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1933

TRANSACTIONS

National Safety Council

Incorporated

TWENTY-SECOND ANNUAL
SAFETY CONGRESS

Chicago, Illinois

October 2 to October 6, 1933

The Stevens Hotel

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Plan of Publication

THE TRANSACTIONS of the Twenty-second Congress of the National Safety Council are published in two volumes. The first, containing the General, the General Subject, and the Industrial Section sessions, is supplemented by a smaller volume containing the sessions of the Street and Highway Traffic Section, the Child Education Section, and Home Safety.

THE LARGE GENERAL volume is being sent automatically to the Industrial members of the Council; the smaller volume is sent automatically to members who are believed to be chiefly interested in those sessions. It may also be secured on request by other Council members.

THE PLAN OF PUBLICATION is the same as that adopted for the sessions of the Twenty-first Congress and found to be very satisfactory. It is a condensed record. The papers of each session or division of the Congress have been assembled, edited with care and discernment to abbreviate or delete the less essential portions, and the concise results are presented for study and reference. Although not "complete" in the sense that every word is reproduced, it is a readable, interesting record which emphasizes the memorable parts of each paper and address. The original manuscripts are on file in the Council Library, available for additional reference as desired.

ALTHOUGH THE National Safety Council endeavors to eliminate from discussion at its conventions matters which are not pertinent to its purposes or which are contrary to its policies, the Council cannot accept responsibility for the views expressed either in the papers presented or the discussions thereon.

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Dust Problem in Industry

FRIDAY MORNING SESSION

October 6, 1933

The special session devoted to a discussion of the dust problem in industry was called to order by J. R. Allan, assistant manager, Industrial Engineering and Construction Department, International Harvester Company, Chicago, who presided. He briefly outlined the purposes of the session and then presented the first speaker.

The Mechanical Control of Dust

By E. O. JONES

Consultant, National Founders Association, Chicago

The speaker said in part: During the last few years, much has been written about the pathological effects of dust. From this material there seems to be some lack of agreement among scientists as to the pathological effects of these types of dust, their dangerous dimensions, the length of time one must be exposed to their inhalation, the density of concentration which is dangerous, and the extent to which they are directly causative or contributory to disease.

It is unfortunate that in the twilight zone between ethics and non-ethics, there are certain members of the legal and medical profession who are willing to take advantage of these uncertainties and capitalize on them largely for their own benefit.

When the foundry industry was confronted with the accusation that it harbored a potential health hazard, its leaders immediately took steps to study the problem, with the object of eliciting all the facts and determining upon a course of procedure to eliminate the causation. This study has been under way in some localities for some time, but its procedure presents many difficult problems.

The mechanical control of dust is not our only problem, nor does the accomplishment of such control depend upon large expenditures of money. We know from experience that gradually human ingenuity will provide ways and means to this part of the problem.

But let us digress from the subject to consider the amount of dust we as individuals create. Take the molder, for instance, who goes to his bench at the start of his day's work. He reaches for his air hose, and starts the day by removing, with its force everything he can from his equipment. In close proximity to his bench,

or on the window sill in front of him, you will usually find a varied collection of relics. He will usually wet down his sand pile, but seldom his floor or gangway. When he is through with his shift he usually grabs the air hose and proceeds to take a compressed air bath.

And we have the foundry laborer: he has many menial tasks to perform. When he sweeps or uses a shovel he seems to be of the opinion that his efforts are judged by the atmosphere he creates. If he does sprinkle the floor it is usually done very sparingly.

Shake-out men and crane men seemingly give little attention to the results of their thoughtlessness. Grab buckets are usually lifted to the limit of their lift and then dumped. Many companies have furnished equipment, such as positive pressure helmets and respirators, to employees who work in extremely dusty atmospheres. But it is surprising to note the apparent lack of interest on the part of the employee for whose protection this equipment is furnished.

From these remarks some may say "Why shift the responsibility?" *Not* a bit. We have merely cited these few facts as an indication that possibly we can improve the supervision. If we make every man responsible for the cleanliness in the vicinity in which he works, and every foreman responsible for his department, and then in turn make the superintendent answer for the cleanliness of his shop, we will not have to worry about the increase in labor cost. After dust gets into the atmosphere, it is, of course, very difficult and expensive to remove. Keeping the foundry floor off the ceiling is a man-size job.

