

TRANSACTIONS

32nd NATIONAL SAFETY CONGRESS



Vol. 1

**General Subject and
Industrial Sessions**

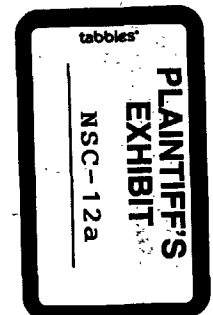
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October 5-7, 1943



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Foreword

VOLUME I

THE Transactions of the 32nd National Safety Congress and Exposition of the National Safety Council are published in two volumes. Volume I contains the General Subject and Industrial Section sessions. Volume II contains the Public Safety, Child Education, Home Safety and Farm Safety sessions.

Volume I is distributed to all members of the Council. Volume II is sent to those members who are believed to be interested chiefly in the sessions it contains.

The Transactions are a record of the proceedings of the Congress, condensed and edited for reference purposes. They are therefore an abridged version of the papers and discussions. The original manuscripts, some of which have drawings and charts too expensive to reproduce here, are available in the files of the National Safety Council.

The National Safety Council, at its Congresses, seeks to eliminate from discussion matters which are not pertinent to the aims of the Congress, or which may be contrary to the Council's policies. However, it cannot accept responsibility for all views expressed, either in the discussions of the Congress itself or in this record of them.

Extra copies of Volume I may be obtained by Council members at the following rates: 1 to 10 copies at \$2.00 each; 11 or more copies at \$1.75 each. Extra copies of Volume II are 75 cents each.

THE NATIONAL SAFETY COUNCIL, INC.

20 North Wacker Drive

Chicago, Illinois

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Safety Takes

The 1943 National Safety Congress—the second in World War II—was a larger and more significant gathering than any of the preceding thirty-one Congresses. It was the culmination of a year's activity in all fields of safety that exceeded the achievements of any previous twelve months.

The year's achievements and the success of the Congress were possible only through the increased safety activities of scores of organizations and the new interest thus aroused among thousands of individual citizens. In the words of President John Stilwell of the National Safety Council, when he welcomed delegates to the Congress, the nation generally had come to realize that accident prevention is "more than a great humanitarian obligation and an important aspect of good business; it is an indispensable means to survival."

The identification of the safety movement with the war program is well demonstrated in the successive slogans of the last three Congresses: 1941—Safety for Defense; 1942—Save Manpower for Warpower; 1943—Stop Accidents—Speed Victory.

Congress delegates in every field of safety came to the 1943 convention to learn how accidents could be stopped and victory achieved sooner. They came from the Armed Forces, from war plants in every section of the country, from public agencies charged with traffic and industrial safety responsibilities, and from many other types of organizations.

Men from the Armed Forces could be found in numbers at practically every session. A special Army Session brought together hundreds of Army men having direct or supervisory responsibility for safety. Top-ranking Army and Navy offi-

cers were honored at the Congress Banquet.

To the 1943 Congress also came men and women in non-industrial fields, to find out what their organizations could do to help meet the nation's accident problem. The attendance of these people reflected what had been going on throughout the year—a carefully planned program of securing the interest and cooperation of every organization in a position to influence its members in accident prevention.

This attendance was a most favorable sign. It reflected the National Safety Council's policy that safety can succeed only by the cooperation of everyone—that no one organization can do the safety job alone.

The Council's program during the year reflected expansion in many directions, three of which are outstanding: First, the establishment of regional offices in New York, Chicago, and San Francisco; second, closer cooperation with chartered community safety councils; third, a definite policy of encouraging every organization to its own safety job.

Two structural changes in the Council during the year were of considerable importance: the staff reorganization of June, 1943, and the adoption of a new Constitution and By-Laws at the 1943 Congress.

The staff reorganization provided, under the supervision of the Executive Vice-President, for a General Manager, a General Secretary, Department Managers, and Division and Regional Directors. Five major staff departments were created: Program, Public Information, Sales, Service, Field Organization.

In replacing the old By-Laws of the Council, the members voted at the Annual Meeting to adopt a Constitution, dealing

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crease in absenteeism from sickness. We found the lost man-days decreased from 5.4 before the visiting nurse was employed to 4.1 in the comparable months. Beginning April 1, 1942, thru March, 1943, was the first year the visiting nurse functioned. The percentage of decrease is twenty-five per cent. The annual reduction of lost man-days, based on 3,250 average employees as of March, 1943, is 4,225. These figures are given in table form.

This improvement was sufficient to make the departments most vitally concerned, especially General Maintenance, very enthusiastic about the service.

Incidentally, as a by-product of the original objective, which was primarily to help relieve the manpower shortage, we found that the money saved by the company was sufficient to pay for all of the

expenses of the visiting nurse, including the use of the automobile.

This improvement is even more significant if we take into consideration the fact that before the institution of the visiting nurse our absenteeism rate from reported sickness was not excessive as compared with concurrent figures available applying to the nation at large.

Also, new employees were being added rapidly, and they included a large percentage of inexperienced people new to the company, some rejected by the armed forces, and also an increasing number of women who had never worked in the shops before. The general experience has been that women in the shops lose more time than men.

The visiting nurse service, in our experience and as outlined, has been very much worthwhile.

AMERICAN AIRLINES, INC.

Man-days due to Illness of Employees in New York, N. Y.
April 1941—March 1943

Year Preceding Institution of Visiting Nurse Service

	Number Employees	Lost Man-days Illness	Lost Man-days per Man
April-June 1941	6,037	2,870	.46
July-September 1941	6,308	2,047	.32
October-December 1941	6,449	2,671	.41
January-March 1942	6,744	3,977	.59
	25,538	11,565	
Monthly Average			.45
Annual Average (12 x .45)			5.4

1st Year After Instituting Visiting Nurse Service

	Number Employees	Lost Man-days Illness	Lost Man-days per Man
April-June 1942	6,969	1,945	.28
July-September 1942	7,357	2,092	.28
October-December 1942	9,184	3,064	.33
January-March 1943	9,152	4,114	.45
	32,662	11,215	
Monthly Average			.34
Annual Average (12 x .34)			4.1
Per cent decrease (5.4 : 4.1)			25%
Annual reduction of lost man-days, based on 3,250 average employees as of March 1943			4,225
5.4 x 3,250 = 17,550			
4.1 x 3,250 = 13,325			
			4,225

4,225

*Sum of the number of employees in each month.

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†As elected by delegates in Congress Session

TUESDAY AFTERNOON SESSION

October 5, 1943

Presiding: General Chairman, WILLS MACLACHLAN, Department Head, Hydro-Electric Power Commission, Toronto, Ont., Can.

Annual Report of General Chairman**WILLS MACLACHLAN**

Over thirty years ago some engineers interested in the prevention of accidents organized the A.S.S.E. and about the same time another group of engineers in the National Safety Council, organized the Engineering Section of the Council. As time went on it was quite apparent that these two bodies had much in common and amalgamation was carried out. Since that time added strength has been given to the work of the engineer in the prevention of accidents. On behalf of the Section and officers, I wish to extend to the officers and staff of the National Safety Council sincere thanks for the full co-operation that has been afforded to the Section during the past year; without this help much that has been accomplished could not have been done. During the year reorganization of the staff of the Council increased the duties of R. L. Forney and he resigned as Secretary of the A.S.S.E. The Association owes much to this able executive, and I extend our sincere thanks. We feel gratified that it has been possible to obtain the services of Joe Stennett as Secretary. Mr. Stennett is no stranger to the A.S.S.E., and we feel sure that the office of secretary is in capable hands.

The formal annual report was presented to the Executive Committee of the Section and adopted. Any member wishing a copy will receive one on applying to the Secretary. I wish, however, to make a few general comments.

