—it is your meeting, and it is up to you to make it interesting and make us get the most good out of it.

At the Detroit Congress you elected Mr. W. C. Wilson of the Lackawanna, Chairman, and Mr. Isaiah Hale of the Santa Fe, Vice Chairman. Mr. Wilson retired from the railroad service several months ago and was succeeded by Mr. Hale, who, however, is at the present time on the Pacific Coast and cannot be here to conduct this meeting. It therefore becomes my duty, as Secretary, to act for him.

CHANGES IN PERSONNEL.

Mr. Chas. T. Banks of the Erie, Mr. A. A. Krause of the Missouri, Kansas and Texas and Mr. Glen S. Locker of the Duluth & Iron Range having retired from Safety work with their respective companies, have been replaced on your Executive Committee by Mr. F. A. Wighman of the Frisco, Mr. F. M. Metcalfe of the Northern Pacific and Mr. J. M. Guild of the Union Pacific.

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Mr. C. M. Anderson of the Nashville, Chattanooga & St. Louis has kindly agreed to serve as temporary Secretary at these meetings.

I know of no special report which I can make to you for Chairman, except to say that the officers and the Executive Committee have tried to properly conduct the affairs of the Section during the year. You have been kept advised by reports from the Chairmen of the sub-committees and by reports and News Letters from the Secretary as to the activities of the Section.

I think it was Emerson who said a long time ago that "Every grand and commanding movement in the annals of the world is the triumph of enthusiasm." I hope, gentlemen, that this meeting may be so conducted that Safety First in the transportation field will be given new impetus. It will be, with your help.

I should have called your attention to a telegram which we received from Chairman Hale, in which he expresses regret at being unable to meet with us.

The next order of business is the reports of committees; that of the sub-committees, whose members, with the officers of the Section make up the Executive Committee. Mr. C. H. Blakemore of the Membership Committee is unable to be here, which, of course, very much regrets, but he sent a copy of his report to the Congress. Until the last minute he hoped that he would be able to be here.

Mr. C. M. Anderson, will you please read the report for Mr. Blakemore. I am sure we will all be much interested.

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 passed and upon the results which have followed those activities.

Under the authority given me by the Executive Committee, originally formed, after the Congress of 1915, a Membership Committee, composed 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. & T. Railway.

R. P. Kyle, El Paso & S. W. Railway.
H. A. Rowe, D., L. & W. Railroad.
J. S. Rockwell, B., R. & P. Railway.
H. K. Relf, S., P. & S. Railway.

These gentlemen entered so enthusiastically into membership work and accomplished such gratifying results during the year ending October, 1916, that I secured their consent to act in the same capacity during this year. The fruits of their labor proves conclusively the wisdom of my choice, and I here take occasion to extend to them my grateful appreciation of the coöperation they have shown in the work of building up the membership of, and arousing interest in, our Railroad Section.

A geographical section of the United States and Canada was assigned to each member of the committee, and solicitation has been carried forward vigorously by personal correspondence, and, wherever possible, personal interview, and by means of periodic circular letters addressed to appropriate officers of railways not already affiliated with the section. As a result of these endeavors the following new memberships have been secured during the year:

NEW MEMBERSHIPS.

Atlanta, Birmingham & Atlantic Railway.
Algoma Central & Hudson Bay Railway.
Central of Georgia Railway.
Charlotte Harbor & Northern Railway.
Chicago, Burlington & Quincy Railroad.
Coal & Coke Railway.
Guantanamo & Western Railroad.
Illinois Central Railroad.
Kansas City Southern Railway.
Lackawanna & Wyoming Valley Railroad.
Lehigh Valley Railroad.
Nevada Northern Railway.
New South Wales Government Railways and Tramways.
New York, New Haven & Hartford Railroad.
New Orleans Great Northern Railroad.
Northern Pacific Railway.
Oakland, Antioch & Eastern Railway.
Pennsylvania Railroad.
Pittsburgh & Shawmut Railroad.

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Rutland Railroad.

San Antonio & Aransas Pass Railway.

St. Louis Southwestern Railway.

Seaboard Air Line Railway.

Texas & Pacific Railway.

At the beginning of the year's work the number of lines holding membership in this section was sixty-three. Today there are eighty-seven members—an increase of 38 per cent.

One year ago the total memberships in the Railroad Section represented some 80,000 track miles. Today they represent more than 139,000 track miles—an increase of 74 per cent, and an examination of the list of new members secured during the year will indicate that many of them are among the largest railway lines in the United States.

There is still a broad field to be cultivated in membership work because some of the most prominent lines in this country are unidentified with the Railroad Section, and I am convinced that many cases of refusal to affiliate have been due to no objection to the organization, but rather to a lack of intimate knowledge as to its scope, purposes and the value of its service, and this lack of knowledge has not been caused by failure of the Membership Committee to supply, as far as in its power lay, that knowledge in the shape of letters, circulars and advertising matter, but because busy railway officers too frequently have not the time to devote to reading the matter of this character sent them. The remedy for this is simple to prescribe, but difficult to administer. It lies in personal interviews with railway officers by those having ready access to them; to influence with them, and I cannot resist the temptation to again earnestly urge upon every member present, whether connected with the Membership Committee or not, the duty to personally interfere himself in bringing, at every opportunity, to the attention of such railway officers, the advantages to be derived from membership in the Council and the duty which devolves, in my opinion, upon every railway in this country to support an organization which exercises so vast an influence for the common good.

There are, in this room, many enthusiastic members of the Railroad Section who come in frequent personal contact with controlling officers of railways not now affiliated with our organization, and how many of you remember, when a tactful opportunity presented

into active connection with the Section? Perhaps some of you have refrained from opening the subject because you were not connected with the Membership Committee, but permit me to call to your attention the fact that while not connected officially with the Membership Committee, you *are* connected with the organization—that the Railroad Section is *your* Section, and that the larger the membership the greater the source of general information, and accordingly the greater the benefit to all, and I am convinced that if each man present takes away from this Congress with him the resolve that he will do, in a personal way, what he can to add to the membership, the coming year will be productive of more new affiliations than perhaps any year in the history of the Railroad Section, and I earnestly urge upon you not to depend entirely upon the efforts of the Membership Committee for results. Let each member of this section, during the coming year, resolve to secure just one new member for our organization.

C. A. BLAKEMORE,
Chairman Membership Committee.

CHAIRMAN BELL: What is your pleasure as to the disposition of this report?

MR. R. C. RICHARDS (Chicago & North Western): I move that the report be received, placed on file, and that the thanks of the Section be tendered Mr. Blakemore for his very successful efforts in increasing the membership.

MR. G. L. WRIGHT (Chicago, St. Paul, Minneapolis & Omaha): I second the motion.

CHAIRMAN BELL: You have heard the motion made by Mr. Richards, and seconded by Mr. Wright. Is there any discussion? If not, all those in favor of the motion will signify assent by saying "Aye." Contrary, "No." The motion is carried.

The next order of business, I think, should be the report from Mr. Metcalfe of the Northern Pacific Railway. He succeeded Mr. Krause of the Missouri, Kansas & Texas Lines as Chairman of the Accident Remedies Committee.

REPORT OF THE ACCIDENT REMEDIES COMMITTEE.

Mr. Chairman and Members of the National Safety Council: Your Committee is not able to make very much of a report on behalf of the committee, as the report of the Accident Remedies Committee

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naturally depends upon the report of the Causes Committee, of which Mr. Locker of the Duluth & Iron Range is Chairman. I received Mr. Locker's report somewhat late and I have not been able, owing to the pressure of other business, to attend to my correspondence with the other members of the Railroad Section, to get their views on the remedies to be applied to the causes which Mr. Locker has covered. Until we get something in the way of remedies to cover these causes I will be unable to give you any information other than I have placed before you.

F. M. METCALFE, Chairman

CHAIRMAN BELL: The Railway Section is honored in a rather unusual way by having one of the members of this Section serving the government at the present time. I refer to Mr. Locker of the Duluth & Iron Range, who has recently enlisted as bandmaster of the battleship Iowa. Mr. Locker is doing a rather unusual thing and I am sure we would all be very glad to hear a word from him.

ADDRESS BY MR. G. S. LOCKER.

Mr. Chairman and Members of the National Safety Council: It is an unexpected pleasure for me to be able to attend this Congress today and to serve my country at the same time. I did not expect that I would be serving my country at this time when I accepted the Chairmanship of the Accident Causes Committee at the close of the Detroit Congress.

I regret very much that I had to leave the work of that committee because of my enlistment, so that my friend, Mr. Metcalfe, did not have an opportunity to get his report completed. It was not entirely my fault, because the replies asked for from the different members of our Section were rather slow coming in.

I wrote to all the members of the Railroad Section, asking them to give the leading causes of their injuries. It took six months to get replies enough to cover what I thought would be an adequate number of answers to make up this report.

I believe all of the members of the Railroad Section received a copy of the report and have had an opportunity to look it over. It was made up in blueprint form, in order to condense it, and it gives all the names of the railroads and the leading causes of accidents.

SIX LEADING CAUSES OF ACCIDENTS.

The six leading causes, shown in the compilation, are as follows:

Out of a total membership of something like seventy, which we had at the time that the report was made, I received replies on the subject from thirty-three railroads. Quite a number said they did not keep a statistical report of their accident causes, and, therefore, could not give the information necessary.

The six leading causes were: *First*, the use of hand tools and machinery; *second*, the handling of miscellaneous material, baggage, freight and express; *third*, the handling of rails, ties and timbers; *fourth*, falling in getting on and off moving cars and engines; *fifth*, slipping and falling on dirt surfaces, and *sixth*, the handling of motor cars.

There were, of course, a great many other causes of injuries, which, I presume, a great many of you have found to be more serious than some of those which appear to be the leading causes that appear in this report, but that information you can get from the report itself and apply to your own particular railroad.

The work of compiling the statistics, as I have said before, took quite a while, because of the fact that the information came in slowly, but we hope that the information is now compiled, and with the Accident Remedies Committee at work upon the remedies of these causes, that some time in the near future a very satisfactory report can be compiled from the reports of the Accident Prevention Committee and the Accidents Remedies Committee.

That is all I have to report at this time. I am very sorry, indeed, that I will not be able to stay during the entire convention, because I know it has a very fine program. I am sorry not to be able to remain here during the rest of the week, but I must leave this afternoon and I cannot stay longer than 5 o'clock. I am glad to be here and to meet the men engaged in this work. I hope before another year is past and another of our annual Congresses is held, that our band from the battleship Iowa will have played the "Star-Spangled Banner" in Berlin.

VOTE OF THANKS TO MR. LOCKER.

CHAIRMAN BELL: Mr. Locker, we are all with you in that wish. We are much obliged to you for the work of your committee during the year. We should be glad to hear a motion as to the disposition of the report which Mr. Locker has just read.

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MR. T. R. McCAMPBELL (Safety Agent, New York Central Lines): I move that the report of Mr. Locker be accepted placed in the records of this meeting and that a vote of thanks be offered to him and his committee for the splendid work that has been accomplished.

MR. GEORGE L. WRIGHT: I second the motion.

CHAIRMAN BELL: You have heard the motion, gentlemen, that Mr. Locker's report be received and become a part of the records of this meeting, and that a vote of thanks be offered to Mr. Locker and his committee. Are you ready for the question? All those in favor of the motion will please signify by saying "Aye." Contrary "No." The motion prevails.

We will be glad to hear from Mr. Richards of the North West Railway on the report of the Committee on Grade Crossings and Trespassing Accidents.

REPORT OF COMMITTEE ON GRADE CROSSINGS AND TRESPASSING ACCIDENTS.

Mr. Chairman and Members of the National Safety Council: Unfortunately, the committee of which I have the honor of being Chairman has really done no work. We have not been able to make any degree of progress in the matter of prevention of accidents at grade crossings. In fact, the subject was a little too big for the committee. I do not know that I have any suggestions or report to make.

It may be interesting to some of the members of this Congress to know that in Mississippi they have passed a law requiring automobiles to stop before crossing tracks. In Illinois we have a law, passed at the last session of the Legislature, requiring automobiles to stop several feet from the track at all railroad crossings where they have a danger sign, and to slow down where they do not have that sign.

Unfortunately, grade crossing accidents seem to be increasing and I suppose they will keep on increasing as long as the class of people who are operating automobiles at the present time continue to operate them.

Through the Secretaries of State, on the lines of the Northwestern and the Northern Pacific and some other roads, we have furnished cards calling attention to the number of accidents, showing the statistics for the last two or three years, with appropriate words

to send these cards to owners of automobiles with their licenses, in the hope that it might possibly bring to the attention of drivers of automobiles the necessity for exercising care.

USE OF POSTERS.

Many of the roads also have placed large posters in their stations, in garages along their lines, and in other places where they can be readily seen, the posters give the same information, calling attention to the necessity of exercising caution in passing over railroad tracks at highway crossings.

The most elaborate posters were the ones sent out by the New York Central Lines. They had a very general distribution over the lines of the road.

In Illinois the General Managers' Association adopted a somewhat similar poster which has been put up in the railroad stations, garages, and other public places in Illinois.

R. C. RICHARDS, Chairman.

CHAIRMAN BELL: We thank you for your report Mr. Richards.

There is one other committee to be heard from. Mr. Hale, while serving as Vice Chairman of the Section also served as Chairman of the Publicity Committee, which had charge of issuing bulletins and similar work. He was succeeded by Mr. Frank A. Wightman of the 'Frisco. If Mr. Wightman is in the room we would be glad to have him present his report. (Mr. Wightman was not present.)

CHAIRMAN BELL: The only report I can make as Secretary of the Section is that I have performed the usual duties connected with that office. During the year we have sent out such information as we thought would be of benefit to the members of the Section, and inaugurated, on the request of the Executive Committee, a plan of sending out monthly News Letters. We will speak further of this later on.

We will now have the roll call, so that the Secretary can get a record of the members present.

ROLL CALL.

New York Central Lines—

Marcus A. Dow, General Safety Agent.

R. S. Jarnagin, Assistant General Safety Agent.

H. S. Balliet, Assistant Terminal Manager, Grand Central Terminal, New York City.

Northern Pacific Railroad—

F. M. Metcalfe, Vice President, Special Representative, St. Paul.

Baltimore & Ohio Railroad—

D. E. M. Parlett, Chief, Welfare Bureau.

John T. Broderick, Supervisor Special Bureaus, Baltimore, Md.

E. R. Scoville, Chairman, General Safety Committee, Baltimore, Md.

J. A. Cochrane, Superintendent of Safety, Great Northern Railway, St. Paul, Minn.

A. D. Chittenden, Chairman Central Safety Committee, B. & L. E. R. R., Pittsburgh, Pa.

F. M. Metcalfe, Vice President and Special Representative, Northern Pacific Railroad, St. Paul, Minn.

C. M. Anderson, Superintendent of Safety, Nashville, Chattanooga & St. Louis Railway, Nashville, Tenn.

David More, Shop Safety Inspector, Union Pacific Railroad, Omaha, Neb.

Howard Elliott, Transportation Inspector, Los Angeles & Salt Lake Railroad, Los Angeles, Cal.

S. G. Watkins, General Secretary, Safety First Organization, Boston & Maine Railroad, Boston, Mass.

A. W. Smallen, Chairman, General Safety Committee, Chicago, Milwaukee & St. Paul Railway Company, Chicago.

C. F. Merrill, Superintendent Lehigh & Hudson River Railway, Warwick, N. Y.

C. E. Schaff, Receiver, Missouri, Kansas & Texas Railroad, St. Louis, Mo.

Frank H. Babcock, Safety Agent, Pittsburgh & Lake Erie Railroad, Pittsburgh, Pa.

Frank A. Wightman, Superintendent of Safety, St. Louis & San Francisco Railroad, Springfield, Mo.

F. W. Fisher, Rochester Railway & Light Company, Rochester, N. Y.

J. M. Guild, Safety Agent, Union Pacific Railroad, Omaha, Neb.

Emory C. Oyler, Assistant Engineer and Chairman of Safety Committee, Cumberland Valley Railroad Company, Chambersburg, Pa.

Steam Railroad Section

John S. Rockwell, General Agent, Buffalo, Rochester & Pittsburgh Railway Company.

G. N. Loughnan, Division Engineer, Lehigh Valley Railroad, Wilkesbarre, Pa.

George L. Wright, Superintendent Safety Bureau, Chicago, Paul, Minneapolis & Omaha Railway, Hudson, Wis.

Chicago & North-Western Railway—

R. C. Richards, Chairman Central Safety Committee, Chicago, Ill.

James Sullivan, Safety Inspector, Chicago, Ill.

H. J. Bell, Safety Inspector, Chicago, Ill.

Duluth & Iron Range Railroad—

Glen S. Locker, Two Harbors, Minn.

W. L. Murphy, Two Harbors, Minn.

E. J. Birmingham, Safety Agent, Erie Railroad, New York C

A. V. Rohweder, Duluth, Missabe & Northern, Duluth, Minn

G. B. Pfoutz, Oregon Short Line, Salt Lake City, Utah.

S. S. Morris, Illinois Central Railroad, Chicago, Ill.

D. A. Klumph, General Chairman, Safety Committee, Pere Marquette Railway, Grand Rapids, Mich.

R. D. Young, Pennsylvania Department of Labor and Industries, Harrisburg, Pa.

W. E. Kimberling, Pittsburgh Construction Company, Pittsburgh, Pa.

E. L. Funch, Works Engineer, Union Carbide Company, Works.

G. R. Davis, Niagara Falls, N. Y.

A. R. Cooper, Toledo, Ohio.

W. C. Wilson, New York City.

Chas. T. Banks, Rutherford, N. J.

CHAIRMAN BELL: Is there any further business to come before the Section before we proceed with the program? If not, we ask Mr. J. S. Rockwell, General Agent of the Buffalo, Rochester & Pittsburgh Railway, who has the first paper on the program,

WHY PARTICIPATION IN WAR MAKES NECESSARY INCREASED ENDEAVORS ALONG SAFETY LINES.

J. S. ROCKWELL, GENERAL AGENT BUFFALO, ROCHESTER & PITTS-
BURGH RAILWAY, ROCHESTER, N. Y.

Mr. Chairman and Members of the National Safety Council:
It seems to me that all we need to say to answer this question is that by such endeavors we will all be doing our bit in the supreme effort our country is now making to help win the war.

Our President has said: "The supreme test of the nation has come. We must all speak, act and serve together." How this thought should be applied specifically to the railroads was well stated by Mr. Daniel Willard in a recent address: "We should consider all phases of the transportation problem from this one point of view, 'What relation does the particular thing under discussion bear to the problem of winning the war? How, if at all, does it contribute toward that end?'"

It is proper for us to recall and to glory in the response the railroads have made to the call of our country. Just five days after war was declared men representing the 175 principal railroads of the United States met in Washington. They voted unanimously, and signed an agreement to place in the hands of a committee of five men full power to control the operation of all the railroads in the country during the period of the war. Thus all became one great system and will act as one great unit in all matters of transportation so important at this time. Nothing of the kind was ever done before by any industry in this or any other country.

FUEL AND ROLLING STOCK.

You all know something of what has been accomplished so far. Trains that could be spared have been discontinued, saving much fuel and releasing engines and cars for service more greatly needed. Efforts have been made with freight-house employees and directly with shippers to increase the loading of cars, so that equipment will more nearly perform maximum service. Shippers in most cases have responded readily and heartily, and, in addition to co-operating by intensive loading, many have voluntarily agreed to the abolishment of reconsignment and diversion of cars in transit.

The commission on car service, treating all the railroads as one

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great system, has done most effective work. The distribution of empty cars, irrespective of ownership, into districts where they have been most needed, has helped wonderfully in handling the abnormal amount of freight. The application of the rule that every car is entitled to have on its rails as many cars as it owns has worked for justice and the removal of many difficulties and complaints. With an increase in car equipment of only 3 per cent the railroads rendered 25 per cent more freight service in June of this year than in the same month last year.

In every department of railroading all matters are being considered with reference to their bearing on the great problem now before the country and this not on account of, or even in the hope of, greatly increased profits, but with the fear at least that net earnings will not be increased.

WORKMEN ARE PATRIOTIC.

The employees, organized and unorganized, are generally showing a patriotic disposition to help in all ways. President Gompers of the American Federation of Labor and member of the Advisory Commission of the Council of National Defense, on April 7, the day after war was declared, pledged organized labor to a full and loyal support of the government in the war.

The Committee on Labor recommended: "That the Council of National Defense should issue a statement to employers and employees in our industrial plants and transportation systems advising that neither employers nor employees shall endeavor to take advantage of the country's necessities to change existing standards."

The railroads again responded, in no uncertain tones, to the call of the country when their men, from presidents to the humblest laborers, subscribed to the limit of their abilities to the Liberty bonds. Thousands of our officers and men have joined the color and soon will be at the front and many, many more will follow. The railroads will be represented fully on the firing line and in all other departments and branches of the service.

WHAT THE NATIONAL SAFETY COUNCIL IS DOING.

No less than the other railroad departments has the safety department responded to the call of the country, as has the National Safety Council, in this first year of war since its organization.

Note the pledge of the C.

Splendid are the slogans which may be gathered from the preparedness bulletins that have recently been issued. Here are a few:

"If the soldiers in our own industrial army are killed or injured in shops, or in mines, or on railroads, the men in the battle trenches must lose.

"America is fighting to make the world safe for democracy. Armies must be fed and clothed and supplied with ammunition.

"America will soon have a great army in the field. She will always have the greatest industrial army of any country.

"These two armies, each supporting the other, will wield a mighty influence in the world war for liberty.

"Armies in the field are helpless without the co-operation of the armies at home."

It is a great satisfaction to every member of this Council to know that in addition to the splendid arrangements by sanitary camps, by hospitals and proper medical attention to safeguard as far as possible the men in the field, now for the first time in the history of the United States, safety engineers are being appointed in the navy yards and arsenals to organize accident prevention.

SAFETY WORK IN NAVY YARDS.

It is encouraging to read the letter addressed by Rear Admiral Burd to the employes of the Brooklyn navy yard, in which he says:

"The prevention of industrial accidents has long been recognized as a personal duty which every man owes, not to himself alone but to his family, to his fellow workmen and to his employer. In the present world crisis, however, the work takes on even greater significance as a duty which every man owes to his country to prevent the needless loss of time resulting from accidents."

RAILROADS INCREASING SAFETY WORK.

Applying all these general principles of service and duty to the one question of safety on railroads, very little more need be said to show that war conditions make increased safety endeavors necessary. The reasons will be apparent to every mind in which glows a spark of patriotism. So thoroughly have these reasons been recognized that some railroads have already increased and even doubled the number of safety inspectors and their expenditures along this line.

From a purely economic standpoint, with relation to the need of the nation, it is more necessary to conserve life and health than to save wheat and other foodstuffs. We must have men at the front and more and more of them. Their service depends on the support they receive from the men remaining at home, on the farms in the shops, in the mines, and on the railroads.

It is of vital importance that the transportation industry be kept up to the highest point of efficiency, and to that end to keep every man from death or disabling injury. Accidents on railroads are bound to increase during war times and this is a sufficient reason for greater endeavors to prevent them.

MANY NEW MEN EMPLOYED.

Some of the causes for such increase, known to you all, are: The necessary employment of incompetent, unskilled and inefficient men; the pressure for larger tonnage and more rapid operation; the tendency to disregard and not to enforce safety rules and regulations.

The British Health of Munition Workers Committee covered the same ground when they said: "At the present time the introduction of new labor and of employees unaccustomed to the processes concerned, particularly in conjunction with the need for speed and pressure, overtime, and night work, with consequent fatigue, must inevitably lead to greater risk of accidents."

Of necessity the war will take many men from our ranks whose places must be filled by whatever men we can hire, nearly always inexperienced, sometimes incompetent and inefficient. We have already had much experience along this line, even before we went to war, by the taking from our service of large numbers of skilled mechanics by the munition factories. We all know how our injuries have increased from this reason and we realize what a large percentage of accidents occur among new men.

FOREMEN A GREAT FACTOR.

Here is a great field for safety work. Train the new man. Urge his foreman to give him proper instruction in his work and see that it is done. Teach him the dangers of his new duties. Show him the necessity of care for his own protection and that of his fellows and for the good of his family. Do not forget to impress on his mind that at this time of stress and strain, it is his duty to be safe.

to his country to keep from injury and thus be able to continue to serve in the great industrial army.

Among the new employes are an increasing number of women, who are now undertaking work absolutely new and untried. While I think it is the general experience that women are less careless than men yet their duties and the attendant dangers should be thoroughly explained to them and they should be surrounded by all necessary safeguards.

The railroads will be taxed beyond their abilities by the tremendous traffic which will arise directly from the national shipments of men, munitions and supplies, and from the needs of the thousands of industries which will be working at high speed to fill the government's needs in addition to the regular and usual traffic. There will be great pressure to speed up the work and to increase the tonnage hauled and the output of the shops. Every engine, every machine, and more, every man and woman in the service will be called upon for full performance and the liability of accidents, the tendency to carelessness and to the taking of risks will be vastly increased.

SAFETY MEN MUST BE ALERT.

The great tendency in times like these to let down on safety rules and regulations and inspections makes it necessary for all safety men to keep always alert. Watch the superintendent, the foreman—the master as well as the men—and see that no bars are let down. Follow the suggestion of the National Council of Defense made at the request of the committee on labor and urge upon all, employer and employe, "The great duty of vigorously maintaining the existing safeguards as to the health and welfare of workers."

Those of us who must remain at home, seeing our sons and brothers and friends march away to trench and battle and perhaps to death, can thus do our humble part in the great war America is fighting for the freedom of the world.

Let us then go on in this great work and increase our endeavors as the dangers increase. Our efforts should meet with greater success than ever before for now we can urge, in addition to the reasons and arguments we have before used, the fact that now every railroad man who loves his country is bound from patriotic reasons above all others to do all he can to save his life and limbs, that he may better serve in that great industrial army without which the army in the field must fail.

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DISCUSSION.

CHAIRMAN BELL: In order that we may get the maximum good from the papers which in every instance represent a great amount of time and thought on the part of the speaker in preparing same, we should have a reasonable amount of discussion before we go on with the next paper.

At the round table meeting which will be held on Friday morning it is proposed to discuss suggestions handed in to the Secretariat of this Section prior to that time. We want to save some of the material for that occasion, so that Mr. Smallen will be kept busy. In the meantime, however, we will take up the discussion of papers presented at the meeting so far as practicable.

Mr. Rockwell's paper is now before the Section.

EMPLOYMENT OF NEW MEN.

MR. R. C. RICHARDS (Chicago & North Western Railway, Chicago, Ill.): I do not like to see a paper like that go by entirely without any discussion, and so, at the risk of boring you, I would like to say just a few words in connection with that part which to me is especially interesting—the matter of training of the vast number of new men who are now entering the service of the roads, especially men in the engine, train and switching service. We all know that on the large roads today we have a sudden stream of new men employed in that class of operation, and the question of how we can best bring home to them the necessity of complying with the operating rules is one of very serious importance.

On the North Western, in Chicago, we have an examination class running every day; we are examining the new men on the books of rules, and I suppose twenty-five or thirty men are examined every day. It occurred to us that if at the time of these examinations and before the men were passed, there could be some practical method adopted of bringing home to them the necessity of complying with these rules, and what would happen to them if they do not comply with them, and we got up a plan of showing the pictures showing accidents, and figures showing the number of injuries and deaths brought about because of failure to comply with the rules, we would impress upon the men at the time they were examined the necessity of their enforcement and the reason why the rules were made.

In addition to that and in order to bring home to these new men

the importance of the Safety First organization, not only on the railroads, but in all the industries of the country, we show them the reduction in accidents brought about since the Safety First organization started, what it was started for, what it is trying to do, and what it has done. It seems to me, if we could commence with the new man and educate him along that line, and impressing upon him at the time he goes into the service what Safety First is and the danger of failure to understand and comply with the rules, that we might get some good results and bring home to the men what the importance of complying with the rules really means.

I would be very glad to hear from anyone else who may be present what plans, if any, they have adopted in the way of bringing home to new men, before they go into the service, something about the Safety First movement and the necessity of complying with operating rules.

CHAIRMAN BELL: We will be glad, gentlemen, to have a very thorough discussion on this interesting subject. I know we all appreciate its importance. I wonder if Mr. McGirr of the New York Central Lines would be good enough to tell us what they are doing along similar lines.

MR. F. P. MCGIRR (Safety Agent, New York Central Lines, Buffalo, N. Y.): I am not very closely connected with the operating department. My work is confined mostly to the inside of the shops, in connection with machinery tools, etc. We have a man here, Mr. Dayton, who undoubtedly can give you the information desired in connection with the operating department. I know that Mr. Dayton would be glad to give you his experience along this line.

COMPLIANCE WITH RULES.

MR. B. H. DAYTON (Safety Agent, New York Central Lines, Albany, N. Y.): We make a specialty of getting after the new men. In fact, I devote my time to looking after them. For instance, on the New York Central Lines, a man makes a trial trip; when he finishes that he goes to the examiner and fills out his book of rules, and at the same time he is given a test covering our safety pamphlet of forty rules.

His attention is called to the fact that, because an older man or someone else may say to him, "In order to get your work done, you will have to violate this rule and you will have to violate that rule," that does not cut any ice; it is up to the men to comply with the safety rules.

We have in our examiner's rooms a safety cabinet containing a number of views of men working in hazardous positions. For instance, in a small opening between cars, or probably kicking over a drawbar, or standing on the wrong side, or jumping on and off the running board of an engine.

This cabinet shows several views of all those things in a very comprehensive way. It shows the safe way and it also shows the unsafe way, and in some cases it shows what the result will be.

Our moving picture we generally send around about once a year. We have a Safety First car operating east of Buffalo and another car operating west of Buffalo, and it takes the greater part of the year to cover the entire territory.

Heretofore we have had a great deal of trouble in getting a large part of our men in to see our picture; in fact, they never realized what it was and did not think it amounted to very much—we could not get them to pay very much attention to it. Very recently we tried the idea of posting a bulletin that every man had to see that picture; if he does not go to see it at the point where he is working he will have to follow the car and see it.

That has worked wonders; in fact, a great many of the men have been more or less frightened, and the consequences are they have made it a point to see the picture. They said: "If we had known what it was we would have been in to see it a long time ago."

START NEW MEN RIGHT.

I certainly think, as Mr. Richards says, that the tutoring of new men is one of the biggest problems confronting us at the present time. It is a condition that we have to face, as it is highly essential that the new men should be started in right and their instructions should be very concise in every detail. In fact, in my work, I make it a special point to lay a great deal of stress on that feature, and after he has made his three trial trips and has studied his book of rules, I make a special point to find out what he has learned on his trial trips. Very frequently he has a little stage fright, or something of that description, and sometimes he does not thoroughly understand certain things and he is afraid to ask about them, consequently, when he goes out to do it himself he does not know what to do. I make it a point to give him proper information. A great many accidents which happen to new men are due to lack of a thorough understanding of rules.

MR. T. H. CARROW (Pennsylvania Railroad): Do you pay the men for the trial trips?

MR. DAYTON: No; the trips are made on their own time. We try to put them on trains doing local work; we lay out certain work within the yards.

MR. CARROW: Haven't you had complaints about the men working trial trips?

MR. DAYTON: No.

MR. CARROW: Do you put them in the yard in the daylight and have them work for a number of days?

MR. DAYTON: That has to do, to a great extent, with such conditions as you have at the points where you employed the men. On the New York Central Lines we put them on the switches first; after the new man serves in that capacity for a certain length of time, and until such time arrives when the man, if he is assigned to that work, is to be permitted to do brakeman's work, he gets experience with the switches in the different operations in whatever part of the yard he is in. It may be that he is throwing switches in the East End yards, in which event he would be assigned to a certain class of work. He is generally put on with an older man.

MR. CARROW: You have some yards where you do not have a sufficient number of switchmen to supply your demand for brakemen?

MR. DAYTON: We have very few such yards. There are very few cases where a man is put to braking right at the start. Of course, with the fireman, he makes his three trial trips and he has nobody to show him, outside of the engineer. In the yard, an older man is put with a new man, but we do not always put the man on daylight work the first time. Very frequently he sees only night work for a certain length of time.

MR. CARROW: The older man is put with the new man for how long?

MR. DAYTON: The length of time entirely depends on the judgment of the older man as to the actions of the new man. Sometimes one man will become familiar with the work much more readily than others and in that event the older man does not have to stay with him as long as he would with a man who does not catch onto things quickly.

MR. F. W. MITCHELL (Superintendent of Safety and Examination, New York, New Haven & Hartford Railroad Company, New

Haven): Is it the custom for the men to see the pictures on their own time or on the time of the company?

GOING TO THE MOVIES.

MR. DAYTON: Under the old working rules, before we had the new eight-hour working day, a man in the yard service was on the company's time, but under the new arrangement the men come around to see the picture on their own time. Our section hands and the men in our shops, where we cannot make other arrangements, the company allows them enough time to see the picture, but as far as the men in road service and yard service are concerned at the present time, they are supposed to see the picture on their own time. We try to show the picture at the most convenient time. They will come if we show the exhibit at 3 or 4 o'clock. The men getting through at 4 o'clock can see the picture before they go home. The men that start at 4 o'clock see the picture before they go to work. In this way it is possible for the men to see the picture at the most convenient time.

CHAIRMAN BELL: We are very much obliged to you, Mr. Dayton, for your interesting talk. Are there other questions anyone would like to ask or is there other discussion of Mr. Rockwell's paper? Mr. Richards' remarks about new men are well worth of consideration.

MR. D. A. KLUMPH (General Chairman, Safety Committee, Peoria & Northern Illinois Railway, Grand Rapids, Mich.): Whom do they hold responsible for the question of deciding whether the new man is capable of taking up the duties of brakeman or fireman?

MR. DAYTON: That is up to the conductor or the engineer with whom he makes his trips. We have a specially prepared form that shows what train the man is to go on. It is up to the conductor to see what the man can do and what kind of a man he is going to make.

MR. GEORGE L. WRIGHT (Chicago, St. Paul, Minneapolis & Omaha Railroad): In line with Mr. Richards' remarks, I wish to state in connection with the examination that is given to new men and list of safety rules that he takes upon entering the service, we have a list of questions gotten up by one of our employees. The first statement on our blank is to the effect that our road has organized a safety movement and asks the co-operation of employees. On the question blank there are twenty-three different questions. The blank is given to the new man to study three or four days before he enters

the service permanently. After the blanks are filled out they are mailed to my office and kept on file. After filling out the blanks and studying our safety rules we find that the percentage of new men injured is very small compared to the injuries received by the old men.

CHAIRMAN BELL: Have you that list here, Mr. Wright? Does it take in all departments or does it simply apply to the operating department?

MR. WRIGHT: Just train, engine and yard service.

MR. CARROW: I would like to ask a question: I would like to address it to both Mr. Dayton and Mr. Wright: To what extent have they noticed an increase in car damage due to the employment of new men? What has been their experience with respect to the increase in damages to cars and engines on account of employing new men?

CHAIRMAN BELL: I suppose you mean in damage to equipment due to rough handling by new men?

MR. CARROW: Yes.

ORAL EXAMINATIONS.

MR. DAYTON: I have not noticed any particular increase in damage to equipment attributable to new men. Unless the man was hurt in something that came in connection with the safety movement, or unless it was something which had to do with safety, it would be something that we would not go into very far.

Mr. Wright touched upon a subject which we cover in another way—the oral examination. After a man has been in the service for a year, for instance, we have an oral examination. In our particular work we really do not make an examination in writing. We hold an oral class. We ask a certain man a certain question and we reach all the men in that way. That is something, in fact, that I inaugurated only very recently. In our experience, where we found a man was violating safety rules it was due, in many cases, to the fact that he had only glanced at his book of rules and was not familiar with it. When we found that a man was violating one of the rules we would go to him and tell him that he was doing it the wrong way and we would then show him the right way to do it.

Very often the men would say that they found other men, when they got their safety rules, would simply glance at them and cast them aside. The consequence was that when you would ask the men a little later about any certain matter they would not know

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anything about it, owing to the fact that they had merely glared over the book of rules. They would not know whether they were violating a rule or not. If you spoke to a man about it he would not know any more about it than someone who had never had a copy of the rules. We are a little more strict now and we are asking men questions. If they have not studied the rules it will be evident by their answers. They have to study their rules or that fact will be disclosed when we make our oral examination.

We are keeping in close touch with the new men. We have a man on each division who makes it his duty to visit the yards and ride local freight trains. He gets in close touch with the men and has a talk with them. We find this has done a great deal of good. If you are unable to visit the yards once every week or if something turns up and you are unable to show up for three or four weeks the men begin to wonder where you are and miss you, and when you go around to their meetings they are glad to see you.

CHAIRMAN BELL: Mr. Wright, have you anything to say in response to Mr. Carrow's question?

CAR DAMAGE BY NEW MEN.

MR. WRIGHT: My experience has been that the new men do not damage the equipment as much as the old men.

MR. CARROW: I want to suggest in connection with the lack of interest of new men and the consequences of his inefficiency in the matter of car damage, and I could furnish statistics covering the damage to cars, I do not hesitate to say that the increase in damage this year, over a year when we were not employing new men, would be 50 per cent. I am keeping well within bounds; in fact, I do not even care to give you the actual figures.

MR. WRIGHT: The most damage we have had to equipment is some old, worn-out equipment you cannot use in the East. You send it out for us to use and you keep the good cars in the East.

MR. JOHN T. BRODERICK (Supervisor of Special Bureaus, Baltimore & Ohio Railroads): I would like to ask the gentlemen on the other roads what means they have of determining when certain rules are violated—when the violation of certain rules have come to their observation.

MR. T. R. McCAMPBELL (Safety Agent, New York Central Lines, Indianapolis, Ind.): In all the yards of the New York Central Lines there is a representative of the safety committee who will

committee to any one violating the safety rules—any violations observed by the safety agent, who visits the shops once or twice a week, are reported.

In regard to the damage in the equipment, I believe in the new employes as well as the old there are careful men and careless men. My observation has been that the careful new man will damage less equipment than the man who has been in train service for a long time. Jobs are rather plentiful at the present time and the old-timer is not very careful how he handles equipment, while the new man just starting in is very careful, because he does not know what the result of the damage to the equipment may be and what the resultant effect may be upon him in the way of future employment.

CHAIRMAN BELL: I do not feel that there is any very direct relationship between employment of new men and the increase in damage to equipment.

MR. McCAMPBELL: That has been my experience; there has been very little if any damage caused by new employes.

SEE MEN SEVERAL TIMES EACH WEEK.

MR. LEO BOSLOOPER (Safety Agent, New York Central Lines, Detroit, Mich.): In part answer to the general question which was asked in regard to finding out how the men violate a safety rule: The territory in which I am, which covers the Detroit district and most of the Michigan Central Railroad yards, there is an effort being made to make it our business to be on the ground at all times. We may see a man two or three times a week in one yard. Very often I run onto a man violating safety rules right in front of my eyes. I talk to that man and tell him what is the proper thing to do. Furthermore, I take his name and warn him not to do it again. I make it my business to see, two or three days afterward, what this particular man is doing. I observe his movements and if I find that he is again violating the rule I report it to the division superintendent.