Ventilation is a problem everywhere. A diligent survey of our existing equipment may develop the fact that by small expenditures we can improve conditions. Inspect your dust-arresting equipment. See that the rapping device is in order, that the screens are in good condition, we suggest that they are rapped and the hoppers emptied regularly. Repair any leaks in pipes. See that the valves close properly. Chutes should be kept in good repair and when emptying arrestors, respirators should be worn by the men whose duty it is to perform this work. If refuse from the arrestors is not removed at once, keep it in containers or wet down until it is removed. Above all, watch your air velocities and make sure you are removing at the source as much of the dust as the equipment was originally designed to do. You pay for the current the motor consumes to operate your suction equipment, therefore get the proper return for that expenditure.

Do not store or allow sand to accumulate around your blasting equipment. Make sure you are receiving the proper air changes in your sandblast rooms. Inspect your masks to the amount of air purging through. The wearer is prone many times to just crack or partially open the valve, and when this is done he is not getting the full protection for which the helmet was designed. We suggest that the helmet be removed from the sandblast room and stored at the end of the day in a dust-tight cabinet, instructing the wearer to clean before re-using.

In your cleaning rooms where tumbling barrels are used, we deal again with air velocities. Piping should be diligently inspected and kept in good repair. Make sure traps are performing the service they were designed for. It might be well to keep floors in this department wet down. Remove the day's accumulation of refuse at the end of the day's run. When cyclones are used, make sure you are not exhausting at the level of windows which may be opened in other parts of your plant.

We will have to look for further co-operation from the foundry equipment manufacturers who serve our industry. Equipment will have to be sold to us not to

meet existing codes, but as dust-tight as human ingenuity can design them. After the equipment is installed, it will be the purchaser's responsibility to see that it is regularly inspected and maintained to perform the service for which it was originally designed.

And we refer again to the employee's responsibility. When he elects to work in a foundry, he should be willing to co-operate and wear the safety devices which are provided by his employer, and it will be the purchaser's responsibility to see that the equipment is well cared for and properly maintained.

Our industry is a basic one and we hope that it will long continue to be essential. For this reason we want to assure those who are sitting on the side lines that it is our determination and hope that, with the help of those in the medical profession who have given so generously of their time in scientific study, we can soon determine the actual extent of the hazard.

In the meantime, while many diverse opinions are being brought into agreement, it is imperative that we give more than passive assent to suggested measures of precaution or improvement. The accomplishment of worth while results depends upon the diligent and active co-operation of everyone concerned and the utilization of all known means of prevention and control. Only through united effort can we hope to accomplish an effective program which will give maximum of advantage to employers and employees alike, and to such an end we are confident the foundry industry will continue to dedicate its earnest and conscientious efforts.

How to Determine the Dust Content of the Atmosphere in Dusty Industries

By DR. E. G. MEITER

Director, Industrial Hygiene Laboratory, Employers Mutual Liability Insurance Co., Milwaukee, Wis.

The importance of atmospheric dust as an agent in the causation of respiratory disease has long been known. However, it is only within the last few years that this subject has achieved medical and legal importance in dusty industries. Because of the extension of compensation laws to include occupational diseases, and through an ever-increasing number of legal suits against industrial concerns by employees claiming disability due to dust inhalation, there is need for a severe attack on the problem of eliminating or otherwise combating the dust hazard. In order to intelligently control the dustiness of the air, the amount of dust present must be determined. With a given dust, two factors are usually considered: (1) the number of dust particles in a given quantity of air, which is usually expressed in millions of particles per cubic foot of air; (2) particle-size, usually expressed in a size frequency distribution curve, that is the percentage less than stated size is plotted against the size of particles.

Instruments Used for Determining Atmospheric Dusts

Many instruments have been devised for determining the dust concentration in air and it may be well to give a brief historical review of this subject. The South African investigators began using the sugar tube method for the sampling of atmospheric dust in 1911; the same method was used by the U. S. Bureau of Mines as early as 1914. By this method a measured volume of the dust air is passed through