Some few years ago the Section appointed a committee under Professor C. W. Breese of Purdue, to investigate the possibility of more adequate training in the prevention of accidents for engineers in the colleges. About a year ago Professor Breese presented his report which was adopted. It was quite apparent that the most effective way to put this into action would be by obtaining the co-operation of the Society for the Promo-

tion of Engineering Education. At the meeting of the S.P.E.E. last June, the recommendations of this Section were thoroughly discussed and tentatively approved. The Society appointed a committee to work with the committee of this Section in the developing of this most important work.

The U. S. Department of Labor has also become very much interested in this subject, due among other things to their 96 hour courses under the E.S.M.W.T. Safety Training Courses. Arrangements are being made whereby a committee shall be set up representing not only governmental bodies but also organizations like our own and the S.P.E.E. to thoroughly review the whole situation in an endeavor to make sure that the young engineer appreciates that the efficient design of machine, plant or system presupposes a design safe to manufacture, install, operate and maintain.

During the year there has been a very considerable increase in the membership. The membership at the present time stands at approximately 3,300, an increase of over 30 per cent during the year. We are very happy to welcome into the membership a number of the officers of the armed forces. These men have done much to carry forward the prevention of accidents on major construction projects in munition plants, army and navy camps and air fields. and it is hoped that they not only will gain from the Section, but also will be able to contribute materially to the work of the Section.

Projects in research have been developed. Literature such as safe practice pamphlets data sheets, cards, etc., have been developed. Work has been done on codes, and cooperation has been extended where effective to various governmental bodies.

A new development in the Council activities has been instituted during the year, and

darkness, hence their use in the aisles of motion picture theaters, etc.

Thus, in the safety plans for tomorrow we need both suns and fireflies—regular hot body illuminants for the work-seeing jobs but also the supplemental glowing low-brightness sources emitting cold light that guide

us toward a needed object or warn us away from the danger point. Thus the dangers that lurk in the dark can be driven further back. Especially through phosphorescence or the self-contained property of storing and emitting light, the otherwise invisible object can be made to say, "Here I am."

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TUESDAY AFTERNOON SESSION

October 5, 1943

Presiding: General Chairman, C. E. Wooliever, Personnel Manager, Buick Motor Division, General Motors Corp., Melrose Park, Ill.

Safety in the Armed Forces

MAJOR RALPH W. APPLIGATE

Industrial Safety Branch, 6th Service Command, War Dept., Chicago

This discussion, logically, divides itself into two principal components: combat safety, namely, protective equipment, training and tactical procedures, and the many devices employed to guard our combat troops, and the army safety program as it applies to production.

Personal Safety of Fighting Men

It is, of course, evident that the primary function in combat safety is to acquaint our troops with the handling of guns, planes, tanks, and other equipment in order that they may insure their own safety from attack and from accidents. Safety in the construction of these weapons is also vital. In order best to bring these factors to your attention, I shall turn to the combat soldier himself and cover his personal safety, including the training, the supplies, the weapons and the protective devices designed specifically for him.

The Army first requires the prospective soldier to undergo a complete physical examination to determine whether or not he is qualified to withstand the rigors and hardships of modern warfare. He is then sent to an induction station, where mental and aptitude tests scientifically determine the branch of service for which he is best suited. The illiterate and those having questionable physical or mental traits are carefully screened out and detailed to special training camps where they are further analyzed to determine whether or not they are qualified at all for the Service.

The next procedure is to harden these men physically, train them in the methods of warfare and condition them mentally so that they may use, during actual combat, the safety they have been taught. This is accomplished by a thirteen-week basic training course given at different training

centers located throughout the United States.

Training The Individual

Since today nearly all of the trainees are former civilians who have led a more or less sheltered life, the course must start slowly. Needless to say, particular emphasis is placed on sanitation and health conditions. Safety is stressed at all times, especially in the handling of machinery, firearms, explosives and other hazardous equipment or material. As the course progresses, the tempo increases.

Let us look at some of the safety measures which are taken during this thirteen-week course. The men are properly outfitted: extreme care is taken to see that shoes fit properly, thus minimizing blisters; shirts and pants are designed so that they do not bind or look sloppy, yet give the soldiers the freedom of action required; raincoats to keep them dry and field jackets and winter coats to keep them warm are provided; and properly balanced meals are well cooked and served in generous quantities. Their health is constantly checked by the Medical Corps. They are taught to detect poisonous and other war gases and the correct use of the gas mask, gas shelter and other protective equipment to combat these gases.

One of the largest jobs during the training period is to condition the soldier mentally for his own safety during combat. In other words, the trainee must be acclimated to actual battle conditions so that he will act safely and not become confused by rifle shots, explosions and other battle sounds. To do this, a number of battle conditions are simulated. For example, sound producing equipment is used that will give the same sounds the

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WEDNESDAY AFTERNOON SESSION

October 6, 1943

Presiding: General Chairman, W. M. Powell, Safety Director, Medusa Portland Cement Co., Cleveland.

Recent Cement and Quarry Accident Experience

W. W. ADAMS

Supervising Statistician, Bureau of Mines, U. S. Department of the Interior, Washington, D. C.

The subject assigned is intended, I believe, to cover accidents in those branches of the quarrying and allied industries that include the production of cement, limestone, marble, granite, traprock, sandstone, and slate. It therefore embraces not only work performed inside the quarries but also such outside work as rockdressing and the manufacture of cement or lime.

The recent accident experience of the industry as thus defined is comparatively good—much better than when the records were started in 1911; better than it was in, say, 1925 or 1930. Moreover, the past five years (1938-42) present a more pleasing picture than that furnished by the five years 1931-35. Annual rates have fluctuated, but the trend has been favorable, showing progress in the prevention of accidents.

Statistical tables accompanying this paper have been prepared from reports supplied by operating companies to the Federal Bureau of Mines. Only the principal facts revealed by these tables will be mentioned.

Favorable Record for Industry

Operating companies began to furnish accident reports to the Bureau of Mines in 1911, thirty-two years ago. For several years after the work was begun, the reports from many companies gave incomplete coverage of accidents. This fact became apparent when the accident rates for the industry were computed and were obviously too low. By 1916 the reports of injuries had improved, so that compilations based upon them produced accident rates that appeared to be trustworthy and reasonably complete.

In that year, 1916, the accident-frequency rate was 63.4. Five years later it was 62.9 and ten years later, 58.0. By 1931 the rate

had dropped to 41.0. In 1936 it had fallen to 39.5 but it rose to 40.1 in 1941. The estimated rate for 1942 shows another drop, this time to 37.6. Only in two other years has the rate been so low, in 1939 and 1940.

When we compare the rate for 1916 with that of either of the most recent two years, 1942 or 1941, we find that the quarrying industry has reduced its accident rate by 35 or 40 per cent. There is a sound basis, therefore, for the statement that the recent accident experience of the industry has been good.

Rates Vary in Different Branches

The generally favorable record of the industry as a whole has not been shared equally by all kinds of quarries. Also, the characteristic accident rates of some branches of the industry may be higher or lower than for other branches.

To consider each branch of the industry separately, it is necessary to select a period of time ending with 1941, as some companies have not yet reported for 1942. During the 11 years 1931 to 1941, the cement industry led all other groups engaged in quarrying and related work by maintaining the best safety record, meaning thereby that the accident rates in that industry were lower than for other branches of the quarrying and allied industries during each of the 11 years. Moreover, the rates for the cement industry continue to improve. Although the rate for 1941 was higher than that in the 3 years immediately preceding, the average for the most recent 5 years was better than the average for the first 5 years.

This favorable record covers the entire cement industry, including work inside the quarries and that performed at the cement mills. The comparison continues favorable

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TUESDAY AFTERNOON SESSION

October 5, 1943

Presiding: General Chairman, Maj. R. C. Stratton, CWS, Office, Chief of Ordnance, Safety & Security Branch, Chicago.

Accident Analysis In Wartime Chemical Plants

By CAPTAIN G. C. WHALEN, Chief, Safety Section,

Plant Protection & Safety Department, Chemical Warfare Service, Washington.

Presented by 1st Lt. Olenius Olson, Jr., C. W. S.