I will state to you a little case that occurred not less than two weeks ago. A certain yard conductor at the junction yards was violating one of the rules in regard to safety conduct. I called his attention to the fact but he took it as a very light matter. I called his attention to the fact that the rules were there, not to carry around with him but they were there to be read and adhered to. Three days afterward I met the same gentleman doing exactly the thing that I had called his attention to and instructed him not to do a few days

before and as luck would have it about two hours afterward I met the superintendent. I called his attention to the fact that I had warned this yard conductor three days before and that I had found him violating the same rule again. That afternoon, when the conductor pulled in with his train, word was there that he was not to be placed in charge again until he reported to the superintendent.

Following that up, this yard conductor reported to the superintendent two days later and wanted to know why it was he could not take the place where he stood on the seniority list. The superintendent said: "I have no objection to you taking your place, provided you apologize to the safety agent and agree to abide by the rules. Furthermore, I want you, in the future, to tell every man you come in contact with during your day's work what the safety movement is, what it means, and what we intend to do to the men who continually disobey the rules."

TAKING DOWN SAFETY SUGGESTIONS.

That had a very good effect. There are two or three little stances in connection with the safety movement that happened around my territory and I know they are looking for me to come around. They all look for the safety agent; they are all interested. I carry a little memorandum book, it has about forty or fifty pages and I take down all the safety suggestions they make. They are all interested and take much interest in the work. After receiving a suggestion I do not drop it, no matter how trifling it may be or how consequential it may seem, because the New York Central has a policy that no matter how unimportant an item may seem to one of its employees they are only too glad to receive suggestions or reports of unsafe conditions in order that they may be remedied.

When an unsafe condition is taken up for consideration I do not take the name of the employee who may have called this unsafe condition to my attention, but I send him a copy of the letter showing what action I took in the matter. When the matter is corrected he is sent a letter advising him as to the disposition of the case showing that the unsafe condition is eliminated.

CHAIRMAN BELL: I am afraid, gentlemen, in view of the time that we will have to delay any further discussion of Mr. Rockwell's paper until later on.

The next item on the program is an address by Mr. C. M. Anderson of the Nashville, Chattanooga & St. Louis Railway, Nashville, Tennessee.

RELATION BETWEEN TIME LOST ON ACCOUNT OF
ACCIDENTS AND INJURIES AND THE OPERATION
OF RAILROADS.

C. M. ANDERSON, SUPERINTENDENT OF SAFETY, NASHVILLE, CHATTANOOGA & ST. LOUIS RAILWAY, NASHVILLE, TENN.

Mr. Chairman and Members of the National Safety Council: Mr. Guild, our most worthy Chairman of the Program Committee, has bestowed upon me quite an honor in asking me to appear before this distinguished audience of safety experts—men who, to the minds of all serious thinking people of our country, are engaged in one of the noblest works of the day. As I stand before you, I am reminded of the fact that my experience in the field of safety labors has not been so wide and varied as some of our more prominent workers, and perhaps I do not possess all the qualifications of a safety expert. However, I am very proud to say to you that I believe I do possess all the earmarks of a safety enthusiast—at least, I am striving to that end.

The subject upon which I have been requested to prepare a paper, "Relation Between Time Lost on Account of Accidents and Injuries and the Operation of Railroads," is one that strikes me as being very fitting at this particular time. Our Nation has been forced into a titanic conflict, and, when our government is sending its wealth and its armies into foreign fields in an effort to bring about an early close to the greatest struggle ever known, much more depends upon the industries at home than under the usual conditions.

Upon the successful operation of the railroads—the main arteries of transportation during troop movements as well as during the period of the war—this country and its people are counting, with a confidence truly characteristic, the effects of which are bound to be far-reaching. While the responsibilities upon us are now greater than ever before, still, with our splendid organization, the roads will, we know, be sufficiently able to shoulder the burden and achieve the results expected, and the thousands of loyal employes comprising these organizations—even though laboring under a severe strain—will, we feel confident, be able to do their duty full well. It devolves upon us at this time to concentrate our forces—start our great drive and beat down with persistent fighting the strongest enemy of railroad employes, carelessness, and throw around our men

every possible safeguard that will prevent accidents, in an effort to keep them at their posts of duty in good, sound physical condition.

ACCIDENTS A SERIOUS HANDICAP.

The loss of time by employees on account of injuries is a very serious handicap to the successful operation of our railroads, and the matter of how to improve the conditions has been, and is today most perplexing problem that is far-reaching.

In this connection, I wish to direct your attention to the fatalities and injuries to railroad employees during the year ending Dec. 31, 1916, as reported to the Interstate Commerce Commission, under whose regulations a man must be incapacitated for more than three days before an injury is reportable. There were:

116 shopmen killed and 70,036 injured.

1,193 trainmen killed and 43,929 injured.

425 maintenance of way employees killed and 31,326 injured. Making a total for the three classes of 1,734 employees killed and 145,291 injured, or an average of one man killed every two hours and one man injured every minute.

All of us read daily of the appalling results of the great battles for freedom and justice that are being waged in the horror-stricken sections of Northern France, Belgium and other places on the European continent, and with much concern we review the casualties in each important battle; but very few of our American people display any unusual interest in the large number of casualties amongst our industrial employees here at home.

Occasionally statistics published showing the number of fatalities and injuries to employees of railroads, etc., are marvelled at some few for the time being, but soon passed up and considered merely a matter of course.

Thus far in the great war in Europe, which has been raging fiercely now for more than three long years, well-founded statistics inform us that eleven out of every thousand are killed and injured or 1.1 per cent of the total number engaged. In our own hard-fought battles, in which we have been and are now desperately fighting to stave off defeat at the hands of our enemy, accidents to railroad employees, 9.8 per cent of the total number of men engaged during last year were killed and injured. If we should go back for the

From the comparison of casualties to which I have just called attention it is very evident that accident-prevention work demands deep thought and consideration at the hands of our people.

The railroad employees who were injured in 1916 lost an average of approximately ten or twelve days per man. This resulted in the loss of 1,452,910 days, or 3,981 years. To impress you with the seriousness of the situation and just what the relation between time lost by employees account of injuries means to the operation of railroads, the number of years lost as herein stated is equal to the labors of one man commencing 2,064 years B. C. and ending with the present time.

GOOD ORGANIZATION NECESSARY.

The successful operation of a railroad or any other large industry is mainly dependent upon a good organization. Next to perfecting and keeping this intact, the most important task is getting the greatest amount of efficiency out of it. Men cannot become proficient in railroad work in a short period—competent railroad men are not “incubated” in a few weeks. We all know that our skilled employees have undergone years of hard training before finally mastering their trades and before they are able to fathom the most intricate problems likely to arise in the course of their daily business. Therefore, it must be conceded that before the highest state of efficiency in our organizations can be reached, long years of experience are necessary for the employees in their various lines of work. As an example of the length of time a railroad employe must serve before he becomes skilled in his particular line of work, an engineer oftentimes serves twelve or fifteen years before he is competent to run a locomotive. Very few of our conductors are advanced to such positions until they have worked in other capacities for a similar period; a machinist apprentice must necessarily serve from five to six years before learning his trade; a section foreman eight or ten years; a boiler-maker four to six years, and so on.

When an employe is injured or killed, whether he is engaged in the transportation, mechanical, maintenance of way or other departments, the organization in that particular branch of service is disrupted and the efficiency there temporarily reduced or perhaps destroyed. Oftentimes when a trainman or other employe—whom it has taken years of careful training to reach such position—is killed, the company, as well as the man's family, is the loser, for

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the years of schooling and careful training he has been given order to prepare him for greater responsibilities are, in a measure, lost.

When an employe is injured so that he is incapacitated, either temporarily or permanently, the department in which he is employed suffers. If the next man in rank is advanced to the position made vacant—even assuming that he will make a satisfactory man—often takes days and sometimes weeks for him to become familiar with his new duties and surroundings. The same follows all the way down the line until the lowest man in rank has been promoted and then it becomes incumbent upon the company to employ an experienced man and go through the always slow process of thoroughly training him. Such changes, of course, result in lost motion and it is not difficult to see to what extent a railroad company is handicapped by the loss of time by employes account of injuries.

CONFUSION AND DISRUPTION FOLLOW ACCIDENTS.

I know of a case that recently occurred on our line where a section foreman was severely injured when a motor car on which he was riding was, through his carelessness, struck by a freight train and demolished. It became necessary for another section foreman to leave his gang for two days to accompany the injured foreman to the hospital, more than a hundred miles away. Other complications arose, for the track supervisor found it necessary to leave a worktrain with which he was engaged to go to the injured foreman's section, re-organize the gang and place a man in charge with less experience and knowledge of the work. This is given merely as an example of what confusion and disruption takes place when an employe is injured and how the organization suffers as a result thereof.

It very frequently occurs that after an employe has been injured and disabled for several days or, perhaps, weeks, when he returns to his work much time is lost while familiarizing himself with the surroundings and the changes that may have taken place during his absence.

There are many, many other ways in which injuries might affect the various departments and their progress, and it is plain to see what a great hindrance the loss of time by employes on account of accidents and injuries offers to the efficient operation of a railroad.

CLAIMS FOR PERSONAL INJURIES.

Aside from the serious disadvantages just mentioned, there are other important items that should be taken into account. Among the most prominent is the financial loss to railroads through the loss of time by injured employes. During the twelve months ended June 30, 1916, \$27,672,862 were paid out by the railroads in this country for claims account personal injuries to employes. This amount of money, even during the present time, with prices of materials, supplies and labor higher than ever before, would purchase 24,727 modern boxcars; 922 largest Mikado-type locomotives; 9,224,226 tons of coal, or 12½ per cent of all the fuel consumed yearly by the railways in the United States; pay the yearly salaries of 38,434 station agents and operators. In fact, there are many needed improvements to railroads in our country that could be made with an amount equivalent to that paid out for personal injury claims.

I do not contend that all of these claims might have been prevented, nor shall I attempt to make a statement as to how much of the money expended for these claims could have been saved, but we do know that something like 85 per cent of the accidents occurring on our American railroads today result from carelessness, and we believe there are ways and means to eliminate a large percentage of such accidents, thereby reducing the personal injury claims.

We are daily demonstrating that the desired results can be obtained by hard and persistent labor in the education of employes in accident-prevention work, and already we feel that our success in this direction has been such that the work itself can no longer be considered an experiment.

ACHIEVEMENTS WORTHY OF COMMENDATION.

In the short time the Safety Departments of the railroads have been organized and working, their achievements in accident-prevention work is quite worthy of commendation. It has been proven to us within the past few years that a most effective method of reaching the employes and educating them in safety work is through safety committees. If a committee has been selected with the proper care and the organization perfected as it should be, some very important work will be done and satisfactory results obtained.

There is, however, one feature in the safety work that I am particularly anxious to bring out, and this is the part that the officials

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of the railroads must play in the successful execution of same their lines. Realizing that their duties are arduous and their well occupied, I hesitate somewhat to comment on the apparent inactivities of some of the officers, but in my judgment officers from the highest in rank to the lowest, must be sincerely interested and devote as much as possible of their time actively to the work.

Through systematic accident prevention, injuries are reduced and the officials and subordinates are fully repaid, in my opinion for the time spent, since it requires no great effort on their part and as the labor and energy formerly devoted to work pertaining to personal injuries can be utilized in a manner that will be of no benefit to themselves and certainly far more profitable to the company.

There is little doubt, so far as I have been able to observe, that the officials are in sympathy with safety work and are interested in its success, but in some cases it has appeared to me when it came to actually putting their shoulders to the wheel the spirit of "Let George do it" often prevails.

The result of such an attitude on the part of officials has a bad effect with the committeemen and the employes, who get the same habit unless closely watched, and in this way the real spirit of safety work is soon destroyed. The officials, committeemen and employes may all contend that they are intensely interested in the success of any work that will tend to reduce the number of accidents and personal injuries—and we will grant that they are—however, unless they keep alive to the situation very little or nothing will be done. I can demonstrate such a feeling on their part, and, gentlemen, I want to take this occasion to say that safety work is, indeed, one thing where actions must speak louder than words if we are to accomplish the good we expect.

ENTHUSIASM MUST BE MAINTAINED.

Enthusiasm must be created and kept in our organizations, and the co-operation of all must be secured in the enforcement of safety rules laid down for the government of employes. When we are able to instill the proper feeling and spirit into all employes comprising our organizations, great strides will be made in accident prevention work and the impediments in the operation of our railroads, brought about through the loss of time by injured employes, will undoubtedly disappear.

There is every reason why our people should be tremendously

interested in a work that means prevention of accidents at this acute period. Just now the conserving of skilled railroad men is more vital to the roads and, in fact, the nation, than at any other time. The loss of employes through injury is felt just as keenly by the railroads as the loss of the brave and heroic soldier—who has been trained for months, and probably years, in the various kinds of modern warfare—is felt by the army.

Skilled railroad men make up one of the strongest and most necessary units in our industrial army at home and the loss of these "soldiers," through injury, or, for that matter, from any cause, reduces the efficiency of our organizations the same as the loss of the soldier upon the battlefield reduces the efficiency of the army. It is squarely up to the roads at the present time to keep the human machinery in the very best possible condition, because the successes of the armies in the field are depending upon the army of industrial workers at home, to keep the fires burning until the day of victory shall come. After the war is brought to a close and peace is restored over the whole world, we should not permit ourselves to gain the false impression that our struggles have ended, for we—the railroads—and, I suppose, every other necessary industry, will find themselves in a similar position. We will still have an important battle to fight, a struggle for efficiency in its highest degree, and in this hard fight we are, it is very evident, going to find ourselves handicapped and our progress to victory impeded for want of man-power. This is a fact that can not be overlooked or in the least underestimated.

CONSERVE MAN-POWER.

The loss of men, each skilled in his particular class of work, whether it be in the transportation, mechanical or maintenance of way departments, is keenly felt under the present conditions, but in closing I cannot refrain from stating that we shall all see the day after the close of the war, when the loss of the human machine will be felt very much more on account of the conditions I have just mentioned. For this reason I am particularly anxious to make the point that the responsibilities upon the men engaged in accident prevention work is heavier than ever before.

The loss of time by railroad employes injured in accidents, through carelessness or otherwise, has always been a factor to be reckoned with, but it will, in my opinion, mean very much more when peace is restored unless we are able to line up and successfully

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combat every force offering resistance to our main objective point that of training and keeping the railroad man at his post of duty from the accidents that are likely to cause disability for hours, days, weeks and oftentimes permanently.

CHAIRMAN BELL: Mr. Anderson's paper has been a very interesting one. Possibly he has so thoroughly covered the subject that there is little left to say in regard to it. If no one cares to discuss it we will go ahead with the program.

Mr. L. E. Abbott, Safety Commissioner of the Oregon Short Line, who was assigned the subject "Safety, Loyalty and Efficiency," unable to attend the Congress, and his paper will be read by Dr. G. B. Pfantz of that company, a member of the Safety Committee on the Oregon Short Line. We will be glad to hear from Dr. Pfantz.

SAFETY, LOYALTY AND EFFICIENCY.

L. E. ABBOTT, SAFETY COMMISSIONER, OREGON SHORT LINE
SALT LAKE CITY, UTAH.

Mr. Chairman and Members of the National Safety Council:
In the fall of 1913 a strike was called in the mechanical department of a certain railroad. John Burns, one of the mechanics, had passed his fifty-ninth birthday, and had enough years of service on his credit to entitle him, on his sixtieth birthday, to cease his work and be permitted to draw pension enough for him and his wife to live on to the end of their days. Burns had no bad habits, he was a good, Christian man. He was looked upon by his employers as a faithful employee. However, he was somewhat feeble for a man of his age and his "output" at best was not standard. He admitted that if he had to go out into the field of competitive labor his earning power would be about 50 per cent of the ordinary man's. "Will Burns go out with the strike?" was answered in the negative by his social friends, the merchant with whom he traded, and also by the railroad officials, because they argued, first, he had too much stake, and, second, it seemed impossible that the union would ask this old man to make such a sacrifice; but he was requested to go out and he did, saying: "I never expect to earn a whole day's wages again."

years of age, worked his way from a brakemanship up to a position as one of the oldest passenger conductors in the service. His run necessitated his being on the road twenty days each month, for which he was paid straight time, \$165. He had said to one of the railroad officials: "I am thoroughly satisfied with my work and I would not trade my job for any other on the road. I do not lie awake nights worrying my hair gray as some officials do, and, therefore, I would not trade with them. It is my ambition to remain with the company during my working life and then become a pensioner." A strike was called and he again came to the officials of the company and said: "You may put me down as one of the men who will stay with the company." But in a short time he came back and said: "I have changed my mind; I will have to go out on the strike. My wife and my son have put it up so strong to me I feel I cannot stay with the company during the trouble."

Andrew Drew was a passenger engineer. He worked five and one-half hours a day on twenty days in the month, for which he was paid \$225. He was a little under the pension age. He was asked to go out on the strike, the consequences of such a matter having been previously experienced by him. He was also asked by the railroad officers if he intended to remain with the company. He replied: "They have millions and I know they will beat us as they did before, but if I have to live with a pick and shovel the rest of my life I shall go out." He manifested some venom, a very different attitude from that of the others.

REPRESENT A MAJORITY OF THE MEN.

Some very caustic remarks were made about John Burns. Some stated he had lost his reason and others listed him as an anarchist, but I say to you that neither of the accusations is true. He is an unusual man, a good and loyal citizen and trustworthy. He acted in harmony with his convictions. The other two men realized they were making a great financial sacrifice and were also determined to stand by their convictions. These three men represent three important departments of a railroad, and I believe are representative of the majority of the workmen of those departments.

I have carefully investigated these facts and am able to vouch for their truthfulness. I have tried honestly and fairly to represent a condition in our present-day industrial organization by which we are confronted, and which, in my judgment, is the problem. I am thoroughly convinced that as long as this condition prevails among

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our workmen we cannot obtain a full measure of loyalty, and therefore cannot reach the desired standard of safety and efficiency.

Here it might be well to agree upon the object of our industrial organizations. So far as I have been able to discern, there is one object and that is to better the human being. It seems to me there can be no other legitimate viewpoint. The human being is the all. His development and perfection must be the one aim, therefore, the monetary returns must be looked upon as by-product. I contend that the lawful purpose of any man or group of men must be one that recognizes that progress, prosperity and contentment of the individual are the chief aims. Safety, loyalty and efficiency merely follow and do not precede the attainment of such aim.

If I am right about the object of our industrial organizations, then, since every worker is a part of that organization, it follows that what is good for the organization is good for the individual and vice versa. A member of an organization, like an organ of the body, has functions to perform, and to obtain the best results these functions must be performed in harmony with the activities of the other organs of the body. May we not consistently say that an organization is no better than its worst element?

THERE IS A REMEDY—CONTENTMENT.

If we agree upon the foregoing, that a condition of friction and discontentment prevails among the human element of the industrial organizations, we may consistently ask: Is there a remedy, and if so what is it? From my varied experience with the human being, ranging from the child in the school-room to the criminal, and including the workers of many of our industrial branches, I unhesitatingly say there is a remedy, and, in my judgment, expressed in one word that remedy is *contentment* in labor. I want to go on record as saying that from my years of experience I am thoroughly convinced that contentment in labor cannot be bought with an increase of wages, neither can it be forced, but it can be produced by the application of the laws which govern the growth and development of man.

... The beautiful rose growing in the garden, with its charming colors, attractive fragrance and perfect form; the golden grain rippling in the gentle winds of summer, with its hopes of reward; the mountain streams, rippling down over their beds of rocks through the channels of majestic pines; the ponderous locomotive attached to the great engine, with its massive wheels and its powerful pistons, all these are the products of the laws which govern the growth and development of man.

its path of safety by little rims of steel, are but evidences that physical results can be obtained only by conforming to physical laws. This we all know. Is it not within reason, then, to conclude that the human mind—the supreme guiding power of worldly things—is also conformant to laws? I answer in the affirmative without fear of contradiction, and I believe these laws are as simple and obvious to the casual observer as the laws of nature. Why they are not applied more universally is the perplexing query in my mind. Let me mention one which I think is self-evident to all within the sound of my voice and which I believe must be applied in our work before we can obtain the desired results. It is this:

“The ordinary human being will be just as much interested in the organization of which he is a part as he is convinced the employer is interested in his welfare.”

Then it becomes evident that the desired results can be obtained only by a change in the attitude of the workmen, which change must come through a proper education.

MISUNDERSTANDINGS AND MISCONCEPTIONS.

In my earlier and more radical life I was thoroughly convinced that this discontent in labor was chargeable to the “master” on account of his inordinate desires to become rich at any cost. I admit I was mistaken and imagine I can see many causes on both sides for the present condition. During the last few years I have had a position, as it were, between the men and the managers, from which viewpoint I could observe the doings and hear the reasons of both. I am now convinced that our present condition is largely the result of misunderstandings and misconceptions. Early in my experience, when trying to “drive a bargain” for a personal injury to an employe, I was confronted by the following words of Mr. E. H. Harriman, the memory of whom makes me a better Christian: “In such cases I want practical Christianity applied.” The spirit which seasoned that remark actuates and controls his successors, so far as my personal knowledge goes, and, therefore, when I hear what I do on various occasions I must conclude many of our laborers misunderstand.

If we would eliminate discontent among our laboring men today we must do it through education, tempered with justice. In the

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course of that education I suggest that the following subjects be lost sight of:

A COURSE OF EDUCATION.

1. *A proper selection.* A definite study must be made with view of selecting a man who will prove satisfactory in the work which he has been assigned.

2. *A central employment department should be established.* In my judgment this department should not only have the final word as to who should be employed, but it should have the final word to who should be discharged.

I believe that most of the disaffection, misunderstanding and discontent in labor today has been caused by "the boss"—"the tyrant"—who has risen to the position where he can extend his chest, swing his arms and utter a strain of profanity, concluding "You are fired!" This is probably due to the fact that the purpose of the organization, and, therefore, the object of the higher-ups is a mystery to him. He interprets the rules which are meant to develop efficiency incorrectly and unjustly. A careful research by scientific men, who have been placed in our organizations as efficient directors, points out as one of the most serious leaks in our modern day organization the unnecessary turnover in labor. This is partially due to the great number of men who are dismissed from service of the company during the year.

3. *Promotion.* There seems to be nothing which causes more disaffection among the employees than the indiscriminate way of promoting foremen. Those who have been instrumental in bringing about a good result in an organization feel that they should share the benefits achieved and be recognized by promotion. We should not overlook any opportunity to reward in the line of promotion, according to the merit of the individual. Many organizations have sought foremen from the older men, but this should not necessarily be done. I suggest that efficiency records be kept and foremen selected by merit.

4. *Training for officers.* Before placing a man in charge of a small squad of men to do effective shooting our government treats him as an officer. By analogy it is important that we teach our foremen the purpose of the organization and train them to handle men.

5. *We must adopt a definite plan for safety and betterment of work, and a plan for the superannuated employee.* Let me have

your attention to the great Union Pacific System relative to its pension system and insurance plan.

I have not attempted to work out in detail a course of education. For a definite plan I call your attention to the great work that is being done by the National Association of Corporation Schools.

In conclusion, let me say that the work outlined above has thus far, in our organization, been handled only by the Safety First department. I am sure a Safety First organization of any company which contents itself with safeguarding the machinery and the method will fail. To obtain loyalty, which is the forerunner of safety and efficiency, we must devote our energies to the improvement of the human being.

DISCUSSION.

CHAIRMAN BELL: Is there any one who has any remarks to make in connection with the paper by Mr. Abbott which Dr. Pfantz has just read?

MR. LEO BOSLOOPER (New York Central Lines): In listening to the paper just read I was inevitably led to the conclusion that there is a lot to talk about in connection with organization. It is a big help to the Safety movement if we approach it in the right manner. Just to give an idea of what we are doing in our territory: We are going to the organizations of telegraphers, engineers, firemen and switchmen; we are going to all those organizations and trying to interest them in safety. It has worked out very satisfactorily so far and is a success to such an extent that at the meetings of these organizations they devote ten or fifteen minutes to talking on the safety movement.

Communications were coming to the superintendent of the Michigan Central, where I am located, from several organizations about something they had to pay strict attention to immediately. It did not have to be put over for a sub-committee or some one else to investigate or look after it. The communication stated unsafe conditions as reported in their lodge room. The stationery used was their lodge's stationery. Their communications bore the seal of the association and it was official. The officials of the railroad were notified in the communications that it called for immediate action and at the very next safety committee meeting the division superintendent laid great stress on the communication in regard to the unsafe conditions and they were eliminated immediately. The secretary of

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the committee was instructed to notify the secretaries of these organizations of the elimination of the conditions that they report

TEMPERAMENT OF FOREMEN.

I have heard a great deal of talk in regard to the foreman and sub-foreman—about their being tried out for efficiency. I believe that in trying out a foreman or a sub-foreman his temperament should be taken into consideration. One who is excitable, nervous, and strung up is not liable to get along with the men over whom he has supervision as well as one who has a cool head. The men shun him when he comes around where they are, thinking he is going to find fault. He gets excited about something that happened a day or two before. If he is a man that is not nervous or high strung and has the confidence of the men under him they are going to be interested in the safety movement. They will call his attention to conditions as they find them and they have no doubt they will be remedied.

Holding the foreman responsible for each and every unsafe condition you may run across, to my mind, may not be such a good course. It is almost impossible, in some cases, for the foreman or the sub-foreman to see all those conditions. He is taken up quite a bit by the line of production, he has to produce the goods; he cannot be around looking for boards with nails sticking up or ladders that might have a rung out of them. It is up to the men under him to take care of that.

WHEN THE MEN GET TOGETHER.

While the safety movement is built around the officer I think the rank and file of employees provides the foundation. When you have the confidence of the men under you at all times I believe you will have success in the safety movement. Unsafe conditions will be eliminated, unsafe practices will be discussed among the men at noon hour or when they may have time during working hours. They will tell each other about seeing Bill Jones doing such and such a thing, they will say he was oiling his machine while it was running or they will say that Tom Smith had a ladder that did not have a rung in it. They will talk about such things and they will call them to the attention of the sub-foreman.

I want to tell you about a little thing put into effect in the shops of the Michigan Central at West Detroit. We are about

an investigating committee. They in turn will automatically become members of the shop committee. It will be their duty to report the causes of accidents and suggest remedies. These men are showing a great deal of enthusiasm. They are talking all through the shops about whom they are going to vote for. Any man in the car shop or the locomotive shop is eligible to be a member of the committee.

We also will install in the different departments in both the locomotive and the car shops, an accident score board. One part of the board will show the number of accidents the day before. A space will be provided where you can write "One" or "Two" or "No accidents yesterday." Below there will be a printed sign "No accidents in — days," with a space for the number of days—two days, ten days, fifteen days or twenty days. If an accident occurs a screen will be drawn over that portion of the board and the accident record shown. Below is a large space for "Cause and the Remedy."

The committee will be elected from the car shop and the locomotive department and it will be their duty to find out the cause of accidents and the remedy. It will work up a lot of rivalry between the different departments, to see which one can keep accidents down to the lowest possible score. They will all endeavor to keep their accidents down as low as possible.

CHAIRMAN BELL: I see Mr. Oyler of the Cumberland Valley Railroad in the back of the room. I had a very pleasant experience going over his line at one time. They have a short and readily supervised railroad and are in a better position to do good work among their men than most of us. I wonder if he will tell us about his methods.

EMPLOY HOME MEN.

MR. EMORY C. OYLER (Assistant Engineer and Chairman of Safety Committee, the Cumberland Valley Railroad Company, Chambersburg, Pa): We have a little road, only about 164 miles long, and I think our loyalty and efficiency is due to handling not floating men, but persons who are natives of the valley, who are married and have home interests. They are very much interested in the welfare of the company and I think that means a great deal more if the men are so-called floaters.

We try to remedy dangerous conditions and practices by having our safety committee members, a chairman and fourteen members, appointed from the various branches. They do not spend any special time on safety work, but look out for the work while on duty.

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We have monthly meetings and issue a monthly bulletin in that way we keep safety work before them at all time. It works very well, but I do not know how it would work on a large system. We try to have plenty of supervision on our line. Our president thinks nothing equals adequate supervision. We have more assistant train masters and men of that kind, in proportion to our mileage than most roads and we think nothing tastes better than supervision.

MR. H. S. BALLIET (Assistant Terminal Manager, Grand Central Terminal, New York Central Lines, New York City): It would be interesting to know how many train masters his road has on its pay roll. We understand it is a very busy line, and we are interested in the organization, particularly the total number of train masters.

MR. OYLER: We have four train masters and three assistant train masters, one foreman of locomotives and two assistants and there are also special men.

CHAIRMAN BELL: I was impressed with the fact that the Cumberland Valley has a lot of supervision and I think that contributes largely to their successful operation. They operated their whole railroad for a year without an employee being killed and with only one serious injury, one broken finger.

MR. OYLER: One joint of the finger lost.

CHAIRMAN BELL: And no fatalities?

MR. OYLER: No fatalities.

THE BEST IN THE INDIVIDUAL.

MR. DAVID MORE (Shop Safety Inspector, Union Pacific Railroad, Omaha, Neb.): I want to tell you one thing, gentlemen, in connection with this matter—it is a fact and I do not suppose there is a gentleman here who will deny it—the president of the railroad has certain privileges. He is president and he has privileges he is compelled to exercise. The general manager has certain privileges and the same is true of other officers connected with the railroad but I also want to tell you that every man connected with a railroad has a privilege belonging to his particular position. The sweeper of the shop has a privilege and it is a privilege just as much as the privilege of the president of the railroad.

That brings out the individuality of your men you will never get in any other way. We all recognize that there are in the service certain bull-dozing men.

When you are carrying out fixed principles...

fire men, but when you are dealing with individuals you must bring out the best there is in that individual and the only way to do it is to show him that he has a privilege in your shop, a privilege that belongs to him as much as it belongs to the president of the railroad.

If I run across an apprentice and find him working on a bad lathe I say to him: "Why are you working on a lathe in bad condition? Don't you know that you have permission to go to the boss and say: 'Fix my lathe, repair my machine; I cannot work unless it is in proper shape.'"

The moment you do that you have an organization that is interested in what is being done, working in an exceedingly striking way and loyal to their interests. We are all very apt to get an idea that we are just working for money. It is true that we are, but there is something in life besides money.

As Safety First men you and I have a larger work before us in the United States today. Something new bobs up every morning, something of interest is right before our eyes every day and it brings out our individuality. You have to bring out the fact that each man has certain privileges, the same rights as the man above him, and as long as you treat men in that way you will get the very best there is in them. You might make a man do this or that by clubbing and forcing him to do it, but you will not gain anything by it. It is just like all other propositions, where the workmen are not interested you may talk safety to them all you want to and they may carry out your instructions while you are standing near, but the minute you turn around it is a different matter. Get the men interested and you will be successful in safety work.

TRANSFERRING MEN.

We transfer our men from one place to another. If a man is not doing very well over here I transfer him over there. I go to him and ask: "What is the matter?" He will say: "I do not like this job, I would like something else." I say to him: "You pick out your job and I will give it to you." I have found it is possible to get the very best out of a man when you treat him right. If he is not satisfied I think he should be transferred to some job that will suit him better. It is much better to transfer him and try to put him in a position he will like than to fire him. Unless your workmen are satisfied they will not do their best and you will be up against a losing game. It is necessary that the workmen be thoroughly satisfied with their jobs.

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A dissatisfied workman is the poorest asset you can have around place. I have overcome this in a large measure by transferring from one position to another with a view of creating in them a feeling of satisfaction in their work.

The reason why we are not getting output in our shops at our railroads today is because we are trying to get out something with the wrong kind of material. If Jim Jones and Tom Smith cannot do a certain line of work they can do some other work somewhere else. A man that is adapted to machine or lathe work cannot work a locomotive because he does not understand it—he is a machinist and it is a specialty with him.

I am telling you facts: you may not agree with me, but I believe I am right. Men are often specialists; one is best adapted for a certain position, a certain job; he can do work that few other men can do and all that is necessary is to give him the kind of work he is best able to do. We have to bring out the best that is in the man, loyalty and efficiency and we can do this if we do our part.

If a well is nearly dry and you cannot get water, the only thing to do is to prime the well and get the water from the bottom. It is like getting water out of a well—getting good out of men—the only way is to get the individual interested in what you are doing.

Every one is familiar with the problems of human nature. You cannot stand up against some men, you can drive them, but there are some men that you cannot drive. Individually we have to adapt ourselves to the circumstances in which we find ourselves. Let the men realize the fact that they have certain privileges and have a perfect right to exercise them.

CHAIRMAN BELL: I would like to ask Mr. More a question. Do you understand you are an expert on shop practices?

MR. MORE: Yes, sir.

CHAIRMAN BELL: On the Union Pacific do you have a shop rule book for men employed strictly in shop work?

MR. MORE: We have not.

CHAIRMAN BELL: Have you had any difficulty in enforcing shop rules? Although you may not have fixed rules perhaps you have rules and regulations of some kind for the conduct of shop work. What I am getting at is this: Whether or not, in view of your method of looking at the matter of employment of shop men (which in my respects is rather unique) whether or not you are able to get cooperation in connection with the carrying out of your rules and regulations?

COMPANY NOT ALWAYS RIGHT.

MR. MORE: We do not have any trouble in connection with our shop rules. I do not want to criticise any gentleman here, I do not want to be personal in my remarks, but I read a statement in a monthly journal (if the gentlemen here representing the railroad do not take offense) of a certain railroad which bought enough goggles to supply every individual employe in a certain state. They put it up to their employes, because the law was behind them—they played politics. The railroad companies are not always right, the railroad company is wrong sometimes and I can prove it. I am going to say what I think. I may lose my job on account of it but I am going to tell the truth.

This railroad has hidden behind the laws in certain states. "We have goggles for every one of our men. You can wear these goggles if you like, but if you get your eyes put out without wearing them, the law says we do not have to pay." That is a very poor law, to my mind.

If we played that thing where I am I would quit my job tomorrow.

We have no trouble with goggles. I tell the men who do not wear goggles that they do not work, that is all there is to it and that ends it. That is not law with a club, it is law by persuasion. I go to a man working at a machine and show him a pair of goggles with both lenses broken. I say to him: "What does this mean? Both the lenses in these goggles are broken." I can talk on that, week after week and tell the men that the goggles preserve their eyes. I ask them if they want to preserve their eyes. It is perfectly clear what would have happened to the man's eyes if he had not had those goggles on, and I appeal to him as an individual if this is not a safety device worth having. A pair of goggles broken all to pieces is the most conclusive evidence of the necessity of using goggles. It brings right home to the man the advisability of their use.

"PUT ON YOUR GOGGLES."

The moment you employ a man you must start to educate him to wear goggles. I will tell you a little story: Last Friday one of our highest class men was working in our boiler shop. A lot of heavy boiler plate work was going on and this man was on the job. I saw he was working without goggles and I said: "Charlie, put your goggles on. It is a bad example for the men on that job for you to

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be working without goggles." He kept right on working with goggles, so I said to him: "Charlie, you will have to put on goggles or shut off the machine." He got mad and began to c He said: "I do not know who you are, I don't care where you c from; I won't wear goggles." "Well, if you don't wear the goggles you will not work here," I said; "it is your job or mine. As long as you have taken a position like that and are trying to force me, I am going to force you." I called the superintendent and I told him that I had a very serious matter to talk to him about, and I mentioned this case. He said: "I will take care of Mr. So-and-So."

The story of the goggle incident went to the president of the Union Pacific. Charlie was wrong. He will never work without goggles again. If he does, he will get a new job. It applies to the president of the railway as much as it does to the sweeper. There is no difference. It is a law by persuasion; it is not law with a club.

We have reduced eye accidents on the Union Pacific 65 per cent by the use of goggles. We have no trouble in the shops. You go into the boiler shop any time you want to, you will not find any man working without goggles. The men would no more think of putting on a bar without wearing goggles than they would think of walking into the boiler shop without a pair of shoes. The goggles are just as much a part of the make-up of the men as their shoes. Gentlemen, it works fine. I am particularly proud of that place, as far as goggles are concerned. We have our troubles, but there is a way to get right to the front, to get right in touch with everyone and that is by winning the confidence of your men. A hot-headed fool will never make a good foreman. Meet your men as individuals and deal with them as such; assure them they are a part of the organization and you will meet with success. We cannot do without the

MAKING SAFETY FIRST SUCCESSFUL.

Here is another way we put it up to these fellows: "We cannot have Safety First unless you are willing to help us. If you will help us succeed, we will, but unless you help us we cannot accomplish anything." We impress upon the men that what they are doing is making the Safety movement a success. If you convince them that it is to their interest to push the movement you are going to have their assistance.

We have a man on the Union Pacific Railroad who worked fifty-one years for the company. His name is Mike Foley: he worked for

the fifty-one years and is independent. I could not have held Mike Foley's job that length of time,—it would have driven me crazy,—but he went along for fifty-one years. He was pensioned on the 1st of August and has gone home worth \$15,000. He made all that money on the Union Pacific Railroad.

It is not a question of wages, it is a question of being satisfied, and that man was satisfied. The only way is to get at the individual thing and work it out. It is in there. You see a boat moving along but you do not see what makes it go. It is what is inside of it that makes it move—it is not a case of hollering and swearing.

I do not care where you come from, I am going to tell you gentlemen what you need—a little enthusiasm injected into you. I heard a man on the elevator say the other day: "The idea of a railroad company telling me they want engines out on time and try to work Safety First at the same time. It cannot be done."

I had a general foreman who would not look at me when I went on the job. He is a friend of mine today. He said: "More, when the Safety First movement was inaugurated I was opposed to it. I have only been in the movement a very few months, but I am working it for all it is worth—200 pounds of steam—superheated at that. When you started the Safety First movement I had no use for you because you stopped the output of the shop."

I work the Safety First proposition and I work the output; I work both ends. I know as much about it as he does. I do not want his job. He said to me the other day: "The Safety First movement has helped us in the output of our shop. It has helped us and it has produced good results. It helps the shop."

GETS RID OF OLD STUFF.

You have to see that the tools the man is working with are in first-class condition, that the lathe on which a boy is working is properly centered—if you properly center the lathe the boy's output is immediately increased. Anything you do helps the output. Let me tell you a story, just to illustrate my point a little more clearly: My grandmother was a very economical lady and when she received anything with a piece of paper wrapped around it she would take the paper off, fold it up and save the string. She did that for forty years. Some friend of hers, looking through the papers found one forty years old. He spoke about it the other day. "My wife does the same thing," he said. "The other day she came in, folded up the paper and put it away. All of a sudden she woke up to the fact that it

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was twenty minutes to 12 and that her husband was just due home to dinner, and she began to hurry. She turned and ran into the door, bumped her head and got a black eye. "That's what she got for wasting her time."

Saving up old stuff always creates trouble in the shop and creates trouble at the home. Get rid of this old "fossilized"

The question is, gentlemen, what are you going to do with a poor man who is trying to make a success but who really fossils in this way? I am not throwing bouquets at myself, but if you find a man to fill my job better than I can I am perfectly willing to let him do it. I am willing to shake hands with him and hand over my job. Any man who can beat you at your job shows you are down and out and ready for the boneyard.

If you make your bed six inches too short and expect to sleep out in it and have a good sleep part of you is going to get up sore in the morning. Suppose your bed is long enough for a rest, but your covers are six inches too short, your feet will get cold. It is all according to how you make your bed and how you make your covers.