a tube containing granulated sugar, which filters out the suspended dust. At the laboratory, the sugar is dissolved in water and the number of dust particles are determined by counting those in a small volume of the sugar solution under a microscope. This method of dust sampling had certain disadvantages, the chief of which was the fact that the purest commercial sugar contained a certain quantity of dust, which introduced considerable errors, especially in those samples containing a low dust concentration. To overcome the limitations of the sugar tube method various other devices were developed, one of which was the Palmer apparatus. This apparatus consisted essentially of a pear-shaped glass bulb, the lower end of which terminated in a U-tube or trap. Suction was applied to the glass bulb by means of an electric exhaust fan and the volume of air measured by means of a Petot tube. Dust-free distilled water was put into the U-tube. The air drawn through the water in the tran broke it up into a spray within the larger portion of the sampling bulb, which washed out and retained the dust. The dust so obtained was analyzed by the usual methods. The Palmer apparatus also had certain disadvantages, the chief of which was that its efficiency as a dust catcher was low. In the search for a more portable type of instrument, which at the same time would yield rapid results, the South African investigators introduced in 1916 a new instrument known as the Kotzé konimeter. The konimeter samples dust by impinging a small volume of air against the surface of a vaseline-coated glass plate, the vaseline serving to catch the dust particles. The dust retained on the glass plate was then counted under the microscope at a suitable magnification. The chief disadvantages of the konimeter are that in atmospheres containing a high concentration of dust, the spots are too dense to allow counting the individual particles and the method can, therefore, not be used in such cases, also many samples had to be taken to secure a correct average determination in places where the dust concentration was variable.

As a result of the different methods of dust determination being used by the different governmental bureaus and others, it was soon found that the various dust-sampling methods did not yield absolute results, consequently some confusion arose in interpreting the various dust studies. In order to arrive at some basis of comparison the U. S. Bureau of Mines conducted a laboratory study of dust-sampling instruments. The results of this study were published in Public Health Bulletin No. 144 entitled "Comparative Tests of Instruments for Determining Atmospheric Dusts." (1925) During the course of this study two of the investigators, Dr. L. Greenburg and G. W. Smith, devised a new apparatus called the impinger. In the comparative study the dust collecting efficiency of the impinger was found to be high, and in addition the method offered several advantages over previous methods. After several modifications to meet special requirements, this instrument was adopted by the Federal Public Health Service and Bureau of Mines as the standard technique for the sampling of dust in air. The instrument has been used in the study of a number of dust trades, and is the commonly accepted method in use today.

Size of Dust Particles Taken into the Lungs

It has been observed from a study of silicotic lungs that most of the dust particles that have penetrated into the air sacs are less than 10 microns in longest dimension (1 micron is 1/1000th of a millimeter, or 1/2500th of an inch). It is generally agreed, therefore, that we need not bother with particles larger than 10 microns in measuring the concentration of a dangerous dust.

So that you may visualize the size of these small particles consider a 280 mesh

screen in which the screen openings are 50 microns. In the absence of a beam of light, an atmosphere containing these tiny particles will appear clear to the naked eye, and therefore is extremely deceptive. Only a powerful microscope can make such particles directly visible.

It is necessary, therefore, to make a microscopical examination of the atmosphere to learn how badly polluted it may be. Larger particles such as are visible to the naked eye are essentially harmless in the causation of silicosis, as these are caught by the membranes provided by nature in the nasal and other respiratory passages and are eventually coughed up or eliminated before any damage is done.

When small dust particles are dispersed in air, they are carried about like smoke and settle out very slowly. How long such particles will remain suspended in quiet air can be roughly determined from Stoke's law. Assuming a round particle to be one micron in diameter, it can be calculated by means of this law that such a particle will fall only 20.3 feet in 24 hours. It can be seen, therefore, that any fine dust dispersed into the air is not only a momentary hazard but remains in the air for an indefinite period. This fact is often overlooked by workmen, as it is usually assumed that as soon as the dust cloud is no longer visible all dust has settled out.

The term "dusty working place" is only a relative one. Most air, both inside and outside of factories, contains some dust. It is, therefore, necessary to adopt a standard content for the dividing line between slightly dusty and dusty working places. The Wisconsin dust code prescribes a "tentative figure of 15 million countable dust particles under 10 microns in longest dimension with free silica content of 35 per cent in a cubic foot of air as determined by Public Health Service technique. Variations in free silica content will make proportional inverse changes in this standard." In accordance with this standard the permissible count for practically pure silica would be 5,250,000 particles.

How Dust Samples are Collected

As mentioned previously, the instrument used in collecting the dust samples is that known as the "Impinger." With this instrument the air to be sampled is drawn through a glass tube and impinged at a high velocity on a glass plate which is immersed beneath a suitable liquid contained in the collecting flask.

The impinger, therefore, combines the principle of collecting dust by impingement with a water-washing or bubbling method and so possesses the advantages of both principles. The dust is thus trapped and remains in the collecting liquid. Suction is applied to the impinger by means of a steam ejector operated by compressed air. Where compressed air is not available, a small electrically-operated vacuum pump may be used. The rate of air flow is measured either by means of a small vacuum gage or an orifice-type flow meter.