In this war as in the first World War, the chemical industry has been called upon to supply hazardous materials for which new plants had to be designed, chemicals for which there was little if any peacetime need and about which information was extremely limited. It has been difficult, and is rapidly becoming more difficult, to secure necessary equipment, raw materials, supplies and technical manpower. New and improved munitions and fighting equipment are continually coming off the drafting boards. Often this has made it necessary to cancel contracts in the middle of the stream, and nothing is more completely confusing to the plant operator than such an unfortunate event.

The quality of workmen in chemical plants has been a major problem for which conscription has been only partly responsible. Many chemical plants are, at best, disagreeable places in which to work, and today workmen can, within reason, write their own tickets; hence, the chemical plants must necessarily offer special inducements to attract labor. In addition to these special aches and pains the chemical industry has all the complex problems of other industries.

Rapid Development of New Products

New commercial chemical processes are usually several years from the laboratory to production. But wars and Commanding Generals will not wait for trials, pilot plants or elaborate experiments. If the Commanding General in a theater of operation wants a more sensitive starter on incendiary bombs, a more effective screening smoke, or a flame thrower that will work effectively from a ship, he cables his desire and expects to get delivery in the shortest possible time. Experts on the staff of the Chief of the Chemical Warfare Service and those from industry

go into a huddle. A paper formula or design results. A manufacturing directive is sent to Chemical Warfare Service Arsenals, and chemical plants all over the country bid for a contract. Contracts are let; then, as in caustic plants, everything goes badly for a while; then all of a sudden it gets a lot worse. But the General gets the goods and gets them on time.

Tendency to Relax Safety Efforts

During such a blitz, plant safety is an easy item for plant management to forget. The relaxed effort is not immediately apparent; hence, it would be a little wonder if safety was asked to wait until the pressure was off before it was resumed. Frequency and severity rates for private chemical plants assigned Chemical Warfare Service for continuing protection indicate that there has been little or no compromise with safety during this emergency, but this is largely because the products most inimical to safety are manufactured in the arsenals.

There is no need to repeat published injury statistics, since they are available in your copy of "Accident Facts", except as a means of comparison. The Chemical Warfare Service has safety responsibility for all plant: manufacturing toxic, irritant or incendiary products manufactured for the War or Navy Departments. This includes many chemical plants of all sizes and types. They all have one common aim—to produce with the smallest number of industrial injuries.

Rates of Plants Assigned to C. W. S.

In January of this year, private plants assigned to Chemical Warfare Service for continuing protection developed a frequency rate of 23.6 and a severity rate of 3.48. The safety section of Chemical Warfare Service

lector hoppers. In slide two we see the dust collector hopper being emptied without any dust disposal. You can see that the operator himself is exposed to high dust concentrations and oftentimes these dust collectors are located inside buildings where a lot of men are unnecessarily exposed to the dust.

These hoppers can be properly emptied; first, in a dry state by using an enclosed, specially designed truck body attached to the ventilating system; and, second, in a wet state by attaching a wet disposal device to the dust arrestor.

In the next slide is shown a specially designed, enclosed truck body, where this dust can be efficiently disposed of. You will notice that the central tube here is a corrugated tube connected directly to the exhaust system. When the air from the truck is exhausted, we have a downdraft in both manholes, through which the truck is being filled. This can be done without any dust at all. This can be done efficiently either by applying the suction by means of an independent fan, or by a proper valve arrangement we can use the regular ventilating system.

Not only can this truck then be filled without creating a dust nuisance but in hauling the dust to the disposal grounds there is no blowing by the wind or jarring of the dust as the truck is driven along the highway. Naturally there is some exposure to the workman while emptying the truck, but by standing against the wind and using a dust respirator, this can be made a very fine job.

Now the next slide shows the wet disposal device which is now commercially available. This was described in the January issue of "Industrial Medicine." Here we have dust from the dust collector coming into a variable speed conveyor. Water enters the center of the spinning or spinner disc and both the water and the dust impinges at high speed, loses its identity and forms a

paste. By using the right amount of water and getting the correct adjustment, this can be removed either in a very wet sludge or in practically any consistency that we wish.

This device is usually used where we have a multiple dust collector system mounted on a rail and, by means of a flexible hose connection and electrical connections it can be moved under each hopper or used along the conveyors and connected all to one unit. This can be used outdoors in temperatures as low as ten above zero.

MR. McQUEERY (General Chemical Company): I wanted to mention the hydrofluoric acid problem. It is assuming greater uses all the time, particularly in the refining of aviation gasoline. I presume that is why these gentlemen brought this problem up.

About six or seven months ago the War Department called together the leading manufacturers of hydrofluoric acid to discuss this very problem. I am sorry I can't tell you the name under which this organization goes, but its headquarters are at Bethesda, Maryland. They have prepared a pamphlet as to the correct procedure in treating hydrofluoric burns which may be obtained by writing to them.

MODERATOR SHAW: Write to the National Institute of Health, Bethesda, Maryland.

We still have some unanswered questions which leaves me unhappy but if you want to persist until you get the answers, write the Council and they will put it in the hands of the right specialist to give you the best information they can get.

CHAIRMAN STRATTON: The questions addressed to the National Safety Council should be addressed to the attention of the Chemical Section representative, Mr. Van Atta.

Coal Mining Section

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† Conducted by the delegates in Congress session

Meetings for Formation of Coal Mining Section

October 6 and 7

During the past two years several coal mining members of the Mining Section came to the conclusion that a separate section devoted to coal mining would enable the Council to accomplish more in this field. This opinion was based on the belief that the problems of the coal mining industry were entirely different from those encountered in metal mining and that it was necessary to develop specific materials. A group of the coal mining members held several conferences, and these discussions finally resulted in approval of the formation of a separate section by the Executive Committee of the National Safety Council.

Following this approval a special meeting was held in Columbus, Ohio, May 26, 1943. The meeting was presided over by Mr. Thomas Moses. At this meeting announcement was made of the contemplated formation of a Coal Mining Section and, in order to get the movement under way, a temporary committee was formed under the chairmanship of Mr. Moses. The committee was known as "Coal Mining Committee to Conserve Manpower."

Following the formation of the committee, Mr. Moses prepared a message

to be sent to coal mine inspectors throughout the country. Mr. Moses also held several meetings in various coal mining states, devoted to organizing safety committees among coal mine inspectors and operators. In the meantime, arrangements were made to hold an organizing meeting during the 32nd National Safety Congress.

A preliminary organizing meeting was held on the morning of October 6, and a second meeting on the morning of October 7. Officers were elected and tentative plans laid for the work of the section.

In view of the fact that these meetings were held only for the purpose of organizing the section, no papers were prepared for delivery. However, at the meeting of the existing mining section the program was designed to cover both coal and metal mining. Reference should, therefore, be made to the program of the Mining Section for papers dealing with both coal and metal mining.

The section having been organized, plans for the development of a program are now under way and a complete program will, of course, be prepared for the next National Safety Congress.

Construction Section

Officers 1942-1943

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Officers 1942-1943

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†As elected by delegates in Congress Session

TUESDAY AFTERNOON SESSION

October 5, 1943

Presiding: Byron O. Pickard, Chief Safety Engineer, Waterfront Employers Association of the Pacific Coast, San Francisco.

The Security of Vessels in Port

CAPTAIN NORMAN B. HALL

Chief, Port Security Division, U. S. Coast Guard, Washington, D. C.

In order to obtain maximum security and efficiency, the Port Security activities of the Coast Guard have been closely coordinated with the work of other government and private agencies directly or indirectly concerned with similar problems. In Washington we maintain close liaison and cooperation with the Army and Navy, the Department of Justice, the Office of Petroleum Administrator, for War and the Office of Civilian Defense, as well as with private agencies such as the National Safety Council, the American Petroleum Institute, the Bureau of Explosives, the National Board of Fire Underwriters, the National Fire Protection Association and others. We have also encouraged the Captains of the Port to coordinate their activities with those of other agencies in the various ports, and in several there have been established formal coordinating committees consisting of representatives of all public and private agencies whose work relates to the protection of ports and shipping. Our object has been to remove all friction and unnecessary duplication; and to insure that all available personnel and facilities are assigned in such manner as to insure their maximum utilization and the optimum security of our ports and vessels.