Don't find fault with this fellow and that fellow. We are all people. It is up to you and it is up to me and if I fall down on my job then I am not any good. If I fall down you should get the fellow that can do the job better than I can.

BEATING THE BOSS TO IT.

I had an experience in Chicago some years ago that was interesting. We had a man come into the shop on the Chicago and Alton Railroad—he believed in making the fellows work. He said: "Make the boys work, make them do more work; we have got out two more engines this week." He would bring up the work and he would say to me: "More, that is all right, go right ahead and get the work out." I certainly did, I got it out and I would bring it back to him and ask him for more work. "I have finished, I want more work." I was boss in two weeks. I beat him at his own game. Instead of saying "I will not pay any attention to him, I will not do much work and that is all," I went him one better and beat him at his own game. This is an illustration of what you have to do when a man tries to beat you at your own game—it is putting it all over them. If the man goes you one better, go him one still better. It is one of the best games that a man or woman can play. In S

is going to stick with us and is going to be of the greatest benefit to all concerned.

CHAIRMAN BELL: The meeting of the Railroad Section will be resumed at 9:30 o'clock tomorrow morning. The program is quite lengthy, and we would like to start promptly.

Is there anything of importance to come before the meeting? If not, as the hour is late the session will stand adjourned.

THURSDAY MORNING SESSION

THE meeting was called to order by Chairman H. J. Bell at 10:00 o'clock.

CHAIRMAN BELL: The meeting will please come to order. I want to call the attention of the meeting to one thing which so far has not made very great headway on the program. An announcement has been made in connection with the round table meeting for tomorrow morning. At this meeting we will discuss subjects which have been handed in during the regular session, as per announcement made at the opening meeting of the Railroad Section. If advisable, we will also take up the discussion of regular topics continued from our regular sessions. The round table meeting will be extended over to the afternoon session for further discussion, if necessary. We have not had any suggestions so far, but hope you will all bear it in mind and if you have any thoughts or ideas you would like to express, or if you feel that topics on our program have not been completely and conclusively discussed, please call the attention of the Secretary or the Vice Chairman to that matter, so we can give Mr. Smallen something to think about tomorrow.

The first topic on our program this morning is one which should invite a rapid-fire discussion. The gentleman who is to discuss it has made a rather unusual study of the subject. I am sure we are going to be very much interested in the address by Mr. T. H. Carrow, Safety Inspector of the Pennsylvania Railroad Company, on the subject of "Employment of New Men and Their Liability to Injury; (a) Transportation and Operating Departments, (b) Maintenance of Way and Mechanical Departments, especially in regard to Foreign Labor." Some of the delegates will remember at the Philadelphia Congress that the foreign labor agent, if that was his

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title, for the Pennsylvania Railroad, gave us some very interesting information regarding the plan then in effect for the education of Italian track laborers. I am sure that Mr. Carrow is going to interest you very much.

EMPLOYMENT OF NEW MEN AND THEIR LIABILITY TO INJURY: (a) TRANSPORTATION AND OPERATING DEPARTMENTS; (b) MAINTENANCE OF WAY AND MECHANICAL DEPARTMENTS, ESPECIALLY IN REGARD TO FOREIGN LABOR.

T. H. CARROW, SAFETY INSPECTOR, PENNSYLVANIA RAILROAD
PHILADELPHIA, PA.

Mr. Chairman and Members of the National Safety Council:
At the beginning of the present era of unprecedented business activity there were employed on the railroads of the United States 1,500,000 men. With the continued increase in business there has been a corresponding increase in the number of employees, until today it is assumed that the total reaches at least 1,800,000, or an increase of 20 per cent over 1915.

In normal times between 80 per cent and 90 per cent of the employees on the railroads have at least two years' service and the majority of these have many years' experience, indicating that a greater part of the working forces on the railroads is made up of permanent employees. Nevertheless, the number of men hired yearly to take care of the labor turnover on some of the larger railroads, even in dull times, is equal to 30 per cent of the total number in service; while during the present year some railroads, particularly those located in the munition manufacturing districts, are having a yearly turnover equal to the average number of men making five years' time. So, after making due allowances for those roads which have a comparatively permanent force, it is assumed that the turnover and the increase in the working forces on all the railroads in the United States at the present time is equal to at least 900,000 men yearly and the actual number may even exceed this figure.

It is impossible to determine the actual number of men now employed on the railroads in the various departments. It is even more difficult to determine the actual extent of the labor turnover.

Commerce Commission and the experience of a large railroad an estimate is made as follows:

<i>Occupation—</i>	<i>Number in Service.</i>	<i>Turnover.</i>
Station men, except agents.....	175,279	171,000
Train service men.....	329,799	99,000
Shopmen	407,729	180,000
Trackmen	397,053	387,000
All other employes.....	490,140	63,000
Totals	1,800,000	900,000

On some of the larger roads about 33 per cent of the total number of injuries occurring at the present time involve men who have been in the service less than six months; while nearly one-half of these occur to men who have been in the service less than thirty days, the percentage varying in the different departments, according to the nature of the work performed. On the basis of reports made to the Interstate Commerce Commission for July, August and September, 1916, it is estimated that there will be 3,024 fatalities and 192,788 injuries to railroad employes during the present year, and, using the above percentage, 64,618 of the injuries and fatalities will involve men with less than six months' experience, while more than 30,000 will involve men with less than one month's experience.

The above figures, showing the number of employes in the service of the railroads of the United States, the extent of the labor turnover and the number and percentage of inexperienced employes injured, clearly establishes a definite relation between the employment of new men and accident frequency. This being done, it is in order to call attention to certain conditions in various branches of railroad work which render employes more liable to injury during their early period of service than after a certain amount of experience has been acquired.

TRAIN SERVICE EMPLOYES.

Getting on and off cars, walking on top of moving trains, setting and releasing hand brakes, coupling and uncoupling, operating switches, firing locomotives and similar operations are in themselves no more hazardous than other ordinary manual labor, but, when the movements of engines or cars is involved in connection with this kind of work additional hazards are introduced, which experience alone can teach a man to ward against under all circumstances.

From the very nature of train operation it is to be expected that the most prolific cause of fatal injuries to train service men is being struck by trains, nineteen out of every 100 fatalities being attributable to this cause, and when it is remembered that even the old and experienced men occasionally walk in front of moving train and thus sacrifice their lives, it is easily understood why it is that a too frequently the young and inexperienced man becomes a victim of this ever-present menace to personal safety. The unfortunate feature of this aspect of the question is that no amount of instruction will take the place of actual experience; for one must be on the ground and personally observe the movement of trains in the yards on sidings, and on the main track in order to be thoroughly imbued with the necessity for being constantly on the lookout.

Coupling and uncoupling cars is fraught with danger under any circumstances and no matter how thoroughly instructed the new man may be, unless he is by nature very cautious, combinations of circumstances may arise when he is performing this particular kind of work which he may utterly fail to anticipate. It follows, therefore, that the strict observance of the rule which prohibits going between moving cars to couple or uncouple and the application of the principle of "Take no chances" are the new man's best guide in performing this kind of work.

On account of the increased size of rolling stock, limited trackage room and unalterable topographical conditions at many places on the railroads of the United States, the distance between the track and structures alongside the track is limited, and as well as the railroads would like to eliminate all short clearances it is a physical and an economic impossibility to do so. However, this is a hazard that can be readily pointed out to the new man and if he can only be taught to bear in mind the necessity for not permitting his body to extend beyond the line of the cars, except when he has a clear and unobstructed view, he can protect himself from injury from this cause.

MAINTENANCE OF WAY EMPLOYEES.

As in the train service the most prolific cause of serious accidents among maintenance of way employes is being struck by trains, sixty-eight out of every 100 fatal injuries to trackmen being attributable to this cause, the difficulties the management of a large railroad encounters in this connection being illustrated by the report of an accident.

"At 4:15 p. m., clear weather, passenger train No. 41 struck and killed a track foreman and three laborers, the latter having been in the service less than one month. The accident occurred on a straight line two miles long. The gang consisted of ten men and the foreman, who were raising No. 3 track, when they cleared for freight extra No. 3000. Seven of the gang cleared on the outside of No. 4 track, the remaining four, including the foreman, taking a seat on the north rail of this track and were in this position when struck by No. 41. Atmospheric conditions and the absence of wind resulted in the steam and smoke hanging low over the track, which prevented them from seeing and the noise of the freight train from hearing the approach of No. 41."

The foreman in charge of these men had worked on this subdivision twenty-two years and had been frequently instructed both in regard to the danger of sitting on the track and failing to clear all tracks when necessary, and so far as his superior officers knew he was a safe and reliable man, and even if there had been any doubt as to his ability or his disposition to protect himself and his men from injury it would probably have been impossible to have obtained a better man for the job, since there is and has been for a long time an extreme shortage of track labor of all kinds.

Loading and unloading rails, frogs, timber and other heavy material is always more or less hazardous even to the experienced man, but with the new man it is doubly dangerous and it is also the kind of work the dangers of which no amount of instruction will insure employees warding against. There are also many other kinds of work in the maintenance of way department, such as tamping ties, driving spikes, etc., which are much more hazardous to the man who has had no experience than to those familiar with the work.

FREIGHT STATION EMPLOYES.

Accidents to freight station employes, as a rule, are not as serious as those occurring to other classes of railroad employes; on the other hand, freight employes are more frequently injured than any other class. At some of the larger stations the ratio of injuries among freight handlers alone amounts to as much as 75 per cent yearly. Nearly all of the larger freight stations throughout the United States

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have had a labor turnover during the present year many times greater than the average number of employees in the service. At many stations the entire platform force have quit in a body, places having been filled by men who had never before had experience in freight-station work. One large station, employing men, whose experience corresponds with many other stations of similar size, had a turnover in the first six months of the year amounting to 2,500 men, or five times more than the number on the pay roll at any given time.

MOTIVE POWER DEPARTMENT EMPLOYEES.

In normal times the labor turnover among motive power department employees is made up very largely of unskilled labor, but the present demand for skilled labor has resulted in the working force being depleted in all branches of the motive power department. The prevention of injuries among such employees is largely dependent upon familiarity with the use of tools, handling material, the movement of cranes and other work incident to the construction and repair of locomotives and cars and until the men become familiar with the layout of the shops and the work in which they and their fellow employees may be engaged, they are less likely to ward against the natural hazards of the business than they are after some experience has been acquired. In many shops the working forces have been largely changed in recent time, and, as in all other departments of railroad business, the necessity for employing new men has created additional difficulties from a safety standpoint.

Many shops are now employing women to fill the positions formerly occupied by men, but sufficient time has not elapsed since the departure was made to determine the relation the employment of female help bears to accident frequency. It is believed, however, that female workers, as a general rule, are not as liable to injury as men, but it will require some time to determine the exact facts of the matter.

PROPERTY DAMAGE CAUSED BY NEW MEN.

In connection with the injuries sustained by new men, it is pertinent to call attention to the excessive amount of property damage attributable to the inefficiency of this class of employees, particularly in connection with shifting cars in yards. Recent inspections have shown that the damage to equipment during the present year in many cases is 100 per cent greater than in previous years. There is a

marked increase in loss and damage freight payments, a large amount of which is attributable to the same conditions. This point is of great importance, as from a financial standpoint it will justify remedial measures that might be prohibitive under other circumstances.

FOREIGN BORN EMPLOYEES.

The stoppage of immigration during the last three years on account of the war has entirely changed the problem of safety so far as non-English speaking labor is concerned. In August, 1914, there were 33,804 foreign-born employes in the service of the Pennsylvania Railroad, which was 24.5 per cent of the total of all employes in the service; in July, 1917, there were only 25,721, or 16 per cent of the total, in the service. Out of the total of 25,721, 8,003 are naturalized citizens, 3,069 have obtained their first papers and 5,604 have expressed their intention to become naturalized.

The following statement shows the number of foreign born employes in the service of the Pennsylvania Railroad by nationalities, which is of interest in this connection:

English	1,833	Greek	496
Irish	3,064	Australian	2
Italian	8,425	Portuguese	13
German	2,069	Belgian	12
Russian	2,186	Serbian	134
Polish	263	Syrian	37
Austro-Hungarian	3,977	Turkish	96
Mexican	1,370	Japanese	2
Swedish	518	Chinese	2
Slavish	105	South American	8
Spanish	54	Jewish	3
Scotch	234	New Zealand	1
Swiss	94	West Indian	9
Rumanian	42	Arabian	1
Norwegian	269	Armenian	87
Dutch	23	Persian	9
Danish	53	African	1
Canadian	81	Ukranian	1
Cuban	17	Costa Rican	1
Bulgarian	37	Croatian	1
Bohemian	19		
French	49		
Finn	25		
		Total	25,721

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These figures, which show the experience of the Pennsylvania Railroad only, may be taken as an indication of conditions on other railroads similarly located and as it appears that a very large percentage of foreign-born railroad employees are either English speaking people or have been in this country long enough to acquire working knowledge of the English language, it follows that the same methods employed to instruct and protect native born Americans are applicable to the vast majority of foreign-born workers on the railroads of the United States at the present time. However, as means of educating both the English and non-English speaking employees, the Pennsylvania Railroad has established free educational courses. At the present time 1,881 students are enrolled while 1,515 of those previously enrolled have within the last three years left the service, many of whom have gone back to the old country to enter the war.

SUMMARY.

The facts and figures above presented may be summarized as follows:

1. That the railroads of the United States are doing more business and are, therefore, employing more men at present than ever before.
2. That there is an unprecedented demand for labor in all branches of industry, which is reflected in a shortage of men in all departments of railroad business.
3. That on account of the demand for labor in all other lines of business, large numbers of men are constantly entering and leaving the service of the railroads, making the largest labor turnover on record.
4. That the liability to injury among inexperienced men is much greater than among experienced men, which is one of the important causes of the large increase in the number of injuries and fatalities occurring at the present time.
5. That the railroads may expect a continuance of present conditions at least as long as the war lasts and even longer if business continues to be as active as at present.

DISCUSSION.

CHAIRMAN BELL: It seems to me that in view of the careful attention given his paper, Mr. Carrow has started something. Before we debate the question...

Los Angeles & Salt Lake Railroad Company. We are especially indebted to Mr. Elliott because he came from the extreme southwestern section of the country to attend the Congress. We will be very glad to hear from Mr. Elliott.

MR. HOWARD ELLIOTT (Transportation Inspector, Los Angeles & Salt Lake Railroad, Los Angeles, Cal.) Mr. Carrow's excellent analysis of the causes of accidents to new men and the relation between turnover and accident frequency is, I think, a most valuable contribution to safety literature. It lends itself easily to a discussion of the larger question of the shortage of labor.

Reasoning from effect to cause we find that a large proportion of personal injuries on railways are suffered by new men who take the places of old men that leave because they are dissatisfied with working conditions or rates of pay. Railways cannot afford to pay the high wages that are being paid by outside industries and our efforts must be confined almost altogether to improving the working and living conditions.

Railroading is a system of voluntary relationships. Our employes are not commandeered by us. They stay because the glamour of the transportation business appeals to them and because they know the work is steady. They go because of the higher wages or easier work or better hours somewhere else. The problem of the railway officer today is to maintain good discipline, tempered with generous treatment of the employes. Men must be made to feel that we appreciate their staying with us and that we are glad to have them submit suggestions for improving the service, which will be adopted wherever practicable. It is possible for officers to fraternize with employes in close fellowship without breaking down the discipline or *esprit de corps* of the organization. Witness the efficiency and splendid morale of the French army, where that system prevails. Inspired men will suffer, bleed and die for a principle. We must inspire our men with the thought that transportation is as necessary in winning this war as bayonet charges, and that by helping in the work of our great railway army they are doing their duty by their country in a very real sense. That done, we should take such affirmative steps as will cement the relations of the officers and the employes and make the employment permanent.

TAKE MEN INTO YOUR CONFIDENCE.

We should pursue a policy of full and free publicity regarding the affairs of our companies. Our employes should be given infor-

mation about the capitalization of the companies, who the stockholders are, what our plans are and all that sort of thing. Vice-President Foley of the Illinois Central has just started a campaign of that kind and it gives birth to an idea which I have long held.

We should have on every road an employment bureau, where each man's record is carefully kept and where his departmental preference is recorded; where square pegs are assigned to square holes and round pegs to round holes.

We should abolish, as far as possible, the system of government by chief clerks and have orders issued only by men who have been on the ground and are able to visualize the men and the conditions affected by the orders. The issuing of orders by clerks who never get out on the road is taking the starch out of some of the best railroad men in the country.

We should hold open meetings of officers and employes, where each man can voice his opinion about the conduct of the company's affairs. We must tell employes *the why* of every move required of them, and if we have practices that cannot stand the acid test of reason the sooner they are abolished the better.

We should shun red tape as a pestilence. We should give the man on the ground all the authority that he proves himself capable of shouldering. We should cut out 50 per cent of our letter writing. If you and I had a houseful of servants we wouldn't tolerate the gardener spending his time writing letters to the cook or the governess devoting hers to typing notes to the chambermaid. Yet the policy we condemn in our own household we permit in our business and instead of talking over important matters with others interested, we push the buzzer, dictate a letter of transmittal and try to fool ourselves into believing that we are doing our full duty. Is it a far cry from red tape to new men? New men are hired to take the places of old men who have become dissatisfied with conditions. Nothing creates dissatisfaction so quickly as a system of red tape which dwarfs the initiative of the individual and saps the vitality of the organization.

A FEW THINGS WE SHOULD DO.

We should provide places of amusement at terminals, Y. M. C. A.'s or clubrooms, where men can spend their time when off duty in wholesome pleasures.

practicable in the passage of laws promoting temperance. The saying is: "The Lord looks after drunken men and babies," but the records of personal injuries on our roads bear mute testimony to the falsity of that proverb.

We should build good houses for our section forces and provide good accommodations for freight handlers, such as smooth floors in our warehouses, good trucks and adequate facilities for comfort.

We should be liberal in the issuance of passes. Instead of a rule requiring five years' service for a trip beyond Chicago, let's reduce it to two.

We should have a system of increasing the pay of laborers the longer they stay, and should grant bonuses to men who stand head and shoulders above their fellows in performance.

We should encourage employes to subscribe for educational courses and make it easy and inexpensive for them to do so.

SHORTAGE OF TRACK LABORERS.

The demand for laborers far exceeds the supply. Pressure should be brought to bear on Congress to waive the literacy test for track and shop laborers, the same as has been done with agricultural workers. A man doesn't need to know how to read in order to handle a pick and shovel.

We should advocate revising the agreement about admitting Asiatics so as to permit 200,000 of them to come to this country under a bond providing for their return at such time after peace shall be declared as the Congress shall prescribe. Japanese section foremen in the West are excellent workers and they get along well with Mexican laborers. Chinese make good track men. They are quiet, of good disposition and do not often get drunk. There is a tremendous amount of needed improvement work on railways which has been authorized but not commenced because of no laborers. These improvements are demanded in order to handle expeditiously the added war business. Allowing 200,000 Chinamen to come into this country for the duration of the war may easily mean the sending of 200,000 fewer of our own beloved Americans to bleed and die on the fields of France.

CHAIRMAN BELL: The program shows that we are allowed twenty minutes for the discussion of each of these papers. We are much indebted to Mr. Carrow and Mr. Elliott for the time and thought they have given to this subject.

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FIGURES NOT ALWAYS ACCURATE.

MR. S. G. WATKINS (General Secretary, General Safety Committee, Boston & Maine Railroad Company, Boston, Mass.): I have listened to a very interesting and convincing array of figures. I suppose we have all been taught that figures cannot lie, but I believe we have all found that figures do not always tell the truth. I appreciate the immense danger of green men, but from my investigations I am inclined to believe that accidents do not happen—they are manufactured, and in the majority of cases I find that the men who manufacture the accidents are not the green men. The accident is not the result of something that some one did not know,—in the majority of cases it is the result of some one failing to exercise knowledge he had. It has been my experience that the men who cause accidents are in many cases the experienced rather than inexperienced men.

I contend that while we should endeavor at all times to educate the inexperienced man we should also exercise a guiding effort to encourage the experienced man to use the knowledge he has and set a good example for the inexperienced man with whom he is working.

I do not intend anything I have said as a criticism of the papers that have been read, but I am of the opinion that sometimes we get as much from the discussion of papers as from the papers themselves.

THE FLOATER PROBLEM.

MR. F. W. MITCHELL (Superintendent of Safety and Examinations, New York, New Haven & Hartford Railroad, New Haven, Conn.): I would like to ask Mr. Carrow what is the average length of time a laborer stays on the Pennsylvania Railroad? What has been their average stay during the present year? If you will specify in a general way it will be quite satisfactory. In centers where labor has been very scarce and difficult to hold we sometimes hire a man and he never comes to work at all. Again, a man will start in the morning and quit at noon. They will sometimes work the whole day, again they will work a week or so, but the chances are they will work until pay-day. A good many floaters will apply and work until they get one pay, then they go away. The average time would be very difficult to determine, but certainly it does not exceed one month in many instances.

weeks, except in some instances where exceptions are made on account of local conditions.

The duration of a man's time of service reminds me of a West Indian negro who took service at one of our large stations. He worked until noon, when he went to the chief clerk to report. He told him that he did not want the job. The chief clerk asked him why he was going to quit and he said: "Boss, that work is not intended for human beings; animals ought to do it."

EXCESSIVE LABOR TURNOVER.

MR. MITCHELL: We have 35,000 employes in our freight department. During 1916 we hired 39,000 laborers in our freight houses—you can understand how things look. Our experience is about the same as the Pennsylvania people's. Some of the men never get to their destination. Some of them work a few days and some of them quit the same day. We pay once a week, but I think we ought to pay oftener because many of the men do not have any money at all when they arrive at our places and start to work. When they get their first pay most of them quit.

MR. J. M. GUILD (Union Pacific Railroad): The Union Pacific goes in part through a very sparsely populated country. Because of this, not only in the track department but also in the train and engine service, it is found necessary to send to another market for labor. As a rule, when the new men come to work they are rather embarrassed financially and it is an almost every-day occurrence for a fireman or a brakeman, after he has made one trip and arrives at the other end of the terminal, to send a telegram asking that his "pie book" and time be sent to him.

The same thing applies to section men; they are usually in an embarrassed position financially when they go to work. They cannot secure groceries and food and some provision has to be made to supply them with the necessities of life until they reach their first pay day.

I would like to know if any gentlemen here have experienced this condition and what arrangements, if any, have been made to overcome the loss in labor turnover on account of employes leaving the service under such conditions.

FIRST AID KITS AND SAFETY GOGGLES.

MR. E. J. BIRMINGHAM (Safety Agent, Erie Railroad Company, New York City): My company has adopted the standard first aid

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outfit for use at all stations, shops, yards and cabooses. This was adopted after a great deal of study. Most outfits contain many articles and should only be handled by a physician. The consists of the following:

Two triangular bandages,	One bottle tincture iodine,
Two bandage compresses,	One envelope (six applica
Four pads picric gauze,	and
Six finger dressings.	Six safety pins.

Goggles are furnished to all shopmen working at hazardous pations, such as chipping, grinding, planing and on steel car or work.

A good many of our employes objected to wearing goggles, saying they were uncomfortable or on account of some one told them that the glasses would injure their vision. The goggles furnished will not harm the vision in any way as the lenses are of special ground glass and suited to the conditions under which they are used. The lenses are so constructed that they will not chip or fly apart when struck a heavy blow. We also furnish special goggles for use by boiler-makers, so as to do away with condensation forming on the lenses. A special mask that takes out the infra-red and the ultra-violet rays which are dangerous to the eye is furnished for electric welding.

Safety committees have been thoroughly organized in all divisions and shops and part of their duty is to see that new or inexperienced employes are thoroughly educated in accident prevention.

Committees are appointed for a period of one year, but fifty per cent of the committees are changed each six months, as experience has proven this is the most effective way to organize such committees.

AUTOMOBILE CROSSING POSTERS.

CHAIRMAN BELL: Our time is up on these papers. Before we go ahead with our next subject I want to call attention to two subjects which the Executive Committee of the Railroad Section thought best to have discussed at this meeting. One is the matter of the New York Central automobile crossing poster, of which Mr. [Name] has been kind enough to furnish several samples. (The posters were distributed to the delegates.)

In order that you may understand what we are coming to I will read some figures from the Railroad Section August News T

The posters were much appreciated by most of the people who saw them and the officers of your Section thought that perhaps some of the railroads would like to get copies for use in their companies. This is one of the co-operative things brought about through the National Safety Council. General Manager Cameron went to considerable trouble to investigate this matter and asked Chicago printers to give their best prices for printing the posters. In the News Letter we find:

"Printed in Black:

- If 6,000 were ordered the cost would be 5 cents each.
- If 10,000 were ordered the cost would be $4\frac{1}{2}$ cents each.
- If 20,000 were ordered the cost would be $3\frac{1}{2}$ cents each.

"Printed in Three Colors:

- If 6,000 were ordered the cost would be 6 cents each.
- If 10,000 were ordered the cost would be $5\frac{1}{2}$ cents each.
- If 20,000 were ordered the cost would be 5 cents each.

"Printed in Four Colors:

- If 6,000 were ordered the cost would be 7 cents each.
- If 10,000 were ordered the cost would be $6\frac{1}{2}$ cents each.
- If 20,000 were ordered the cost would be $5\frac{1}{2}$ cents each.

"The paper stock would be three-ply, 17x25 inches. The New York Central poster is printed on ten-ply stock, but it is thought three-ply paper will be sufficiently substantial for general use. The original poster is printed in six colors; the prices quoted are in black, three colors and four colors."

The New York Central Lines are not trying to make anything out of this. Mr. Dow has been courteous enough to say to the Railroad Section that if we want any of these posters we are perfectly welcome to them. We are welcome to use the original plates. All he wants is the cost of the original plates, the original expense in getting them out.

You will note from the figures that in large quantities the price of the posters is quite reasonable. If two or three companies are interested in something of this kind they might be able to get together and order ten or fifteen thousand. That would make the cost for individual posters very small.

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RAILROAD SECTION NEWS LETTER.

I also want to call attention to the News Letters that have sent out. The Secretary has done his utmost to get out a 1 that would appeal to the membership. I have forgotten at just w suggestion, but every thing I have done has been at the request of the Executive Committee of the Railroad Section.

The News Letter has been largely experimental—we have out three or four. We want to know, for the benefit of the officers who are to guide the Section next year, what you think of the News Letter plan? Does it perform any service? It is some job to get the information together and have it mimeographed and sent out. Of course, there is a certain amount of mailing expense connected with it. We do not want to burden you with it if you do not like for it, so we would like to get an expression from the delegates as to whether or not the News Letters are worth while.

MR. RICHARDS: Would it not be a good idea to consider this subject at the round table conference?

CHAIRMAN BELL: That is a good suggestion. We will leave it until tomorrow morning.

MR. McCAMPBELL: As a matter of information, will you briefly explain what the News Letters are?

CHAIRMAN BELL: The News Letter is a sort of special letter plan, designed to keep the Railroad Section posted as to what is going on in railroad work. If, for instance, Mr. Guild of the Union Pacific or Mr. Mitchell of the New Haven does something unusual or good or unique the plan is to get that information to the members at large. Unfortunately, the Secretary has had to originate all the ideas. With only one exception your officers have had no assistance. I do not like to make a report of that kind, but at the same time it seems to me that a large body like this, who appreciate the importance of our Section, ought to make the Secretary work over his shoulders, caring for your suggestions for the News Letter and it is necessary that we have suggestions from different men. Our organization is not a one-man proposition—it cannot be, with hope for any degree of success. We ought to get suggestions from everyone, not only about News Letters but about other questions that concern the affairs of the Section. You have a Publicity Committee whose business it is to get out bulletins that their influence might be of some benefit to the Railroad Section. The Bulletin Committee has had only one or two suggestions during the year.

This is not a criticism but an admonition. I hope we will all take it to heart and remember that the Railroad Section is our Section and that we will try to help the officers and the Executive Committee make the Council and especially the Railroad Section a successful institution.

The next subject on our program is an address by Mr. David More on the "Prevention of Accidents Due to Use of Tools and Machinery." I do not know how many of you heard Mr. More speak yesterday, but I think we are going to have a mighty good paper.

PREVENTION OF ACCIDENTS DUE TO THE USE OF TOOLS AND MACHINERY.

DAVID MORE, SHOP SAFETY INSPECTOR, UNION PACIFIC SYSTEM.

Mr. Chairman and Members of the National Safety Council: This subject is very comprehensive, embracing all departments of life—from farmers in remote corners of the earth to the busy commercial centers of our large cities—and only by comparison can any idea of the results be known. But as this subject refers chiefly to the railroads we must confine our remarks to this great industry.

Without power railroads are "commercial graveyards." Time is money—a time saver is generally a labor saver. Invention has entered into the manufacturing and repairing of the great locomotives—the power of the steam railroads.

View the air brake, one of the greatest safety inventions of our times. It was refused by Commodore Vanderbilt time and again, when presented by George Westinghouse, with this remark, "I have no time to talk with fools. The idea of stopping a train with wind!" But Westinghouse persisted. Vanderbilt submitted to a trial test on one locomotive, and, fortunately for Westinghouse and the rest of us, on the trial trip a wagon was stalled at a crossing outside of town and an accident would have resulted but for the air brake. The new device was applied, the train stopped, and Westinghouse received an order from Vanderbilt to equip his other power. The air brake came to stay and other improvements were the result. The government took it up and it has become an integral part of the steam railroad and of other industries.

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USE OF COMPRESSED AIR.

On this line compressed air (or pneumatic) tools followed due time, but met strong opposition from all sides, as all improvements do at their introduction. The average mechanic opposed on the ground that it would kill the trade and less men would be employed. But the industry came to stay, as you gentlemen know.

For example, take the pneumatic jack for raising locomotives off their wheels—a labor-saving over the old screw jack. But the pneumatic jack is obsolete, giving place to the electric crane, which eliminates all the manual labor and consequent danger—a real Safety First device, indorsed by all progressive and up-to-date superintendents and general foremen.

Take the flue roller—the work was formerly done by manual labor and many a man was strained and injured rolling and beating flues. The manual labor has been eliminated, the time reduced 50 per cent, safer conditions exist for the men, and still we realize the need of *more* men instead of the old objection that we would need less.

Time will not permit me to enlarge upon all the uses compressed air is adapted to, but I will mention the air riveter, the air stay bolt ram, air flanger, bulldozer, motor drills, flue welders, air hoists and air hammers.

With the use of modern equipment consumed in industrial operation time has been reduced 25 per cent in the last thirty years and safety predominates, and as the years go by, with increased improvements, Safety First comes into its own.

ELECTRIC FLUE WELDER.

The electric flue welder now installed at our shops is a wonder. It eliminates the oil furnace, the noise and the danger of flying sparks, reduces the cost of production, and how much safer it is we cannot estimate. Efficiency produces Safety First. It won't do to pay to introduce devices which lack the integral idea of Safety First. We cannot grasp the vital importance of the movement which we in the city of New York represent at this Congress. Each one is adding his little bit in making history. The movement is covering this land like a blanket.

The smallest detail in a Safety First suggestion is adopted on

catcher. A square box is made out of front-end netting, with a handle attached about two feet long. One of the air gun operators holds this opposite the chisel and when the rivet head is cut off it is caught in this box and is prevented from flying and hitting someone.

NEW IDEAS WANTED.

Give us an idea. We want it now, gentlemen. You know we cannot be perfect all at once on this Safety First movement. We have much to learn but we are progressing. You can tell the way we are going by what we do. This body of progressive Safety First men does not want to become like a boy I once heard of. His mother was behind the times in some of her ways and the pity of it was she could not make clothes for herself and family. Well, her son John, a schoolboy, needed a pair of pants, so she procured the cloth, and, laying it spread out on the table, had John lie on his back while she marked around his legs and waist. Then she turned him over and did the same, sewed the pieces together, put them on John and sent him to school. When he returned in the evening he looked downhearted. She said: "John, what's the matter; did they make fun of your pants?" He said: "Yes, ma; they told me they did not know whether I was going or coming." Now, friends, we don't want this said of us. Our work must be done along good business lines. Don't let us fool ourselves.

Some say our meetings and the Safety First work is dull. On this point I disagree with them. It is the most interesting and all-absorbing work on foot today—something new is always bobbing up. Something you overlooked yesterday is ready for you today. Some new condition has arisen that needs your personal attention. It is an education in itself.

A MODERN BLACKSMITH SHOP.

Our blacksmith shop is up-to-date and I have the evidence with me of what is being accomplished. Some tell me that with modern tools and machinery we have *increased* accident conditions. Let us take a fair, square look at this and see. We have only to take the drop hammer as an example of this. Look at this product in my hand—a hammer made by a single blow and without danger to anyone. The old way was to forge it out at the blacksmith's anvil, using one hundred blows, adding thereto the danger connected with the operation. It is not needful to enumerate. We use an oil furnace.

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eliminating the old coal fire with its smoke and hot cinders and numerous tools used in the manufacture—the human element ing into all the methods. The cost, by improved methods, to this hammer is far below the old way.

WANTED—MORE MEN.

Take the bulldozer, the Bradley hammer—all tell their t labor-saving and accident-reduction, and, last but not least, First principles are established to stay.

The forging machine—"Oh!" I hear some one say, "the do away with so many more men!" Gentlemen, send us son need them. It is a prevalent epidemic just now, and we want more modern tools. They eliminate 15 per cent of the mine some of the serious accidents over the old sledge-hammer way its slow and hazardous conditions, and men are getting in line their personality is not interfered with and dominated by principles and cramped ideas.

Work is the backbone of a nation and is splendidly exer in the present national crisis. I was in San Antonio last and, speaking to some of our soldiers, they told me that since was declared they train from eleven to twelve hours a day. In of peace it was only two hours. They said: "It feels as thou were doing something now." They are a fine looking lot c and the government gives them a thorough physical test every to make sure they are conserving their strength. There is weakling amongst them.

MACHINE TOOLS—HIGH AND LOW SPEED STEEL.

In the old days when I was a boy we thought it a great speed up a sixteenth cut at the rate of fifteen to eighteen minute, but now we go forty-five to fifty and three-eighths inch cut—at trial tests five-eighths. The machine does the the company pays for the machine, the men are not hurt, only times we get a fellow whose feelings are hurt—then we get him. Even bees throw out the drones as parasites and in th show us a good example.

High speed hurts no one. After the whistle blows some g hurry on the wrong street, you know. We have men in Oma started at the bottom, at lowest wages, and today are gett highest. Why? Simply because they applied themselves and not allow anything to kill their personality. They spent thei

ings improving themselves and qualifying for better jobs—and they got them.

THE OLD DAYS.

When I was a boy thirty years ago, we had to do almost everything by hand. All the gears and keyways, etc., were cut out with a hammer and chisel; now they are cut out by automatic machines, with absolutely no danger to life or limb. Tell me speed hurts! It only hurts the fellow who speeds up to do nothing. He is dead and we need a funeral.

Then, again, we had no goggles to protect our eyes thirty years ago and a tallow candle was our light. Now the work is done by machinery and we have an electric light to see clearly to do our work right. I remember, in looking up through a frame bolt hole, the helper holding the tallow candle to show me light, a dob of tallow hit me squarely in the eye. Tell me of the old days! Yes, I hear you. "But not in mine" any more. The modern mechanic is protected and the machine shop is a paradise alongside the old way, when you froze all day long and only got warmed up at night for the next day's work.

MACHINE GUARDS.

The Union Pacific Railroad Company, through our superintendent of motive power and shop superintendents, has spent the sum of \$20,000.00 on safety guards and will spend more if any of you gentlemen will show us where to put them or if you can find a man anywhere that can. We are like a man in New York who was selling a force pump and in his remarks he said: "Gentlemen, this pump will pump the Atlantic ocean dry. All I want you to do is to show me where you want the water."

We are all Safety First men. All the new machinery applied to the shop is motor-driven independent power, eliminating counter-shafts, belts, hangers, and the dangers consequent thereto. Ninety per cent of our machines are motor driven. We are getting rid of all old-class machinery. You can see at a glance we are doing everything possible to make the shop entirely safe. I truly believe we have the most thoroughly equipped Safety First shop in America—I mean railway shop.

TOOL INSPECTION.

Do you get that? Every month a special inspection is made of all tools: besides, we have a man on the job at all times. Then an itemized description is sent to the superintendent of shops of what

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defects are found, their nature, and what disposition is to be made of them. This is very thorough. The men are protected from defective tools, oversized wrenches, badly faced hammers, pulleys, drifts, cold sets, flatters, pinch bars, etc. A very firm hand is on all the items pertaining to Safety First, and I believe every shop should adopt this rule. To show you gentlemen how far we go at Safety First, one day, some months ago, I noticed the general foreman, Mr. C. H. Doerr, with a fireman's coal pick out at the chute breaking coal. I watched him. He said: "Is a flat-face pick or a round-faced one the safest?" I did not know, but the superintendent was after the safest tool in order to protect the fireman's eyes when he was breaking coal. This may seem extreme but it is a fact nevertheless. Nothing passes here unless it is safe. There is no use fooling ourselves, because facts come back to settle upset heads on tools are permitted. By putting them out of service we have reduced accidents from this source 25 per cent.

CAUSE OF ACCIDENTS.

I cannot leave this subject without mention of what we find as the cause of accidents. In the car shop I find, from our latest record, is not defective tools or machinery that contributes materially to the accident list, but the workman's own affairs or the foreman allowing men to do things in a dangerous way. Ninety-eight per cent of the injuries are caused by carelessness, poor judgment, lack of thought or by inexperience. Other departments show about the same average. I could cite many cases; here is one as a sample. We hired a new man, a helper on the machine side, to assist the driving box man. The crane conductor had explicit instructions (shop rules) never to leave the side or main rods lying on the ground. On this particular occasion he left two sections of side rods or main rods with a small piece of wood beneath to keep them from falling and tipping over. He said it was "just for a few minutes." The new man turned around to receive two driving boxes from the crane. In so doing he braced himself by putting one foot farther back, thereby knocking the piece of wood out from under the two rods, allowing them to fall on his ankle, fracturing it. He only worked seventy minutes, but the company had to "pay for the freight." This was rank carelessness and you know a careless man does not work on that job any more.

Every injury is recorded and charged up to the foreman. The record is itemized every three months and the percentage given is

right, because it gets down to the root of the evil. We investigate and find the cause.

One thing I am proud of, and that is this: The company has given me a free hand and also stands behind every suggestion of merit from any employe. It has given me instructions like this: "If the company is to blame, say so; if the men are to blame, say so." So you see it is always a clean book—we have nothing to hide and no reports to "doctor." This honest method is simply an effort to find the real causes of accidents. If the company is to blame they want to rectify the cause, so as to forestall recurrence. With the men the same rule prevails. Whenever a man, no matter who he is, draws blood by a scratch or cut it is imperative for him to go to the doctor for treatment. With modern methods, tools and machinery I can recall only two or three injuries directly caused by defect or method.

FOLLOW NATURAL LAWS.