The entire apparatus is calibrated before use against a standard gas meter, so that a known volume of air may be sampled. The rate of sampling is approximately one cubic foot of air per minute. The dust-collecting device is placed in close proximity to the breathing level of the workmen involved while performing their respective duties, so that air samples representing actual working conditions may be obtained. After a sufficient volume of dust-laden air has been sampled, the collecting liquid is placed in a suitable container and removed to the laboratory for the necessary analysis.

When the dust sample reaches the laboratory, the entire sample is filtered into a clean graduated flask through a 280-mesh screen so that only particles smaller than 50 microns are permitted to pass; particles larger than 50 microns are not considered

injurious and are, therefore, removed from the sample. After proper dilution, the contents of the graduated flask are thoroughly shaken so that a uniform suspension is obtained, and two portions of about one cubic centimeter are removed with a pipette to just fill two Sedgwick-Rafter counting cells. The cells are allowed to stand at least 20 minutes and the dust particles are then counted by means of a microscope.

The microscope with an Abbe condenser is provided with an eyepiece micrometer, a 16-millimeter objective and a 7.X eyepiece. The eyepiece micrometer has a large square engraved on it, and this square is divided into 100 squares, one of which is further divided into 25 smaller squares. The proper tube length of the microscope is determined by calibration with a stage micrometer, so that a side of the large square of the eyepiece covers 1 millimeter (1,000 microns).

The large square of the eyepiece micrometer, therefore, encloses the dust in an area of one square millimeter, and since the counting cell is one millimeter deep, all the dust suspended in one cubic millimeter of the sample is under the ruled field. All particles visually less than 10 microns in longest diameter in one quarter of the field are counted at five points on the cell, namely, near the four corners and the center.

Two cells of each dust sample are counted and the average of 10 counts is obtained. Control counts are subtracted from the average sample counts, giving finally, average net counts of the number of particles which are then calculated in terms of particles per cubic foot of air sampled.

Having determined the concentration of dust particles less than 10 microns in diameter in a given atmosphere, it is also necessary to obtain information regarding the mineral composition of the dust before any evaluation of the health hazard can be made.

In general it may be said that the harmfulness of a quartz containing dust is usually in direct proportion to its free-silica (SiO_2) content. It is, therefore, necessary to distinguish between "free silica", that is the silica that occurs as quartz, and "combined silica", or the silica that is combined with other elements in the various silicate minerals. It should be borne in mind, therefore, that the total silica reported in the customary chemical analysis is no measure of the amount of free silica.

The quartz content of fine dusts is usually determined by a combination of petrographic and chemical methods. Each dust presents individual problems and no individual technique applies to all dusts regardless of their composition. Those interested in this problem should consult Reprint No. 1560 of the Public Health Reports, February 24, 1933, entitled "The Quantitative Determination of Quartz (free silica) in Dusts" by Adolph Knopf, Professor of Physical Geology, Yale University, and Consultant, United States Public Health Service.

Discussion of Dust Problems

By DR. LEONARD GREENBURG

Yale University, New Haven, Conn.

The speaker said in part: On the technical side of this problem you have been presented with two excellent papers by Mr. Jones and Dr. Meiter. There is little that I should add from this point of view. Perhaps the most valuable contribution that I can make is to present to you my own personal view of the broader administrative aspects of this problem gained as a result of many years of close contact. In order to do this, let us analyze the problem in its simplest terms.

We may begin by agreeing that pulmonary fibrosis results from the inhalation of certain dusts in known concentration over a sufficient period of time. This fact has been demonstrated repeatedly by means of industrial, laboratory and pathological studies. On this simple fact, I take it, there is complete agreement.

Such legitimate cases of disabling pulmonary fibrosis are held in many states to be the responsibility of the employer. Further, a perusal of the compensation laws makes it evident that there exists a decided trend in the direction of broadening the compensation acts throughout the Union for we find from time to time that additional states are being added to the list of those holding silicosis to be a compensable disease. We would certainly be blinding ourselves to the facts were we not to admit the existence of this trend in social legislation. It should be pointed out here that this is a very wholesome and desirable state of affairs. The insurance principle has justified its existence in spreading the burden of ill fortune over a long period of freedom from catastrophe and surely in the case of industrial accidents it has freed us from the deplorable state of affairs in existence prior to 1912. In the case of the occupational diseases we may hope for equally satisfactory results.

Nevertheless, compensation insurance is not the complete solution of the problem at hand.