Security and Efficiency

In instituting port security measures, the Coast Guard has always attempted to balance two factors: the first is the need for thorough and effective port security measures. We have recognized, however, that the need for maximum security must be balanced against another factor, which is the need to maintain the output and efficiency of ports and their facilities at a maximum. Our security measures have been designed to insure a proper balance

between these two factors. Our object has been to attain the maximum possible security, without impairing the operation of our vessel and port facilities.

Today, no person is permitted on a vessel or waterfront facility unless he possesses a Coast Guard identification card. In addition, all operators of waterfront facilities have been urged by the Coast Guard to institute pass systems. A simple yet effective system has been suggested by the Coast Guard and adopted by large numbers of operators.

To prevent person from approaching waterfront facilities and vessels from the waterside, the Coast Guard has relied upon two measures. First, it has maintained constant small boat patrols of all harbor areas. Secondly, all boats must obtain movement and departure licenses from the Captain of the Port. We have found that the combination of the Coast Guard identification card system and the vessel license system enables us to maintain a substantially effective control of the approach of persons to vital facilities from the waterside, as well as from the land-side.

Combating Fire

Injury to vessels and port facilities may result from accident, negligence or sabotage. Irrespective of the cause, however, the most common and dangerous means of injury is by fire. Realizing the necessity of combating fires if adequate port security is to be maintained, the Coast Guard has been taking steps to prevent fires and to combat and limit any waterfront fires which may occur. In every port, waterfront facilities have been surveyed by Coast Guard officers to determine the existence of fire hazards. In almost every case, these hazards have been voluntarily

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Special Maritime Advisor—PROFESSOR H. L. SEWARD, Yale University, School of Engineering, New Haven, Conn.

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therefore, the time to get the safety idea into his mind is when he is eager to learn about his new job. Remind the new worker of these important work factors before he actually goes to work.

I have found more than one instance where an older employee has kidded new workers into an injury, in violation of safe production practice. At a time when we hear much about seniority of job rights, wouldn't it be encouraging if we could hear more about seniority of job responsibility? I believe our war on accidents will be stimulated into results of life-saving proportions if we level off and let go a hatch-load of bomb-sighted block-busters in that direction!

Training for Transfer Employees

In using the term new worker, the meaning is not restricted to the employee

just going on the payroll for the first time. This includes the employee loaned to another department. Although this transferee is an experienced and safe worker on his own job, he goes into the new department as a new worker. Turned over to an experienced worker who follows the foreman's job-training method, he will learn the right way to do the job from a skilled worker who has developed a sense of responsibility toward job performance without injury. The pride of accomplishment in avoiding injury to himself on his job is the seniority of job responsibility developed within himself that prompts him to teach the new worker the way his job must be learned to avoid injury. Seniority of job responsibility, as an added objective in our training for safety, certainly seems to be a worthwhile target for each of us to include in our plans for the year ahead.

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TUESDAY AFTERNOON SESSION

October 5, 1943

Presiding: General Chairman, JOHN TREWEEK, Safety Engineer, Homestake Mining Company, Lead, S. D.

Accidents from Roof Falls in Coal Mines and Metal Mines — Statistical Analysis

W. W. ADAMS

Supervising Statistician, Bureau of Mines, U. S. Dept. of the Interior

In numerical importance, roof falls in coal mines occupy first attention because most of the deaths and injuries from accidents of this type occur in coal mines. Roof falls in coal mines cause about 625 deaths and 15,000 injuries yearly. Of this total, more than 500 fatalities and nearly 12,000 injuries occur in bituminous mines; the remainder, or about 100 fatalities and 3,000 injuries, occur in the anthracite mines of Pennsylvania. The total for metal mines is between 50 and 75 deaths and about 2,200 injuries per year.

In proportion to the number of accidents underground, roof falls cause 50 per cent of all deaths and 30 per cent of all injuries in bituminous coal mines; 60 per cent of the deaths and 20 per cent of the injuries in Pennsylvania anthracite mines; and 40 per cent of the deaths and 20 per cent of the injuries in metal mines.

Classification of Mines

To obtain a broad as well as a clear view of our subject, let us examine it from several angles. First, let us consider roof-fall injuries during the 11 years, 1931 to 1941, by classes of mines in which the falls occur, classifying the mines according to the kinds of minerals produced. As already stated, most falls occur in coal mines; but this is largely to be expected because coal mines employ more men than any other branch of the mineral industry. This is not the only reason, however, for mentioning coal mines first; these mines have the highest accident-frequency rate from roof falls per million man-hours of employment. Next to coal, ranks the group of metal mines that produce gold or silver; but this group includes some mines outside of the Mississippi

Valley that produce lead and zinc. Copper mines rank third from the highest of the major classes of mines from a fall-of-roof standpoint. Lead and zinc mines in the Mississippi Valley states rank fourth. Ranking best is iron-ore mining, for which the rates are less than half and sometimes only a third as high as the corresponding rates for some of the other major classes of mines.

Mining Methods and Falls

Comparable figures for falls of roof by mining methods are available beginning with 1936. Starting with 1936 and ending with 1941, the rates for top-slicing have ranged from $4\frac{1}{2}$ to 7 accidents per million man-hours of work underground. Rates of the past several years have been higher than those of the first part of the short period for which comparable rates are available, but they are still lower and more favorable than the rates for other mining methods.

Sublevel caving also has favorable accident rates. This method ranks next to top-slicing from a low-accident-rate point of view. Sublevel caving is here represented mainly by iron-ore mining in Michigan.

A close third for the best accident-rate showing is supplied by open-stope mines. Examples of open stoping are afforded by lead-zinc mines in the Kansas and Oklahoma area, some iron mines in Alabama and some gold-silver mines in the far west.

Fourth position from the best is occupied by mines that use shrinkage methods. This group is represented largely by some gold-silver mines in Colorado and Nevada, and the group as a whole has made good

ferent results, depending on whether they place the emphasis on proficiency in first aid, or on accident prevention. In the first two fields, emphasis on accident prevention will obtain far more beneficial results than emphasis on proficiency; and it is believed that every effort should be made to use the training as a stimulus to safety consciousness. In the third field, it is probable that safety consciousness is inspired by other activities and it may be desirable to emphasize proficiency.

Perhaps the principal fault of first aid training lies in repetition. One and even two such courses can maintain interest, but when the course is repeated three or more times on an annual basis, it tends to become monotonous, losing its punch. Since first aid manuals are not ordinarily revised for several years, and revision then is not extensive, this situation will continue to prevail. There is a definite need for variety in first aid training and it could be obtained by developing an advanced course. This advanced course need not depart from the basic subjects covered but would involve some change in teaching methods. For example, if men who had completed first aid training one or more times were given an advanced course covering the same field but disguised in the form of team training, the monotony of the work would be greatly relieved.

Cost of Training

The value of first aid training as a safety incentive cannot fairly be established without some counting of the cost. At prevailing mine wages and under the present wage regulations, a minimum cost of \$20.00 per man can be expected. Shortage of labor makes it undesirable to conduct such training during working hours and it must, therefore, be conducted on an overtime basis. Even when it is realized that this amount might be saved if one fatal accident were prevented, there will be difficulty in convincing an operator of a mine employing, say 250 men, that he should add \$5000 to the current cost of his safety program for first aid training. It also is certainly difficult, if not impossible, to prove that any accident has been prevented by one safety activity.

Thus, while first aid training, as a sole safety activity or as an introduction to a general safety program, will undoubtedly "pay-off," it may be difficult to show that first aid training, when conducted as part of an extensive safety program, will produce returns in keeping with its cost.