I want to go back to speed. This world travels at the rate of one thousand miles an hour, and it seems to do pretty well because it holds to a perfect center. We must follow natural laws and form constructive methods. All men and all nations who pursue destructive policies go down before the march of civilization—Caesar, Alexander the Great, Napoleon, and now the Kaiser. Nature is opposed to the destructive ways of any man or nation and destroys the destroyer. It is a serious thing to live. Personality is yours as an individual, it is for good or evil, life or death, peace or war. It was a serious undertaking for Moses to lead the children of Israel out of Egypt. It was a serious thing for King George III. to oppose the people of America. It was a serious occasion when the Declaration of Independence was signed. It was a serious time when Washington crossed the Delaware. It was a serious occasion when Lincoln upheld the constitution of the United States. The entrance of this nation into the great war marks a crisis in history. View all these signs along life's highway and by comparison see the destructive and constructive policies and the outcome of each. No need to say more. Safety First rules those who follow the constructive policy—men or nations.

PATRIOTIC SERVICE.

Now a word on patriotic service. The patriot won our independence—he held to a constructive policy. He fought for love and

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home against the hired armies of the foe. We fight today for li against destructive and despotic ruin. May each one of us : under the flag—that symbol of purity and liberty—filled with patriotic spirit which dominated those who have gone before, strong, rich American blood running through our veins, wit thought of defeat in the breast of one of us.

Let me tell you a story in this connection ; it is a fable, but i a moral: "A lion seeking its prey saw four bulls (not 'Johnny Bu feeding in a field. He said: 'If can only separate them and one in each corner I can lick them, but if they remain united I beaten.' " See the moral? Look today at Russia, divided and be whereas if they had held together they could have beaten the foe

Our country must stand united. If there is a traitor, who w sell his country in a day like this, hell is too good for him. May rise to the occasion under Old Glory as a united people who k no defeat. Go to Berlin and smash the kaiser and his destruc outfit, and turn the land back to those who believe in Safety F Pursue a constructive policy and live in peace.

Seventy-five per cent of the British soldiers return to trenches ; 25 per cent are either killed, disabled or taken prison What a great showing for the principles of Safety First and conservation of life!

CO-OPERATIVE SERVICE.

I will close with a little story: A man took his little girl out a walk and while she played around on the grass he fell asle When he awoke he called her but got no answer. Looking arou he saw that while he slept she had fallen over a precipice and v killed. Friends, no matter how good our organization is, if : members are asleep it means defeat and great regrets. Let's be and work while we have opportunity and defeat defeat.

I am afraid I have not and cannot do this subject justice in t time given. In conclusion, I would say that our electric plant is winner. New devices are being invented. The electric welder h relieved the blacksmith shop of lots of minor but much needed wor also the ox-weld plant for all classes of wrecking and cutting an welding, eliminating dangerous and heavy work originally done : manual labor. Men are beginning to wake up to the great efficien.

THREE KINDS OF MEN.

The Satisfied Man.—He has reached or passed the height of his desires—leave him alone. We have them and they fulfill their duties successfully and are useful but will never turn the world upside down. They follow, but never lead the procession. Their father used a candle, and if no one had ever devised a better light they would be satisfied. So it is up to you progressive men to light the road to better and safer ways.

The Dissatisfied Man.—He is a menace and a trouble-maker and should be "bumped," because bumping is the only method to bring him to his senses. He is always kicking and never satisfied. Here I would like to tell you a story. It is about a Scotchman, a farmer, and he had a wife who was a suffragist. His name was John. His wife was always dissatisfied and was a kicker—may we all be delivered from such a woman. Well, they had some friends visiting the farm one day and after dinner John said: "Come out and see *my* horses and *my* sheep and *my* hogs and *my* chickens and *my* crops and *my* farm." When they returned to the house, had supper, and the friends had departed, John's wife said to him: "John, why do you not say *our* horses and *our* sheep," etc. Then she took a club and blackened both of John's eyes. They went to bed as usual and when they awoke in the morning John began groping around the foot of the bed. His wife said: "John, what are you doing?" It was unusual for him to act so. He meekly replied: "I am looking for *our* trousers." Poor John!

The Unsatisfied Man.—I hope every gentleman in this meeting comes under this last title. What do I hear some one say: "I am perfectly at rest"? Poor man, you are to be pitied! Did you ever see a locomotive fireman feed his engine through the firebox door—did you ever see it perfectly satisfied? If you did it was a dead "bird" and so are you. Your appetite should always be unsatisfied—more work—keep climbing; when things go wrong, keep climbing; when deeds well done stand unrewarded, keep climbing. The hill is high, the top's in sight—keep climbing. Go on; don't stop. Hard work never killed any man. Idleness has slain more men than strong drink. Success spells this way: "Doing things a little better than the other fellow." You can't keep a good man down, but if you lay out a dead man you'll have one more job, and that is to carry him. If you don't bury him you have a life job. Your name in an organization is not enough. Work! You can't do my work and I can't do yours—each contributes to stimulate the other.

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FORMATION OF NEW DIVISIONS.

CHAIRMAN BELL: Mr. Marcus A. Dow, a member of the Executive Committee of the National Organization and an ex-officio member of the Executive Committee of the Railroad Section, has something to say to us regarding the new divisional organization National Safety Council.

MR. MARCUS A. DOW: *Mr. Chairman and Gentlemen Railroad Section:* It has been a source of very great regret that I have not had time to meet with you in this Session, Chairman of your Arrangements Committee I have been very I trust you will pardon my necessary absence.

General Manager Cameron has asked me to explain to you something about our new divisional organization. It really does amount to as much as might appear, so far as it affects the sectional organizations. In the Transportation Division it has no material change.

The reason for the divisional organization arises out of the fact that the National Safety Council has grown to such proportions that without some such arrangement the Council might become unwieldy. Under the new plan various industries of a similar nature and of a similarity in character are to be placed in special divisions. Thus we have the Industrial Division; it will include a number of sections, divided according to industries that work along similar lines. The Transportation and Public Service Division, of which the Steam Railroad is one of the sections; others are the Marine and Industrial Relations Division, the Public Administrative Division and Public Safety Division. Under the heading of the Transportation and Public Service Division there are four sections: Electric and Street Railways, Marine and Navigation, Public Utilities and Steam Railroads.

EACH SECTION WILL ELECT OFFICERS.

Each of these sections will elect their own officers, just as in the past. Each section will have a chairman, a vice chairman and a secretary. Each of the divisions, however, will hold a meeting at which the chairmen of the various sections, and the chairmen will elect a chairman of the division.

In other words, the four chairmen of the Transportation and Public Service Division, before the close of this Congress, will hold a meeting and from their number will elect a chairman of the division.

portation and Public Service Division. The chairmen of the several sections in this division will continue to be members of the Executive Committee of the National Safety Council.

I think, perhaps, the only explanation for the real, underlying reasons of the new divisions is the fact that there are so many industries and so many sections that eventually there would be an Executive Committee, composed of the regularly elected members and chairmen of the various sections that we would have an unwieldy Executive Committee—probably fifty or sixty members if all the sections were represented.

In the Industrial Division the Chemical Section will include the rubber industry, the Metal Section will include finished iron and steel and the Mining Section will include quarries.

The Miscellaneous Manufacturers Division will be very comprehensive, so that really the only division affected by the new plan is the Industrial Division, because it enables the Council to call together, under various sections, the different lines of industry that are working along similar lines.

There will be no change in the management of your own section; it will run its own affairs just as in the past. You will have your own officers and your own meetings and carry on your work as in the past. The chairmen of the four sections will get together and select a chairman of the Transportation and Public Service Division.

MR. RICHARDS: What is the chairman elected by the four Sectional Chairmen of the Transportation and Public Service Division going to do?

DUTIES OF CHAIRMAN.

MR. DOW: I do not know that the duties of the chairman have been fully mapped out. It is expected that he will hold the various sections in that division together, so that certain problems that may affect the entire division may be worked out.

It has been suggested that the Transportation and Public Service Division might eventually work out a joint meeting of the sections in that division on some particular problem that would affect the four sections. For instance, take the grade crossing problem. That also affects the Electric Railway Section and if the two sections could get together and hold a discussion on such a subject it would be very valuable to all concerned. It is, I think, the principal idea of the divisional plan.

MR. RICHARDS: Suppose we cannot get a majority vote on the board, what are we going to do? Suppose the four votes are equally

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divided; how is that going to be decided? Are we to keep on until we get a majority?

MR. DOW: That is a problem that has not occurred to me. I do not suppose it has occurred to any one. It just happens. In the Transportation Division there are only four sections.

CHAIRMAN BELL: Mr. Dow, for the benefit of the officer who will be elected for this section tomorrow afternoon, is the division given a Vice Chairman and a Secretary as well as a Chairman?

MR. DOW: No. The details of the work will be handled by the various sections just as in the past. The idea of General Chairman is to have closer relationship between the various sections.

CHAIRMAN BELL: Is there any further discussion? Does anyone wish to ask Mr. Dow any questions in regard to this plan?

INCREASE IN DUES.

MR. F. M. METCALFE: Has it been decided to increase the membership dues?

MR. DOW: Yes. Commencing with the next payment, the dues of all the members of the National Safety Council have been increased 50 per cent. A member paying a maximum of \$100 will now pay \$150 in the future. That has been made necessary on account of the high cost of everything, coupled with the fact that the Council has now grown to a point where it must extend its activities. As it has a surplus on hand to tackle certain problems it has not been able to attempt in the past.

MR. METCALFE: How do our dues compare with the dues of other organizations?

MR. DOW: The dues of the National Safety Council are based upon the number of employees in an industrial plant or upon the number of miles of railroad operated.

MR. METCALFE: In some other organizations in the country the dues are only \$55 per annum.

MR. DOW: The National Safety Council bases its dues upon the number of employees in an industrial plant or the number of miles of railroad operated.

MR. METCALFE: I understand that other associations do the same thing.

MR. DOW: The dues are made to cover actual service. The bulletin service which you are receiving is one. As the cost of service is increased it becomes necessary to increase the amount

ELECTION OF SECTIONAL OFFICERS.

MR. RICHARDS: I would like to make a motion that the election of officers take place this afternoon; by tomorrow afternoon this gathering will be pretty well broken up. We may not have as many people here tomorrow afternoon as we have now. It seems to me that the election of officers ought to take place at a time when most members are present, and if it will not interfere too much with the program I would suggest that we have our election this afternoon. Personally, I cannot be here tomorrow and probably there are many others who are here today who will be unable to be with us tomorrow afternoon. I would be present if it were at all possible, but it will be impossible for me to remain.

MR. CARROW: I would like to second the motion, Mr. Chairman. I think we ought to hold the election of officers this afternoon.

CHAIRMAN BELL: The Nominating Committee—Mr. Cochrane of the Great Northern, Mr. Mitchell of the New Haven and Mr. Anderson of the Nashville, Chattanooga & St. Louis—have already been appointed. The reason the election was set for tomorrow afternoon was the fact that it appears in that way on the program. I agree with Mr. Richards and Mr. Carrow that the election ought to be held this afternoon. We want as many members as possible to vote in the election, so that the officers elected will be the officers whom the membership wants. In connection with this matter I might say for your information that the Executive Committee of the Railroad Section, composed of the chairmen of the committees of the section, such as the committees you heard reports from yesterday afternoon, is appointed by the chairman of the section with the advice of the Vice Chairman and the Secretary. Are you ready for the question? Is there any further discussion?

MR. WATKINS: It seems to me it would be unwise to disrupt our program. We received our programs ahead of time and have made arrangements to complete the work of the sections. In fact, some delegates may be here for the election tomorrow afternoon who are not here today; some are here today who will not be here tomorrow; therefore it seems to me very unwise to disarrange our program in any manner.

CHAIRMAN BELL: It seems to be a debatable point.

MR. METCALFE: How long would it take to elect a Chairman?

CHAIRMAN BELL: The Nominating Committee is ready to report, but the Constitution and By-Laws provide that nominations

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may also be made from the floor, independent of those brought by the committee. The object of the Nominating Committee course, is to simplify matters so that the election will not take up a large part of the time of any particular section. Last year it took ten or fifteen minutes.

Are there any other questions before I ask for the vote on the motion? A motion has been made by Mr. Richards and seconded by Mr. Carrow that the election of officers of your section be held this afternoon instead of tomorrow afternoon, as provided by the program. All those in favor of the motion will signify assent by saying "Aye." Contrary "No." The motion is carried. The election will be held promptly after we convene at 2 o'clock, in order not to get into our program during the middle of the session. I will request the Nominating Committee to present its report at that time.

SUGGESTION TO NOMINATING COMMITTEE.

MR. RICHARDS: I would like to suggest to the Nominating Committee, if it is possible, that they select some man for Chairman for the next year who will be able to represent us so well that he will win the gratitude of the members of this Section so that they will be able to elect him General Chairman of the Division. I think you ought to take that into consideration in making our nominations. We want to select some man who will be big enough to have a chance of being the Chairman of the Division.

CHAIRMAN BELL: Gentlemen of the Nominating Committee, I hope you will take cognizance of Mr. Richards' remarks. We have no assurance that the Chairman of the Railroad Section will have any chance of being elected Chairman of the Division, but we will do well to keep this in mind.

Mr. Anderson has an announcement to make.

MR. ANDERSON: If there are any members of the Steam Railroad Section who have not signed the roll we would be glad to have them do so after the meeting is over, as we want to get a full roll of all the gentlemen present.

CHAIRMAN BELL: Mr. Wightman of the 'Frisco brings a point which perhaps needs mention. The officers are voted for only by the membership of this section. Each delegate has a vote and each member has the privilege of offering nominations from the floor, independent of candidates nominated by committee.

There is one other announcement which the officers of the Railroad Safety Council request the Chairman of this Section to

Not to forget the Safety Exposition being held at the Grand Central Palace. It is being held under the auspices of the American Museum of Safety and the National Safety Council. It is well worth while. We owe it to the American Museum of Safety and our own organization to go there and get the benefit of the exposition.

Gentlemen, it is 12 o'clock and I am somewhat responsible for the program. Shall we adjourn now and return half an hour earlier or do we want to work a half hour more and then adjourn? The difficulty with the former arrangement is that the people who have already left will not know we intend to start at 1:30 o'clock and will not get back here until 2.

MR. CARROW: I suggest, Mr. Chairman, that we give very careful attention to at least one more paper and avoid all digression, and that we remain seated until after the paper is read.

CHAIRMAN BELL: That strikes me as being the best plan. I am sure Mr. Broderick has a splendid paper. You will please give your full attention to Mr. Broderick's paper. I take much pleasure in asking Mr. Broderick to take the floor.

SAFE AND PROPER HANDLING OF TRACK, BRIDGE AND BUILDING MATERIAL

J. T. BRODERICK, SUPERVISOR OF SPECIAL BUREAUS, BALTIMORE &
OHIO R. R., BALTIMORE, MD.

Mr. Chairman and Members of the National Safety Council:
If the rules of the operating and maintenance of way departments and the safety rules which have been issued on the Baltimore & Ohio, and no doubt on many other lines, for the guidance of employees engaged on track and structure work, were strictly observed, probably 90 per cent of the accidents occurring in the handling of track, bridge and building material would be averted, but it is a difficult matter to constantly keep this before the men, and it, therefore, becomes the duty of the supervising officer to continually check the men under his direction to know that there are no violations of the rules. In other words, the safety problem in the performance of maintenance of way work by railroad employees is summed in the maxim "Eternal Vigilance is the Price of Safety."

THOROUGH INSPECTION NECESSARY.

In preparing for the day's work the foreman should see that an inspection is made of all tools, appliances and hand cars, so that he

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may have positive knowledge that there are no defects which result in accidents. This is especially important with respect to condition of tools, since many accidents occur because the men do not take time to make a few necessary repairs.

In hiring men the foreman should make special efforts to impress upon them the necessity of carefulness and thoughtfulness while on duty and explain very clearly the dangers and accidents that result from carelessness. Safety demands this.

When it is necessary to employ foreigners, special care should be taken to acquaint them with the provisions of the book of rules and the regulations promulgated for the guidance of employees engaged on or about the track, that they may become thoroughly acquainted with their duties.

The principal cause of injury in the handling of track, bridge building and other maintenance or construction material is the improper handling of heavy structural material, such as rail, and timber.

LOADING AND UNLOADING RAILS.

One of the most frequent causes of injury is found in careless and dangerous methods of handling rails. This is true from the time a rail leaves the mill until it is placed in the track. Many of the mills now load heavy sections of rail by magnet cranes, thereby avoiding the risk that is involved in loading by hand or moving from skids into the cars. This same method (that is, use of magnet cranes) should be followed in loading or unloading rails where they are stored in large quantities. Where rail is stored in small quantities and crane is not available, the rail should be placed on skids in single layers so as to avoid unnecessary handling.

In unloading rail for distribution along the track, a small crane or, preferably, an air hoist unloader, should be used. Such a device is not only safe but also economical, and is, therefore, doubly justified. However, even with the use of such an unloading device, there are frequent injuries to the men in separating the rails in the cars and attaching to the hoist. This is especially true where rail is loaded indiscriminately into the cars or nested in close tiers. In order to avoid this the rail should be loaded head up in tiers, with timber strips between each tier. From a safety standpoint such a method of loading is almost ideal.

In handling rail on the ground, rail tongs should be used as

doing so. Where labor is scarce when rail is being laid and a sufficient number of experienced men cannot be obtained to safely pick up rails, the use of one of the several types of rail-laying machines may be advisable. These machines generally embody some form of hoisting device, mounted on a push car, and may be handled by a very small gang.

INSPECT HOIST AND CAREFULLY TRAIN MEN.

When air-operated rail hoists are used, the foreman should see that all working parts are in proper order, that the cables and rail tongs are inspected, and that the stay chains extending from the corner of the car to the boom are properly adjusted and secured. It is necessary that the men employed with rail hoists be organized in gangs, so that each man shall know exactly what is expected of him.

The men handling rail should not be addressed in a hasty or boisterous manner as this has a tendency to excite the more sensitive ones and is likely to cause them to do things that they would not do under ordinary circumstances.

When it is necessary to load rails on to cars by hand it is desirable that the gang be divided equally at the ends of the rail. No attempt should be made to throw the rail unless an ample force is at hand to throw it clear. One member of the gang should be specifically designated to call directions and no attempt should be made to load when men cannot get away quickly in event of the rail falling back. It is also deemed essential, in the interest of safety, that the loading of material be discontinued while trains or cars are passing on adjoining tracks.

HANDLING TIES.

While the handling of ties does not cause so large a number of injuries as the handling of rail, yet special effort must be made to insure safety. When being piled for loading or in storage yards, ties should be placed in medium size and uniform piles, according to some approved plan. This will add not only to the stability of the pile but also insure safe and economical handling to cars. At large store yards or at tie treating plants, the use of a locomotive crane is justified for the handling of ties, since it is safer and more economical.

When ties are unloaded for renewal, they should be distributed and piled in comparatively small lots, say from three to five ties.

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They can be lined up uniformly at some fixed distance from the track, thereby avoiding danger of men stumbling over them. In renewing ties the use of tie tongs, where available, is advisable from a safety and an efficiency standpoint. This is especially in the case of treated ties. With such ties the creosote or treatment material is likely to poison the hands of the men handling them and in every case the men should be cautioned to use

FROGS, SWITCHES AND CROSSINGS.

Other classes of track material presenting difficulties and in handling are frogs, switches and crossings, and, to some extent, ballast. Frog and switch material should be handled in the same manner as rail, and, in loading or unloading cranes or derricks should be used. For heavy and complicated crossing work it is often advisable to place same directly in position with a local or wrecking crane.

About the only chance of injury in the handling of ballast is during the unloading and distribution along the track. Where this is done from ordinary cars, such as hoppers or hopper-bottom gondolas, considerable difficulty is sometimes experienced in getting the material to run out properly, and it is not unusual to have cars derailed or to have the men in the cars injured. For these reasons it is advisable to use special designs of cars for this purpose. There are several such types, mostly of patented design, which uniformly spread the ballast as desired and at any practicable speed.

The foreman should exercise particular care in the unloading of material along the right of way, so placing it as to avoid the possibility of its fouling the track, and to see that his men do not pile ballast so high in the center of the track that it will come in contact with the pilot or with other parts of locomotives or cars. To avoid from the danger of causing a serious train accident the material should be thrown with sufficient force to injure persons nearby.

In general, in the handling of almost any track material small monorail cars of the type generally known as pony cars are very useful. They will carry heavy loads, can be handled by two men, and may be quickly unloaded and lifted from the

HANDLING BRIDGE MATERIAL.

In handling bridge material, especially in maintenance work, the use of such cars as just mentioned is advisable. This is especially true in handling timbers on and off the structure. In such

material is generally lifted or lowered to place by means of rope and tackle and provided these are of proper quality and the men using them are sufficiently experienced little or no improvement could be suggested in the method of handling. In placing bridge ties, however, the use of the tie tongs of a two-man type is recommended as being safer and more expeditious than rope.

In loading heavy ties or timber of large dimension from storage yards it is advisable, wherever possible, to use flat cars or drop-end gondolas. This will avoid the necessity of lifting the timber over the high sides of a car if a crane or other device is not available. The storage yards themselves should be equipped with derricks or locomotive cranes to handle the timber. By concentrating storage at a few principal points, the use of such devices can generally be made an economic as well as a safety feature.

Heavy steel work and structural members are generally of necessity handled by cranes, derricks or travelers. On some smaller jobs, however, considerable manual handling is often done, but it is nearly always possible to obtain the use of a wrecking or other crane for such work. Plate girder or "I" beam spans and slabs should be unloaded from cars in this manner and it is generally best to use a crane in placing them in position or in position for rolling.

ERECTING BUILDINGS.

In erecting buildings the foregoing remarks also apply to heavy timber and steel members. In handling brick, terra cotta or similar material, where the building is carried to a height of several stories, an elevator should be provided rather than to have the material carried up ladders. Such material as is stored on the ground should be piled in a neat and stable manner, both as a measure of protection to the material itself and to prevent injuries to the workmen.

Of miscellaneous materials which require special treatment mention may be made of inflammable and explosive substances. Gasoline, oil, etc., should be kept for distribution at some central point where a properly designed storehouse may be built. Only comparatively small quantities should be kept at outlying points and then only in tight and well-designed tanks kept underground or isolated.

Explosives, such as blasting powder or dynamite, are often necessary in case of slides or for removing dangerous obstructions or overhanging rocks. In territories where the use of explosives is frequent enough to justify keeping a quantity on hand, a concrete storage house should be provided at some isolated point. Under no

circumstances should it be kept in section houses, freight houses etc.

While the foregoing remarks are applied to the safe handling of track, bridge and building material, yet it is equally important to see that proper care is exercised in the handling of all material used in railroad operation. With that in view all safety rules concerning the manner in which the work should be performed must be enforced to protect employees against accidents.

DISCUSSION.

CHAIRMAN BELL: I do not think Mr. Broderick's paper will be complete until we hear from Mr. Floyd of the New York Central Lines, who has been assigned to a formal discussion of this paper. I would say, in justice to Mr. Broderick and Mr. Floyd, that we have to defer informal discussion of their papers until either the afternoon session or until the round table meeting. We do not intend to do that, but it is now nearly 1 o'clock and we must all be back at 1:30. Mr. Floyd, we will be very glad to have your paper now.

MR. C. B. FLOYD (Safety Agent, New York Central Lines, New York): The paper you have just heard treats in a very clear and concise manner the safe and proper handling of track, bridge and building material. So much has been said, and so well said, that I will confine myself to a few brief suggestions.

The handling of track material is a big question. All sorts of safety rules and regulations can be circulated among our employees but is this the best method if we can get only one in fifty to read them? Men of the pick-and-shovel type, and it is with these we are very largely concerned in the matter of track building, are, because of the very position they occupy, an inferior class, and good results from this class of men are as hard to get as safe results are hard to obtain from an inferior grade of machinery. Therefore, the best method I would suggest would be to hold the man in charge largely responsible. Figuratively speaking, he is the hinge upon which the door swings.

The man in charge should keep a constant watch over his men so he will be in position to direct any unusual undertaking. He should spend a certain amount of time each day instructing his men in safety matters, and he should insist on their handling all material with the least degree of danger, so as to avoid personal injuries.

should be held personally responsible for any detectable defects in tools, push, hand or motor cars, unloading devices, etc., and he should make his safety inspections before the eyes of his gang. All this would be a big help in instilling the safety habit in their minds.

We are told that 90 per cent of our accidents are due to the careless acts of the injured man. If this is true he should be able to prevent a great many of these accidents through a greater degree of proper supervision. The man in charge can make or break our safety records, and we safety men should feel a personal responsibility in making the man in charge a "safety" man.

ACCIDENTS NOT ALWAYS PREVENTABLE

The handling of bridge and building materials is a different proposition. Men engaged in this work are of a higher moral type. They are not here today and gone tomorrow; they are, as a rule, masters of big and heavy undertakings. When an accident befalls one of them it is not due, usually, to carelessness, but to undetectable defects in material or machinery.

Mr. Broderick, in his very able way, has explained just how different materials should be handled with the least danger of injury, and I cannot add anything to what he has said, for I would emphasize the importance of the use of cranes and hoists when loading and unloading heavy materials; also the use of cars best adapted for the safe handling of such material.

Some time ago I read in one of the mechanical journals a short editorial which I know will be of interest to you and is appropriate at this time. It read something like this: "Safety is not actually the first consideration in life. If it were, we would neither breathe, nor eat, nor drink because of germs and other dangers. So in railroading, transportation comes first, it is for that that railroads exist, and if safety were the first consideration railways could not be operated. But for the individual, safety is the first consideration. His deferring all other considerations to this, at the moment, will not impair the general and necessary service. Rather, it promotes it." This should be borne in mind as we deal with the subject "Safe and Proper Handling of Track, Bridge and Building Material."

CHAIRMAN BELL: Gentlemen, I think we had better adjourn. Please be here promptly at 2 o'clock, so we may all give particular attention to the election of the officers who are to guide our section throughout the next year.

The Section then adjourned.

THURSDAY AFTERNOON SESSION.

THE meeting was called to order by H. J. Bell, the Chairman at 2 o'clock.

CHAIRMAN BELL: Has any one present any reason in mind we should not at this time receive the report of the Nominating Committee? (No response.) There being no objection we ask the Nominating Committee—Messrs. Cochrane, Mitchell and Anderson—to make their report on officers of the section for ensuing year.

REPORT OF THE NOMINATING COMMITTEE

MR. J. N. COCHRANE, CHAIRMAN: Mr. Chairman and Members of the National Safety Council—In making the report for the Nominating Committee I desire to state that the committee though would be advisable to take into consideration the practices on all of the railroads, in fact, all of them, by recognizing efficiency service. The gentleman selected for the Chairmanship I trust meet with your approval. Your committee believes he is a gentleman who has rendered this organization as efficient service as one could, under the circumstances, due to the fact that he has other duties to perform. The committee has selected the present president, Mr. Harry J. Bell, Safety Inspector, Chicago & North Western Railway.

For Vice Chairman the committee has selected Mr. T. H. Crow, Safety Inspector of the Pennsylvania Lines.

As the office of Secretary is an important one and one which involves considerable work your committee are of the opinion that a gentleman now acting as Secretary would make a real assistant your other officers and they therefore offer the name of Mr. Anderson of the Nashville, Chattanooga & St. Louis Railway.

We have not any further nominations.

CHAIRMAN BELL: What is your pleasure with the report? MR. MARCUS A. DOW: I move that the report of the Nominating Committee be approved, the nominations be closed and that the Secretary be instructed to cast the unanimous ballot of this Section for the gentlemen named. (The motion was seconded.)

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ELECTION OF OFFICERS.

CHAIRMAN BELL: Mr. Anderson and myself cannot very well act as officers of the Section and be parties to electing ourselves to office. I will ask Mr. Dow to act as chairman and see that the election is properly conducted.

(Mr. Dow assumed the chair during the election of officers.)

CHAIRMAN DOW: I greatly appreciate the embarrassing position of the Chairman under these circumstances. It happened to me at one time, so, in order to relieve the presiding officer of any embarrassment in this matter, I will put to you the motion before the house. Is there any further discussion? If not, all in favor of the election of the officers as nominated by the Nominating Committee will signify assent by saying "Aye." Contrary? The motion is carried.

(Mr. H. J. Bell in the chair.)

CHAIRMAN BELL: I want to assure you that I am very grateful for this honor. It is like a bolt out of a clear sky. I did say to the committee that the Secretary of the Section is the fellow that does a good deal of the work and as I had that office for two years, I felt that it was only proper that some one else be nominated, and now you have placed me in the Chairmanship instead.

In conferring this honor upon me I feel that you are really paying tribute to Mr. Richards, a man under whose direction I have worked for a number of years. From him I received inspiration that would make any one engaged in this work try to do it successfully. I hope we will have in the future, as we have in the past, in connection with the Executive Committee work, the advice and counsel and help and inspiration of men like Mr. Richards and Mr. Dow and some of the other gentlemen who have so ably served the Railroad Section of the National Safety Council. We will try hard to successfully conduct the affairs of the section during the ensuing year.

We would now like an expression from Mr. Carrow as to his action as Vice Chairman.

VICE CHAIRMAN CARROW: When I was at school I learned that some inherited glory, some achieved it and some had it thrust upon them. This was thrust upon me. I do not anticipate having anything to do, but I want to warn you that Mr. Roosevelt, one of our greatest workers, did all his work by virtue of the death of the President. I do not anticipate that Mr. Bell will die, but if anything

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should happen to him or he should give up his position I warn to look out!

CHAIRMAN BELL: Mr. Anderson, we will be glad to hear from our new Secretary.

SECRETARY ANDERSON: My words are very simple. It seems as though the whole situation resolves itself into one proposition. I do not know whether Webster publishes this word or not, but I have often seen it in print—"goat." It seems that I have been made the goat. This honor has been forced upon me, but I am glad to say that in the South we do things, we try hard to accomplish them and I will put forth my very best efforts in behalf of the organization.

CHAIRMAN BELL: The election having been disposed of we are ready to proceed with the program. There is one thing I would like to have you consider now, while so many of the delegates are here. That is in connection with the poster to which you have had your attention called by this meeting. The National Safety Council, through General Manager Cameron will be glad to receive and care for orders for the automobile crossing poster. Orders may be given direct through the national headquarters.

The next item on our program is the subject of "Safe and Proper Operation of Hand and Motor Cars" by Mr. S. G. Watkins, General Secretary of the Central Safety Committee, Boston & Maine Railroad, Boston, Mass. Mr. Watkins, will you please take the floor.

SAFE AND PROPER OPERATION OF HAND AND MOTOR CARS.

S. G. WATKINS. GENERAL SECRETARY, CENTRAL SAFETY COMMITTEE, BOSTON & MAINE RAILROAD, BOSTON, MASS.

WORK OF TRACKMAN PERILOUS.

Mr. Chairman and Members of the National Safety Council
I would like to give expression to a thought that I have no doubt is in the minds of all of the people here, and as my only son is wearing khaki "Somewhere in France" perhaps this expression will not seem presumptuous. A century ago we were engaged in a war with the greatest naval power on earth for the freedom of the seas. Today we are engaged in a war with the greatest army the world has ever seen for the freedom of the seas and for the freedom of the world. We hail the man who can put on a khaki suit and go in defense of the flag, but is it not well to --

are not fought with the musket and that the whole victory is not won on the battlefield, but, on the contrary, there is something for each one of us to do.

The mechanic and the manufacturer should think about how much he can produce rather than the amount of profit he will make and the aim of the workman should be turned more to how much he can produce rather than on the amount of overtime he can put in.

The men at the front must be maintained and the women and children at home must be protected and if each one of us is to do our bit, surely there will be no small task left for the railroad man. We shall do our duty and there is a big task ahead of us. It is for us to see that this great scheme of transportation is made 100 per cent perfect and by each of us doing his part our great flag and the principles for which it stands may not only be maintained at home, but may be honored and respected throughout the civilized world. In no walk of life is there absolute safety. Danger, the subtle enemy of mankind, lurks to a greater or lesser degree on every hand, and humanity falls prey either through natural causes or the failure of the human element. Happily, the percentage of accidents through natural causes are small. Happily, I say, because were it otherwise the great majority of accidents would be beyond our control and our cause would be hopeless. If my confidence in the human element is not misplaced, this, the weakest element though it be, is capable of being strengthened until the greatest number of accidents are within our control.

I regard the work of the trackman as the most perilous in the railroad service. Perilous though it may be, and while his whole duties are on the railroad track, he has little or no rights while there which any one is bound to respect. It is considered enough for him that he knows the danger and must protect himself. Herein, I believe, we are failing in our duty to the trackmen.

The hand and motor car has been a fruitful source of accidents to the trackman. By regarding every accident report as a notice that something is wrong and approaching accidents from that point of view, we are able many times not only to discover the cause but to find the remedy. These accidents usually occur from three causes:

Improper equipment.

Improper loading.

Improper handling.

Nearly all are traceable to failure of the human element.

EQUIPMENT.

I will mention two cases of faulty equipment: In the hand car we have found that the breaking of the handle or lever was causing many serious accidents. Many times poor material was used in making of these levers, and the foreman never thought of replacing one until it broke. On our road I contended for an iron handle instead of wood, but it met with so much opposition by those in position to know more about it than I, that the idea was abandoned. However, the situation was improved, I think I may say was made satisfactory, by ordering first-class hickory and constructing the handles in our own shops; also instructing our section foremen to frequently test these handles, and having a new handle applied before the old one should break and cause an accident. The objection to the iron handle was that in extreme hot weather it was uncomfortably hot and in very cold weather it was uncomfortable cold. It was slippery in snowy weather, and a damp mitten would stick to it when frosty.

I think that no motor car is properly equipped unless it has a rail eighteen inches high across the front end of the car to prevent men from falling off, because many serious accidents have occurred from this cause.

IMPROPER LOADING.

If more attention could be paid to the proper loading of hand and motor cars, accidents from this source might be eliminated. I recall a very serious accident where a cattle guard, a supply of tools, and eight men were loaded into a motor car when an iron bar fell from the car and derailed it. It is hard to realize that in these enlightened days of Safety First an accident of this kind could occur. I have many times observed men sitting on the front end of motor cars with their feet hanging down, and have known serious accidents to occur because, in case of a quick stop, a derailment, or a collision, the men in such position were entirely helpless. There was nothing for them to do but fall from the car and be run over. It is certainly a case of improper loading.

Great care should be exercised in loading at all times, especially when the motor car is in use. Tools should be not only properly placed, but secured in such a manner as to make it impossible for them to fall from the car when in motion. There seems to be a tendency to overload the motor car. This is a bad habit.

it is overloaded with men, and great care should be used to have men properly and securely seated before the car is started, always having in mind the possibility of a quick stop or a collision.

IMPROPER HANDLING.

Speed seems to be the menace of the motor car. It appears to be hard for the man in control to realize that he is going thirty, or even forty, miles an hour instead of twenty, and, again, although in another form, that is responsible for many accidents. I have known many track foremen, but have yet to find one—no matter what his faults may have been—who was not a conscientious worker. He goes on the job in the morning with his day's work planned; is accustomed to regard the time spent by himself and crew in waiting around the station to get such meager information as he can obtain from the operator as time wasted, especially since the rules say: "He must protect himself regardless of information obtained from the operator." He hastens away to his work with little or no knowledge of what is ahead of him.

Faults are apparent, but the remedies are not always so plain. In the few cases I have cited, however, I believe the remedy is simple and effective.

Strengthen the human element by education. I would teach the foreman that it is not enough that the men under his charge should know their danger, but that it is incumbent upon him that they avoid it. Any foreman will worry if he loses a hand car. I would have every foreman educated to the fact that it is a thousand times worse to lose a man. I would convince him that it is not economy to run into danger when a few minutes' delay would insure safety, and that speed purchased at the price of safety is always dearly bought. I would educate the dispatcher and operator to have a little more consideration for the trackman and to realize that his work is as important as any, and that his life and limb are as precious. We should all bear in mind that it is difficult for a foreman, with two or three men, to operate a hand car and flag himself around curves, and that the men in these positions are sometimes entitled to a little more consideration than they are getting.

I have found one means of education which seems to be effective. Occasionally I make a list of all accidents to trackmen which have occurred on our system within a certain period, omitting the names and places, but telling just how each accident occurred. This information is sent to the supervisor, who in turn sends the lists to

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the track foremen. Sometimes enough are sent out so that each man receives one. In this way the individual is brought to realize how many accidents are really happening and how many of them are caused by the same foolish thing he is doing.

From such reports as I receive from foremen and supervisors I am led to believe that this stimulates an interest among the men and is a means of educating them to avoid the careless practice which has injured his fellow, and may soon fall upon himself.

After more than twenty years of close association with railroad accidents, I have arrived at the conclusion that it is the human element that oftenest fails; that education is the remedy, and the best of rules is the best Safety First text book we have.

DISCUSSION.

CHAIRMAN BELL: Mr. Watkins, we certainly appreciate not only your paper but your very patriotic remarks.

The subject of track accidents is one closely allied with the bridge and building and engineering department accidents and I think we are fortunate in having Mr. Loughman, Division Engineer for Lehigh Valley Railroad, with us to discuss Mr. Watkins' paper. I am sure we will get some illuminating information from Mr. Loughman.

F. N. LOUGHMAN (Division Engineer, Lehigh Valley Railroad): There is no question but that the work of trackman is the most perilous in the railroad service. When we consider that a large percentage of railroad accidents are due to being run down by engines or cars and that practically the entire time of the trackman is spent working on or upon the railroad tracks it can be readily understood why his position is most perilous.

Prior to the invention of the patent coupler and other mechanical improvements in railroad equipment, accidents were largely due to being crushed or squeezed between cars, but since the introduction of safety appliances the major portion of accidents on roads is caused by being run down on the tracks by trains, engines or cars.

In support of this statement I quote the following, taken from the editorial page of the New York Sun, Sept. 8, 1917, in an article entitled "Keep Safety First."

"Ten thousand and one persons were killed in railroad accidents

of 1,371 persons killed and 34,835 injured. The figures are those of the Interstate Commerce Commission.

"No analysis can obliterate the badness of this record. Of course most of those killed and hurt were trespassing on railroad property, but that is always the case. Only 291 passengers were killed, but 2,941 of the dead were employes; 8,000 passengers and 176,923 employes were injured.

"At present the railroads have nerve-straining tasks of transportation to perform, but safeguards to travel and the work it entails come ahead of everything else even in war time—perhaps especially in war time with troop movements under way. Though we have our hands full we must hold them steady. Keep safety first!"

MUCH DEPENDS ON TRACK FOREMEN.

In view of the large number of trespassers that meet with accidents on railroad tracks, persons whose attention should naturally be directed to their own individual safety, how much more dangerous is it for the trackman who is continually working upon the track, engaged in performing duties such as tamping track, renewing ties, rails, frogs, switches, etc., where it is necessary for him to be always stooped over in a bent position, with his eyes riveted on the work in which he is engaged, which, together with the noise of his tools naturally prevents him from hearing the approach of trains and distracts his attention from the danger of being run down.

A great deal depends upon the vigilance and watchfulness of the foreman to keep his men from meeting with accidents under such conditions. On single lines this danger is not so great as on double-track or four-track lines where trackmen must watch out for trains running in opposite directions.

In this connection it is an established rule of the Lehigh Valley Railroad that where two main tracks or more are in operation the trackmen have imperative instructions to stand clear of all tracks while trains are passing. All track foremen are supplied with whistles to signal their men to move on and off tracks to comply with this ruling.