The only adequate means of avoiding the burden of silicosis is by the prevention of this disease. All other methods do not touch the crux of the problem and they carry in their wake a vast amount of litigation, illness, and a large financial burden on industry. If what we have agreed upon to this point is true it is obvious that industry must prevent the dissemination of dust in the workroom air by such adequate engineering techniques as are available; or in certain cases where this is not possible industry must provide, and force the worker to use, such means of personal protection as will adequately safeguard him against the inhalation of dust. It is only by these means that we can guarantee a future free of disabling pulmonary disease due to dust inhalation.

In spite of the very best efforts of industry to solve this problem there will undoubtedly be a certain number of cases brought to the courts and presented as legitimate cases of silicosis. While some of these are true cases of silicosis others, I have been informed, are not, but are designed merely as a means of obtaining funds from industry. A consideration of such cases brings us logically to the second part of the present discussion. What is the ideal method of handling compensation cases with reference to occupational disease and more particularly silicosis?

If we examine the development of the compensation acts we find that a technique designed primarily to adjudicate cases of industrial accidents has by degrees been given jurisdiction over occupational diseases. In fact, in some states diseases are regarded as injuries so that they may be brought within the scope of the original compensation acts. But on close examination it becomes apparent that diseases are far more difficult to adjudicate than are the ordinary injuries arising in industry. They present many technical facets and often require a detailed knowledge of this particular branch of medicine with which the average commissioner is very often unfamiliar. As a result we find in practice that the Court is presented with highly technical evidence by experts for the plaintiff and for the defendant which is very difficult if not impossible to satisfactorily evaluate. Often the commissioner is caught between the conflicting views of such witnesses and is not provided with his own experts to aid him in arriving at the real scientific background of the problem at hand.

What we really need is a strengthening of the technical side of the compensation acts to keep pace with the increased factual understanding regarding the occupational diseases. This does not merely refer to the Courts themselves but should begin with the promulgation of accurately worded compensation acts which clearly define the diseases for which compensation is to be paid. Compensation commissioners should be assisted by boards of technical experts composed of engineers appointed by the deans of the various engineering schools and of physicians appointed by the deans of the recognized medical schools. The engineers selected should have a very complete knowledge of factory conditions and the field of ventilation, and the physicians should be experts in the field of industrial hygiene and occupational disease. It is only with the aid of such highly specialized boards, or their equivalents, that the compensation commissioners may be able to do complete justice to both sides in these highly technical cases. It is the belief of the speaker that employers and employees alike would benefit greatly from the establishment and use of such boards. In order to hasten the establishment of this system employers are justified in appealing to their legislatures with this end in view; certainly such a legitimate demand should receive the hearty support of all concerned.

Frequently one is asked, what should be done with those claims which are based on little or no real evidence of injury to the worker but which are merely reared by some very enterprising attorney? Such claims are, I have been told, becoming very common of late and constitute a real problem to industry. It is obvious that the compensation advisory boards suggested earlier will, as soon as they are formed, serve the future as a healthy bulwark against this type of baseless claim and I venture to predict that few such cases would be favorably acted upon by a board of real experts in this field. At the present time factory officials should employ the very best legal talent available and should reinforce such legal talent with technical and medical experts thoroughly versed in the field of silicosis. Many cases have been lost by a failure to bring to bear the requisite technical aid required to prove the non-existence of a hazard. Here is an excellent example of a case in which money may be saved in the end by increased expenditures.

We now arrive at the final steps in the control of this problem, the physical and X-ray examination of the worker. Every factory should have pre-employment and routine post-examinations. It seems obvious that the burden of the health of the worker should not be placed on the plant without the privilege of the pre-employment examination. How can industry be legitimately expected to hire a worker "in the blind" as to his or her physical condition and then a day later be expected to shoulder the burden of the worker's health? By repeated physical examinations it is possible to discern the faint early deviations from normal health if any take place. In this manner the employer would be forewarned very early if any workmen showed lung changes suggestive of early silicosis. The routine industrial health examination on a broad scale throughout the major portion of American industry would constitute a public health procedure of major significance. By its means a very large proportion of the population would be aided in the prevention of the degenerative diseases of middle life which today constitutes such a real menace.

ADJOURNMENT

Safety Section, A.R.A.—Steam Railroad Section N.S.C.