Nevertheless, it is the opinion of the writer, that first aid training is one of the most effective single safety activities that can be carried on; and it is encouraging to note that some organized labor groups recognize this to the extent that they sponsor or encourage training carried on independent of the employer.

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throw this question open to the floor. "Has any one present designed, or have in operation a corner cutter guard that will pass Industrial Accident inspection?"

MR. MELVILLE: I know of a corner cutter guard the Cornell Wood Products at Cornell, Wisconsin, have, which passes the inspection of the Wisconsin Industrial Commission. They would probably send you a print of it.

MR. PLZAK: The United States Department of Labor Safety Department have a detailed specification, a blueprint for that particular guard.

THE CHAIRMAN: We will continue with "Cooperation from supervision in the safety program."

MR. M. J. MCCARTHY: If you emphasize the importance of safety to the supervisor through his cost statement, that problem of safety would be licked. If someone in the company, with authority, would tell that particular manager, "Now your job is safety as well as production, and when you hurt a man, I am going to take away your chances of promotion, just as if your costs were off" that's about the only way.

MISS DOWLING: Isn't this where the records would come in? Good records can prove it. Take the paper and say, "Look, this is how many times this particular thing has happened, and how much lost time has been caused, as a result of the accident on this particular hazard." There it is concretely. "It has cost so much; how about it?"

THE CHAIRMAN: I think one other thing should be added as to the arrangement of machinery and the manner of their production, the matter of handling safety.

We made a complete change of 7 dif-

ferent machines, added one man. At our monthly meeting on safety, the supervisor in that division was asked if he would be willing to give up the individual who takes care of keeping aisles open. He nearly had a fit over it.

Under the new condition, this one particular division, has had no lost time accident in the past six months. Before that, goodness knows, they were having everything. That's the way this man handled his problem.

MR. ROLAND RICHARDSON: As I understand cooperation from supervision in the safety department—supervision to me would be the superintendent and foreman in the department. If there is a bad accident in the department, and you require that foreman or superintendent go to the man's home and break the news to his wife that "John has gone to the hospital" that he has a broken leg or something, he won't forget it very soon.

MR. AUGUSTUS: In some plants it is a practice to make up a budget, showing what you anticipate the cost to be in certain departments. How many include in that budget, if you want to call it that, "cost of accidents."

... One hand shown. . . .

THE CHAIRMAN: Our manager had his eyes opened. I asked him to go over our accident records and figure up the hidden costs so that management and supervision and foremen would get the picture. He figured it cost us \$894,000.

The general manager and Vice President were sitting right behind me, and Mr. Purdy turned to him and said, "I wish you would just take this paper, figure out what departments are costing you money, and fire the head of the department." Charlie said, "Well that isn't a bad idea. It might have some effect."

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 R. S. BONSB, Standard Oil Co. (N. J.), New York, N. Y.
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 J. H. BROWN, Tide Water Associated Oil Co., New York, N. Y.
 R. E. DONOVAN, Standard Oil Co. of Calif., San Francisco, Calif.
 C. L. HIGHTOWER, United Gas Pipe Line Co., Shreveport, La.
 G. O. LOCKWOOD, Continental Casualty Co., Tulsa, Okla.
 F. R. McLEAN, White Star-Ohio Div., Socony-Vacuum Oil Co., Inc., Detroit, Mich.
 CHAS. A. MILLER, The Texas Co., Houston, Texas.
 C. J. NOBMANN, Shell Oil Co., Inc., Sacramento, Calif.
 GEORGE F. PRUSSING, LaCrescenta, Calif.
 R. B. ROAPER, Humble Oil & Refining Co., Houston, Texas.
 E. J. SENNE, Baldwin, N. Y.
 C. W. SMITH, Standard Oil Co. (Ind.), Chicago, Ill.
 D. J. WALLACE, Sinclair Prairie Oil Co., Tulsa, Okla.
Secretary—D. V. STROOP, American Petroleum Institute, New York, N. Y.

Officers 1943-1944†

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Off-the-Job Safety Committee Chairman—ROY S. BONSB, Standard Oil Co. (N. J.), New York, N. Y.
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Gulf Coast Division Chairman—W. A. ALLRED, Lone Star Gas System, Dallas, Texas.
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 R. W. BLACK, Standard Oil Co. of N. J., Elizabeth, N. J.
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 ROY S. BONSB, Standard Oil Co. (N. J.), New York, N. Y.
 A. W. BREELAND, Lone Star Gas Co., Dallas, Texas.
 J. H. BROWN, Tide Water Associated Oil Co., New York, N. Y.
 R. E. DONOVAN, Standard Oil Co. of Calif., San Francisco, Calif.
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 F. R. MCLEAN, Mgr., White Star-Ohio Div., Socony-Vacuum Oil Co., Inc., Detroit, Mich.
 CHAS. A. MILLER, The Texas Co., Houston, Texas.
 R. B. ROAPER, Humble Oil & Refining Co., Houston, Texas.
 C. W. SMITH, Standard Oil Co. (Ind.), Chicago, Ill.
 D. J. WALLACE, Sinclair Prairie Oil Co., Tulsa, Okla.

†As elected by delegates in Congress Session

TUESDAY AFTERNOON SESSION

October 5, 1943

Presiding: JOHN C. ASKAM, Safety Director, The Ohio Oil Co., Findlay, O.**Safety as a Management Responsibility****WARREN WHITNEY****Manager, National Cast Iron Pipe, Division James B. Clow & Sons, Birmingham, Ala.**

The best policed city is not the one in which the police department makes the most arrests. The child who receives the most parental punishment is not necessarily the best mannered. The best conducted club is not the one in which the members are bound by rules and regulations which tend perhaps to make it socially correct, but blackout the enjoyment of the members. If these things be true, conclusions regarding management's responsibilities in safety may perhaps be drawn.

Three Definite Phases

In looking at safety problems, management must take into consideration its three definite phases. These are education, economics and human relations. Too much stress upon any of the three will render the program ineffective and worthless. Too often management does not recognize its responsibilities toward the third phase, human relations, in building and operating a sound safety program.

Management for a long time has realized the value of education. Even more poignantly within the past few years of war time operation, has management come to realize that knowledge is invaluable, that training is expensive, that a little "know how" is a definite expeditor.

The business executive has seen some of his best trained and most intelligent men leaving for the service of his country, not always with a commission, but with a firm determination to use their abilities and energies against a ruthless enemy which must be outsmarted, as well as outfought. The effects of the loss of these men has been tempered by the knowledge that educated men anywhere are more effective than others. Whether it be in designing a machine or slitting a throat, "know how" is needed.

Education in safe practices, education in knowing how to make any operation more safe is expensive and management, almost without exception, is willing to make the investment. Training in safety in the modern industrial set-up has been recognized as having equal importance with all other types of employee training. Management has come to realize that a little knowledge of safety, like a little smattering of any other type of knowledge, is a dangerous thing. A full complement of safety practices makes even a hazardous operation much safer.

Definition of Efficiency

Management believes and fosters the theory that economically safety is sound practice. Management has learned to count the cost of accidents both direct and indirect. Management has learned the ratio of costs and has found that, indirectly, excessive accidents to men, equipment and materials can ruin an otherwise profitable business venture. They subscribe to the definition of efficiency long established as being accurate in its every detail: "Efficiency is doing the job correctly the first time, at the lowest possible cost, without accident."

They know that to remove the last two words of this definition is to destroy its meaning.

Human Relations

Recognizing safety as an economically sound policy of American business, management must, therefore, look to its third phase, that of human relations, for the success of any safety movement. Lessons can be learned from the cop on the corner, who even in rush periods courteously and politely moves masses through intricate and ever changing patterns of traffic without the loss of valuable life. Lessons can

Rubber Section

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*R. A. BULLOCK, Corduroy Rubber Co., Grand Rapids, Mich.
*RALPH S. FARNUM, U. S. Rubber Co., Detroit, Mich.
*OLIVER HOPKINS, U. S. Rubber Co., Providence, R. I.
*C. F. HORAN, Hood Rubber Co., Watertown, Mass.
*J. M. KERRIGAN, U. S. Rubber Reclaiming Co., Inc., Buffalo, N. Y.
W. H. MACKAY, Dunlop Tire & Rubber Co., Buffalo, N. Y.
*R. M. MORSE, The Firestone Tire & Rubber Co., Akron, Ohio.
WILLIAM SPANTON, American Hard Rubber Co., Akron, Ohio.
R. M. WEIMER, The Dayton Rubber Manufacturing Co., Dayton, Ohio.