On a busy double or four-track railroad with trains operating every ten or fifteen minutes, the responsibility of the track foreman increases as the position of his trackmen becomes more menacing. The responsibility and danger is still greater in yards where engines and cars are running in every direction and on every track, thus

necessitating extraordinary vigilance on the part of the trackmen keep out of danger.

The trackmen perform their duties under more perplexing conditions than those of any other employe and this fact generally not given due consideration. For example, with a train running on the railroad the enginemen are usually protected by automatic signals; he knows what is ahead of him and what to expect. He "Caution," "Proceed" or "Stop" signals as the case may be. When it is necessary for the crew of this train to drill out a car or stop train for any purpose on the main track there is a qualified conductor in charge to supervise any switching to be done with the train and also a flagman to protect the rear end while the train is standing.

The track foreman's duties call for flag protection in practically every detail of his work, and while the automatic signal affords protection to him in some instances, there are others where it is of no aid to him whatever.

WHEN SIGNALS FAIL.

A defective condition developing in the tracks that breaks the signal circuit, such as a broken rail, switch point, or anything that will break the track—or where there will be no contact between the broken parts—will set signals at danger, but where conditions of this kind are of such a character as to leave the signal circuit intact although equally as menacing, the track foreman must, especially upon such conditions suddenly developing, put forth greater effort than the train conductor, to rush out flag protection to stop trains which, in the case of such defects, would be running on "Proceed" signals, notwithstanding the fact that any of those conditions would be unsafe for a train to pass over.

With a train crew on a main track shifting out cars a train following them will have a caution signal, probably one or two miles to the rear, and that train will, therefore, be on the lookout after passing the caution signal for a signal in the home block, which would be in "Stop" position.

The flag protection sent out by the train crew is therefore looked for or expected by the train following them while in the case of the trackman the train which he must flag, on account of suddenly discovered dangerous defects in track is notwithstanding such

the safety of the track to be impaired, but naturally has in mind only that the blocks are clear of preceding trains.

In this connection it might be said that the necessity for flagging trains is not as frequent with the trackmen as it is with the trainman. In these days of intense traffic, with heavy power and equipment, the wear and tear on track is so great that trackmen are continually under flag protection. This condition is especially applicable to busy railroads with large engines, frequent and long trains, where tie and rail renewals are correspondingly heavy.

Aside from defects suddenly developing in track, thus impairing the safety of same, for which the section foreman must provide flag protection and is not afforded any protection by the automatic signal, a large part of his time is consumed in renewing ties, for which the track must be raised—in connection with such renewals two-thirds of the foreman's time is engaged in such work. In the old days of renewing ties it was the general custom to replace the old ones by the new ties by digging holes, but in modern track maintenance this method is entirely dispensed with, as ties are renewed in every case by first raising the track a few inches to permit of placing new ties without disturbing the old bed, and also with the important object of relieving track from being center-bound. A center-bound track, as every trackman is aware, is a very bad riding track and an antiquated track condition to have existing on any railroad, from the fact that such a track, in addition to being rough and uneven, is difficult to maintain in line, surface and gauge. As the track must be raised to renew ties, to maintain them with the heavy power and equipment and intense traffic running over our railroads today, such work can only be done under the protection of the flag.

FOR ACCIDENTS DUE TO IMPROPER FLAGGING.

I mention these facts to show that trackmen are expected to flag and protect themselves in their work under peculiar conditions, and that they are called upon for this protection much more frequently than any other employe.

Notwithstanding these conditions accidents due to improper flagging or protection on the part of the maintenance of way employes, especially trackmen, are very few compared with those in other departments; a fact that, no doubt, due to the competency and vigilance of the section foreman and in my opinion reflects very creditably on this faithful employe.

The work of the trackman is of such a character that it is difficult

to devise any system whereby they would be insured full protection in their work, and, as a consequence, it is necessary to depend on foreman's vigilance and good judgment for the safety of his men.

A good foreman in any capacity, but more especially in railroad track work, is a valuable asset, and no railroad can afford to do without such men. Regardless of what precautions are taken to protect men they are of little avail in the absence of a competent and reliable foreman.

Competent and reliable supervision in any line of work is the keynote of efficiency and the first move in the direction of safety, and this, in my opinion, applies to the railroad track foreman more than to any other employee.

The labor situation during the past few years has been a serious problem, especially so in maintenance work of railroads, and other employees have suffered more on account of this condition than the track foreman.

Our railroad tracks must be kept up to the standard required for safe operations in transporting troops and war material required during the great conflict in which we are now engaged. This, together with the movement of all the commodities needed in the commercial and industrial lines of our country today, will tax our railroads more than they ever have been in the past and we must depend upon the track foreman who invariably remains in the service and is not what can be called a "floater," to do the lion's share of the work.

Should the great war continue for several years large drafts of men for military service will practically eliminate competent men from track work and considerably decrease the number of available men for such duties. It is then that the important duties of the track foreman and the factor that this loyal employee is in the successful operation of the railroads, will be fully realized.

MOTOR CARS FOR TRACK MEN.

On the Lehigh Valley Railroad a large number of our section and extra gangs are equipped with motor cars, only a small portion of them now having the lever or pump car. Every section foreman is regularly qualified in the operating rules of the Lehigh Valley Railroad. Where the motor cars are operated by other than track foremen such operators are regularly qualified in the operating rules to run the cars over the railroad. These cars are provided with necessary signal protection for both day and night, which consi-

day, or practically the same flagging paraphernalia provided for trainmen.

Our experience with vehicles for the movement of maintenance of way forces is that the motor car is not a fruitful source of accidents, as claimed by Mr. Watkins in his most excellent paper. It is true that we have had a few accidents, and serious ones, caused by faulty levers on hand cars, or cases where the wooden lever became defective and broken off while the car was running—breaking where it is attached to the wooden beam or propelling lever with a screw.

While we have had these accidents due to defective wooden handles in those old lever cars, we have also had as many or more accidents due to other causes with those cars, but the accidents with the cars in recent years was due to being run into by trains following, or in other words, the lever cars were too slow in motion to keep out of the way of following trains. If their speed could have been increased the accidents would have been avoided. These accidents were caused by trains overtaking such cars on sharp curves where their view was obstructed.

We have had a number of accidents with motor cars, but we have had none with motor cars that was due to faulty equipment. We have had comparatively few accidents due to improper handling of the cars. The major portion, in fact 99 per cent of our accidents with motor cars, can be said to be due to overloading, or improper loading.

The motor car has developed into such a wonderful convenience for conveying men to and from their work of maintenance, especially of track and bridge gangs, that the lever hand car has become obsolete and a larger number of men are hauled around on motor cars than such cars are supposed to carry.

We have quite a number of motor cars on the system but not enough to equip every section and extra gang; consequently some cars are occasionally overloaded, carrying twelve, fifteen and sometimes eighteen men, where their capacity is eight and ten men. This condition results in the operator's view being obstructed while running over the road, which may cause him to collide with trains ahead, run through switches and derails and interlocking plants. In practically every case where such an accident has occurred the operator's excuse was that he could not see ahead on account of so many men on the car, at least our investigation of the matter developed this fact.

MOTOR CAR OPERATORS ARE INTELLIGENT MEN.

Operators on our motor cars are usually picked from our intelligent maintenance of way employees. They are qualified to such an extent that they are on an even footing with men in the same service in this respect.

Our experience with the operation of motor cars, practically the only mode of conveyance used by maintenance of way forces on the Lehigh Valley Railroad, as on many other railroads with similar tendencies, is that if we had a sufficient number of motor cars properly equip every section and extra gang in both track and bridge forces, so that no car would be overcrowded or carrying men over capacity, our accidents on account of motor or other cars would be considerably reduced.

We are decidedly of the opinion that accidents due to motor cars are comparatively less than with lever trucks. In fact, we consider the motor car a safer mode of conveyance than the lever truck. In the first place there is no wooden lever to break; the motor car being self-propelling.

Secondly, in recent years, with the heavy traffic in which a large number of trains and engines are running over our railroads, the old lever truck is becoming obsolete and practically a dangerous vehicle from the fact that it is too slow to move gangs of men over important main lines with the requisite speed to run between and keep out of the way of trains. This is especially the case on mountain divisions and heavy grades where the propelling of the old lever truck up grade is practically out of the question.

No doubt there are a great many roads still using the old lever truck and where such equipment is in being we think that first-class hickory being applied in the construction of the lever handles is a proper thing—the exception as to the substitution of iron for wood in lever are well taken.

TO PREVENT MATERIAL FALLING FROM TRUCKS.

It is the practice on the Lehigh Valley when new motor cars are received to construct a block at the ends on the floor of the car to prevent bars from sliding off, as there is more danger from this source than from any other tools carried. In many cases we maintain a practice of removing the handles from the picks. The picks and handles are loaded on the cars separately and laid down on the floor.

where there is no danger of their creeping out by the vibration of the car when running.

A great deal can be accomplished towards eliminating accidents by instructing everyone concerned how to properly carry tools on motor cars and also by prohibiting men from sitting on the front and with feet hanging down. While we have had no accidents to men sitting in this manner, due to the fact that we prohibit our men from so riding, it can be readily seen that accidents could occur in this way, and foremen operating motor cars should be educated along those lines.

SPEED OF CARS.

While speed is looked upon generally as being the great menace of the motor car, to my knowledge we never have had an accident due to this cause. It is an imperative rule on the Lehigh Valley Railroad that motor cars should not be run in excess of twenty miles an hour. We consider twenty miles an hour a safe rate of speed for motor cars, and in fact, from experience we have found that a lower speed is too slow on the busy railroad of today.

Our trackmen do not have to wait for orders in the morning before starting work because our road is equipped with telephone booths located at practically every foreman's headquarters and the foreman can get in touch with the dispatcher every morning and receive instructions from him about what trains are due and what have passed. Our foremen proceed to their work with every knowledge of what is ahead or behind them.

EDUCATING MEN IN SAFETY FIRST.

We consider the education of our men on the subject of safety, especially in the operation of motor cars, as an important factor in the prevention of accidents. It is the practice on the Lehigh Valley Railroad, whenever an accident of any character occurs, to issue general instructions to all concerned, giving the nature of the accident and what should be done to prevent a recurrence. Names of those involved are of course omitted.

It is also important that the dispatcher and operator give due consideration to the safety of trackmen and others. I must say that this feature of the subject is given due consideration and dispatchers and operators always give motor car operators the information necessary to proceed over the line with safety.

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In his paper Mr. Watkins makes mention of the fact that it is difficult for the foreman, with two or three men, to operate hand car and flag himself around curves, and that men under such conditions are sometimes entitled to a little more consideration than they are getting.

While I have not as yet been confronted with any conditions of this character, nevertheless, with the tendency of the times in the labor situation we may find it difficult in the very near future to procure sufficient men to man our sections. When such conditions develop we will, of course, have to put up with it and do the very best we can under the circumstances.

To reduce the accidents to a minimum in the operation of hand cars for transporting section men and extra gangs of all kinds, and from their respective duties in maintenance of way work, the following is recommended:

RECOMMENDATIONS FOR SAFETY.

1. The elimination of the old-time lever or pump truck and its substitution by the modern motor car, a change that is justified from a financial as well as a safety standpoint.

2. The equipping of every section and extra gang in maintenance of way work with a sufficient number of motor cars to carry the designated number of men for which they are constructed; motor cars are built to carry only a certain number of men and should not be overcrowded.

3. That no employee be detailed to operate a motor car unless regularly qualified in the operating rules of the road.

The following are a few of the more important regulations issued by the Lehigh Valley Railroad governing the operation of motor cars. They are rigidly enforced:

When a new motor car is introduced on a section where a foreman is expected to operate it, an experienced motor car operator is detailed to educate him in its use and instruct him how to maintain it and not to leave until the foreman is properly qualified to handle the car.

That all motor cars be equipped with signal protection for day and night. Motor cars are equipped with two red lights on rear end, two white lights on the head end at night, in addition to this they have torpedoes and red flag by day. Torpedoes must

Motor cars when in operation and running behind trains should keep ten rail lengths or over (300 feet) from the rear of the train.

Motor cars when approaching public or private crossings to run slow enough to come to a full stop before passing over the crossing.

Daily inspections by the man in charge of motor cars of all the mechanism on the car to see that it is in perfect running order.

Mechanism on the cars to be cleaned by those in charge every day.

Periodical inspections to be made of the cars by the regular motor car repairman at least once a month.

Periodical inspections also to be made by the supervisor, division engineer and superintendent, as an incentive for the cars to be kept in proper condition and working order.

Since the introduction of the motor cars we have found this facility of such valuable service that this equipment has been used for almost everything.

The motor car has proved to be a great facility in getting men to and from their work in cases of emergencies, such as derailments, washouts, etc. In tracks affected by washouts a great deal can be and has been accomplished by making a reconnaissance of the affected territory and information in this way can be acquired which could not be obtained by any other method but by walking the ground over. Motor cars can be run over track washed out and suspended in the air, and can be carried around slides, thus permitting the getting of quick information as to the conditions preparatory to the work of restoration.

Motor cars have been used to a great extent in piloting trains, both day and night, in derailments or other emergencies when one or more main tracks would be obstructed.

We therefore find that the motor car is as useful at night as it is by day. The motor car in such cases is an economic proposition as it takes the place of an expensive engine and crew.

CHAIRMAN BELL: The farther we go with our program the more we realize the good work of the Program Committee. I think we are especially fortunate in our next number in having for the speaker an operating superintendent whose division for three successive years won the Safety banner awarded by the 'Frisco Railroad to the division of that system which made the best record in accident prevention.

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PREVENTION OF ACCIDENTS DUE TO EMPLOYEES GETTING ON AND OFF MOVING CARS AND ENGINES

C. H. BOLTZELL, SUPERINTENDENT, ST. LOUIS & SAN FRANCISCO
RAILROAD, FORT SMITH, ARK.

Mr. Chairman and Members of the National Safety Council:
The subject we are now discussing, in my estimation, is one that has never been given proper consideration by division officers. In starting a student brakeman in his new work we are very careful and particular to coach him in various ways to fit him for his position and for promotion later on, but the one oversight and error has been in coaching and training him in the proper method of getting on and off moving cars and engines.

We have assumed that the man understood this feature of the work when, as a matter of fact, there are very few men in train yard service that make it a custom and habit to get on and off of moving cars and engines properly. It is a part of their work that is performed mechanically, with their minds on some other feature of the work, and in this the danger lies. They do not make a serious effort to improve or perfect themselves in this work.

Very frequently we have a personal injury caused by a man jumping off of a car and not looking where he is about to land. The result may be a broken leg or he may fall under a train and count of striking some obstruction. Often material has been loaded too close to the rails and if the employe does not watch where he is going the result is a personal injury. This might have been avoided, first by prohibiting the unloading of the material dangerously close to the track, and, second, if the employe is kept alert and watchful of conditions as he is about to leave a moving engine, he might avoid personal injury.

WHY OPERATING MEN ARE INJURED.

I want to especially emphasize the importance of breaking bad practices of men using oil boxes as steps and the equal practice of men riding on couplers or catching approaching cars by stepping on brake beams or hanging on brake staffs. Trainmen should be cautioned against catching the front end of cabooses and should catch the rear end just as well and reduce the hazards of personal injuries by reason of falling under the wheels.

GETTING ON AND OFF YARD ENGINES.

We all realize and understand the wonderful improvement that has been made in train and yard practice in getting on and off switch engines. The reduction in personal injuries under this topic has been very satisfactory by reason of studying the situation, keeping in mind the importance of getting on and off under proper and safe conditions. We must extend this education among trainmen and other employees.

We have noticed for years and years the very bad habits of men getting on the sides of freight trains by using the oil box as a step. Perhaps under the personal observation of division officials men have lost their lives or limbs by reason of this careless habit. It must be stopped. I think that a strong crusade of education will result in a very satisfactory reduction of personal injuries from this cause. We know the effort that has been made to educate passengers on street cars to be more cautious in getting on and off street cars—especially in alighting. The same effort should be brought to bear on our train and engine men and other employees. Division officers must assist in seeing that this duty is properly performed.

CARELESSNESS AND INDIFFERENCE.

We know from experience that carelessness and indifference, as well as thoughtlessness, is the prime cause of personal injuries to employees under this heading. We also know that in many cases employees ride trains by hanging from side ladders when it is unnecessary. I have in mind a case at Fayetteville, Ark., where one of my safety committeemen—a train porter—called attention to the fact that other train porters were hopping trains and riding up and down through the yard when they were not on duty. They were unnecessarily taking chances. This practice was immediately stopped.

I am of the opinion that one of the most prolific causes of personal injury under this topic is caused by men failing to take advantage of their time when off duty at the terminals to take proper rest and prepare for the next trip, the next shift, or the next hours of service. At this particular time, when the railroad men of this country are so unusually busy, not only on the "Frisco Railroad" but on all other railroads, men are failing to take advantage of the time off duty to secure their proper rest. They go out on the road with a fourteen or fifteen hour trip ahead of them and before they are half-way over the division they are sleepy, tired out and indifferent, because of their failure to prepare themselves for the trip.

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Because of their physical condition, employes often run a necessary hazard in getting on and off moving cars and engines. I know from experience that the most dangerous period is when we are fagged out and exhausted for want of proper rest and sleep. It is impossible for a man in this condition to be keenly alert and alert to all the situation. The result is that we have personal injuries, the cause of which is the failure on the part of the employe, to the disadvantage of his time off duty to prepare himself for his next

BE PATIENT IN SAFETY WORK.

I am strong in my belief that we should be tolerant and patient in our Safety First work, for by these methods we can reach and convert the careless man to Safety First ideas and principles. There are exceptions to this rule but they are not frequent. My experience and the experience of my associates proves that the persistent patient method is best in securing results. Safety First workers should be Safety First workers each and every day, never overlooking any opportunity to speak to the men violating Safety rules and regulations, calling his attention to violations and use every influence to convince him that his actions are wrong. It may be necessary to correct the same man several times but in the end, when you have reached his heart and converted him to Safety First, you have accomplished a great good. When the man in question joins the Safety First forces in thought and in action he leads others in the same direction—instead of being a *student* he immediately becomes a *teacher*.

HOME CONDITIONS OF EMPLOYEES.

I have a great deal of faith in proper home conditions for railroad employes. I am strong in my belief that influences at home largely govern the man both when on duty and when off duty. I have been cases where it has been necessary to call in the employe's wife, after I have called attention to Safety First violations of the employe several times, and stated in the presence of both the necessity of taking some immediate action, that I could not assume responsibility any longer having called attention to violations several times. Invariably the wife will make a plea to give the husband another chance to make good and that she will use her influence to correct the bad habits that have been noticed by the division.

INTERESTING DIVISION OFFICERS.

I want to especially emphasize the importance of taking more interest in safety work. Get in the habit of calling attention to every violation or irregularity noted, not only in safety work but in violations of transportation and maintenance rules. I do not mean by this that superintendents, assistant superintendents and other division officers should correct the men in a harsh manner. Talk to them in a business-like way—earnestly and sincerely. This is what really reaches the man's heart—the sincerity and the spirit with which the criticism is offered.

Nothing is more important in our safety work than the correct and clear understanding of the transportation rules and the living up to the important rules in each and every case. The division officers observe sufficient irregularities and violations to handle the entire situation if they will do so. I think we should discourage the habit of "tattling." I think we could have a better understanding between division officers and employes if the matter was handled as suggested. I do not mean that one employe should not, in the right manner, speak to another employe if he is violating safety laws and transportation rules. I have in mind an effort to bring about a strong personal spirit of co-operation between employes and the division and general officers. Teamwork should be our motto. We should work it to a conclusion, just as we do in baseball, football, or any other game.

YOUNG EMPLOYES.

It is of importance that the railroads give special consideration to their young employes. A good many railroad men have joined the colors, and more are going, making it necessary to break in a large number of new men. Let us make a strong effort, in educating the new men in their duties, to teach them the right way to do their work. We must give these men special consideration—go into the smallest details of their work, and follow them up frequently to know definitely and positively that they are performing their work in the right way.

We must give these young men a great deal of encouragement. The greatest asset in America today is our boys and young men. We must help them by taking a personal interest in every one of them. Explain to them the necessity of their learning at this time as much in three months as you and I learned in three years. We should treat the boys as we would treat men, impress upon them the

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responsibility of their positions. We should never fail to encourage clean, healthful athletic sports and advocate all rational forms of physical culture.

We should give more attention to this important feature in railroad work. I know from personal experience that splendid results are obtained through encouraging boxing, swimming, playing and other clean, healthful sports among young men. There is no denying that the athletic man is a better Safety First man than the man without that training. He is more keenly alert to every situation and is less liable to injury.

Presence of mind is one of the big features in safety work. How can presence of mind be secured in a better manner through athletics and physical training. There is no doubt but that physical culture and Safety First go hand in hand. Every man appreciates the real pleasure of association with boys and young men and the more you cultivate this association the more it will improve you as well as the boy. Invite them to come to your club and see you frequently. It will be a surprise to you to find how much strength it gives you as well as the results obtained through the efforts of the young man by reason of the encouragement you give him. After all, it is only a question of a few years when these young fellows will be running the affairs of this country. Let us not fail to take advantage of the opportunity now to help them grow into whole, uninjured, strong, capable, clean, honest and thrifty Americans.

DISCUSSION.

CHAIRMAN BELL: It seems to me that no more timely subject than this could be brought up for discussion at this Congress. The Interstate Commerce Commission report for the year ending January 30, 1916, shows that there were ninety-four employees killed and 7,234 injured getting on and off cars and engines, which of itself indicates the importance of the subject.

But I think that the program does not quite state the subject matter as it was intended it should be discussed. What I think we are all most concerned about at this time is accidents due to men being struck by trains while walking on the track, working on the track, crossing the track or jumping from an engine or car on which they are riding.

Such accidents are, of course, often closely related to getting on and off cars or engines.

You will remember that at the Detroit Congress a special committee of the Railroad Section presented a report with a recommended form for reporting the causes of accidents. This form Mr. Richards put into effect on the North Western on the first day of January and one of the things we have ascertained from it is that in the eight months ending August 31st we have had one employe killed and eighty-nine injured in getting on and off cars and engines, but that in the same period we have had twenty-nine employes killed and fifty-nine seriously injured from the other causes enumerated. The fatalities represent 50 per cent of all the deaths which have occurred in the stated period to employes.

CAUSE OF ACCIDENTS.

These accidents occur, for example, in this way: A conductor, backing his train into the yard from the east main track, stands between the two main tracks to give signals. He stepped too close to the west bound track and was struck and killed by a passenger train.

A section man was working on the main track adjoining a yard track. The way-freight engine backed in on the yard track to set out a car. The man thought the engine was on the main track and moved over onto the yard track as he thought to get out of its way and stepped in front of the engine and was killed.

A train crew was switching in the yard and the engine was pulling a number of cars and shoving several ahead of it. The brakeman rode on the head car and got off to run ahead and throw a switch. He found the switch was on the opposite side of the track to that on which he was working and in running across the track ahead of the cars, fell, was run over and lost both legs.

When it was found that so many accidents from this cause were occurring a special bulletin was gotten out with an illustration showing how such accidents occurred and giving a brief outline of the causes of them, together with information showing the number of employes who had been killed and injured in that way. This bulletin was placed on all Safety Bulletin Boards and given individually to each employe in the train, engine and yard service. This bulletin in revised form was recently sent out to the membership by the Railroad Section of the National Safety Council.

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REMEDY IN EDUCATION.

Then the matter has been called to the attention of the committees a number of times and been discussed by the through them brought to the notice of the general employes.

The matter of preventing accidents of this kind appears one entirely of education. We have tried in every way that seemed proper to impress upon the employes the importance of exercising care and being constantly on the alert when working about tracks to avoid such accidents.

This subject is one of very great importance and one concerning which we are all seeking enlightenment and I hope that it will be fully discussed by the members so that some constructive plan may be devised to meet this problem.

Our own plan of constantly agitating the matter, however, has not had good results, for in March, the month in which the bulletin mentioned was issued, we had eight deaths and ten injuries from this cause; in April three deaths and three injuries and in May two deaths and four injuries.

MR. CARROW: Do I understand that the reduction was in connection with accidents which resulted from being struck by

CHAIRMAN BELL: Yes,—while walking or working on the

PROPER WAY TO GET ON AND OFF CARS.

MR. RICHARDS: Before we take up the next topic I would like to ask Mr. Boltzell a question. I was very deeply interested in your paper, particularly that part where he said there ought to be a proper method of teaching men how to get on and off cars in a safe way. What is the proper way to do it? What method did you use in teaching them how to do it?

MR. BOLTZELL: The old, experienced men are the best teachers for that kind of work and that is the plan I am working out. We give reference very largely to new brakemen. We have never before it was necessary to tell him how to get on and off trains—we assume he knew. Perhaps we did not think it would be worth while to teach a man how to get on and off a car or train or engine and for that reason he was never shown how to do so properly. We have recognized that weakness and the division officials and the older men in that particular branch of the work are giving special attention to new men, coaching them how to get on and off properly.

MR. RICHARDS: I would like to be coached. What do you

them to do? I would like to know, so I may be in a position to tell our men how to get on and off properly.

MR. BOLTZELL: Very much in the same fashion as we give instructions to people getting on and off street cars: "Look where you are going; get off in the same direction the car is going, etc."

MR. RICHARDS: Do you do that by posters or anything of that kind?

GOOD HANDHOLDS AND FOOTHOLDS.

MR. BOLTZELL: No, sir; nothing in the line of literature. We are handling the matter among ourselves. I think that gives us the best results.

MR. CARROW: For Mr. Richards' information, we have our classification for getting on and off cars at rest and for getting on and off cars in motion. The first cause for accidents is missing the hand holds, the second cause is missing the foothold, the third cause is defective hand holds, the fourth cause is defective footholds and so on down the line.

It seems to me if you had some classification like that, to carry out Mr. Boltzell's idea, to show the men that it is very necessary to secure a good handhold, it is very necessary that you secure a good foothold, etc., that idea should be satisfactorily carried out.

I have a great deal of sympathy with the question that was lurking in Mr. Richards' mind, because it is easy to say we would be guilty if we did not instruct our men, but when you come to do it it is a very intangible thing.

MR. DOW: Supplementing the question Mr. Richards has just asked: I wish there were practical railroad men here who could answer the question as to how to get on a car in the right way.

Not long ago we got out an illustrated bulletin on that subject which showed a man supposed to be getting off in the right way. He had hold of the grabirons with both hands and we will say the train was going in this direction—he was on the left hand side. He swung around with the right foot coming to the ground first. Many were of the impression that if he was getting off on the left side that the right foot should be the last to leave the car. A number of railroad men criticised that picture. They said it was not the natural way to get off. They said that if he got off the left hand side of the car with his right foot first he would put it down in a very awkward position and it would be very clumsy for him to do it that way. Is there any set rule we can lay down for getting off cars? They

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said that he should use his right foot; that is, he should step off his right foot when he was on the right hand side of the car. I ever, when we get right down to the essential features of the matter, is it not a question of practice, the natural way in which the person swings himself off the car?

I would like to hear from some of the other gentlemen in regard to this subject, and to have the opinions of the practical railroad men.

RIGHT FOOT OR LEFT FOOT.

MR. McCAMPBELL: I have been in train service on our railroad for twenty years. I believe that every employe jumping off a moving train has his own way of doing it and he does it, as Mr. Dows said, in the most natural way. Some prefer to have the right foot leave the car first and other employes prefer to have the left foot leave the car first. Some employes have feet that are not strong, one is probably stronger than the other. The man may have a broken arch or something of that kind and he favors the weak foot. I do not know of any way or any rule which has ever been established or can be that can be carried out by the rank and file as a proper way of getting on and off trains. My idea is that a man should get off in the most natural way, the way in which he can do it best. I think it is a matter of fifty-fifty as to which foot he gets down first.

The most important thing, to my mind, is the fact that one way is natural to one man and another way is natural to another man, consequently, the man will use the way that comes most natural to him.

MR. C. H. HAMMOND (Safety Agent, New York Central Line): I have been in the switching service for twenty-six years and I have also obtained a flat foot, but I find if I am on the right side of the car, whether it is from force of habit or some other cause, I do not know, but I find if I am on the right side of the car I can get a better view of the ground on which I am about to alight, by having my left foot hit the ground first. If I am on the left hand side of the car I can do it better by letting my right foot strike the ground first. It is a rather odd position for a man to get off a car, but I find it much more convenient for me to get off with my right foot on the left hand side of the car and my left foot on the right hand side of the car.

MR. E. M. HARRIS (Safety Inspector, New York, New Haven & Hartford Railroad Company, New Haven, Conn.): I would

to add that it has always appealed to me that it was a safe practice, because I am tall, to keep my hand on the grabirons until I am sure that my feet are on the ground, or rather to be sure that I have my footing before I let go with my hand, so in case I stumbled or missed my footing, I would be able to hold on with my hand. I always waited until the speed was reduced to such an extent that I could keep up with the train. If every one would do this I do not think there would be much danger in getting off trains. If they would wait until the speed of the train was reduced so that they could keep up with it, then it would be pretty safe to get off the cars.

SPRING AWAY FROM TRAIN.

MR. HARDSPEED: I am not a railroad man, but I want to make one point that we must remember: There is a right way and a wrong way and each man may have his own way, the most convenient way for him, because he will not do wrong in the beginning. This gentleman's paper brings out the point that we should instruct our employes and the time to instruct them is when the employe is new, and if we will do that we will be that much ahead of the game. Take base ball, for instance; you can teach a boy the wrong way to catch a ball and sometimes he will catch it, but it is better to teach him the right way.

Another gentleman spoke of getting off a car with his right foot when he was on the left hand side of the car and with his left foot when he was on the right hand side of the car. That brings him so his body swings away from the train, throws him right away from it instead of dragging him under the car. For that reason I would like to ask if he ever used motion pictures and found which was the correct way to get off of the car and which was the proper way to teach his men? I want to use something of that nature and teach some of our yard men—(we have been having trouble) the proper way to get off a car.

I believe the whole matter goes back to the new man finding the right way, and utilizing, not only the motion of the train, but the motion of his body, and the physical swing, to get the best position to keep the man away from the train as he leaves it.

WATCH YOUR STEP.

SECRETARY ANDERSON: Does not a great deal depend on the man looking where he is going to alight? That is, not to step on any

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obstacle to possibly trip him and throw him under the train seems to me that is an important factor in that class of accidents.

MR. McCAMPBELL: I do not believe it would make any difference on which foot you were going to alight if you are going to alight on your feet.

SECRETARY ANDERSON: I do not think it makes any difference at all.

MR. WILLIAM VAN GORDER (Safety Agent, New York Central Lines, Middletown, Ohio): This seems to have brought up a good deal of discussion. Some say to put down one foot and others to put down the other foot. I have been railroading for twenty-five years and have been in train service and in the maintenance of way department and I have always noticed that certain men had their own way of getting on and off trains. Getting on and off trains is largely due to the practice a man has and while one man may practice one way and another man may practice another way, it practically resolves itself into the manner that a man has been accustomed to.

I have seen men get off trains on the left-hand side of the train, swing their right foot around, and strike the ground first with that foot. They did it very successfully while another man could not get off that way at all—they would put down their outside foot.

In regard to what was said by the gentlemen in reference to getting his foot on the ground before he let loose with his hands, I hardly think that is a practical way of getting off a train at a station. I want to say to him that he does not want to get off a train going at any rate of speed and hold on with his hands, because he will get a fall.

My way of getting off a train is by putting my right foot down first if I am on the left-hand side of the train, and swing out on my right foot. If I am on the right-hand side of the train, I put down my left foot first. I let loose of the grabirons before I strike the ground. If you strike the ground and have hold of the grabirons and the train is going just a little bit faster than you thought you were liable to get jerked off your feet and the train will drag you along. Some one will laugh at you.

CHAIRMAN BELL: This is a proposition that is very debatable. It is a matter of seeing that the men are instructed to be careful in seeing that the track force, the station force and others having to do with the matter.

APPOINTMENT OF SUBCOMMITTEE.

MR. HARRIS: I thought I made my position clear when I said you must wait until the speed of the train decreased. If you are going to get off the train at a speed that is faster than you can run, then, of course, that destroys my whole argument. My idea was that the employe should wait until a train slowed down sufficiently so they would be able to run as fast as the train was going.

MR. McCAMPBELL: Does it not resolve itself down to the exact question of teaching the new men to get off the car in a safe way? It seems to me that it is necessary to educate him how to get off the car.

MR. VAN GORDER: I think a rule that would cover this point would be to instruct your safety agent, or a safety committee to talk to the older and more experienced railroad men and impress upon them that it is their duty to watch new employes and coach them in the right way to get on and off of trains. I think that is a good way to cover this matter.

CHAIRMAN BELL: Mr. Balliet, one of the New York Central operating officers, is here in the front row. Perhaps he can help us. We seem to be getting into a pretty deep question.

MR. H. S. BALLIET: I was listening very intently and was very much interested. If it is possible under your organization to appoint a subcommittee of four or five men to analyze this subject, I think they would be able to get you some wonderfully good data.

Personally, I do not believe you will get together on the question. From what I have seen in the few years I have railroaded, there is a wrong and a right way to get on and off cars. You have to teach the new man the right system and he will spread the good news all over the division. He will often get the old man, finally, because the old fellow will see how much easier it is to do it the way the new man is doing it. The natural way is to throw your body from the moving train and that cannot be done by stepping off on the right foot when you are on the right side of the car. That principle is wrong. In order to be careful to alight from the car, so you will throw your body away from the car, it is necessary for you to step off with your right foot first when you are on the left hand side of the car and your left foot first when you are on the right hand side of the car.

MR. DOW: I do not want any one here to understand that the illustration to which I referred came out of my own fertile brain.

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The picture was posed by a practical man, who was asked to do a stunt and show how it ought to be done. That is the way he

My suggestion is that the Railroad Section, through its Secretary, get out a letter to the members of the Section and see if this suggestion cannot be put to a vote of the safety committees of each road, then poll the result of that canvass.

CHAIRMAN BELL: What do you gentlemen think of that suggestion?

MR. CARROW: If Mr. Dow will make that as a motion I will be glad to second it.

MR. DOW: I will make it as a motion. (Motion seconded.)

CHAIRMAN BELL: You have heard the motion. Is there further discussion? If not, all those in favor will signify by saying "Aye." Contrary, "No." The motion prevails.

We will proceed to the next number on our program and ask Mr. Morris to give us his paper.

PROTECTION OF MEN WORKING ON AND ABOUT TRACKS.

(a) TRACK AND MAINTENANCE OF WAY DEPARTMENTS.

(b) MECHANICAL DEPARTMENTS.

S. S. MORRIS, CHAIRMAN, GENERAL SAFETY COMMITTEE, ILLINOIS
CENTRAL RAILROAD, CHICAGO.

Mr. Chairman and Members of the National Safety Council:
The subject assigned to me is "Safety in Maintenance of Way and Mechanical Work." How these accidents occur has been shown by previous papers read in this meeting, and it has been a live subject at every National Safety Council meeting, and at the meeting last year a coterie of the very ablest safety men have taken the question without gloves and advanced many good ideas which have later have been adopted by many roads, and the results obtained have yet to be seen.

When we stop to consider that at least 60 per cent of the employees on a railroad belong to the shop and maintenance of way departments, and that 80 per cent of that number cannot speak the English language, is there any wonder that personal injuries occur? The majority of this class have never been educated in self-protection or even the rules of carefulness, and are placed with a

man that scouts at the word safety and drive their men so that they lose all sight of safety for themselves or others, and finally wind up with an accident that causes his men to leave him. When asked why, they merely shrug their shoulders and walk away.

CO-OPERATION OF WORKMEN.

An efficient foreman will show safety in his every movement and seldom has an injury to report and never short of men. Such foremen get the co-operation of their men and show good team work.

Yet there is another factor we must not overlook—the roadmaster and supervisors. They are the responsible parties, and, unless they talk safety and follow it up closely their subordinates will not and chaos soon resigns supreme.

The urgency of safety was never more apparent than at this time. The scarcity of men has forced a condition upon us that must be met. Many men that have not arrived at the age of discretion and many that are in their dotage are accepted, and unless they are placed under the leadership of men known for their safety habits, will meet with accidents. Therefore, the roadmaster and supervisors must meet the situation with a determination that will insure safety of these men, and not stop at a half-way point in this work, but carry it to the limit, eliminating the careless man or placing him where he can do no harm to others.

To my mind one great factor in safety is good team work and cleanliness in doing work. Do not invite an accident by leaving material and scrap so that men will have to stumble over it and possibly break a leg, run a nail or sliver in foot or hand, and the foreman should at all times see that tools his men are using are in good, safe condition. Where you find this prevails, you have few, if any accidents to record.

SHOP WORKMEN.

The same supervision as outlined above is more or less prevalent in shops. Foremen will allow men to work without goggles where they should be used, or not use a safe guard, and until an accident occurs, is perfectly oblivious to safety. Why, because their supervising officer has not encouraged the safety habit with the vigor that he should, thereby passing it down to his subordinates and workmen. It may be said that I am criticizing unjustly, but the facts are before us every day.

APPLYING THE REMEDY.

Now the remedy—what shall it be? Encourage safety meetings and follow them up; see that they are held. Post bulletins promptly on boards for that purpose. The bulletins furnished by National Safety Council are of great value and are read with interest by the workmen and, no doubt, have prevented many similar accidents. Keep after the careless man. Encourage men that their health and happiness will come through safety. Encourage the use of safety devices and where objected to firmly insist on their use, remembering that they are men and probably little egotistical as to their ability to take care of themselves, but can be properly reproached. No man is so narrow that he will not listen to reason.

In conclusion, I will say to the safety men here that their work at the present time is more stupendous than ever before, and co-operation must be furnished each and every one if we expect to get good results.

DISCUSSION.

CHAIRMAN BELL: Mr. G. L. Wright of the Omaha Line, who was expected to discuss Mr. Morris' paper, unfortunately had to leave early because of sickness in his family. The subject is now open for discussion. We have time to take up the discussion of this paper now and would like to hear from anyone in connection with it.

There is present one of the most active members of the Railroad Section, the gentleman whom you elected last year to serve as Chairman of your Section. We would like to hear from Mr. Wilson.

RESPONSIBILITIES OF SAFETY WORK.

MR. W. C. WILSON: It is a great pleasure to be privileged to be here and see so many familiar faces and to greet so many friends. I trust, among other things, that the incoming officers will not have the same experience those who were elected a year ago apparently have had. It appears that about nine-tenths of the men elected last year who were appointed by the officers to serve on the Executive Committee are now out of the service. I hope that will not happen to Brother Bell and his associates. The gentlemen elected last year are out for one cause or another, some of them probably have better jobs, wider activities, or perhaps it was thought the railroad business

should be presented and they sought wider fields where they could bloom and blossom as the rose.

The railroad business has appealed to me very strongly and I find, after having left it, that the work of the safety organization is the one that sticks in my head the longest and is closest to my heart.

I was deeply interested in the work and incidentally was charged with a great deal of responsibility connected with the safety organization. It was always much more fundamental, to my mind, to prevent an accident than to settle the damage after it occurred, and that it was a broader and a higher field and one that appealed more strongly to the heart and to the mind of a man to save human life and human limbs and human health than to worry about the damage after the accident happened, although both are important and necessary.