Officers 1932-33

Chairman—CHARLES E. HILL, New York Central Lines, New York City.
First Vice-Chairman—C. L. LAFOUNTAINE, Great Northern Railway Co., St. Paul, Minn.
Second Vice-Chairman—H. A. PARISH, Chicago & North Western Railway Co., Chicago.
Secretary—J. C. CAVISTON, American Railway Assn., New York City.
Members, Committee of Direction:
F. HARTENSTEIN, Lehigh Valley Railroad, Bethlehem, Pa.
H. A. ROWE, Delaware, Lackawanna & Western Railroad Co., New York City.
C. N. WOODWARD, New York, New Haven & Hartford Railroad, New Haven, Conn.
ROBERT SCOTT, Atlantic Coast Lines Railroad Co., Wilmington, N. C.
A. O. BECK, Canadian National Railway, Montreal, P. Q., Canada.
F. W. CURTIS, Denver & Rio Grande Western Railroad, Denver.
E. G. EVANS, Louisville & Nashville Railway, Louisville, Ky.
C. F. LARSON, Missouri Pacific Railroad, St. Louis.
F. M. METCALFE, Northern Pacific Railway Co., St. Paul, Minn.
J. T. PRATT, Reading Co., Reading, Pa.

The complete report of these sessions is published in a booklet entitled "Proceedings of the 13th Annual Meeting of the Safety Section", available from the American Railway Association.

TUESDAY MORNING SESSION

October 3, 1933

The sessions of the Safety Section, American Railway Association—Steam Railroad Section, National Safety Council, were held as a part of and in conjunction with the Annual Congress of the National Safety Council in the Stevens Hotel,

TUESDAY AFTERNOON SESSION

October 3, 1933

Address

By FREDERICK E. WILLIAMSON

President, New York Central Lines, New York City

The speaker said in part: I got my first lesson in safety in a very trying way. I was working in Utica, and the yard was badly congested. I was working with a switch engine in the lower part of the yard, and it was snowing hard. I was on top of a string of cars, and I was trying to figure out how to get them out. I swung down on a side ladder, with my mind wholly intent on what I was trying to accomplish, and stepped back on track No. 2—there was a screech of a whistle, and here suddenly was No. 3's engine about 50 feet away, or so it seemed to me. Instinctively, I made a dive between this string of cars that was pulling out, and I could just feel that pilot beam whistle by me, and the engineer thought he had hit me. He stopped and came back to find that I was all right, but certainly I got a safety lesson from him in no uncertain words.

So I learned my first safety lesson by a shock and a scare. Today, however, we have adopted another principle. Now we are trying to teach the young men safety by rules, by education, rather than by letting them learn through experience and narrow escapes that safety is essential.

You and the affiliated safety bureaus of the several railroads have taught us to understand that while you can't undo accidents that have happened, you can see to it that no accident that does happen will be considered a closed book until there is a thorough analysis of its cause, with a view to the avoidance, wherever possible, of that same cause of succeeding accidents.

As we review the official records of the Interstate Commerce Commission, we note with pride the progress of the American railroad in the reduction of accidents, and all who are familiar with the subject recognize the large contribution of the Safety Section of the Association in that noteworthy achievement.

One of my distinguished predecessors in the presidency of the New York Central Lines was fond of saying that a railroad is composed of plant and personnel, and that personnel represents 90 per cent of its value. Much of the success of your work is dependent upon a recognition of the large importance in safe railroading of the so-called "human element." You must consider and deal with a mental approach of officers and employees to all safety work. It is not enough that the physical plants be cleared of lurking hazards, nor is it enough that instructions as to the safe methods of operation be promulgated. Both of these things, of course, are vital. Of equal importance, perhaps of larger importance, is the molding of mental attitude toward safety movements, and toward safety itself. The number of accidents that are utterly unavoidable is surprisingly small. Everything that is done to impress on all the frightful cost of accidents in life, limb and money, is yeoman service. We must eternally seek to instill in the minds of all a serious respect for safety measures and a dogged determination to do, each one, his job, not only well, but safely. Your section is now, as it has been from its inception, in the vanguard of that movement, and it is but candid that I say to you that railroad executives generally, congratulate and honor you for what you have done and are doing.

the operation of track motor cars by: (1) operating a car at excessive speed; (2) improperly storing tools on the car; (3) permitting men to occupy unsafe positions on the car; (4) failure to protect against trains and other track motor cars; and (5) failure to observe switches and crossings, especially with respect to speed and obstructions.

The maintenance of way supervisor must know the standard operating rules, and should at all times have in his possession current time tables and be familiar with special instructions. There are few duties of a maintenance of way supervisor that we can well delegate to someone else, or avoid responsibility for.

From the maintenance of equipment standpoint, it is particularly the duty and responsibility of the supervisor to note hazardous conditions about the shop plant. He should be quick to hear any report of unsafe conditions of the premises, machines and tools, and his quick eye should personally observe these conditions. He should be of as great value as others working under him in foreseeing possible accidents and injury as the result of these hazardous conditions.