Officers 1943-1944†

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*JOHN L. GRIDER, Gould & Eberhardt, Newark, N. J.
*OLIVER HOPKINS, U. S. Rubber Co., Providence, R. I.
*C. F. HORAN, Hood Rubber Co., Watertown, Mass.
*J. M. KERRIGAN, U. S. Rubber Reclaiming Co., Buffalo, N. Y.
W. H. MACKAY, Dunlop Tire & Rubber Corp., Buffalo, N. Y.
*R. W. MORSE, The Firestone Tire & Rubber Co., Akron, Ohio.
R. M. WEIMER, The Dayton Rubber Mfg. Co., Dayton, Ohio.

†General Chairman
elected by delegates in Congress Session

those who handle bales of the finished product occasionally develop contact dermatitis.

In order to best illustrate the frequency and distribution as well as the disability resulting from dermatitis, a study has been made of 27 claims from one of our larger plants manufacturing synthetic rubber. These claims were filed during the first eight months of 1943. The disability occurred between November, 1942 and July 1, 1943. The occurrence of these cases by months was as follows:

November	1
December	3
January	0
February	2
March	7
April	5
May	1
June	8

It is interesting to note this distribution of cases because, during March and April, an unusual number of cases of dermatitis developed among the employees working around a large dryer. Just what caused this dermatitis was difficult to determine; but all persons in any way subjected to the fumes or dust in the vicinity seemed to be affected. This even included the cleaning force, composed of both male and female janitors. It also included a painter working in the vicinity. It was concluded that exhaust hoods were necessary, and the installation of this equipment seemed to solve the problem. Later, however, the painter and one of the janitresses had recurrent attacks of a mild form of dermatitis.

From the standpoint of distribution the 27 cases were reported by the following persons:

Utility Men	7
Solution Mixers	3
Janitors	9
Mechanics	1
Reactor Helpers	2
Chemical Engineers	2
Painters	2
Chemists	1

Most of the cases reported were mild as indicated by the claims filed. In only

three of the 27 claims was there a disability of more than seven days. In two claims the disability was nine days each and in the third, 12 days. It is evident, therefore, that the cost of compensation was negligible and the medical expense was very small, many of the cases being seen at the plant hospital only once or twice.

The distribution of cases, as far as part of body involved, shows that the dermatitis appeared chiefly on the exposed surfaces, that is, hands, forearms, face, and neck. In some instances several portions were involved at the same time. For example, hand, forearms, and face or face, neck, and arms. The classification of claims shows that the face was involved in seven claims, neck in four, arms in six, forearms in 14, hands in four, trunk in four, legs and ankles in four, thighs in one.

Symptoms and Treatment

The type of eruptions, as described in the medical reports, indicates that it appeared chiefly as a rash or erythema. In most instances the term "dermatitis" was used. In one claim, vesicles were described; in another, folliculitis was described; and in a third case, a maculopapular eruption was mentioned. From this it should probably be concluded that the skin irritation usually occurs in the form of a rash with redness and perhaps small pimples or may occasionally have water blisters or small pustules.

The period of disability was usually very short and, in many instances, no time was lost. The treatment prescribed by the attending physician consisted chiefly in simple lotions or ointments, to which the dermatitis yielded readily, apparently without any complications.

In conclusion, therefore, our experience indicates that the manufacture of synthetic rubber occasionally causes dermatitis among the employees, due largely to exposure to the various chemicals, especially styrene. The dermatitis occurs on the exposed surfaces of the body, in a mild form, causing little disability and responding to the usual treatment for mild dermatitis.

Steam Railroad Section

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D. G. PHILLIPS, Wabash Railway Co., St. Louis, Mo.
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O. F. GNADINGER, Elgin, Joliet & Eastern Railway Co., Joliet, Ill.
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G. M. DEMPSEY, Chicago, Milwaukee, St. Paul & Pacific Railroad Co., Chicago, Ill.
J. J. SNAVELY, New York, New Haven & Hartford Railway Co., New Haven, Conn.
- Safe Practices Pamphlet Committee*—W. J. FLANNIGAN (*Chairman*), Northern Pacific Railway Co., St. Paul, Minn.
S. C. FLAGLER, Atchison, Topeka & Santa Fe Railway Co., Topeka, Kansas.
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C. M. KIMBALL, Southern Railway System, Washington, D. C.
L. B. HARPER, Illinois Central System, Chicago, Ill.
- Health Committee*—DR. I. S. CUTTER (*Chairman*), Chicago & North Western Railway Co., Chicago, Ill.
DR. HARVEY BARTLE, The Pennsylvania Railroad, Philadelphia, Pa.

Officers 1943-1944†

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 D. G. PHILLIPS, Wabash Railway Co., St. Louis, Mo.

†As elected by delegates in Congress Session

TUESDAY AFTERNOON SESSION

October 5, 1943

Annual Report of General Chairman

**F. A. BOGUE, Superintendent of Safety,
The Chicago, Rock Island & Pacific Railway Co., Chicago**

The past year has placed an enormous load upon the railroads, taxing their capacity to the limit to provide the required transportation service for the country, and during the past year the railroads have been con-

fronted with the rising toll of personal injuries which has made unusual demands upon the time and efforts of all.

It has, however, been inspiring to have served as your General Chairman during

Steam Railroad Section

this period and to have associated with the officers and members of the Steam Railroad Section, whose untiring efforts and helpfulness for the cause of railroad safety will always be remembered and appreciated.

Increase in Membership

During the past year the following railroads have become members of the National Safety Council:

The Southern Pacific
 Louisville and Nashville
 Chicago, North Shore and Milwaukee
 Columbia, Newberry and Laurens
 Alton & Southern

This is an addition of 5 railroad memberships to the National Safety Council and, while we regret that 3 of the smaller lines cancelled their memberships during the year, there is a net gain of 2 members, there being 104 member railroads a year ago, 106 at present; reflecting much credit upon Chairman G. W. Elste and his committee.

The Contest Committee has followed the established practice of the past several years as it has been felt that the basis is proper and no changes are in order. The annual award dinner was held on May 3rd last. Awards were given to the winners of the various railroads, to the Pullman Company zone and several shops which operated

throughout the year 1942 without a reportable employee casualty, also to the switching and terminal companies showing the best results in accident prevention work. The Annual Green Book was prepared and published by our efficient secretary, Lew Palmer

Poster Sales Large

The Poster Committee, of which Mr. Henry is chairman, submitted 6 sketches to the National Safety Council, one of which was adopted and which many of you will remember—THEY'RE DEPENDING ON YOU. This poster had one of the largest sales of those issued by the Council.

The Safe Practices Pamphlet Committee, of which Mr. Flannigan is chairman, has shown substantial progress.

Because of the increasing accident trend and the unusual conditions with respect to labor turn-over and the difficulties of securing the necessary labor which applied to all departments of the railroads, it was felt that no more beneficial program could be provided for two days of our three day session than the panel discussion program which has been arranged through the efforts of our program chairman, Mr. John Tenney. The effect of disabling injuries has taken on an even greater importance than under ordinary conditions in interfering with railroad operation for there has never been a time when the availability of every employee has been so important.

Greetings From Safety Section, A. A. R.

O. F. GNADINGER, Supervisor of Safety, The Elgin, Joliet & Eastern Railway Co., Joliet, Ill., and Chairman of Safety Section, A.A.R.

It is an honor and a privilege for me to convey to this meeting the greetings of the Safety Section of the Association of American Railroads.