MUST MEET SPECIFIC QUESTIONS.

The Railroad Section has very high ideals. The question is, are we progressing as we should? We believe and we are preaching a gospel of safety. We tackled it first upon broad lines and we had first-class years, but now we have come to a point where general statements, general propaganda and general principles—while still having a place—will not reach the point.

Safety work must be systematized, it must be made a science. We must get down to bases. We must tackle specific questions in a practical way in order to progress. If we do not I fear the life and spirit and punch will go out of the organization and it will become fossilized.

I do not want to criticise, but I heard a number of papers. I was here yesterday and I have attended all of the meetings of this Section in other years and I have been impressed with the thought that too much time is spent in studying self-evident facts. The body of gentlemen that meet here are experts. They have gone all over the A B Cs of this proposition. They do not have to be talked to as you would talk to a primary class. They come here for new ideas; they come here for the solution of difficult problems; they come here to get new ideas, new slogans, new ways of doing business; they come here for inspiration. They do not come here to hear things that they all know and have gone over time and time again.

I throw this out by way of suggestion, for the future good of the

organization. It is along lines I have mentioned before, that if are to continue the interest of this organization you must put the brain into it that you can and must not be contented to rest on past laurels. You must go forth into new fields to grow and progress and to make this organization what it will no doubt become, one of the strongest factors in American railroad life.

I think, Mr. Chairman, I have talked long enough. I thank you very much, indeed.

AN ACCIDENT IS A NOTICE OF SOMETHING WRONG.

MR. RICHARDS: I would like to make one suggestion, if I may on the matter of preventing accidents—the way to go about it. We know that when an accident happens it is a notice there is something wrong. It may be that the man injured or the man working with him is at fault or it may be the track or the equipment is wrong.

We have adopted a plan on our road, when we have an accident brought about by reason of some careless man's failure to conform with the rules or something of that kind, if we have a bulletin literature that would apply to that specific accident we utilize it in sending it to the man. For instance, a man is injured going between moving cars or is injured in attempting to get on a locomotive coming toward him or a man is injured crossing a track in front of a moving car or engine or is standing too close to the track and so is struck by a moving car or engine. What we are trying to do is to prevent similar accidents occurring in the future. We send to every man who gets hurt and to every man that was in his crew a bulletin calling attention to that specific kind of accident and telling them of specific cases of men hurt in that particular way. We try to bring home to them, right at the time they have this accident in mind, cases of their friends or co-workers killed or injured, and the necessity of complying with some particular rule or of doing work in a particular way or by calling attention to how many men get hurt doing that particular thing. The same applies to the car department; we show the number of accidents that have occurred because men did not put out a flag. Every car repairer in the territory where an accident occurred immediately gets a bulletin calling attention to the accident and to other accidents of that kind and as to the necessity of complying with rule No. 26.

That is what we are attempting to do and this method is one way of bringing to the attention of employees specific accidents of a certain kind so they will not be injured in a similar way.

wonder if any of you men have other methods of doing it? I would like to have information on the subject.

Of course, you cannot prevent all accidents, but when you have one from some known and preventable cause how are you going to bring it home to the men so that you will not have another exactly like it?

WORK OF GENERAL SAFETY COMMITTEE.

MR. WATKINS: I think I might answer Mr. Richards' question: I have sent to my office copies of reports of all accidents that happen on the system. I classify them and every month I select from that collection a certain class of accidents; jumping from a moving train, for instance, or accidents of that kind. I take that classification to the next meeting of the safety committee and those accidents are read to them. We have about 150 men scattered throughout the system on our committees. The accident reports show just what happened on the whole system during the previous month. The committeemen talk it over with the other men and tell them what took place in the way of accidents.

In that way we are able to accomplish a great deal of good. For instance, last month we had five men's fingers injured, and one man's hand was crushed entirely off, while coupling cars. The six accidents were kept together and read over the entire system and all the men knew that six employees were injured during that time in that particular manner.

At the last meeting I attended one of the committee men said: "During my lifetime I have been doing the very thing that crippled six men last month. I did not suppose that men were getting hurt to that extent, but as long as I live I shall never put my hands in any place where they will be caught."

ALL TIME-LOST ACCIDENTS GO TO SUPERINTENDENT.

MR. FRANK A. MITCHELL: We have a practice on the New Haven,—possibly some of you have the same thing in effect,—that if an employe is injured through an accident which causes him to lose any time he is required to appear before the superintendent before he can resume duty. That is not intended as a reprimand, but it provides an opportunity for the superintendent to talk with the injured man and impress upon him the importance of guarding against whatever carelessness resulted in his injury. This plan has worked out very successfully. Of course, he has to go to head-

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quarters anyway to see the superintendent, so it does not entail loss of time or any unusual hardship.

CHAIRMAN BELL: Do you do that in the case of all accidents or only in connection with serious accidents?

MR. MITCHELL: All accidents resulting in loss of time.

CHAIRMAN BELL: Regardless of the cause of the accident?

MR. MITCHELL: Yes, sir.

CHAIRMAN BELL: Does that include shop men?

MR. MITCHELL: Shop men do not appear before the superintendent; they appear before the foreman.

CHAIRMAN BELL: Is there any further discussion of subject?

SECRETARY ANDERSON: Mr. Mitchell, have you had any opposition from the superintendent to this extra duty you impose on him?

MR. MITCHELL: No, he is very glad to do it for us. He feels the results obtained justify the slight inconvenience he is put to in this respect. It does not take very long, just a few minutes.

MR. DOW: Do you think that has any effect on employees other than the ones injured?

MR. MITCHELL: I could not say as to that. It has an effect on the fellows that get the talking to.

MR. CARROW: I get a good many ideas from Elbert Hubbard. He once said that the only sin was the sin of repression. Accepting that as a fact, I have committed a serious sin, for it has been my thought that the condition referred to by Mr. Wilson and also Mr. Richards was the greatest impediment to this Section in its work, namely, speaking in generalities. I saw, much to my satisfaction and I take it to the satisfaction of all the members, the demand for a man to stand on the platform and say something specific. We have too many platforms on nucleated educational methods; we do too many things that do not accomplish anything; in short, what you are doing gets you nowhere.

In this meeting, more than ever before, I have noted a disposition to hold the speaker, or the man who has a suggestion to make down to "brass tacks." That, I think, is the most significant indication of the future success of our work as safety men.

For a long time I have been a student of statistics. A year or so ago Mr. Richards made a suggestion that started me on this track. Such statistics as are available are elaborate and complicated, but

class of accidents and attempt to describe them in a series of bulletins. I wanted the bulletins to be so simple and plain that every one who read them would understand their meaning and purpose. My purpose was to carry on a safety first campaign among our men. I very soon found that I was up against a difficult proposition, and while I am still working and hoping for success I have not as yet found the key to the situation.

DISTRIBUTION OF BULLETINS.

Take the North Western Railroad, the Delaware, Lackawanna & Western, the Pennsylvania or the New York Central Lines. You want to bring some specific hazard to the attention of your men, so you prepare a bulletin. I do not know what arrangements you gentlemen have for the distribution of the bulletin, but it is a big job. The work includes the printing and distribution of 5,000 to 15,000 bulletins and after you get one out and congratulate yourself, thinking you have done well, in less than a week you realize that you will have to get out another the next week and another the week following. After you have issued half a dozen you find you have attempted a subject that is not quite susceptible of continuous treatment. Then, of course, you must plan a new campaign and go over the preparatory work a second time.

Bulletins are very good things but they are not exactly, as far as we have been able to develop them so far, entirely satisfactory, because of their unwieldy nature and because it is not always possible to assure yourself that they get to the men.

The bulletins we are planning are as specific as we can make them and we find they have an increasing value in safety work. Our theory is very simple: When we have something to say we try to put it so it will be understood by those who listen and the information is of such character that it can be applied in our own daily work.

USE OF "F. D." BLANK.

MR. DOW: We are enlarging somewhat on our procedure of inviting or familiarizing employes with the causes of accidents—what we call our form "F. D." At the Congress in Detroit the Accidents Statistics Committee of this Section exhibited a sample accident blank. Mr. Richards was chairman of the committee. Since that time we have used that form on the New York Central Lines and have improved it somewhat.

In the first place, we send the accident classification blank to the

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members of the division, shop and yard safety committees throughout the system. Our committee organization is being very largely increased; we now have not only divisional safety committees of the various operating divisions but operating underneath each divisional safety committee is the yard committee. In every large operating yard, the yard master being chairman of the committee reports to the chairman of the divisional committee. He is by virtue of his chairmanship of the subcommittee a member of the divisional committee. We also have a number of committees composed entirely of yardmasters with a general yardmaster as chairman.

The blank I refer to is sent to every member of our division, yard and shop committees. Several thousand are distributed every month in that manner and they reach a representative class of employees on every section of the road.

One of the points we have elaborated on the blank is to separate division accidents from those relating entirely to shops. We have a classification of "eye accidents" and if a man loses an eye in the car department of the East Buffalo shops it appears under the proper column, "car department, East Buffalo shops." Our blank will record the specific information and will show how many men lost their eyes in the East Buffalo shops.

With this information we are in a position to know exactly how many accidents occurred in that particular shop, and, therefore, when there are a number of accidents, we know that there is something wrong in that shop; that the enforcement of the wearing of goggles is not being carried out or that proper discipline is not being administered in some particular department.

I will be glad to furnish a number of our blanks to this Section tomorrow morning. I will bring enough copies to go around and you will have an opportunity to see what we are doing.

While I am not prepared to say how effective it is going to be, we only put it into operation on the 1st of July—I cannot conceive of a better way of keeping the general causes of accidents before the employees than through such a statistical sheet.

MR. CARROW: Mr. Dow, do you think the average employee would have enough interest in this matter to read so many causes as that.

ANALYZING ACCIDENTS AT SAFETY MEETINGS.

MR. DOW: The instructions require that the sheet be analyzed at meetings, that it be gone over very carefully and every cause shown must be discussed and commented upon.

MR. CARROW: That is for the committeemen alone?

MR. DOW: That is for the committeemen alone.

MR. CARROW: That would not actually reach the men on the firing line, save by word of mouth.

MR. DOW: The word is passed from the committees to the men. Of course, on the New York Central Lines we have an organization that includes a divisional safety agent on each main line division. There are twenty of our men here today and all these men use this blank form in connection with their work of continuously circulating among our employes and talking to them as to the most prevalent causes of accidents.

MR. BALLIET: I was very much interested in Mr. Morris's paper and in what Mr. Carrow said. I am wondering, and I have a number of things in mind—whether it is possible to have more supervision over the section foreman and cover all the ideas advanced in this room at this session; that is, safety, operation, maintenance, renewals and everything else. The foreman seems to be a man who has superior knowledge. He has many functions, we all know that. Most of the time he is hard to reach—he is very difficult to supervise. He hires men as he can get them. It might be possible after due consideration to create a joint supervisor of some kind and invest him with all the functions enumerated.

CHAIRMAN BELL: We will postpone further discussion until tomorrow. Mr. Cochrane, we will be very glad to have your paper on the "Inspection of Cars and Engines," classified under the sub-headings, "Prevention of Accidents" and "Prevention of Fire Losses."

INSPECTION OF CARS AND ENGINES: (a) PREVENTION
OF ACCIDENTS. (b) PREVENTION OF FIRE LOSS.

J. A. COCHRANE, SUPERINTENDENT OF SAFETY, GREAT NORTHERN
RAILWAY COMPANY.

Mr. Chairman and Members of the National Safety Council:
The successful salesman is the man who believes in the article he has for sale. His enthusiasm and belief in it is what sells it to his customers. The same principle applies to the safety movement. Real progress can only be made when every man in charge of men is made to realize the necessity of his being enthusiastic along accident prevention lines, when his enthusiasm will, in the natural course

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of events, be communicated to his men. Safeguards may be provided, rules and instructions issued and unlimited reading material dealing with safe methods be distributed among men, but all this will be valueless unless the man in charge be an active exponent of such principles.

This is specially true in regard to the work of car foreman. The inspection of cars with a view of preventing accidents can only be performed by inspectors who are painstaking and minutely careful in every detail, if the desired end is to be attained. If the foreman in charge of these inspectors does not lead the way it is hard to be expected that the men in his charge, who look to him for their instructions and guidance, will do their work in the proper manner. This applies even further to the foreman, who in each case is a man who has come up from the ranks, the inspector of today becoming the foreman of tomorrow, and he will naturally reflect the character of the man under whom he has received his training.

The matter of education—continued education—is important. The instructions issued should be as simple and as easily understood as it is possible to make them. Involved, technical instructions given to men not capable of fully understanding them are more apt to harm than good. The plainest and simplest of language should always be used and each point brought out clearly.

RESPONSIBILITY FOR REPAIRS.

The enactment of the Safety Appliance law of 1893, and the various amendments thereto, including the Ashpan law, Boiler Inspection and Locomotive Inspection laws, which are controlled and enforced by government bureaus, places the responsibility of seeing that repairs are made directly upon the carriers, and should an inspector fail to discover penalty defects, and same are later discovered by government inspectors, the company is penalized for non-compliance with Federal laws. The car foreman should incorporate the Federal requirements into language easily understood by his inspectors, calling particular attention to the more important points. In addition to this he should further instruct his men in the best method of performing their work. While it is important that no point be forgotten when issuing such instructions, it is equally important that such instructions be reduced to as concrete form as possible, for if they go into much detail some really important points may be overlooked, due to attaching too much importance to minor

Once the inspector has a thorough understanding of all the defects for which he is to examine a car or engine, the next thing for him to do is to formulate a method of procedure so that each action will follow in a natural sequence. As good a method as any, and one which has been used successfully for some time, is as follows:

FOLLOWING THE INSPECTOR.

The inspector should commence by uncoupling the air hose in order to examine the hose, coupling and gasket. Then he should examine the uncoupling mechanism, coupler, end of car, including handholds, running boards, brackets, cleats, end and side ladders and sill steps. Then the coupler and parts, draft gear and sill, wheels on inside, axles, longitudinal sills, body and truck bolsters, brake beams, connection, etc.

Then to the side of the truck and examine the tread, flange and outside of wheel and oilbox, inside of oil box to determine condition of the journal, its bearing and wedges. Next the arch bars, bolts, brakeheads, shoes, etc., are examined. He should then look under the car for any defects which may be visible to the eye from that side of the car, note the condition of the side of the car as he goes along, proceeding to the center of the car, where he examines the condition of the side door, etc. Here he inspects and tests the air brakes and connections, which is very important. Should a car be empty he will also look inside, inspecting the interior for any defects. He then goes to the next truck and proceeds as before. This concludes the inspection of one side of the car and should be repeated on the other side.

When the ground inspection is completed the inspector should climb to the top of the car and make a thorough inspection of the roof, examining handholds, hand-wheel ratchet, wheel pawl, running boards, etc., from one end of the car to the other.

The same careful inspection should be given to outgoing trains as is given to incoming ones. Cars are often switched after inspection and rough handling by yard crews may cause damage and result in defective equipment.

After inspection is completed, the air hose should be coupled and a test made to see that it is cut in on all cars and that the angle cock handle is closed on the last car so that the train will be ready for the terminal test for air brakes.

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TERMINAL TESTS.

This terminal test is carried out in this manner: When the engine couples on to cars, and while the engineer is charging cars so they will have seventy pounds of air pressure, it is the duty of inspectors to look over the train to see that the air is cut in, to watch for any leaks, and to remedy the same if found, and when the engineer applies the brakes the inspector should again go over the train and see that cars have the proper piston travel and watch to see that the retaining valve handles on cars are closed to prevent running wheels. He should also see that the air properly applies and releases on all cars. Full set and full release constitutes a terminal test of air brakes. When this has been done, and equipment on cars has been found to be in proper working order, the train is ready to leave so far as the inspector is concerned.

In addition to the above examination, however, it is also the duty of the car inspector to see that cars are properly loaded. Trains must not be loaded beyond their safe capacity. It must be seen that the load on open cars is properly distributed and that material does not extend beyond the authorized height or width. Particular attention should be paid to the manner in which material is loaded on two or more cars to see that loading rules are complied with. For cars loaded with machinery or like commodities must not be permitted to go forward unless the load is secured to prevent it from shifting.

Longitudinal sills over the body bolster and cross tie timbers on the car are more apt to break there than at any other place and require special attention. At the same time the inspector should look over the decking underneath the cars between the sills, paying particular attention to stock cars, for the reason that this class of cars will be found to contain more or less manure at all times and a damaged deck may not always be readily visible from the inside of the car. Such inspection will prevent many accidents to live stock.

PROTECTION FOR INSPECTORS.

Proper protection should at all times be afforded the men who are making inspection of cars, either by means of blue flags, derailed cars or some other device. The inspector who makes a proper inspection of cars for defects will never fail to provide adequate protection for himself while making such inspection. There are many ways:

examining wheels on the inside looking for cracked flanges, spokes, plates or wheels loose on axles, it is always well to inspect the wheel from the opposite side of the car. In order for an inspector to look over the wheel nearest to him it is necessary for him to be right up against the wheel where the slightest movement may catch him.

The question of engine inspection is one which is equally, if not more, important than that of cars. As heretofore stated, this matter is regulated by the Interstate Commerce Commission, which defines very clearly the matters which require attention. The engine-house foreman is charged with the responsibility of knowing that at the end of each trip proper inspection has been made of each engine. He must depend in part upon his inspectors to detect such defects as will in any manner fail to meet with the requirements of the law, as well as to see that mechanics make the necessary repairs.

The engine inspector should have a regular routine when making an inspection. He should start at the same point each time, inspecting the various parts in regular order.

PIT INSPECTION.

Inspection should be made of buffer beam brackets and bracket bolts, cylinder keys and fastenings, to determine whether bolts are tight in male and female castings to engine truck. The frame should also be looked over carefully for flaws and to see that the jaw bolts are all secured. Cradle pins and hangers, springs and spring hangers should also be inspected for broken leaves or other defects as well as for loose bands on springs.

All truck brasses should be examined as to the amount of babbitt between brass and journal. Boxes should be inspected for lateral motion—one inch is the requirement for swing truck, and one and one-half inches for rigid truck. Engines with pony truck should be inspected closely for clearance of swing and center casting as a lack of proper clearance may cause the engine to derail on a short turn-out.

Side bearings on tanks should be in place and properly secured, and sufficient clearance between bearings maintained at all times. Steps should be examined to see that they are secure and the treads in good condition and backstops on treads in place.

The main frames back of cylinder and in front of driving boxes should be inspected at the end of each trip and driving box brasses examined to ascertain if they are broken or working out. Springs and spring hangers should be gone over carefully for broken leaves,

loose bands and worn hangers; also for cracks or flaws. All cotter keys should receive close inspection. The crank-pin bolts on the back side should be examined to see that split keys are in place.

The Stevenson valve motion should be inspected after each run to see that the cams are tight on the shafts, set screws in their place and keys in the cams. An examination should be made of the blades and eccentrics, and eccentric strap bolts should be looked over closely for flaws and to see that all cotter keys are in bolts.

It is very important that the foundation brake gear be given thorough inspection for worn pins, eyes in connecting rods examined and care taken to see that split keys, properly spread, are in all pins and hangers, as well as cotters in brake-shoe pins.

On engine trailers the A-frame hanger should be inspected closely at the main frames to see that they are secure and that all braces are properly bolted. The bolts that hold collars in driving boxes should be carefully examined to see that they are capable of holding the collars in place.

Deck, deck castings and drawbar pockets should be examined for flaws and cracks, also drawbars and pins. Drawbars should be equipped with cotter keys as well as with safety chain pins. Driving box binders should be examined closely to see that they are not working in the fits, loose binders often causing frames to break. It is also well to tap the shoes and wedges on all driving boxes, the hammer will show readily if they need adjusting.

The male and female castings on tender and truck transoms should be inspected carefully to see that all bolts are tight and that there are no flaws in the transoms. The foundation brake gear on tenders should be observed to see that all clevis pins are in place. It should be seen to that safety chains are securely fastened to the brake beams, and cotter keys in the brake rods. The pull rod eye and draft gear keys in the back end of the tender should be examined closely. Careful inspection should be made for broken arch bars.

OUTSIDE INSPECTION.

Draft casting pocket bolts should be securely tightened at all times, as slack in these is the cause of bolts breaking. The knuckle should be opened and closed with the uncoupling lever to see that they work automatically and that the lifting chain does not kink. All couplers should be examined to see that they are the prescribed height; pin lifters and lock bolts must be in proper repair. Inspection

tion should also be made of all grab irons and handholds, as well as of outside hand railings along running boards and cab to see that they are maintained in good condition. Grab irons should be observed closely to see that they have the proper clearance of two and one-half inches, and that the drawbar is the proper height above the rail—from the center of the knuckle face thirty-one and one-half inches for minimum and thirty-five inches for maximum.

Pilot steps should be inspected closely to see that they are tight and that they are the proper height from the rail. Pilot should also be measured from the rail to the bottom of pilot, three inches for minimum and six inches for maximum.

Engine truck tires should be examined for loose retaining ring bolts and loose wheel fit on axle, this being readily noticed by the grease working out around the fit of the journal. Loose retaining ring bolts usually represent a loose tire. Flanges should be gauged, especially those that are getting worn, to see that they do not get beyond the limit. Pistons should be examined closely where they fit in the crosshead to see that they are not working, and crosshead should be given a special examination inside and outside for flaws. Guides and guide yokes should be closely examined for flaws and loose bolts. Guides should also be inspected for lateral motion and for openings.

The wheel centers on drivers should be examined to see that they are not working on the axle, number of broken spokes noted, tires checked for looseness and flat spots and a special examination of all rods and straps made for flaws.

Rod bushings should be closely examined to see that they are solid in the straps and not worn to exceed three-sixteenths of an inch or one-quarter of an inch laterally. The same with all other brasses. Main and middle connection brasses at all times should be kept tight in straps. If they are not they should be keyed up at once.

The equalizers on the spring gear pins should be examined on the outside very carefully both for wear in the holes and for cracks and flaws, as well as to see that they are in a level position. Outside valve gear should be examined carefully to see that the pins are not working in the outside fits and to see that nuts are tightened and cotter keys in place.

The link trunnion brackets should be examined to see that they are tight on frames.

Tanks should be also closely examined for loose tires, loose wheel fits on axle and for worn collars. Oil boxes, equalizers, springs and

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hangers should be examined very closely for flaws, cracks, breaks and bands.

A close examination of all pipes should be made to see that they are properly secured. All steam pipes must be carefully inspected for leaks around collars. All water and lubricator glasses must at all times be provided with suitable guards. Gauge cock should be tested and water glass blown out. Engines must also be equipped with bell cord long enough to be within easy reach of both engineers. Examination should be made of shaker posts to see that shaker bar fits properly. It should be seen to that engine is properly equipped with the correct classification lamps and flags; that the water glass lamp is so located that the engineer has a clear and unobstructed view of the glass at all times. The inspector should also see that the proper boiler forms and blue cards are in their appointed places in cabs.

INSPECTION BY ENGINEMEN.

In many instances engineers are relieved from making inspection of their engines when they are pooled, but are required to report such defects as can be readily observed from the ground. Engineers can render valuable service in the proper upkeep of locomotives, and prevent many accidents, by promptly reporting every defect that concerns the safety of the employees or patrons of the road. An engineer, while operating an engine over a division, has an opportunity to observe many defects which are not so readily discernible when the engine is at rest. He should, therefore, at the end of each run report in writing to the roundhouse foreman the results of his observations made during the run.

When taking charge of their engines, engineers should also see that the air brakes and train signal apparatus on the engine and tender is in good working order; that the air pump and lubricator are working properly and that all devices used for regulating pressures are adjusted to the authorized amount; that the brake valve works properly in all positions, and when brakes are fully applied, with the cam type of driver brake, that the pistons do not travel less than two inches or more than three and one-half inches with other types of driver brakes from four inches to six inches; that the engine brake and trailer brake pistons travel not less than four inches or more than six inches, and that the tender brake piston does not travel less than six inches or more than eight inches.

It would be hard to settle on any definite rule.

inspection should begin, as nearly all inspectors have their own ideas on this subject, and each one has some reason (usually a more or less logical one) for starting at the point which he considers the correct one. The main object is to always make the inspection in the same order, no matter where the starting point, as in this way it is less likely that anything will be overlooked. Haphazard inspection should at all times be avoided.

FIRE PREVENTION.

The inspection of engines with a view to preventing fires is so closely allied with inspection along accident prevention lines as to be practically inseparable. It is a matter which is giving the roads of the West in particular a great deal of food for thought, since practically all Western roads run through immense stretches of prairie land and forest, where a spark may do unlimited damage. Most of the states check this matter up closely and have inspectors detailed to see that all roads give it the most careful consideration. Our practice, which I think is that of most other roads, is to require inspection of front ends and netting at the end of each trip and a record kept at the terminal of each inspection. We are using what is known as the master mechanic's front end, which we have found, when kept tight, to be as effective in preventing sparks as any we have tried out. We use a $2\frac{1}{2} \times 2\frac{1}{2}$ mesh, No. 11 gauge netting.

When inspecting netting, which duty is performed by some member of the boiler force, such as a boilermaker's helper, it is required that he open the front end door of the engine after each trip, take out the trap doors and thoroughly inspect the dead plates to see that they properly fit around the steam pipe, around their nozzle box and around the interior of the smoke arch. He should also see that the netting fits correctly around the smokebox, that it does not buckle and that there is no opening which could permit cinders or fire to escape. As an additional precaution, we cement all small openings around steam pipes at dead plates and blower pipes in connection with nozzle box to eliminate the possibility of sparks coming out at any of these places.

The quality of coal used, of course, has a great bearing on this matter. With some coal it is almost impossible to use a small mesh screen and get the engine to steam. This we have found to be particularly the case with coal obtained from the Pacific coast. This reduces the spark proposition, then, to the question of getting a coal which will allow us to use the smallest possible mesh screening

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and still insure its not stopping up and causing the engine to stop for steam. Due to the fact that nearly every railroad uses a different screen which is at least slightly different in grade from that used by others, the matter is brought to the point where each company makes its own tests to determine what size screen will give the greatest amount of satisfaction.

Next to sparks from the smokestack, more fires are caused by defective ashpans or careless dumping of ashpans than from any other condition. Proper inspection should be made to ascertain that ashpans are in good condition, so that any live fire dropping from the pan will not fall through and cause a fire.

In inspecting grates and ashpans it should be seen that the grates work freely and that lost motion be eliminated from the grates, shakers and grate rods to allow them to perform their function properly. Ashpans should be watched closely to see that the net doors are kept in proper repair and that they fit tightly to the sides of the pan when closed. It should also be seen that the hopper bottom slides fit tightly to the hopper bottoms when the pan is closed and that the ashpan rigging is so arranged and kept in repair that it will not be necessary to close the ashpan with a pinch bar.

Enginemen can do a great deal to prevent destruction of property by fire if they will use care in the handling of ashpans. A fire should be shaken down some little time before approaching bridges so that there will be no danger of live coals reaching bridge timbers. The fire should always be shaken down in advance of dumping the ashpans and the sprinkler used freely. Judgment with regard to surrounding conditions should always be exercised before dumping ashpans.

REPORT FIRE HAZARDS.

In many cases where fire breaks out along a railroad right-of-way the occupants of the property on which the fire starts are more often to blame than the railway company. Agents and local officials of the company can do a great deal towards eliminating this hazard if they will keep a careful watch of the conditions surrounding the right-of-way. In many cases piles of rubbish of highly inflammable nature are left around the property of various industries, making a veritable fire trap which the smallest spark may ignite. These conditions should be called to the attention of the men in charge of such points and every effort made to see that they arrange for clean up of all such material. The condition of buildings off

renders them a great fire risk, due in most cases to defective or non-fireproof roofs.

It should always be seen that engines are equipped with sprinklers in good working condition. The liberal use of the sprinkler, without delay, will result in preventing many small blazes, which, if left unchecked would do considerable damage. In this respect train and engine crews should be made to understand that it is their duty to watch for small fires along the right of way and to act promptly when they discover one.

The following items are the ones most frequently overlooked when making inspection of engines, and are very important if the machine is to be kept in good condition:

Cylinder casings gone; loose cylinder casings; nuts missing from bolts in running boards; condition of engine deck, shoveling sheet and apron, jacket and bands out of place; dome casings out of place; hinges on front cab doors loose; sash loose in cabs; ceiling loose in cabs; ventilator cover hinges broken; seat box cover hinges broken; gauge cock drippers out of place; nipples off gauge cocks; water glass not projecting through top of guard so as to have firm hold in guard; hinges broken off locker boxes to tanks and off back tool boxes to tanks; outside hand railings on cab and to front end insecurely fastened or spliced; front end draft appliances, nettings, plates and ash pans.

FORCE OF GOOD EXAMPLE.

This again brings up the matter of education and coöperation of employees. The careless man among a gang of careful men soon sees the folly of his ways and becomes as careful as his fellow employees. It may be in some cases he does not even realize that he has ever been careless, but so strong is the force of good example that it is only a short time before he involuntarily adopts the methods of the others who have always been careful.

Care and painstaking effort, together with a thorough understanding of what is required of him, are what make a really efficient inspector. The first and second of these may be fostered greatly by getting the man to take a pride in the work he accomplishes. To attain this end it is usually necessary to wage a systematic campaign. Here again the foreman is the greatest influence. He must be constantly on the watch, correcting all bad or careless practices among the inspectors under his charge and pointing out to them the necessity of always working in such a way as to protect themselves and

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their fellow employees. No man wants to feel that it was due carelessness in not noticing that a grab iron was loose that a man owes the loss of an arm or leg. There are, unfortunately, many of these instances occurring, and a chance to make capital of them should never be missed. Some men take an instinctive pride in their work, and with these the task of the foreman is easy.

A point which should never be lost sight of is that the man who does the greatest amount of work is not necessarily the best man. In many cases he is the poorest. A job poorly done is better than one never attempted. An inspector carries a great deal of responsibility, for switchmen and trainmen are required to climb the sill steps, side ladders and running boards, depending on the inspector to see that they are in safe condition. Therefore, to a large extent the inspector holds the limbs and perhaps the lives of these men in his trust. "It is better to cause a delay than an accident" is a slogan which may be applied to the inspector with particular significance. How much better to cause a terminal delay of a few minutes, if in doubt as to any part of the equipment being out of order, than to take a chance which may possibly cause a derailment and loss of life. Men should never be hurried when making inspections. Taking it on a basis of dollars and cents, it does not pay. A terminal delay, even though it may be the means of causing a tieup under the sixteen hours' of service law, and added competition for the crews, is a small matter when compared with the expense occasioned by a derailment, not only in damage to equipment and roadbed, but also in possible claims covering death or injury. It would take a good many of these terminal delays to amount to the expense of one accident.

REPAIRING DEFECTS.

Inspection, however efficient it may be, will avail but little if the defects discovered are not promptly and properly repaired. Here again much depends upon the foreman. He it is who should follow up the work and see that repairs are carried out as indicated by the inspectors or himself. Under no circumstances should he ever allow a car or engine to go out that has not been repaired to complete satisfaction. Half measures will not suffice.

A few years ago the duties of inspectors were more difficult, due to the fact that equipment, safety devices, etc., on all cars was not the same. The Interstate Commerce Commission, by standardization of these things, has made it easier. Now the inspector knows

just what to look for; he knows just where it should be placed; he knows the proper clearance it should have from the top of the rail, the proper amount of allowance for lateral motion, the proper travel for air brake pistons, etc., and he has only to observe that all these matters conform to the standard in order to know that his work is properly done.

DISCUSSION.

CHAIRMAN BELL: Anyone who has ever prepared a paper on a technical subject such as Mr. Cochrane dealt with must appreciate the amount of work he has done. We are very grateful to Mr. Cochrane for his splendid paper and I want to ask him whether he will be able to stay over tomorrow to attend the round table meeting.

MR. COCHRANE: I expect to leave at 1:50 tomorrow.

CHAIRMAN BELL: I hope you will be here as long as possible. Speaking for myself, there is a lot of information I hope to get by asking questions at round table.

I hope you will all bear in mind our round table meeting tomorrow morning. We do want a good turnout because the more of us there are the better it will be. When there is a crowd we seem to get more ginger and enthusiasm into our meetings and that is what is absolutely necessary in a round table conference.

THE SAFETY EXPOSITION.

There is some feeling that the various delegates to the Safety Congress are not giving the Exposition at the Grand Central Palace the consideration and attention it deserves. The managers and exhibitors have gone to a lot of trouble and expense to arrange this splendid exhibition and they feel we are not giving them the consideration they are entitled to. We know the bright lights of Broadway have a very magic attraction, but I managed to spend two very busy evenings at the Exposition and feel well repaid for the time I spent there. I hope every one will make an effort to attend the Exposition and will stir up an interest among his friends at the Congress. We owe this, not only to ourselves but to the Exposition, to the American Museum of Safety and to the National Safety Council.

Before we close it is only fair to say to Mr. Wilson that he has assisted us to get down to brass tacks in our work. Mr. Carrow has well said that we want something definite to get before our

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audience. We need to be specific and get down to brass tacks rub elbows on this proposition. It is too early to predict what the Railroad Section may be able to do next year, but, speaking in the broadest sense, we are going to do just what the members of the Railroad Section make it possible for us to accomplish.

We are greatly indebted to the gentlemen who have prepared papers and presented them before this Section and to the men who have participated in the discussions. We hope your enthusiasm and interest will last over tomorrow and we will show Mr. Smith, chairman of the round table that we are having a real conference.

MR. DOW: Will the session last all day?

CHAIRMAN BELL: The round table meeting will be held in the morning from 9:30 o'clock until noon. A time has been reserved for the completion of unfinished business. I am sure we all feel that we have not gotten to "first base" in discussing some of our papers. Let us do justice to our program and ourselves and try to complete our work at the round table meeting tomorrow morning. I hope to make the conference a real meeting and a valuable addition to the work of the Section.

MR. WILSON: You do not mean to give the impression that the round table discussion will be confined to a discussion of the papers which have been read, do you, Mr. Chairman?

CHAIRMAN BELL: Not at all. In accordance with a preliminary announcement a number of suggestions have been handed to the Secretary and they will be up for discussion at the round table meeting tomorrow morning. I anticipate a real, live meeting. If any other suggestions occur to our delegates we will be very glad to receive them.

If there is no further business to come before the Section, I will now adjourn.

The Section then adjourned.

Railroad Sectional Round Table Meeting

Sept. 14, 1917

A. W. SMALLEN, Chairman

Chairman, General Safety Committee, Chicago, Milwaukee & St. Paul
Railway Company, Chicago, Illinois

FRIDAY MORNING SESSION

THE meeting was called to order by Mr. A. W. Smallen, Chairman, at 9:30 o'clock.

CHAIRMAN SMALLEN: The first question for discussion is one in regard to railings on turntables. Let us hear from our members as to their experience in this connection.

RAILINGS ON TURNTABLES.

MR. RICHARDS: The question was propounded by me and I am looking for information. Formerly we did not have railings on our turntables. The matter was taken under consideration by the Central Safety Committee of the North Western Line and we found on inquiry among our neighboring roads that very many roads like the New York Central, the Pennsylvania, the Lackawanna, the Baltimore & Ohio and others have had railings for many years. I was at the Exposition the other night and I noticed from a picture that the Baltimore & Ohio had railings on the side and also a protection over the center of the table. They seemed a mighty good thing to have at that particular place. They had lights over the center of the table—a good thing at such a dark place.

We have had several accidents, one of which comes to my mind—the case of a roundhouse foreman who lost an arm. He was walking over the turntable at a time when an engine was passing; he slipped on the icy surface, and, there being no railing to catch him, he fell. One of his arms went under the wheels of the engine. We all know that it is necessary to have some protection there; we all know how slippery the turntable becomes from snow and ice and sleet, especially in our cold country. In Northern Wisconsin, Michigan, North Dakota, and the Northwest, where the weather is some-

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times exceptionally cold and continues around 10 or 15 degree low zero for thirty to sixty days, the keeping of turntables clear of ice and snow is a very serious problem. I hope that I will get information from the members of this Section on that particular question that will be of benefit to the North Western Line. I appreciate it if the Chairman would be kind enough to call on some of the roads who have railings or guards on their turntables, would be very glad to have the opinion of the different railroad men in connection with the matter.

MR. MERRILL: We went into the turntable question. At first I was rather skeptical about railings on the turntable—I am an operating man, not purely and simply a safety man. I think you should divide your tables into two classes: First, on tables in the shops there ought not to be any trouble in keeping up the railings because they are under inspection all the time. They are a good thing although we had one case where a broken railing caused a man's head hurt. It happened at an outlying point, where one section of the top rail was broken off, but a report was not made promptly. An engine went onto the turntable and I suppose the brakeman had a hat sitting on the rail of the table. They do not do that now; they are all warned about it. This brakeman did not sit on the rail, but opposite his engine and moved back to lean against the top rail. The top rail was not there and he went over on his head into the pit. That was, however, the only accident in four years. Of course it was due entirely to some one breaking the top rail and not replacing it. You are going to have that element of danger at outlying points unless you have very strict supervision and even then accidents are liable to occur.

I think the greatest danger is from slipping off the table, although the slipping hazard is not very serious. At these outlying points when the engine goes on the table the whole crew gets on with the engine and the brakemen go wandering around and may slip off. I never had a case brought to my attention where a man has slipped off a table except the case cited and that accident was the result of pure carelessness.

MR. CARROW: Is it not feasible to build the railing substantial enough to insure its holding up?

USE OF HEAVY PIPE.

MR. MERRILL: The railing was of heavy pipe and had an intermediate rail the same as I have seen on your road. How on a

it was broken I never have been able to find out, although I spent a good deal of time with the crews who used that table in an endeavor to do so. One section of the top rail was missing the afternoon before the man was hurt, but no report was made and I have not been able to find out who broke it or how it was broken. It must have received a very heavy blow. I would advise a heavy pipe railing and careful supervision.

MR. SCHAFF: Before we installed railings on the tables we had quite a number of accidents caused by men falling off the side when they took a short cut. They were in a hurry to get to their engines and on two or three occasions men have slipped and gone into the pit. The standard tables on our road have a height from the railing to the bottom of the pit of eight or nine feet.

Besides putting railings on our tables we extend the ties as a bearing for the railings. We allow plenty of space between the rail and the railing and in that way we have done away with many accidents. We all know that in a snowy country a lot of ice accumulates on the turntable and makes it slippery. I know of one case where a man put on his injector, when the brakeman thought he was going to be salted he fell into the pit.

I believe that railings should be installed on turntables, and all of our tables east of Buffalo have them except the girder tables—the ones we call the through tables. I do not know of an accident having happened on a table where the railings have been applied. We also have a light in the centre of the table.

MR. RICHARDS: Have you any pictures of those tables?

MR. SCHAFF: Yes, sir.

MR. RICHARDS: Will you send them to me?

MR. SCHAFF: I will be glad to. I believe a railing is very essential in preventing accidents.

CLEARANCES.

SECRETARY ANDERSON: Do you know the exact clearance from the outer edge of the rail to this railing?

MR. SCHAFF: I will be glad to look it up and give you definite information.

SECRETARY ANDERSON: I will be much obliged if you will do so.