After a possible injury, the supervisor also has an important duty toward the injured employee. He should see that immediate first aid care is given the injured person and make sure that he gets into the hands of a competent physician as rapidly as possible. To call in a physician and a claim agent every time a man stubs his toe or skins a knuckle is, of course, a mistake. It is possible to make too much fuss over small injuries. But there should be at hand some simple means of preventing infection for minor injuries, and if an injury is serious, the personal attention of a physician is the only recourse.

The Green Book

The final feature of this session was a presentation of the current "Green Book" by L. R. Palmer, Conservation Engineer, Equitable Life Assurance Society, New York City. Mr. Palmer very briefly called attention to the fact that he had prepared a tabulation covering employee casualty rates for the six months' period of 1933, Class I railroads, in accordance with the standard Green Book grouping and will forward copies to Class I railroads.

WEDNESDAY MORNING SESSION

October 4, 1933

The Goggle Rule and How Enforced

By J. C. YOCUM

Manager, Safety Department, Chicago, St. Paul, Minneapolis and Omaha Railway

The speaker said in part: It has always been a puzzle to me why it is necessary to repeat over and over again to employees that one of the greatest things which has been given us is sight and how necessary it is that they use the means so freely afforded them to protect and preserve this blessed gift. To my mind, being blind is about the worst disaster that can happen to anybody.

Experience has shown that we cannot take it for granted that men will of their own accord think for themselves in this respect, and for this reason it has been

went into hospitals, too large a percentage, sometimes 50 per cent of them died, although the operation was successful.

Our trouble is not that we don't know how to switch cars, it is not that we don't know how to get trains over a railroad, it is not that we don't know how to make those trains fine and comfortable for passengers or to meet the needs of the shipping public, but we cannot perform our operations without the infection of carelessness; and the only way we can eliminate it from our railroad operations is to make each individual man on our railroad an expert in the performance of his operations.

So we need to study each individual operation and see where the bug gets into that operation, and develop a technique that will assure efficiency every time that operation is performed.

WEDNESDAY AFTERNOON SESSION

October 4, 1933

Report of Committee on Train Service Accidents

By D. G. PHILLIPS

Superintendent of Safety, Wabash Railway, St. Louis

The speaker said in part: In 1932 there were 63 employees killed and 326 injured in train accidents, while in train service accidents for the same period there were 367 employees killed and 6,861 injured. So without minimizing the importance of safety work in connection to train accidents, these figures show us the much greater field for work in the prevention of train service accidents. In 1932 there were six times as many killed in train service accidents as in train accidents, and 20 times as many injured.

In 1932, 20 persons were killed and 307 were injured in accidents while coupling or uncoupling cars or locomotives. The remedy for this class of accidents naturally suggests itself, keep from between moving cars that are about to couple, do not attempt to make any adjustments in the coupling apparatus of a moving car that requires you to go in front of the car. Such adjustments should be made when car is still. We believe that proper supervision can eliminate entirely this class of accidents, but if a supervising official stands around seeing men doing work in this manner and says nothing, just so long will accidents of this kind occur.

During 1932, 9 persons were killed and 123 injured while coupling or uncoupling air or steam hose. The principal cause of employee injuries coming under this heading is due to attempting to do their work without proper protection and from inadvertently uncoupling air or steam hose under pressure. If accidents of this kind are to be prevented, it is absolutely necessary that where a blue flag rule is applicable, such a rule should be made and should be complied with. However, frequently in switching operations there is no opportunity for the use of a blue flag. In such cases, not only the men doing the work, but those working with them should be on the alert to see that no movement is made when men are between the cars. Of course, the man himself should be sure that air and steam are shut off before any attempt to uncouple hose, and even then they must be careful, as steam and air are frequently trapped and remain for sometime in a short section of hose. Supervising officials should not overlook the failure to blue flag when the rule so provides and should watch to see that the man understands the proper method to uncouple air and steam hose.

reduced and supervision understaffed and which condition will, we greatly fear, continue for some time. But whereas many activities must be reduced, the one activity, safety education of railroad workers, cannot be allowed to be relegated or delegated to inefficient leadership. The safety organization on every railroad must function as never before in energizing and stimulating interest.

THURSDAY MORNING SESSION

October 5, 1933

Report of Committee on Proper Method of Reporting Casualties to the Interstate Commerce Commission

By G. H. WARFEL

Assistant to Executive Vice President, Union Pacific System, Omaha, Neb.