I do not believe we can over-estimate the value of meetings such as this. In addition to giving us the opportunity to renew old acquaintances and friendships, we also are given an opportunity to discuss those problems that we must meet from day to day in our work of accident prevention and to exchange ideas.

The Steam Railroad Section of the National Safety Council and the Safety Section of the Association of American Railroads are both working for the same purpose, the prevention of railroad accidents, and the two organizations should co-operate, particularly when we remember that nearly all railroads are represented in both. Every safety officer should be as willing to serve the one organization as the other. None of us should hold back when called upon to serve on committees or to take part in a program.

Safety Exposition Exhibitors

EXHIBITION HALL—SHERMAN HOTEL

Alphabetical List of Exhibitors of Industrial Safety Equipment

- American Abrasive Metals Co., Irvington, N. J.**
Safety Flooring, Treads, Abrasive Paints.
- American-LaFrance-Foamite Corp., Elmira, N. Y.**
Fire Protection Equipment.
- American Optical Co., Southbridge, Mass.**
Industrial Safety Goggles, Welding Helmets, Respirators, Safety Clothing.
- Ampco Metal, Inc., Milwaukee, Wis.**
Beryllium Non-Sparking Safety Tools.
- Barrett-Cravens Co., Chicago, Ill.**
Mechanical Handling Equipment.
- Bausch & Lomb Optical Co., Rochester, N. Y.**
Safety Goggles and Safety Goggle Lenses.
- Benjamin Electric Manufacturing Co., Des Plaines, Ill.**
Industrial Lighting Equipment, Safety Guards for Punch Presses.
- Bradley Washfountain Co., Milwaukee, Wis.**
Washroom Equipment.
- R. H. Buhrke Co., Chicago, Ill.**
Safety Belts and Allied Equipment for Construction and Maintenance Work.
- E. D. Bullard Co., San Francisco, Calif.**
Personal Protective Equipment.
- Burroughs Wellcome & Co. (U. S. A.), Inc., New York City, N. Y.**
First Aid Equipment.
- Carbisulphoil Co., Dallas, Texas**
Antiseptics and Burn Treatments.
- Cardox Corp., Chicago, Ill.**
Fire Extinguishing Systems.
- Chicago Eye Shield Co., Chicago, Ill.**
Head and Eye Protective Equipment.
- H. Childs & Co., Inc., Pittsburgh, Pa.**
Industrial Safety Shoes.
- Columbus McKinnon Chain Corp., Tonawanda, N. Y.**
Steel Sling Chains and Safety Hoists.
- C-O-Two Fire Equipment Co., Newark, N. J.**
Carbon Dioxide Portable Fire Extinguishers and Systems.
- Davis Emergency Equipment Co., Inc., Newark, N. J.**
Industrial Safety Equipment.
- Dockson Corp., Detroit, Mich.**
Head and Eye Protective Equipment.

- C. B. Dolge Co., Westport, Conn.**
Fungicides, Disinfectants, Hand Cleanser.
- Dugas Engineering Corp., Marinette, Wis.**
Fire Extinguishing Equipment.
- Duo-Safety Ladder Corp., Oshkosh, Wis.**
Fire and Safety Ladders, Ladder Shoes.
- E. I. Dupont de Nemours & Co., Inc., Wilmington, Del.**
Hand Protective Cream, Neoprene Products, Rayon Yarn.
- Elliot Service Co., New York City, N. Y.**
Production Posters, Foremanship Development Material.
- Finnell System, Inc., Elkhart, Indiana**
Electric Floor Maintenance Systems and Treatments.
- The General Detroit Corp., Detroit, Mich.**
Fire Extinguishers and Allied Products.
- Hild Floor Machine Co., Chicago, Ill.**
Floor Cleaning and Maintenance Equipment.
- Holcomb Safety Garment Co., Chicago, Ill.**
Industrial Safety Clothing.
- Hynson, Westcott & Dunning, Inc., Baltimore, Md.**
Mercurochrome, First Aid Antiseptics.
- Industrial Gloves Co., Danville, Ill.**
Industrial Safety Clothing.
- Insto-Gas Corp., Detroit, Mich.**
Torches and Furnaces Using Bottled Propane Gas.
- International Shoe Co., St. Louis, Mo.**
Industrial Safety Shoes.
- C. Walker Jones Co., East Germantown, Philadelphia, Pa.**
Industrial Safety Clothing, Fire Blankets.
- Junkin Safety Appliance Co., Louisville, Ky.**
Safety Devices for Punch Presses.
- Justrite Manufacturing Co., Chicago, Ill.**
Safety Cans, Electric Safety Lanterns.
- Karel First Aid Supply Co., Chicago, Ill.**
Industrial First Aid Supplies, Hospital Equipment.
- Keystone View Co., Meadville, Pa.**
Industrial Visual Testing Equipment.
- Walter Kidde & Co., New York City, N. Y.**
Carbon Dioxide Fire Extinguishing Equipment.
- Kimball Safety Products Co., Cleveland, Ohio**
Industrial Safety Clothing and Goggles.
- Walter G. Legge Co., New York City, N. Y.**
Non-Slip Floor Polishes and Treatments.
- Lehigh Safety Shoe Co., Inc., Allentown, Pa.**
Industrial Safety Footwear.

- Lightfoot Schultz Co., New York City, N. Y.**
Powdered Hand Soap for Industrial Washrooms.
- Lonn Manufacturing Co., Indianapolis, Ind.**
Compressed Air Spray and Blow Guns.
- Marks & Fuller, Inc., Rochester, N. Y.**
Identification Cameras and Equipment.
- Thom McAn Safety Shoe Co., New York City, N. Y.**
Industrial Safety Shoes.
- B. F. McDonald Co., Los Angeles, Calif.**
Industrial Safety Equipment.
- Medical Supply Co., Chicago, Ill.**
First Aid Kits and Refills.
- Metropolitan Life Insurance Co., New York City, N. Y.**
Life, Health, Accident, Annuities and Group Insurance.
- Milburn Co., Detroit, Mich.**
Products for Industrial Skin Protection.
- Mine Safety Appliances Co., Pittsburgh, Pa.**
Industrial Safety Equipment.
- National Safety Council, Inc., Chicago, Ill.**
Services and Material for Safety Education.
- Onox Co., Inc., San Francisco, Calif.**
Athlete's Foot Preventive.
- G. H. Packwood Manufacturing Co., St. Louis, Mo.**
Skin Cleansers for Industrial Use.
- Patent Scaffolding Co., Chicago, Ill.**
Safety Ladders, Scaffolding and Work Stands.
- Phister Manufacturing Co., Cincinnati, Ohio.**
Maintained Air Pressure Carbon Tetrachloride Fire Extinguishers.
- Protectoseal Co., Chicago, Ill.**
Safety Devices for Hazardous Liquids.
- Pulmosan Safety Equipment Corp., Brooklyn, N. Y.**
Industrial Safety Equipment.
- Pyrene Manufacturing Co., Newark, N. J.**
Portable Fire Extinguishers and Extinguishing Systems.
- Rose Manufacturing Co., Denver, Colo.**
Safety Belts and Harnesses, Ladder Shoes.
- Safety Clothing & Equipment Co., Cleveland, Ohio.**
Industrial Safety Equipment.
- Safety Engineering, New York City, N. Y.**
Publishers Safety Engineering Magazine.
- Safety First Shoe Co., Holliston, Mass.**
Industrial Safety Shoes.
- W. H. Salisbury & Co., Chicago, Ill.**
Linemen's Rubber Protective Equipment.
- A. Schrader's Son, Brooklyn, N. Y.**
Pneumatic Safety Control Devices.