CHAIRMAN SMALLEN: The broken railing was the cause of your accident?

MR. MERRILL: That was the cause of the accident. If the railing had been there he would have been all right. I am in favor of

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railings. The trouble is in getting supervision at outlying point having unsafe conditions reported promptly. The clearance the rail to the railing, I think, is four to five feet. That would be satisfactory—you want a good clearance.

MR. RICHARDS: Have you toeboards on your tables?

MR. MERRILL: Yes, sir.

MR. CARROW: Mr. Schaff was formerly an engineer and it seems to me his statements have more weight than those of men who have not followed that occupation. Mr. Oliver Young, who is also an engineer and chairman of the safety committee of the New York division, might give us his ideas on the question.

MR. YOUNG: We have adopted the railings and found them very serviceable. As has been said, men will take short cuts at the tables and do many other careless things. We have had several accidents from slipping. So far as I can recall all our turntables are equipped with safety railings. I think they are slightly over four feet in clearance—I do not know the exact measurement but it is ample clearance to allow men to get by an engine.

CHAIRMAN SMALLEN: That clearance is figured on the large power, is it not? You allow five feet clearance from the rail for large power?

MR. YOUNG: Yes, sir; the railings will clear all of our large locomotives sufficiently to allow a man to work. That is absolutely necessary. Although I do not favor doing any work on turntables in close clearance there are times when things do not go just as they ought. When you are getting locomotives out in a hurry you are pretty apt to follow them up and do a little work in places where you would not otherwise do it. When it is necessary to do such work all of the safety appliances should be used.

MR. McCAMPBELL: I would like to ask Mr. Richards if his company has adopted the plan of toeboards on the outer edge of turntables?

MR. RICHARDS: On some of the tables we have; on some we have not.

MR. McCAMPBELL: I thought perhaps in the absence of railings you might have adopted the toeboard.

TOEBOARDS.

MR. RICHARDS: No, we have not. We tried toeboards on some of our tables but found most men did not like them.

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MR. MORE: We use railings on our tables. They are a thing. If a man should slip and fall he may go into the pit. A upkeep: We have not had any trouble with our railings. Of course, it is part of the inspector's duty to see that the railing is in good shape and our employes co-operate in the matter. I have been with the road long enough to give you an itemized account but I do not know of any accident caused by broken railings or on account of the railing being imperfectly attached to the table.

CHAIRMAN SMALLEN: Mr. Dow, we are discussing the question of turntable railings and we have heard from several of the roads represented. We would like to hear from you.

EXPERIENCE ON NEW YORK CENTRAL LINES.

MR. DOW: We have a standard for railings on turntables, it is optional with our local officials whether or not the railing shall be applied, as we do not require them in all cases. We leave it entirely to the division superintendent as to whether he thinks that, under conditions existing at some local point, they should be installed. The specifications are provided for him to follow in case he wishes to enforce them. We have railings on a great number of our turntables on the main line, especially east of Buffalo, but on some of our other lines, such as the Big Four and Michigan Central, they are not so common. I cannot say whether or not we have noticed any particular reduction in accidents due to the placing of these railings. I do not think we have had a great many accidents due to men falling off of turntables. I seriously question whether on all of our lines there has been sufficient necessity shown for applying railings.

MR. MITCHELL: On the New Haven road some tables have railings and some have not. We put railings on new tables.

CHAIRMAN SMALLEN: Do you use a pipe railing or a wooden railing?

MR. MITCHELL: Some of the older railings are of wood but the later ones are two-pipe railings.

CHAIRMAN SMALLEN: I believe it is the consensus of opinion that railings are necessary for the safety of employes whose work requires their being on the turntables. On our railroad, the Milwaukee, I believe we have been paid back in more ways than for every railing on the turntables. A great many employes use the turntables as a kind of walkway and I believe the railings are proper safeguards and that their efficiency is demonstrated in various ways.

COVERS FOR DEEP CINDER PITS.

If there is nothing more on turntables we will take up the next topic. A suggestion was made this morning that we ask whether or not railroads are using covers for deep cinder pits. I would like to hear from the representatives of the various roads.

MR. F. A. WIGHTMAN: We have installed quite a number of deep cinder pits—some of them are eighteen feet deep. Our largest one is about 40 feet wide and 130 feet long. In the past year three men were drowned in these pits. We have been experimenting in the way of safeguarding, and at one point we have installed a platform. Our cinder pits are between the tracks. Between the rails, where our engines are dumped, we cross the space with two-inch pipes, twelve inches apart, to allow the cinders to fall through. Between the tracks, where the cinders go to the pit (on either side of the pit, one 20x40) we have put "I" beams extended along the track for some length off from the pit. We built a platform and installed a Brown hoist and when the cinder pit proper is not in use the hoist places a cover over it. When it comes to cleaning the pit we run it off on its own rails. We have several pits on curves and I would like to hear discussion as to how they could be covered, as it has been very difficult for our engineering department to give us any advice.

CHAIRMAN SMALLEN: This is a very important subject and I would like to have some one advise us as to proper methods. If you are covering your cinder pits how are you doing it?

SECRETARY ANDERSON: We have three pits and we cover a portion of them, say eighteen feet from the end, with a heavy screen. Whenever it is necessary to empty the pit we use a Brown hoist. We lift the screens and when the work is finished the screens are replaced. We feel if a man walks eighteen feet on the screen and if he does not realize that he is over a pit, the next best thing for him is to go in. We did have several men fall into the pits, but since we guarded them we have not had an accident.

CHAIRMAN SMALLEN: What do you do on curves?

SECRETARY ANDERSON: We have grades, but no curves.

CHAIRMAN SMALLEN: Mr. Richards, have you any experience on this line?

MR. RICHARDS: No, I cannot give any information on the matter.

CHAIRMAN SMALLEN: How about the Baltimore & Ohio?

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MR. SCOVILLE: The Baltimore & Ohio have no covers or pits. We protect them with railings.

CHAIRMAN SMALLEN: I would like to ask Mr. Wightman kind of a cover he uses?

MR. WIGHTMAN: Heavy oak plank?

CHAIRMAN SMALLEN: Is that a regular cover?

MR. WIGHTMAN: A regular cover. They cover the entire on its own rails right between the tracks.

CHAIRMAN SMALLEN: That is new to me. We have not used a cover. We have used railings such as Mr. Scoville mentioned.

MR. WIGHTMAN: We had railings at the ends of the pit, where we had the accidents the men stepped off the engine the pit.

MR. COOPER: I would like to ask the members to put a little more "kick" behind their voices in order that we may all hear discussion.

CHAIRMAN SMALLEN: I would also suggest that the delegates volunteer a little faster. This is a get-together meeting and we are all friends. Get busy and give your experiences, one after the other.

MR. McCAMPBELL: From the excellent paper Mr. Cochrane read yesterday afternoon I take it that he is very familiar with tables and kindred matters. I would like to hear from him.

MR. COCHRANE: We do not use deep cinder pits. Our pits are only about three and a half feet deep and we shovel the cinder into the cars. The only thing we do is to build a railing around the ends and across the opposite side. Employees who walk on the outside of the pits, where the car is kept, have a railing which prevents their falling in and we rarely have an accident. We have experimented with all kinds of pits, but we have found that the present one gives the best satisfaction.

USE OF LIGHTS.

MR. WILSON: We tried a number of experiments in guarding with cinder pits because we had a number of men drowned. We tried railings, then we tried a system of illumination. We experimented with headlights at each end, or at one end, then with overhead lights, making it very light, hoping in that way to avoid accidents, but no satisfactory solution has been found. A great many suggestions have been made but the devices were not adopted.

so interfered with operation that they were vetoed. I cannot give a very satisfactory report of our experience in the matter. We reduced the number of accidents, but we did not solve the problem.

CHAIRMAN SMALLEN: What is your opinion of covers?

MR. WILSON: I came in while Mr. Wightman was speaking and I did not get a very clear idea of the device.

CHAIRMAN SMALLEN: They have covers of large planks, such as are used in platforms, made purposely to cover the pits.

MR. WILSON: If they worked satisfactorily on pits that are active and have found them practical, I think that might be helpful. A cover is difficult to get on and off; it generally entails a great deal of delay and trouble.

CHAIRMAN SMALLEN: Mr. Wightman cannot get a cover on a curve and he wants suggestions.

MR. WILSON: I would leave that to mechanical engineers.

MR. DOW: Mr. Banks, formerly of the Erie Railroad, might give us some information on the subject.

USE OF OLD BOILER TUBES.

MR. BANKS: We utilize old boiler tubes, making them in sections small enough to be handled by two men. They can be made to fit a curve if you are unfortunate enough to have a cinder pit on a curve. I cannot imagine a cinder pit on a curve, but there is no reason why it could not be done in the way I have described. The only objection to that sort of cover is this: With the class of men we are using for taking out cinders you will find they do not use their hose freely enough. The heat will expand the steel and warp your covers out of shape. However, if proper care is taken to turn on the water—you have plenty of water to wet down your cinders—steel coverings made of old boiler tubes will last a long while. You do not need very much space to dump an ashpan, you do not need to remove very many sections.

MR. WIGHTMAN: Some engineers work in mysterious ways and some of our deep cinder pits are on curves. How would the covers work on a pit, say, 120 feet long and 30 feet wide? The maximum depth of the pit is in the center. The tracks on either side of the pit are covered with pipe, but in between the tracks you have the long, deep cinder pit protected only by a railing across the ends. Anyone walking across the yard or stepping off an engine might step right into the pit. At one of our 20x60 pits we took "I" beams and strung them just inside of the rails of the tracks

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over which fires are dumped and then extended them sixty beyond the pit. We then covered it with a platform mounted only as to the tracks through which the cinders fall and they covered with two-inch pipe.

MR. BANKS: After you have dumped your ashpan in the between your rails you then put on your cover with the hoist?

MR. WIGHTMAN: No; they go right down in.

MR. BANKS: You take them out of the center with the Bro hoist?

PITS USED AS SWIMMING POOLS.

MR. WIGHTMAN: It is filled up. The pit is kept full of wa They run from twelve to eighteen feet deep.

MR. BANKS: It would be a good swimming pool?

MR. WIGHTMAN: It has been used for that. Our trouble occ where five or six divisions run into one terminal. New men rollers. When they clean out the cinder pit with a Brown hoist remove the platform. After the pit has been cleaned the platfo is replaced and the men can walk right over it. There is dan continually coming in and our instructions are for men to get the engines before they reach the turntable and turn them over hostlers, but sometimes they step right off the engines into the We had twelve men go into one pit.

MR. BANKS: Better have it equipped with life belts.

MR. BOSLOOPER: In the larger places along the Michigan C tral the pits are not very deep and they shovel the ashes into a right out of the pit. Sufficient clearance is generally given and one could fall in except through pure carelessness.

After listening to the discussion I do not feel that I can offer ve much of a suggestion, but if the boys are in the habit of using as a sort of bathing resort I would suggest providing not or bathing suits but that life preservers be installed at these points.

MR. MITCHELL: Our pits are shallow and we illuminate the with flood lights.

CHAIRMAN SMALLEN: Have you anything to offer, Mr. Ric ards? In the discussion it has been shown that several men ha been drowned. If there is any way of preventing such acciden it should be brought out at a meeting such as this.

MR. BANKS: You are going to have men drown in deep cind pits, just as you are going to have men drown in the lakes and the ocean. It is a good thing to cover nits. but you will ~~rather~~ etc

men drowning as long as you use the deep pits, at least, that is my belief. There is no way of entirely stopping it.

MEN WORKING ON TRACKS.

CHAIRMAN SMALLEN: Our next topic for discussion is: "How Can We Prevent Accidents to Men Working on Tracks?" Then we have "How to Prevent Accidents to Men Walking on Tracks, Crossing Tracks, and Jumping Off Engines and Cars in Front of Engines and Cars Moving on Adjacent Tracks."

We will take up the first question. Mr. Richards offered the topic. I take it that would mean in certain locations. We have a place on a curve in Minneapolis where we have a great many men doing repair work and they get over on the other tracks. We have installed a bell which rings at the approach of a train a thousand feet away. Since we have installed that bell we have not had a man injured at the place. Previously we had several serious injuries.

MR. CARROW: Did I understand you to say that on a curve on your line you have installed an automatic bell?

CHAIRMAN SMALLEN: Yes, sir.

MR. CARROW: To advise the workmen of the approach of trains?

CHAIRMAN SMALLEN: Yes, sir.

MR. CARROW: For all curves?

CHAIRMAN SMALLEN: No; just the one at Minneapolis, where the conditions are bad. Trains go around that curve very fast and are onto the men before they realize it, so we installed the bell.

MR. MERRILL: Are buildings close to the tracks?

CHAIRMAN SMALLEN: No; this is a place where men are repairing cars. We have a very peculiar condition at Minneapolis. The men get over on the other tracks while doing their work or walking around. We had several men killed previous to this installation.

MR. MERRILL: They were not section men?

CHAIRMAN SMALLEN: No, car repair men.

MR. CARROW: Have you considered doing that on the main line?

CHAIRMAN SMALLEN: That is on the main line.

MR. CARROW: Why are your repair crews there?

CHAIRMAN SMALLEN: Our repair tracks, at that point, run right alongside our main line.

MR. CARROW: Is not the bell ringing nearly all the time?

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CHAIRMAN SMALLEN: No. It rings a great deal, but that track is used only for main line trains. We only use the bell on the w track.

MR. WIGHTMAN: It is not to protect men working on the track, but to call their attention to approaching trains when t cross the main tracks?

CHAIRMAN SMALLEN: Yes.

MR. WIGHTMAN: You use a blue flag on rip tracks?

CHAIRMAN SMALLEN: Yes.

BRINGING DANGER HOME TO MEN.

MR. RICHARDS: My idea in putting that question to the rot table for discussion was this: We put into effect on Jan. 1 classification of accidents suggested at the last meeting of Section, and for the eight months ending Sept. 1, I think it w we found that one-half the fatalities among our people came fr men being struck by moving cars or engines while they were wo ing on or crossing tracks. It seems to me that if there could some way of bringing the danger home to the men who were do that kind of work that possibly we might be able to eliminate so of our accidents. Therefore, I made this suggestion, so that anyone here had experience along that line we might get the ben of it. We want to hear what, if anything, is being done to red accidents from that specific cause.

MR. DOW: I think this question resolves itself down to point of the effectiveness of education. You have to impress up your men to be on the lookout for the movement of trains in eitl direction at all times. It is a question of how that can be m effectively done. We have one supervisor of track who has in tuted the practice of requiring each one of his section foremen devote fifteen minutes every Monday morning to a talk on safety his track gang, and that is one of the things he impresses up them—to promptly obey warning signals and get off the track when they are out of the jurisdiction of the gang foreman to proper care and caution in observing whether trains are approachi from either direction.

That is the only suggestion I can offer. Undoubtedly some our delegates have something that they can tell us along the lines—educating and impressing upon the men the necessity of ca tion when they are on railroad tracks.

MR. SCHAFF: I believe a bell is a poor way to warn men, I

cause if the bell fails they have no warning, and a bell often fails. We have a supervisor on one of our divisions who issued instructions to every one of his section foremen that they should give a fifteen-minute talk at least once a week to all their men. As a result accidents dropped off in his territory. I believe that education is the proper thing to prevent accidents. Keep at it, do not go about it for one week and let it go for two or three, but keep at it. Each of our supervisors gives a safety talk every week and every foreman devotes at least five minutes every week to instructing his men along this line.

MR. BALLIET: I am interested in the Chairman's plan—the ringing of a bell as a warning to repair men. This bell is operated by a track circuit on the main line of a railroad where there are no switches or switching movements. Presumably the alarm is a standard crossing alarm and if it is provided with a visual as well as an audible indicator it is going to serve a very good purpose, the visual indicator being there to take care of the failure of the audible warning.

WHISTLEMEN AND FLAGMEN.

I want to reiterate what I said at Detroit last year: I have found the most effective way of protecting men working under conditions described yesterday and today is by supplying efficient whistlemen or flagmen or watchmen. At the Grand Central terminal we use the whistle, on account of the many noises prevalent, the poor visibility and the many train movements. We have between 2,700 and 3,000 train movements every twenty-four hours in the yard limits. Men must do their work and we have many periods of the day at certain spots when we cannot get more than fifteen to a maximum of fifty minutes out of twenty-four hours to make repairs to our tracks. I have in mind very clearly what the North Western folks are discussing, and have wondered whether, perhaps, Mr. Richards could not find some solution by the use of a whistler in certain localities for the following reasons: If you want a man to work efficiently and produce a proper return to the company you must give him unobstructed means of working. If the man who is engaged in any occupation in the vicinity of a railroad track must, as we are trying to make ourselves believe, constantly look out for something to strike him, he becomes very inefficient; 25 per cent is a very high efficiency in many cases under those conditions. So, perhaps, we might get more work done by our men by not having them worry

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over trying to know what may strike them, but hire a cheaper proportionately speaking, and use him as a pilot to protect the men so they can concentrate their thoughts on their work.

MR. CARROW: Mr. Richards has called up for discussion a important subject in connection with accidents. In a bullet recently put out we printed a line in capitals, "The Greatest D of All." There is nothing equal to education, assuming that can educate your men. You can do it under certain circumstances but the difficulty in that direction just now is almost insurmountable. In 1910 one of our vice presidents was impressed with the number of fatalities due to men being struck by trains and repeatedly prodded us about it. We kept after it so strenuously that we were successful in making a very marked reduction—I forgotten what it was; but I think it was almost 50 per cent. was, however, at a time when our track forces were comparatively permanent. Today if the track foreman gives a lecture to all men in his gang every time he has a labor turnover he will have to give a five or ten minute lecture every morning. I do not say with the idea of speaking disparagingly of educational work, but I think the idea is a good one, but on nearly all of our main divisions our track force is changing almost constantly. If we had a permanent force I have no doubt that instruction would be a proper and feasible thing, but I feel more or less hopeless just now. I hope we may get some light on it in respect to the new men—men who are coming on Monday, Tuesday, Wednesday, or other day in the week.

A very important aspect of the question is whether it is practical for men to clear all tracks on multiple track systems. We have the whistles—all of our foremen have them. The men are drilled and we print bulletins about it, yet fatalities from this continue to increase. I do not think we are making any appreciable showing in this direction. As long as we have so many new men the prospects are not particularly bright.

I was out on the road a few days ago and a gang cleared a freight train. It was a floating gang of twenty-five men and ten of the men cleared to a track on a siding and sat under a tank. I said to the foreman: "Why do you not advise them that they are in a dangerous place?" He said: "Why, they would take off and quit if I did." That, perhaps, is an exaggerated case; I do think that the men would have quit. I have heard, not only in

labor, that the men will not stand for very much discipline or reprimand.

MR. PAULETT: Are your new men examined physically?

MR. CARROW: That is what we would like to do.

MR. PAULETT: And so would we; that is a very vital point. Sometimes we are obliged to accept men that have not normal hearing or normal vision and sometimes are not of normal intelligence. I agree with Mr. Dow that the burden is on the foreman. If we have no doctor to examine these men we must rely upon the foreman to safeguard his men and find whether any of them have defective vision or defective hearing or really defective intelligence. We are accepting Mexicans now and while this is an extraneous subject, I would like to call attention to the fact that on the Mexican border, at the present time, there are 120,000 cases of typhus fever. The disease is caused by the body louse and it is well to have all men from that locality examined physically.

MR. CARROW: Even if we have a system that we cannot always live up to it is preferable to vary the system rather than to let our tracks run down.

EFFICIENT TRACK FOREMEN SCARCE.

MR. BANKS: No one will dispute the educational advantage in connection with trackmen. The foremen you are getting now are not very satisfactory. When you put educational work up to them you have little assurance that it will be practiced, to say nothing about getting it down to the man with the pick and shovel. It is a very serious subject and I think it is one that is not going to be worked out while the present labor situation stands as it is. I do not mean by that that every one ought to stop and not try to do things, but I do not believe a solution will be found under present labor conditions and while so much higher wages are paid for intelligent men in other lines of work. A man who is intelligent enough to be a section foreman and give instruction and do educational work is not obliged to work for the salary he gets as a foreman. He can go elsewhere and get more money. There are cases, of course, where these men have been in the service for a long while, they own their homes and are sticking, but a good proportion of the foremen are not in that class. They know little more about track work than some of the men working for them and they do not believe in safety work anyhow.

If all the delegates to the Congress have had the experience I

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have had, you have experienced some difficulty in convincing masters, or track supervisors as they call them in the East safety work is essential and necessary. If you have not convinced them you may be sure they have not convinced any of their foremen and that the work has not trickled down to the men.

MR. WATKINS: Mr. Banks' discussion appeals to me. I believe education is the solution of the problem, but the question, as presented to me, is how to apply our theories of education. I know about getting the men together for a lecture from the man, because I find on our road, according to the number of men employed, we kill more foremen than we do men under them. One has to lecture the foremen and I do not know just how to do it. I have been trying this plan for the last year, but I do not know whether it is good or not. I make a list of all the accidents that have occurred during a certain period of time and explain just how they occurred. I have it printed in three or four languages and distribute it in circular form, say, once in three months, to our track foremen, in the hope that when the foreman realizes how many of his fellows are killed by doing the same foolish thing that he does he may appreciate the danger and begin to take care of himself. In some cases we have had enough circulars printed that they are distributed not only to the foremen but to every one of their men. A supply is kept on hand so that when a new man comes into the service he can be given a circular the first thing that way we try to get into the man's mind the dangers of his position.

BULLETINS IN FOREIGN LANGUAGES.

There is this difficulty: While we print the circulars in three or four languages, probably not one of the languages used is spoken by the men who get the circulars. That difficulty is so great we cannot overcome it; but I have this hope—that in the family there is a child who can get the meaning of the circular and inform the father what we are trying to teach him. If one language is printed in red and one in black and one in some other color makes the circular look so peculiar that the man who gets it wonders what it is all about and will take pains to find out, and when he really finds out he can then find some means of protecting himself. I do not know whether or not that will do any good; I cannot say it is really efficient, because the process of education is slow. I

I would be very glad to hear suggestions from others as to what they are doing to educate not only the trackmen but the track foremen, because in our case the track foreman needs it most. On our terminal division—the most dangerous division of all—we have the fewest accidents to trackmen. I think that comes about wholly because, realizing the dangers, those men are supervised and watched better than anywhere else on the system.

MR. WIGHTMAN: We have selected as an instructor one of our supposedly best Safety First men in track work, a roadmaster. From my office he is sent to a division superintendent, who arranges an itinerary over his entire division. A roadmaster accompanies him on a motor car. They stop and visit every section gang, inspect their tools and flagging equipment and advise them on all hazardous work. The instructor reports by divisions to the superintendent. In that way we have been able to interest the roadmasters. Last year one roadmaster went through ten months without a personal injury to any of his men.

SECRETARY ANDERSON: How many foremen were under the jurisdiction of the particular roadmaster who made such a good record?

MR. WIGHTMAN: He had fifty section foremen.

MR. DOW: Education must begin at the top. On the New York Central Lines we began several weeks ago, by holding round table conferences for officers and men of supervising capacity. Our system is so large that we have eight districts, each one under the jurisdiction of a general superintendent. We set aside an entire day, conducting the meetings very much the same as a round table session of the National Safety Council at its annual Congress. A program is prepared and papers assigned on specific subjects, such as "How to Prevent Injuries to Trackmen," and so on. We even require the general superintendent to prepare and read one of the principal papers. Two men are assigned to discuss not only his paper but each of the other papers.

Each one of our round table conferences is attended by anywhere from 100 to 250 officers, there being in attendance the general superintendent, all of the division superintendents in his district, trainmasters, yardmasters, shop superintendents and so on—all the men that can possibly be spared and brought into headquarters for that day.

MR. CARROW: How often are they held?

MR. DOW: The first meetings were held this year and we in-

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tend to hold them once each year. I think the interest among the officials and the men of supervising capacity in these meetings will do more good than any other one thing. It is enlightening to the men. They get information on the causes of accidents and the way to prevent them that is absolutely new to them. They get a new insight into affairs, a new inspiration, and I think one of the best things we have inaugurated on our lines. I hope splendid results arise out of it.

I have had general and district superintendents tell me that they never really received a proper viewpoint of safety work until they attended one of the conferences devoted entirely to the subject of safety. Nothing else is discussed at that meeting.

EDUCATION THROUGH MOVING PICTURES.

SECRETARY ANDERSON: We are advising our supervisors of accidents that occur and some of them are surprised at the number of accidents the foreman under their particular jurisdiction is having. That gets the supervisors busy. We also have a demonstration car in which we are exhibiting the picture produced by Mr. Dow, "The House That Jack Built." We also have 150 lantern slides, showing safe and unsafe practices by trackmen, brakemen and other employees. We started out of Memphis with the car and stopped at every station along the line. The agent and his family, the section foreman and his family, the section laborers and their families all visit the car—it will seat about 50. We stop at every station and generally sixty people make up the town. We stay there one night, if necessary two nights, then go on to the next town. In this way we are getting pretty close to the section men and vitally close to their families and it is proving very effective. We have been using the car about five months. When we first went over the line and stopped at junction points, getting transportation employees and yardmen into the car, but now we are stopping at every little station. We have not a very large system, a 1,400 miles, and if there are not employees to fill the car we get school children and outsiders.

Our car is equipped with an independent lighting system so we do not have to depend on the outside for electricity. If we are on a spur track in a cornfield we stop there and show our picture.

MR. WATKINS: Do you pay the men for attending the

SECRETARY ANDERSON: No, sir; we hold our demonstrations at night.

MR. WATKINS: Have you ever had the men put this up to you: That it is an instruction car and they are entitled to a half-day's time if they go into the air brake car and receive instructions? You are running an instruction car, they say, and we will come into it when you pay us. Have you had that question raised?

SECRETARY ANDERSON: No, sir; we do not pay our men to go into our instruction cars. In our shops—the first place we exhibited the pictures, in April—we had about 1,800 men. We gave them the time, possibly fifty minutes, as the superintendent of machinery wanted them to see it in classes. So we started at the boiler shop and went right through the various departments, winding up in about two weeks.

MR. MITCHELL: I was interested in Mr. Balliet's system of using whistles. While we use whistles on the New Haven we say that it means "Clear all tracks!" I am wondering if he is able to apply any code, owing to the diversified movements they must have in regard to tracks to be cleared and the direction in which the trains or engines are approaching.

MR. BALLIET: A code is provided when men are working on main tracks. Two whistlemen or watchmen are provided in yards, one for either direction. It is then incumbent on the men, when they are warned, to observe the position of the approaching train, the movements in the yard being limited to twenty miles per hour.

"GET INTO THE CLEAR."

MR. BANKS: We inaugurated a code on the Northern Pacific, then we stopped it. You know a man does not hear all the whistles. We depend on just one whistle and that means "*Get off the track!*"

MR. MITCHELL: All the tracks?

MR. BANKS: All the tracks, "*Get into the clear!*" If you undertake a code and the fellow does not hear all the different whistles he may get in the wrong place or perhaps he gets in the right place. You will find, when you start a code, that you are going to have trouble.

MR. RICHARDS: We have only one signal.

MR. MITCHELL: We have only one. The whistle means "*Clear all tracks!*"

MR. DOW: I would like to ask Mr. Richards if he can tell what

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proportion of the accidents due to being struck by trains by classifications of employees?

MR. RICHARDS: Unfortunately, I cannot answer that question, Mr. Dow, because I have not my figures with me.

MR. CARROW: What do you mean, the proportion?

MR. DOW: What proportion are trackmen and what are employees. We run about fifty-fifty.

MR. CARROW: It is not fifty-fifty with us.

MR. BANKS: We run more than that.

MR. RICHARDS: I do not think it is that much.

MR. CARROW: It is about thirty-five and sixty-five.

MR. DOW: Thirty-five trackmen?

MR. CARROW: Thirty-five trackmen; that would vary according to the class of railroad.

MR. BOSLOOPER: From the district I come from—Detroit, the Michigan Central Line—answering the question as to the examination of section men: On the Michigan Central the foreman, the sub-foreman, on their regular sections, have the visual examination all along the line. Every so often the men are called and examined.

I attended a round table discussion last month. The supervising officials were there and one of the main topics under discussion was "Injuries to Trackmen and How to Avoid Them." Suggestions were made along the line Mr. Schaff just referred to—education. The supervising officials agreed that it was a good idea to have five or ten minute talks once a week on a certain day and allotted time on the safety movement.

ALL CLEAR ON SAME SIDE.

Another suggestion for the protection of trackmen was the matter of getting back to the foreman and sub-foreman. The trackmen were under their direct charge. A great many men were injured while scattered along the tracks, some on one side and some on another, where the foreman or sub-foreman could not have his eyes on them at all times. Consequently some were being struck by trains and things projecting out from the cars. A suggestion was made at that meeting that the foreman and sub-foreman, in their direct supervision over the men, should arrange not only to give them good and sufficient time to get off the track but to know

on the same side that the foreman and sub-foreman get off on, in order that they may know at all times that the men under them are sufficiently clear of all tracks to avoid injury.

MR. McCAMPBELL: In my territory, on the Western lines, I give our foremen the same instructions—to clear the men on the same side that he is on, in order that he may have better supervision. We had a case, on a neighboring road, where there were new members in the section gang—young men—and they got off on the opposite side from the foreman. A freight train was passing rather slowly at the time and they boarded it to take a little ride. As a result one of the men lost both of his feet. I think that brings out the necessity of keeping men on the same side as the foreman.

Some of our section foremen say they are instructed by their engineer of maintenance of way, or by that department, to have one man on the other side, in order to look the trains over as they pass and to exchange signals with the trainmen. I believe it is a good idea to have the foreman select one man, possibly the oldest man in his gang, and station him on the opposite side, if that is necessary, to look over passing trains and exchange signals. That is a request or rule of the operating department and I believe a very good one. It is also a good idea to have the section men keep back at least twenty feet from the train, where conditions will permit. We had a case in Ohio recently where a section foreman had his leg broken by a large piece of coal falling off of a coal car. That might very easily have been avoided by stepping back fifteen or twenty feet from the track—at the place where the accident occurred he had thirty or forty feet of level ground. We are trying to follow such practices on the western lines.

CHAIRMAN SMALLEN: I would like to ask Mr. Schaff to explain about his car and the paying of employees.

MR. SCHAFF: No men on the New York Central, so far as I know, are paid for any examination or for instructions. At the shop terminals the day workers, of course, are allotted the time they spend in the cars. It is rather hard to compensate men employed on a piece-work basis, but we have a schedule at each of the shops and approximately sixty-six men attend the car as a class. We have, on an average, six classes each day. At night we ask the men to bring their families and many of them do so. We know our men are interested in the car and in the exhibit because we very frequently find piece workers coming into the car two or three times to see the pictures. The day workers come in only once and they

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are paid for that time—that is the only time they are allowed to ride in the car.

MANY NEW MEN EMPLOYED.

MR. YOUNG: I have been following safety work for seven years, and education, to my mind, is the greatest and best feature that could be adopted. I agree with Mr. Carrow that at one time we had our section or maintenance-of-way work run down to a minimum, for the last year and a half they have been climbing up. The section foreman has a gang today but tomorrow he has lost half of them, and the following day he has a completely new gang—they walk in and walk out. It is an utter impossibility to educate the crowds of men continually coming and going. The section foremen are instructed to see that the rules are carried out, they are instructed to see that the whistle is blown and to get men off the track.

We also have a local safety committee, composed of various department heads—yard, shop, track, and so on—they meet every month. We take up every accident, read it over and discuss it. Every six months we change the chairman. In addition to the chairman there is a sub-chairman. Where we are not satisfied with the explanation of an accident or where there is a flaw in the rule we send the accident report to the superintendent with a criticism. He, in turn, confers with the heads of his department—we find the follow-up very important. The foremen dislike to be criticized, they hate to have their reports returned, and I hope that if we settle down to a more permanent basis our educational feature will be of some value. I feel very shaky about it, however, at the present time and under present conditions.

SHOP MEN RIDING ON ENGINES.

CHAIRMAN SMALLER: We are doing educational work along the lines referred to. Our trouble is not so much with the trackmen as with the men of a little more intelligence, the shop men. We have a great deal of trouble in keeping some of our employes off the engines. We have difficulty in getting engineers to co-operate with us by driving them off and men are injured by getting on engines, riding home and jumping off. What can we do to stop it? We have threatened to discipline them and to discharge them but it does not seem to accomplish the desired result.

have three or four thousand men going home from work every night and they climb all over your trains and use the right of way as a footpath, what can you do to stop it? What would you suggest?

MR. CARROW: I do not think that question can be answered.

CHAIRMAN SMALLEN: Is there not some way in which it can be stopped? We are talking about all classes of employes and we are in a position to get a better hold on our shop men than our trackmen.

MR. BOSLOOPER: Some of the highest railroad officials in the country are working overtime trying to solve that question, because that brings us right back to the labor turnover. Men are very sensitive nowadays and if you call their attention to unsafe things they are doing or to an improper practice they quit their employment.

CHAIRMAN SMALLEN: We have posted notices warning employes against doing this very thing as we are continually having accidents from the causes just given. We are holding meetings and doing everything that we can to stop these unsafe practices but we do not seem to accomplish a great deal.

ENGINEERS REQUIRED TO STOP.

MR. WIGHTMAN: We have about broken up the practice of employes riding to and from their work on the pilots of engines. All our engineers have been instructed when any one gets on a pilot of an engine, even one of the trainmen, to stop the engine and call the offender's attention to the rule. An engineer is not permitted to move his engine while a man is on the pilot. In our switching yards our instructions to our enginemen are to stop before any switchman gets on the footboard of an engine coming towards him. We have an official continually going from one yard to another, holding safety meetings of the men and showing how men are killed or crippled by this and various other unsafe practices. Almost every engineer is an old employe and he stops his engine when he sees anyone about to get on the pilot. If he sees a switchman step out to get on the footboard he brings the engine to a stop before he lets him get on.

SECRETARY ANDERSON: Have you had any opposition from your operating people as to delays?

MR. WIGHTMAN: No.

SECRETARY ANDERSON: We tried a somewhat similar rule and one of our yardmasters said: "In a very short time we will have to provide a derrick to lift these fellows on and off."

MR. WIGHTMAN: The same was true with us. Two or three

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of our superintendents of terminals and operating officials that it would be necessary to put extra engines in a great many. The general manager said if it was necessary to use extra engines on account of delay caused by stopping to pick up switchmen they should do so. We found it was not necessary. In fact, in a matter of yards, since our readjustment to an eight-hour basis, we reduced the number of hours of engine service.

MR. SCHAFF: I would like to ask Mr. Wightman if they permit a man to get onto the footboard of an engine while standing outside of the rail?

MR. WIGHTMAN: The engineer assumes, when a man steps to get on, he will step in the middle of the track and the engine brought to a stop. At first we had men stringing out, in opposition to the movement, getting 100 or 200 feet apart and expecting the engineer to stop each time. A little missionary work soon induced one man to get on the rear footboard and another at the head.

MR. COCHRANE: Do you consider it dangerous for a man to get on the footboard from the side when an engine is moving slowly?

MR. SCHAFF: I do. I do not think they should be permitted to get on the footboard of an engine when it is moving.

SECRETARY ANDERSON: What is the practice on the New York Central?

MR. SCHAFF: Our safety rule says men standing between rails must not get on the footboard of an engine; but I am sometimes to say it is permitted by men standing outside of the rails.

COVERS FOR DROP PITS.

SECRETARY ANDERSON: I want to ask a question of members who are familiar with mechanical departments. Do you cover drop pits; if so, in what manner and what is the operation?

MR. SCHAFF: In our shops and roundhouses we cover them when they are not in use. When they are in use a portable saw rail is provided, but as soon as the engine is off the pit they are covered with planking.

MR. WIGHTMAN: All pits in your roundhouses are covered.

MR. SCHAFF: Pits for the dropping of drivers and engine truck wheels.

SECRETARY ANDERSON: Is the covering in sections?

MR. SCHAFF: Yes; in sections so that two or three men

SECRETARY ANDERSON: With rings in the ends of each section, possibly?

MR. SCHAFF: Yes, oftentimes.

SECRETARY ANDERSON: About two weeks ago we had an accident to a yard engineer who went into the roundhouse and, not paying attention to where he was walking, fell into one of the pits. A couple of planks were lying across the pit but one was out of place. The engineer was careless, of course. You have to make some things fool proof and this was a case where we should have done so. He stepped on the unsafe planking and fell, going down two or three feet into the drop pit. He was very severely injured.

MR. SCHAFF: We had several such cases before we took pains to properly cover the pits.

MR. WIGHTMAN: Do you use two-inch planks?

MR. SCHAFF: Yes.

SECRETARY ANDERSON: What is the practice of other roads? Mr. More, what do you do?

MR. MORE: We do not cover drop pits.

SECRETARY ANDERSON: Do you put railings around them?

MR. MORE: No. Where the engines go in over the drop pit it is covered with portable boards. You can lift them up and take off the drivers.

SECRETARY ANDERSON: I am talking about the space between the tracks, where you take off the drivers.

MR. MORE: That is entirely covered unless the wheels are being taken off the engine. We have had no accidents on that account, but we had one very peculiar accident: A man was working in the cab of an engine when he fainted and fell right into the pit and was killed. He struck his finger with a hammer—he was a faint-hearted fellow—and fainted and fell.

GOGGLES IN BLACKSMITH SHOPS.

SECRETARY ANDERSON: While we are on the topic I would like to ask another question: What is the practice of wearing goggles in the blacksmith shop? To what extent do you require them to be worn?

MR. SCHAFF: It is difficult to make a hard and fast rule. Where men are engaged in chipping, riveting or grinding, or anything of that sort, we require them to wear goggles. If emery wheels are properly equipped with iron guards and glass protectors I do not think there is any reason why a man should wear goggles.

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SECRETARY ANDERSON: I had in mind boilermakers, blacks doing sledging and work of that kind.

MR. SCHAFF: The foreman ought to be well enough informed to tell his men when they should wear goggles. We have cases of salary men working under cars on the pipe lines, where they may get into their eyes. I believe such men, for their own protection, should wear goggles. I think the foremen ought to see that men wear goggles where they are engaged on work liable to cause eye injury.

MR. MORE: That was taken up by our road. A man running a big hammer in the blacksmith shop said he would wear goggles. One of our officers would come down and wear goggles alongside him when he was operating the hammer. So our surgeon went and the smith told him to put on his goggles and stand next to him while he was manipulating the hammer. The surgeon did so and after the trial he said: "I have nothing to say." The excessive heat from the big hammers and from the great pieces of hot material men were handling made it impossible to use goggles. The light is so concentrated that the men's eyes are inflamed after using them, so our men do not use goggles on our big hammers. It is impossible that a man wear goggles in the operation of emery wheels, and we have a rigid rule for this and similar work. We had so many accidents that the question became a critical one with us and we adopted a rule requiring goggles, but we have no hard and fast rule in the blacksmith shop.

SECRETARY ANDERSON: That is the reason I asked the question. Our foremen are rather apathetic and I have been unable to enforce the use of goggles in the blacksmith shop.

HANDLING NO. 19 ORDERS.

I have a question for men in the transportation department. What is the length of the handle on the hoops used to hook on No. 19 orders?