The speaker said in part: A year ago, in the Committee of Direction, the question was raised as to whether or not there was need for some other method of determining the relative progress of safety work on various railroads. The casualty rate per million man-hours has from time to time been questioned, particularly the very low casualty rate sometimes established, and there have been those who wondered if some other basis could not be developed. So our Committee was appointed to study the desirability or the practicability of developing some form of severity rating for casualties, as well as the frequency rating, to see if by that the relative standings of different carriers and the progress of safety work generally could be better determined.

After a very careful study of severity ratings and the conditions surrounding their reporting, and especially the very great difficulty of securing accurate severity statistics, we came to the conclusion that the casualty rate per million man-hours has been and is a very reliable guide and index to the progress of accident prevention work on railroads, and that the general casualty rate, as it has been established through the Green Book and our other agencies, is a good and reliable general guide to the progress of safety work among the railroads.

There is no question in our minds but what there has been some distortions one way or the other of the relative standings of individual carriers, due usually to different interpretations of what constitutes reportability. Your Committee believes, however, that what is needed is not some other yard stick to measure by, but the assurance that everybody use the present yard stick the same way. We come to the conclusion that what was most desirable was that everybody who had to do with the reporting of accidents on a railroad should understand alike the requirements of the Interstate Commerce Commission Reporting Rules. So this Committee undertook to put together an interpretation of the Interstate Commerce Commission Reporting Rules. We tried to make this interpretation as clear and concise as possible, so that anybody reading them could understand clearly whether or not a man's injury was reportable. I want to sketch for you briefly here some of the points in the text we have finally agreed upon.

Take, for example, "Accidents arising from the operation of a railway." I will read two or three things here: "This expression is intended to include not only accidents resulting directly from the operation, construction or maintenance of a

reduced and supervision understaffed and which condition will, we greatly fear, continue for some time. But whereas many activities must be reduced, the one activity, safety education of railroad workers, cannot be allowed to be relegated or delegated to inefficient leadership. The safety organization on every railroad must function as never before in energizing and stimulating interest.

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and to the co-operative response and assistance of those called upon to contribute their thought, time and effort to promote such a commendable cause as the conservation of human life and limb, and desiring to recognize each and every one in a proper and fitting manner,—therefore, be it resolved—

That this Section recognizes and appreciates the contribution made by each and every one who in any manner arranged for or participated in the conduct of these meetings, including, and with particular reference to, those whose presence, although not upon the program, have added so much:

That the Section is not only grateful, but indebted to Messrs. F. E. Williamson, President, New York Central Lines; M. J. Gormley, President, American Railway Association, and Judge R. V. Fletcher, General Counsel, Association of Railway Executives and of the American Railway Association; for their sacrifice of time, and for the great and lasting benefits that must accrue to and aid in the advancement of this Section and its work because of the timely, well chosen and pertinent thought given us:

That our appreciation is also extended to the management of the Stevens Hotel; to the Press and to all others who have so kindly assisted in making our stay in "America's Chicago," so pleasing and so profitable;

That in our hearts, we cherish the memory of those who have been called to fields beyond, and express our earnest desire and hope, that to those of our Members upon whom burdens have been placed through physical infirmities and otherwise, lasting and effective relief may speedily come.

That these Resolutions be spread upon the records of this Annual Meeting.

Announcement of Election of Officers

The chairman then called for the report of the tellers who had canvassed the votes for officers of the Section for the ensuing year. This report was presented by Frank Strouse, Pennsylvania Railroad, who announced the election of officers as follows:

Chairman—C. L. LaFountaine, Great Northern Railway.

First Vice-Chairman—H. A. Parish, Chicago & North Western Railway.

Second Vice-Chairman—W. H. Failing, Central Railroad of New Jersey.

Members of Committee of Direction—

Eastern Territory (One-Year Term)—T. H. Carrow, Pennsylvania Railroad.

New England Territory (One-Year Term)—F. R. Bradford, Boston & Maine Railroad.

Southern Territory—L. G. Bentley, Chesapeake & Ohio Railway.

Canadian Territory—A. O. Beck, Canadian National Railways.

Western Territory—E. A. Meyer, Chicago, Milwaukee, St. Paul and Pacific R. R., and

G. H. Wartel, Union Pacific System.

Committee on Nominations—

O. F. Johnson, Minneapolis & St. Louis Railroad; J. G. Fitzhugh, Gulf, Colorado and Santa Fe Railway; A. V. Rohweder, Duluth, Missabe and Northern Railway; J. L. Walsh, Missouri-Kansas-Texas Railroad; D. G. Phillips, Wabash Railway.

ADJOURNMENT