MR. MITCHELL: I should say about five feet. We use a hoop and a slip-socket, with a handle about five feet long, which forms a holder for the operator to use in reaching up the hoop. When the hoop is caught the handle pulls out of the slip socket and remains in the operator's hand.

SECRETARY ANDERSON: You have two sections: The hoop and the handle.



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MR. MITCHELL: There may be hoops on exhibition at the Central Palace.

SECRETARY ANDERSON: I did not see any. I have one question. I am getting a great deal of good out of this round discussion because there are things in front of me all the time. Matter I wish to inquire about is the question of linemen repairing telephone wires using a ladder and depending upon the wire to hold them up. We have had cases where the wires broke and linemen fell and caused one or two serious injuries. Our people charge say there is no way around it. What is the practice of roads?

MR. CARROW: I never heard of it being done.

MR. VAN GORDER: I never saw a ladder used on a telephone wire.

SECRETARY ANDERSON: How do you solder a joint, how do you get at it?

MR. VAN GORDER: They are soldered before the wires are strung up. The lineman makes his joint on the ground and then pulls the wire up and makes his connection to the pole.

CINDER PIT COVERS REFERRED TO SPECIAL COMMITTEE.

MR. McCAMPBELL: As to the cinder pits and the covering of them: At the round table conference on Tuesday morning it was stated that a committee would be or had been appointed and the questions would be referred to that committee. If that is correct, I would be glad to have the problem of cinder pit coverings referred to that body.

SECRETARY ANDERSON: That was in the general round table discussion. The Secretary was instructed to canvass the membership—he will be very glad to do so.

MR. McCAMPBELL: We understand your ability to handle the question and will be pleased to hear from the other roads.

SECRETARY ANDERSON: I will see what the various ideas are and give them to you.

GENERAL MANAGERS INVITED TO ATTEND CONGRESS.

A resolution has been offered: *Resolved*, That the Railroad Section request the officials of the National Safety Council to send individual invitations to general managers and vice presidents in charge of operations of the various railroads to attend the next Safety Congress.

CHAIRMAN SMALLEN: Any discussion?

MR. MITCHELL: Why do we stop with the vice presidents and general managers. I invited our superintendents and general superintendents, but not one of them showed up. I think we might extend our invitation to the whole official force in the operating department.

SECRETARY ANDERSON: Mr. Dow's invitation to the president of the road was really the cause of our being represented at the Congress three years ago and that brought us into membership in the Council.

MR. PAUTLET: I would not substitute the word "executives" for "vice presidents" for the reason that every man here is an executive. It is the desire of this organization to get the substance of the papers before the vice presidents and general managers and to show them just what is being done so they will appreciate it. We all know what industries outside of the railroads are doing in the matter of safety and it is chiefly because those men are concentrating and coming in contact with the higher officials—the higher officials know as much about safety as the foremen. With the railroads it is a different matter. Seven or eight thousand miles of track compose a road and the president is on one end and a great many of the chief officials at the other. I believe we will go further in safety matters if we have the vice presidents in charge of operations here to hear some of the excellent papers and the discussion which follows them. In a large city like this we have difficulty in securing publicity in the papers, but we are struggling along, working and investigating, and when we go home we must write a denatured, short and very brief report of the procedure. As a consequence the higher officials do not appreciate the enthusiasm, the courage and the intensity of thought in the splendid papers read at these meetings. I am in favor of sending an invitation to the vice presidents and general managers in charge of operations to attend our next Congress.

MR. BELL: The resolution seems to be a proper one. We are not getting anywhere in arguing about titles or the details of issuing an invitation. The resolution asks the National Safety Council officials to try and get the officers of railroads to attend the sessions and take part in the Congress—to be present and see what we are trying to do. The fact that we send an invitation to a vice president or a general manager does not mean anything more than informing railroad officials that we have something of interest for them. I do

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not think it makes a whit of difference whether we address the superintendent, the executive officer or anyone in particular. I move that the resolution be adopted. I think the Executive Committee of the Council will be very glad to act on the resolution whether it is in the form of a request or a recommendation.

The motion, being duly put, was carried unanimously.

MR. BELL IN THE CHAIR.

CHAIRMAN BELL: Mr. Dow referred yesterday to a form used on the New York Central Railroad. Fatalities are shown regardless of time elapsing between the date of the accident and death. Accidents to employees not on duty are also included. The black figures show injury cases. In referring to Mr. Boltz's paper I called attention to the form adopted by the North Western Railway. Our form is the one recommended by the special committee of the Railroad Section at the Detroit Congress. We found after using the form, that we were having a large number of a certain kind of accidents. Mr. Dow also spoke of his form as being designed largely from the same source. Perhaps the delegates will be interested in the details of this form, so we are passing it around for your perusal. If you desire any detailed information I am sure Mr. Dow will be glad to give it to you.

COMMENDATION FOR NEWS LETTERS.

At the March meeting of the Executive Committee of the Railroad Section the Secretary was charged with the duty of getting out News Letters, similar to the ones issued by the Iron and Steel and other Sections. We have issued three or four and this is a good time to find out what you think of them. Are they worth what I am seeking the information for the benefit of Secretary Anderson, who will do the work next year if you desire the letters continued?

MR. DOW: If Secretary Anderson can get out as good News Letters as Mr. Bell has issued the last few months I think it ought to be continued.

SECRETARY ANDERSON: It is pretty hard work to originate material and if we are to continue the News Letters I would like members to act as missionaries and send a line or two to the Secretary so your officers will have something to work on.

CHAIRMAN BELL: That applies also to helping the Publicity Committee in their work. The Publicity Committee is charged v

under the rules of the National Safety Council, to a bulletin every two weeks. In order to make them worth while we do not want them to be one-man bulletins. We want every one to take part in preparing the materials. Whenever you get out a bulletin please send copies to General Manager Cameron, who will forward it to the Chairman of your Publicity Committee. If you have statistics or other material or unique or unusual ideas put into effect on your road please give the National Safety Council as well as the Railroad Section the benefit of such information.

MR. McCAMPBELL: I move that the News Letter be continued.
(The motion was duly seconded and unanimously carried.)

GENERAL DISCUSSION.

SECRETARY ANDERSON: Mr. Mitchell said yesterday that every time an employe was injured on his road the man was brought into the superintendent's office. Suppose a trackman was injured, say 100 miles from the terminal, and he was laid up for one or two days. Would that man be brought into the superintendent's office?

MR. MITCHELL: I will have to qualify my statement. So far as the superintendent is concerned the rule applies only to men in the operating department—the yard, train or engine men. Shopmen report to their foremen. The rule applies only in cases where the men are injured to the extent of losing time. Our object is to explain the rule the man has violated and impress upon him the importance of compliance in the future. The procedure would not apply to a trackman injured 100 miles or so from division headquarters—we would use some other means of educating him.

SECRETARY ANDERSON: We also talked about rivet cutters. We have a great deal of trouble in our shop from flying rivets. I was told that it was an impossibility to stop it. Has anyone devised a remedy for this hazard?

CHAIRMAN BELL: On the North Western our men use a broom to catch the rivets when they are cut off. This keeps them from flying.

I would like to ask if the gentleman from the Erie has anything further to say on the subject of first aid?

MR. BIRMINGHAM: No; but I brought a first-aid kit with me today. We went into the first-aid package very thoroughly and found almost every station had a different kit—each man seemed to have a preference for some particular outfit, so we devoted our energies to devising a standard kit for all stations and cabooses.

Steam Railroad Section

We usually found a small bottle of iodine in the old-style cases and when a brakeman was injured and the bottle was two or three of the articles in the kit were often spoiled. One package contains individual bottles.

MR. MITCHELL: Do you lock your first-aid cabinet?

MR. BIRMINGHAM: Yes; when the cabinets are in the cars the conductors are responsible; at the stations the agents charge.

MR. PFOUTZ: A short while ago we were discussing the use of goggles—some men in the blacksmith shop did not wear them. We require our men to wear them. No metal part of the goggle touches the face, so we do not have any trouble with them or from abrasion of the skin. In some classes of work we use a goggle with a wire front; this is interchangeable with another with white glass. Since we have been using this style of goggle we have not had any trouble with the men in the blacksmith shop. The nosepiece is so arranged that the goggle can be set off a little, leaving a small air space. The majority of goggles, if you will notice, rest upon the cheek and not on the nose. The nosepiece is covered with waterproofed leather and the frame can be bent sufficiently to give a clearance. Before we adopted this goggle a great many men had blistered faces and a few had infections, but during the last year we have had no trouble.

CHAIRMAN BELL: The Chairman ought to be the last to make suggestions for more work, but we have some very important matters in connection with papers presented before the Section. It was our plan to have our round table meeting this morning and to take care of unfinished business this afternoon. Is it the wish of the members that we hold another meeting this afternoon?

MR. DOW: A great many members have left or are leaving this afternoon. The representatives of the New York Central Line are leaving this afternoon and I want to have a staff meeting in my office right after luncheon. We have been in session for the greater part of two days and I doubt very much if it is advisable to hold another meeting.

CHAIRMAN BELL: We have had a splendid meeting and I am sure we have all profited by the papers and by the discussion. I wish to express the appreciation of the Section to the gentlemen who have contributed so materially to the success of the Section.

MR. RICHARDS: I move that we now adjourn.

THE ENTHUSIAST

The enthusiast in the safety movement is the man who knows he is working along broad, humanitarian lines. He is aware that safety does not consist of a few speeches, a splurge of ink, and a moving picture show. These things help, but they alone will not suffice to pull men from the careless danger habits of years. That takes time, thought and constant effort. Above all, it must be remembered that when Indifference comes in at the front door, Safety flies out the window.

National Safety Council

Woodworking Sectional Meeting

New York City

Sept. 13, 1917

E. K. PRITCHETT, Chairman

Secretary, the Macey Company, Grand Rapids, Mich.

F. G. LOVETT, Vice-Chairman

Furniture Manufacturers Safety Association, Toronto, Canada

F. A. BARKER, Secretary

Lumbermen's Mutual Casualty Company, Chicago, Ill.

THURSDAY MORNING SESSION.

THE meeting was called to order by Mr. S. W. Tener, Manager, Accident and Pension Department, American Steel and Wire Company, owing to the unavoidable absence of Chairman Pritchett.

A very interesting program was presented and the paper was well received. Much interest was shown by the delegates in attendance and the informal discussions were participated in by a large number of safety engineers.

The officers of the Section were continued for the year 1918.

SAFETY RULES AND ORGANIZATION IN LOGGING CAMPS.

ROBERT B. GOODMAN, GOODMAN LUMBER COMPANY, GOODMAN, N. Y.

Mr. Chairman and Members of the National Safety Council:
The work of this Council—the work of the state industrial commissions, all working for the elimination of industrial personal injuries, rests securely on two fundamental assumptions: The conviction of the employer for the safety of his employees and the concern

actuated by the same moral and economic pressure and by the same obligation to society. The chief task of this organization and others co-operating with it is education; that is to say, the gathering and disseminating of data pertinent to this subject. Properly compiled and intelligently classified statistics show the employer and the employe the extent of these injuries, their economic wastefulness, and their personal hardship. Both parties are shown, by the mere fact of classification of injuries, that industrial accidents are not accidents at all but the result of ascertainable and, to a large extent, controllable causes. By this compilation and classification the belt hazard, the elevator hazard, the gear hazard, the set screw hazard, have been located as causes—then it was plain sailing. I do not mean the work of eliminating these hazards, when discovered, is by any means easy work, but it is work along definite lines which is surer and more effective than the preliminary groping.

WORKING ALONG DEFINITE LINES.

The great bulk of the work *now* being done for the conservation of life and limb is being done along practical and definite lines. There are actual results to show for it. No longer can the employer or the employe disregard specific warnings; these are not now, as they were once, tentative, hopeful suggestions. This Council is now in a position to offer tested rules, tested devices; it can in a manner, guarantee results and this is something that appeals both to the employer and the employe. No matter how far we are able to go in this work of safety promotion in any field, it is never a completed task. It is a work whose results, like the results of all advertising, depend on keeping everlastingly at it and the fact that the pioneering work has been done and the courses charted and the interested parties fully appraised of the chief dangers to be averted should only be a further incentive to continued effort. This is the situation in the factory, on the railroad and even, to a surprising degree, in the conduct of our war against Germany. In all these fields we have routine employment, highly perfected organization and machinery. We have the possibility of guards, screens, air brakes, danger signals, trenches, metal helmets and gas masks. We have men educated to the importance of and habituated to the use of these appliances and we have definite statistics that show how the toll of life and limb is progressively decreased.

But in the industry of logging which is primitive and of the very essence of pioneering, we are still largely in the tentative or

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experimental stage. Very generally, I believe, employers of labor have learned the fundamental principles of safety which be briefly enumerated as follows:

GOOD WATER, FOOD AND SANITATION.

1. Our camps must have good water, both for the men and horses. In our Wisconsin administration of the Workmen's Compensation Act this requirement is a legal responsibility.

2. We require good food; that is to say, sanitary cooking conditions, good, nutritive food, appetizingly prepared.

3. Our camps must be sanitary in the matter of venereal cleanliness and a proper disposal of infectious matter.

4. Drunkenness is an offence.

(My wood superintendent interprets this by the following posted on the camp offices: "*All foremen are instructed to employ or harbor any man who drinks liquor on the job or at the camps under the influence of liquor. We do not want men in our employ who will bring liquor to the camp. The above will be strictly enforced.*")

5. The operation of the camp must be in sole charge of competent foreman.

6. The wood superintendent is in sole charge of all logging operations, including railroad operations and maintenance and construction, company logging and jobbers' operation.

WHAT THE FOREMAN CAN DO.

Except that we pay more attention to sanitation, these rules are about the same as logging operators employed fifty hundred years ago. Under them the safety of the lumberman is dependent upon his own competency and the competency of his foreman. The competent camp foreman will not buy a lame or a biting horse. He will see that the skidding reins are strong enough for the driver to walk clear of the log; he will judge men, for he knows well one of your slogans, "The Best Device Is a Careful Man." He believes, in his crude understanding, that accidents are largely the result of personal incompetency, from lack of training; faulty temperament or lack of alertness; or to poor physical condition. He therefore trains his inexperienced men, beginning with our safest tools—the pick and shovel. Foolhardy, the careless or the hopelessly awkward he will not employ.

Through the efforts of the Industrial Commission of Wisconsin we are now beginning to get some authentic statistics of logging accidents. Last year our commission published a tabulated statement in considerable detail, covering classified causes of accidents, the nature of injuries, the cost of indemnity and medical aid and the days lost in temporary disabilities. This report shows that for the year ending June 30, 1916, there were 927 injuries sustained, or about one to each million feet of logs cut. Of these thirty-one were fatal. There were 29,904 days lost and the indemnity and medical aid amounted to \$101,876. Two hundred and nine injuries, or more than 20 per cent, were from cuts of axes, saws and canthooks, but none of these were fatal. Falling trees and limbs came next in the number of accidents, 126, and led in the number of deaths, which was sixteen, or over one-half the total fatalities for the year. A surprisingly large proportion of these accidents occurred at those periods in the winter when the snow was the deepest.

LOADING AND UNLOADING LOGS.

The third largest source of accidents was in the loading and unloading of logs. This accounted for 162 accidents and five deaths. Steam logging machinery, which, in our territory, is chiefly confined to down skidding, decking and car loading, is credited with fifty-seven accidents and two fatalities; and kicking and biting horses accounted for twenty-five accidents and two fatalities.

When these statistics were distributed to the logging operators suggestive comments were called for by the commission and the few replies that were more than a simple acknowledgment of the receipt of the statistics were far from encouraging. One stated: "Hired forty new men who claimed to be experienced but not over 10 per cent knew woods work thoroughly and not one of them could be called a lumber jack. These men are likely to be injured. Changing industrial conditions are responsible for this situation."

The next one replies: "Woodsmen are happy-go-lucky fellows who will always take chances in spite of warnings. Physical conditions of men caused by booze is a great factor. Medical examinations before employment and prohibition of booze during employment would prevent many accidents, but is not practical on account of shortage of labor. Poor equipment also a factor. Too often will a chain or cable, used too long, snap or give at the critical moment. A campaign of education would be a good thing."

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Another writes: "Booze is the principal cause of accident

Another: "High wages and scarcity of men make men careless and they quit if reprimanded by foreman." This letter also describes a case where a foreman discharged a man for failing to comply with safety orders. The man quit and the foreman did not get another to replace him.

"Accidents largely due to booze," writes another. "The Industrial Commission has helped safety by requiring patent car seats, etc.

"Most accidents are caused by inexperienced men who move from camp to camp. Experienced men are not often injured though they work in the most dangerous places," is a section of another letter.

CAMPAIGN OF EDUCATION.

The Employers Mutual Liability Insurance Company of Wisconsin is co-operating with the Industrial Commission in this particular line of safety work. This company writes that they "have come to the conclusion that the simplest and best methods to attain to reach the individual employe is by means of safety leaflets and pamphlets. Our plan is to publish a series of these pamphlets in English, Polish, Austrian and Bohemian. The first number, which is now in press, is a leaflet containing an appeal from the employer to his wood crews to observe safe practices. The succeeding numbers will contain reading matter and illustrations of interest to the lumber jack, with particular attention to safety.

"Amongst other measures that are practical are the use of bulletin boards at each camp on which safety bulletins may be posted. Instruction should be given each new man by the foreman in relation to safe practices that must be observed."

This company also suggests a modified form of safety organization for the larger camps, in the form of a committee composed of three to five of the best employes. Their duties would be to inspect chains, jammers and other similar apparatus; look after accident prevention in general, and have authority in all matters relating to safety. They put particular stress on the moral effect of such a committee.

I am not in favor of special safety organizations in our logging camps for the reason that I have not found many practical loggers who will enthuse on this subject. They all prefer to place the responsibility on the foreman.

CONCISE SET OF RULES.

The investigations of our Industrial Commission and the results of the statistical data they have been able to accumulate has enabled them to prepare what I consider a concise set of rules which they have printed in poster form and an abbreviated copy of which I append hereto. The commission has also published two illustrated posters relating to this field of work, both of which have undoubtedly proved beneficial.

We are at the present time facing a serious situation. The old time lumber jack is passing, experienced woods workers are becoming scarce. Our forces are being recruited largely from inexperienced men and our compensation laws have, to a certain extent, relieved the shortsighted workman from apprehension. On the other hand we are beginning to experience the change that has taken place more largely in other regions from human and horse energy to steam machinery. The introduction of steam machinery in our woods work brings with it, of necessity, the introduction of more definite organization, the adherence to specific rules of conduct and the possibility of specific safeguards. What special dangers it brings with it are so obvious that the actual danger is greatly diminished.

In closing I wish to again emphasize the great value of definite statistical information concerning personal injuries as a basis of further progress in their prevention and to urge the importance of this work upon the industrial commissions of all the lumber producing states.

I wish to express my high appreciation of the splendid work done by the National Safety Council and to pledge the support and co-operation of the National Lumber Manufacturers' Association in promoting this work in the lumber industry.

¹ SAFETY FOR LOGGERS.

By the Industrial Commission of Wisconsin.

CHOPPERS AND SAWYERS.

1. *Carrying Axe.*— The only safe way to carry an axe is with the handle on the shoulder and the head back of the shoulder.

¹ Complete copy of this poster may be obtained by writing the Wisconsin Industrial Commission of Madison, Wis.

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2. *Carrying Saw.*—The only safe way to carry a saw is to carry it over your shoulder with the teeth pointed away from the man.

3. *Trees Kick Back.*—When a tree falls it is liable to kick back from the stump. When the tree starts to fall, always get back far enough so you cannot be struck by the butt of the tree.

4. *Space to Swing the Axe and Get Away.*—Before starting to fell a tree always clear out a space which will give you room to swing your axe safely, and also be sure to clear a path so you can get away when the tree falls.

5. *When the Tree Starts to Fall.*—Always get out of danger as soon as the tree starts to fall, and look up and watch for limbs.

6. *Chopping Spring Poles.*—You should be careful in chopping spring poles. There is always danger of them flying back and striking you.

7. *Kicking Horses.*—Be careful skidding around horses. Horses are liable to kick.

8. *Hitching On to Log.*—When you hitch on to a log be sure to get out of the way and stand on safe side before the log starts to move.

9. *Swampers Get Out of Way.*—Swampers should keep out of the way of the team of the skidder, and before the log starts to move should step out of the way.

10. *Look Out for Stumps.*—Skidders should look ahead and steer clear of stumps or other obstacles which the log or log skidder may strike, and thus cause them to be thrown against the skidder.

LOADING.

11. *Engineer Responsible for Equipment.*—The engineer should carefully inspect all machinery, cables and other equipment, at least once each day, and make sure that everything is in good condition and in safe condition.

12. *Hookers Stand Away.*—When the logs are lifted the hookers should stand away and give safe clearance for the logs.

13. *Top Loader Has Important Position.*—The top loader occupies a very responsible position. If he is careless or reckless the lives of the loading and the unloading crews, the trainmen, and the public are endangered. He should be careful to see that all

some loader was careless. The loader occupies a dangerous position and should also be careful to protect himself.

14. *Engineer Steady Logs.*—In lifting the logs the engineer should steady the logs at the point where they break on to the load, and then he should look to see the position of the top loader before placing the logs.

15. *Twisted Chains Dangerous.*—Loaders should watch the chains to see that they do not get twisted. A twisted chain is easily broken and is always dangerous.

16. *Overloading Cars.*—Loaders should not overload the cars.

DECKING.

17. *Good Foundations.*—The most important thing in decking is to have good and safe foundations.

18. *Safe Decking.*—Be sure that the log on the face of your deck is so placed and blocked as not to crowd out and allow the skidway to break down. All face logs should be placed in such a position that they cannot crowd out.

19. *High Rollways Dangerous.*—Take special care when standing on high rollways.

SLEIGH HAULING.

20. *Top Loader Responsible.*—The top loader is responsible for all equipment and should make frequent inspections to see that everything is in safe condition. In loading, the top loader should always remember that if he is careless he may cause a serious accident to his fellow workmen.

21. *Danger on Hills.*—When approaching a hill teamsters should make sure that the hill is in safe condition before attempting to go down.

22. *Twisted Chains Dangerous.*—Loaders of sleighs should watch the chains to see that they do not get twisted. A twisted chain is easily broken and is always dangerous.

RAILROADS.

23. *Jumping Off Cars.*—When riding on the cars going to and from the camp don't jump on or off when the train is in motion.

24. *Standing Too Near Moving Train.*—When a train of logs is passing always stand back from the track at least twenty feet.

(Note: These rules are followed by twelve additional rules of caution concerning dynamite and caps.)

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SAFETY ORGANIZATION IN THE WOODWORKING
LOGGING INDUSTRY.

M. L. FELLNER, CHIEF SAFETY ENGINEER W. H. MARKHAM
ST. LOUIS, MO.

Mr. Chairman and members of the National Safety Council. Our friend, General Manager Cameron, wished this subject and, like a good soldier, I am going to do my best, although to say at the start that when it comes to giving you specific in regard to safety in unloading logs at the pond and in piling in the yards, I fear that I have not much to offer.

The first part of the theme assigned me, that of "Organization," is where I live and have my being, and if I over-enthusiastic in dealing with this subject I beg to remind that I take safety work very seriously indeed and sincerely that we cannot have too much information on this all-important subject.

Organization, etymologically speaking, means: "A number of individuals systematically united for the achievement of the purpose."

Efficiency, in mechanical parlance, means: "The ratio of effect produced to the energy expended."

An efficient safety organization, therefore, we can define as "Systematically uniting the entire personnel of a concern, from president down to the last waterboy, for the purpose of eliminating accidents as far as possible, and doing it with the least friction in order to produce the greatest effect to the energy expended."

In the woodworking industry we are confronted with conditions somewhat different from those obtaining in other branches of industry. As regards logging and lumbering, these branches have always been classed as particularly hazardous, the men employed therein carrying themselves with a certain spirit of bravado and disdaining caution. Sawmills present another kind of hazard and in all woodworking plants, yet the problem of organizing for safety remains the same in all industries.

LAUNCHING A SAFETY CAMPAIGN.

We can safely classify an industry into: "Business Management," "Operative Management" and "Working Force."

The point of attack is in the "Working Force."

is the business management, for, in order to be effective, a safety campaign must permeate the entire business structure from the very top to the bottom. In states having compensation laws it is somewhat easier to interest the business management in safety measures, as the absence of organized effort means higher insurance premiums, while good safety work is rewarded by a reduction in rate.

In liability states this rule does not apply unreservedly. The liability insurance business is so unprofitable that a great many casualty companies do not care to write this form of insurance at all and it is with difficulty that employers can place their risks in quite a few of such states. (Of course, you expect me to present the insurance situation first, as I am an insurance man.)

But aside from insurance rates, there are very strong reasons why employers should be heart and soul for a thorough safety organization in their plants. We are not here to talk insurance—we want to learn all we can about safety and safety organization and there is where our mutual interest lies.

No employer present would willingly injure any one of his employes, that goes without saying. When an accident happens in any plant, it certainly produces a gloomy feeling, not very easily shaken off, when we find that by some little care or effort on our part the accident could have been avoided. From a strictly humane point of view all of us would like to see industry in such a state that accidents could not happen, but, let me say right here that without well directed effort we will never reach that goal.

The most powerful reason for an employer to heartily support a thorough safety campaign in his plant is economic, however. We are all in business for the profit to be derived from our activities and industrial accidents are the greatest economic waste known.

BREAKING IN NEW MEN.

Government statistics prove that it costs approximately \$45.50 to hire a man. It costs that much on an average to break in a man to do our work in our way so that he will produce a profit for us. Now, if we allow the man whom we have hired at an expense of \$45.50 to get hurt, because we are too indifferent to study the conditions under which he has to work from the viewpoint of safety, we lose at least that amount of money, for we have to break in somebody else to do his work in a manner profitable to us.

Let us see whether that is all we lose. When an accident hap-

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pens the work in the entire plant, for the time being, is disrupted for that shift at least, to a great extent. If the accident becomes enough the efficiency of the crew is quite seriously impaired and become overcautious until the effect of the accident is felt and in becoming so they slow up production, aside from causing one or more additional accidents because of being too the handling of their work.

Another aspect is that at present employment is so plentiful men will seek safer or apparently safer employment wherever can and the employer that shortsightedly refuses to conserve present short supply of labor by co-operating in a safety campaign will undoubtedly be found to be complaining about the difficulty securing "hands."

At the present time it is not only the economic and humanitarian of everyone of us to preserve workmen in their health and maximum efficiency—it is our patriotic duty above all else. A man hurt means a potential soldier less to our government, on the fighting line or in the industrial army.

Quite recently the office of a lumbering concern was visited for the purpose of getting action on safety recommendations made six months before and the astonishing answer was that they would comply with the recommendations if they were promised a certain definite reduction in rate. Needless to say the man that sort of an answer had never given the matter of labor and labor turnover a thought. Just a few days ago I learned this very concern a workman lost an arm because the man referred to above, in his office in the city, did not realize that an unguarded belt, which was to blame, was dangerous.

After the business management of a concern has entered the Safety First field it must sell the operative management up to the same ground—that of ultimate pecuniary saving in turnover and adequate labor supply and efficiency—and the operative management must enlist the wholehearted co-operation of the foremen and

INSTALLATION OF SAFEGUARDS.

The first thing in the organization of safety work should be the installation of mechanical safeguards wherever necessary. Insurance companies, at great expense, maintain safety engineering departments and their safety engineers will make a thorough inspection of the plants of any of their assured and show them

a word must be said as to the attitude of the assured toward the safety inspector of the insurance company. His visit should be welcomed and the manager in charge should personally accompany him on his round in the plant and talk over with him the recommendations which he has to offer. Then the manager should give his order to his subordinate officers and should see that the order is complied with. Let me show you just how things are mostly done in that respect now: The inspector appears at the plant, sends in his card, is turned over to the superintendent, who in turn gets some strawboss to take him through the plant. Inspector and strawboss talk over the recommendations, strawboss agrees that things as outlined by the inspector are necessary; the inspector leaves and the recommendations reach the head office of the concern in due time. If the head office is not at the same location as the plant the recommendations may never reach the operative manager. If they do reach him he keeps them on his desk until some opportunity arises where he can take them up with the superintendent. If they ever get that far the super looks them over, smiles sarcastically and says: "Another set of damphool recommendations," and then proceeds to show the general manager just how the compliance with the recommendations will slow things up, how much money it will cost and how there is nothing to them from the practical standpoint anyway.

Result: Prejudice on the part of the management as to the value of the inspection service—an attitude like the one exhibited by the gentleman that wanted a reduction in rate, I detailed to you a while ago—and more accidents that could have been avoided. But your super has impressed the boss with his superior ability and has saved a few dollars, as he thinks. What the real cost of non-compliance is going to be no one knows.

SAFETY COMMITTEE THE ONLY EFFECTIVE PLAN.

Experience shows that mechanical guards eliminate a little less than 30 per cent of preventable accidents, therefore the education of all concerned is the main object of every safety campaign. The only effective plan of safety organization is the committee plan. The management appoints a central committee, consisting of the superintendent and a general committee of workmen from the different plants, or, in the case of one plant only, from different parts of the plant.

Just try forming such a committee from the workmen and turn them loose to make an inspection once a month and instruct them to

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look for conditions that they would change if they owned them and watch result. If they do not show you many a condition needs material improvement you have either not impressed them thoroughly enough with the fact that you wanted their honest sincere co-operation and that they need not fear censure for constructive criticism of existing conditions or—you have a perfect Then you can "light up" and pat yourself on the back, but, in the language of the farmer that saw the giraffe at the circus, "there is no such animal."

Not infrequently the workmen's committee reports come in that, if properly taken in hand, will result in a material increase in efficiency. Let the workmen's committee report their findings to the central committee for their approval or rejection. Right now let me emphasize again that it is the spirit of co-operation you want after and that spirit must be in evidence at the meetings.

The men may make suggestions which the management find impracticable or not acceptable for one reason or another. When not feasible tell the committee why some suggestion cannot be used. If you do not feel that you should tell them, thank them for their suggestions anyway and encourage them to further effort, although you may not accept this or that suggestion.

After you have held a meeting of the central committee together the foremen and watchmen open their eyes when they see how this or that operation can be made safer and more efficient and how this or that condition in their department can be improved. An amusing incident happened not so long ago in a plant which had just instituted a safety campaign. At the meeting of the foremen a foreman's attention was called to certain conditions reported by the shop committee as existing in his department. The young foreman smilingly said: "That may have been true at the time the inspection was made but you can go out there now and I'm certain you will find this condition." When he was asked why and how, he replied "I pumped the committeeman before coming here and went out after the thing." That, gentlemen, was the most gratifying thing that young safety campaign. The spirit of Safety First was permeating that organization very thoroughly.

LESS DIGNITY AND MORE WORK.

Naturally, the personnel of the shop committee should be changed from time to time and as the committeemen step back into the

and caution newcomers against unsafe practices. At the meetings of the committees do not have parliamentary rules used, make it a roundtable affair. A good cigar handed around helps a whole lot in getting the men at their ease.

Employers in the sawmill industry frequently are still better situated as regards the safety movement than are the employers in the woodworking plants in cities. In a great many instances the sawmill employer is the only employer in his locality. He personally knows all of his employes and any efforts shown by him to improve working conditions for his men and to reduce the chances of accident are bound to produce the most beneficial results.

Keep the safety campaign alive by means of well-arranged and well-kept bulletin boards. Teaching through the eye is recognizedly the best means of reaching people whose knowledge of the three R's might not be so very highly developed. Have no hard and fast rules and regulations but foster that spirit of co-operation between men and management that is of such great benefit in making the men feel that they are valuable parts of the organization rather than hands to be used today and discarded tomorrow.

In conclusion let me say that all who have given the Safety First Plan a systematic and thorough tryout will bear me out when I say that if you go about your safety campaign in this spirit you cannot fail to reap the glorious satisfaction of feeling that you have done your part in diminishing the appalling sum of needless human suffering in industrial life and at the same time preserving the happiness of your employes, while getting increased efficiency from your plant, because you will have made things so safe that your men will not have to expend a considerable percentage of the energy for which you are paying in warding off possible dangers.

This is not a theory but an absolute fact.

RIP SAW ACCIDENTS AND THEIR PREVENTION.

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Mr. Chairman and Members of the National Safety Council:
The aims and objects of the National Safety Council are, as you all know, the preservation of human life and limb—and a most noble cause it is. When we think of the awful carnage, the wastage of young life, and the crippling of human beings on the blood-

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stained fields of France, where men are killed or wounded, maimed for life, by the tens of thousands, I say, when we see and think of these things we are apt to feel that our efforts are of little importance.

But this is just the time when our efforts are of the greatest importance—with the labor markets of the world being drained by the call for men and still more men to go and fight, a flower of our young manhood at that, it is important that we do the utmost to protect those who are left. For, if we are to win the war—and win it we must—we must keep up our production of food supply. We must keep our manufacturing industries in operation, also our transportation systems, and to do this requires men and women, not cripples. The war is turning these over to us enough without any help from the industrial world. You war-weary residents of the United States do not realize this yet, but the residents of the allies do.

FIGHTING FOR DEMOCRACY.

In Canada, the country I am proud to represent, you go into the smallest hamlet without being impressed with the suffering. In the larger cities you meet crippled men at every turn—armless, and sightless. And we remember that lost army who shall never see again, who have made the supreme sacrifice and have given their lives that democracy may live. I say these men have not come home to you, as they have to us.

Now that your glorious republic has entered the war, you must taste of this bitter fruit; but you will not shirk; your men will not falter. Some are already in the trenches, others are marching on—a glorious, conquering army. Some will not remain, may they be few. There will be the maimed and the injured. Mothers' hearts must bleed and many homes be darkened. When the dove of peace returns to our shores, but return it will, and it will be a peace such as the world has never known.

It is because of the awful price we must pay in the waste of life and limb that organizations of this character must exert themselves to the utmost to preserve the lives of those who do go to war, that we may build up nations stronger physically, mentally, and morally than they have been heretofore. It is to this end we are gathered here today, each to do his part, small though it may seem, to help the other fellow take care of himself. If we

on "Rip Saw Accidents and Their Prevention." It is a subject that requires our careful consideration, for if we examine accident statistics we will find that the rip saw is responsible for a large proportion of all accidents attributed to woodworking tools, and while the greater number are of a more or less minor nature, the number of serious ones is so great that it behooves us to give careful consideration to their elimination.

NATURE, CAUSE AND INJURY.

For convenience, I have divided my subject into three parts:

1. The nature of the accident or injury.
2. The cause of same.
3. Their prevention.

There are, again, three types of injury that the operator of a rip saw is apt to meet with if proper protection is not provided. The most common of these are to the hands, and more particularly to the thumbs and fingers; the next is to the eyes, and the third is to the body and intestines.

The causes of hand injuries are, in the most part, due to carelessness, or, what I believe would be more correct, absent-mindedness on the part of the operatives, who, to use a Biblical expression, "having eyes, see not," because their mind is not on their work. An operator in passing work over a saw will use his thumb more than any other part of his hand to press the material forward. If he is not careful he will push his thumb right into the saw, or it may be one of the fingers—more usually the index finger. Injuries also result from the operator trying to remove edgings or slivers which become lodged in the saw groove or throat of the table while the saw is in motion, with the result that the hand is jerked suddenly into the saw. Reaching over the saw to pick up stock or failing to use a push stick in ripping narrow stock are the most common causes of hand injuries.

While these accidents are serious enough, those to the eyes are much more so. Those wonderful windows of the soul, through which we look upon the beauties and wonders of earth. When the blinds of these windows are closed and the soul is confronted with the blackness of eternal night, when the faces of those we love are but a memory; this, I say, is more awful than the loss of fingers or even a hand—and this may be the result of one of the accidents that happen to rip saw operators, caused by flying knots or fragments of wood striking them in the eyes.

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KICK-BACKS.

Another type of injury that is most terrible in its effect caused by "kick-backs," when a piece of board is thrown back by the revolving saw, striking the man in the abdomen causing internal as well as external injuries, often proving fatal. There are several conditions that may cause a kick-back, a proper spreader, for, if the spreader is too thin, it will not work efficiently; or it may be that the saw has not enough clearance will cause it to bind in the stock. The use of too small a spreader setting it high enough through the table—these conditions are the main causes of kick-backs. These are the types of injury conditions under which they are most frequently met.

While it is comparatively easy to find the cause of the injury it is not so easy to eliminate it. Will a mechanical guard prevent the hand injuries? In some cases, yes, but in the majority of cases it will not fill the bill. Carefulness and thoughtfulness of the operator are the main factors. No matter what style of guard is used it must be raised to allow material to pass under the guard. The operator is using his thumb, which is a common practice, to follow right under the guard unless he is watchful to keep his thumb off the line of cut. I think you will find more rip saw accidents with the end of their thumb cut off than the operators of a hand wood tool. So, while a guard is an absolute necessity, it is not the only requirement. A good guard and a careless operator are a dangerous combination.

RIPPING AND EDGING.

What is the best type of guard is a broad question, as is the use of a good deal on the class of work in hand. For ordinary ripping, where no edging is done, a guard may be used that covers the saw completely. In the better grade of work, such as on a table where the edge must be straightened before the piece is finished in size, and where no edging table is provided, it is necessary for the operator to see the saw that he may properly judge his work. It is not possible to use a guard that totally covers the saw. No matter what the class of work or type of guard used, it is only the care and thoughtfulness on the part of the operator that most of these accidents can be prevented.

It is in the prevention of eye injuries that the guard is a most important factor in stopping flying splinters or knots. I have had me

claim to dodge the bullets. To prevent these accidents the guard need not completely cover the saw, but it should be set low enough and far enough forward so that the operator cannot see more than two inches of his saw.

SAWS AND SPREADERS.

To prevent kick-backs the first requirement is a proper spreader. This should not be less than two inches in width and of the same gauge as the saw, the set of the saw teeth giving clearance enough to prevent binding. It must be set in perfect alignment with the saw and the front edge should be beveled on both sides so it will enter the knife easily. This will prevent stock from binding on the saw. Too little set in the saw will also cause a kick-back, because the stock binds the saw. The setting and filing of the saw has a good deal to do with its safe working condition, but this would make a very interesting paper in itself, and I do not intend to discuss it here.

The use of too small a saw or setting the saw so that it just cuts through the stock are both bad practices and the cause of many kick-backs. Let us suppose that a man is ripping one-inch lumber with a ten-inch saw, set just high enough to cut through the board. Under these conditions the saw teeth strike the stock at such an angle that it has a tendency to drive it back, and if the saw has the usual one-inch pitch he is engaging three teeth at one time, making it much harder work. Whereas, if the saw be set up to a proper height, it will only be engaging one or at the most two teeth. The cut will be more squarely through the board and the tendency will be to draw the board in rather than drive it back.

FOUR REQUISITES.

The condition and the position of the saw are two factors in safety work that receive altogether too little attention. This also applies to the gauge, or, as some term it, the fence. For an ordinary rip saw, the gauge should not be more than two inches high. The high gauge does not leave room for the operator's hand, even with a push stick on narrow stock. It should extend at least six inches beyond the back of the saw and should be in perfect alignment with it, if anything a little slack at the back end, and thus prevent stock from binding on the inner side of the saw. If it is the reverse—that is, tight at the back—it means that when the stock reaches the returning saw teeth coming up through the table they