- Sellstrom Manufacturing Co., Chicago, Ill.**
Face and Eye Protective Equipment.
- A. Smith & Son, Inc., Philadelphia, Pa.**
Hospital and Ambulance Stretchers.
- Spencer Turbine Co., Hartford, Conn.**
Vacuum Cleaning and Dust Collecting Equipment.
- Standard Safety Equipment Co., Chicago, Ill.**
Personal Protective Equipment.
- Steel Scaffolding Co., Evansville, Ind.**
Steel Scaffolding.
- Stonehouse Signs, Inc., Denver, Colo.**
Accident Prevention Signs.
- Strand Manufacturing Co., Chicago, Ill.**
Safety Guards for Punch Presses.
- The Strauss Co., Pittsburgh, Pa.**
Safety Belts and Hats.
- Surty Manufacturing Co., Chicago, Ill.**
Safety Equipment.
- Trimont Manufacturing Co., Boston, Mass.**
Forged Steel Safety Tools.
- United States Army, Washington, D. C.**
- Wahlert Products Corp., Brooklyn, N. Y.**
Industrial Safety and Fire Equipment.
- Waverly Petroleum Products Co., Philadelphia, Pa.**
Oil and Grease Absorbents.
- West Disinfecting Co., Long Island City, N. Y.**
Skin Protective and Plant Sanitation Products.
- F. H. Wheeler Manufacturing Co., Chicago, Ill.**
Industrial Safety Clothing.
- Willson Products, Inc., Reading, Pa.**
Personal Protective Equipment.

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TRANSACTIONS

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Industrial Health

WEDNESDAY MORNING SESSION

October 6, 1943

Presiding:—WALTER S. PAINE, Manager, Engineering Department, Aetna Life & Affiliated Companies, Hartford, Conn., and Vice-President for Industrial Safety, National Safety Council.

An Approach to Tuberculosis in Industry

C. RICHARD WALMER, M.D., Medical Department,

Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.

Assuming that one of the greatest individual losses of earning power in the productive period of a man's life, that is, in early or middle life, is due to tuberculosis, we, in industry, feel it our obligation not only to seek out these cases but to counsel them accordingly.

Our approach to these cases is, of necessity, limited due to the fact that, generally, a prospective employee will offer nothing in the way of past or present medical history. In order to cope with the situation, we must have a system of rules to which we can turn. In our situation we go about this by:

1. Preplacement examination—routine of all prospective employees.
2. Transfer examinations—which are required of all present employees seeking advancement in certain jobs.
3. Periodic examinations—this type, unfortunately, is limited to those of selected occupations and comprises only 4,000 (or one-sixth) of the total population of our plant.
4. Cases reported sick and examined upon returning to work.

Preplacement Examination

The preplacement examination may be our last chance of ever physically evaluating the employee for the duration of his employment with our company and, therefore, must be comprehensive and all inclusive. All new employees are fluoroscoped routinely and their chests examined clinically. Insofar as the prospective employee offering informa-

tion about himself is concerned, one would classify him as a mental case if he were to offer any damaging evidence to hinder his obtaining a new job. All new employees are routinely X-rayed, as is any case of doubtful fluoroscopy or clinical chest finding. We pay particular attention to any case giving past occupational history of employment in mining, welding, or in the dusty occupations, such as foundries.

Any prospective employee having sufficient chest findings to warrant his rejection as an employee is promptly told of our suspicions and advised to see his own physician without delay. We offer him a letter of our findings to take to his doctor and in many cases receive an appreciative reply from both the doctor and prospective employee.

Transfer examinees are not routinely X-rayed unless they have actual complaints, clinical findings, or are to assume duties in a dusty atmosphere.

Periodic Examinations

Periodic examinations are, as mentioned before, unfortunately, limited to about one-sixth of our personnel. However, we feel that these men and women are the ones whose occupations may cause occupational illness, if environment is not properly controlled. The system of examination in this category depends upon the type of job and hazards involved. We will limit this paper to that of chest findings only. Each man receiving a periodic examination receives a thorough clinical chest examination includ-

man after landing to quickly flip seat out from between his legs. The inboard end of the line passes through a block then over a cleat. Several turns of the line are always taken around the cleat.

On the end of each landing boom a light has been installed, the rays of which are directed downward and brightly illuminate the surface on which the deck hands have to land. Since putting these rules into effect in 1938, the most serious accident reported to date has been a sprained ankle.

You all know that the success of safety work depends upon the support received from company management, and in this

regard I would like to say that the interest and support of our management has been excellent.

Safety aboard a lake freighter is a broad subject, but possibly you are now aware of some of the problems with which we are confronted each operating season.

With lake freighters performing such an important role in the transportation system of both the United States and Canada, it is imperative that the present manpower shortage is not aggravated by avoidable personal injuries. This challenge is being met. Lake freighters are carrying record cargoes of ore and coal cargoes vital to our war program.

THURSDAY AFTERNOON SESSION

October 7, 1943

Presiding: D. L. Hartnett, Regional Safety Consultant, U. S. Maritime Commission, Philadelphia, Pa.

The Control of Fumes in Shipyards

WILLIAM E. LAWRENCE

Safety Engineer, New York Shipbuilding Corp., Camden, N. J.

Many articles have been published on this subject, including miles of statistics; however, I am sure that every shipyard in this country today has acquired knowledge through experience and information unselfishly passed on by pioneers in ship welding until it is assumed that everyone knows the most satisfactory fume elimination is that of ventilation by exhaustion.

Extensive experiment during the past decade with different types of equipment proved that the surest method was to remove the trouble at its source. Blowers and exhausting devices were developed accordingly, with satisfactory results. Respirators fitted with metal fume filters will give some protection when fume concentrations are low.

In common with other shipyards and heavy industries, much care is being exercised by plant medical staffs in routine re-checks and re-examinations of workers exposed to welding fumes. In so far as we know, we still can honestly state that we have not had one case of lasting or per-

manent ill effect to anyone associated with welding, tacking, burning or heating.

New Method and Precautions

You may be interested to hear of a development new to us at our plant. It may be new to some of you also. I refer to carbon arc burning in connection with smoothing off the large countersunk heads of tap bolts in armor plate decks. These heads were formerly chipped and ground off flush with the deck plates. This was a long, tiresome, rough and costly job. By the use of the carbon arc, they are burned off so that only a small amount of grinding is necessary, thus cutting the time and labor to a minimum. (5/16" carbon, 400 amps., 7000° F.)

Of course, the fume and dust hazard had to receive special consideration. This was accomplished by the use of a compressed air jet, which blows the slag and carbon residue into exhauster funnels located at the ends of two 3" metallic flexible tubes with powerful portable ex-

hausters at the outlet ends of these same tubes. This equipment is skidded easily along the deck as required and is kept close to the job at all times, even eliminating the necessity for the use of respirators.

Seasonal Hazards

Many other fumes must be controlled in shipyards. One of the seasonal hazards in our own plant will have to receive attention before the advent of cold weather, which is just around the corner. Men will build fires in any kind of a receptacle in spite of safety men and supervision, and will use fuel, such as charcoal or coke, without stopping to realize the danger involved and the necessity for proper ventilation. The resulting carbon dioxide and carbon monoxide gases are both deadly and create oxygen deficiencies.

We recently issued a notice in connection with this hazard and posted it conspicuously. It stated that if any fire pots were found on ship contracts, plant protection men should immediately contact a safety inspector and be governed by his decision as to the removal of same.

Fumes From Fires

I think we should mention the danger of fumes from fires in ships on the ways, while under construction, and in the water after launching. Many of the fires may be trivial but there is always the possibility of men being trapped by smoke and toxic fumes and unable to get out from below decks. This is when the trained safety inspector or a good watch force man comes into the picture. He must quickly don a mask, hook on a life rope and go down to make sure everyone is out. He must be followed as closely as possible by another man with a powerful electric lamp. If any deficiency of oxygen is suspected, an oxygen breathing mask must be worn. Ventilation must be provided at once, smoke and fumes must be exhausted and a fresh supply of air blown in.

Much could be added about the maximum allowable concentration for carbon monoxide and carbon dioxide, but the main point to remember is that carbon monoxide is the number one poison killer, both in industrial and non-occupational

life, following close upon auto accidents as a cause of death. It is true that whenever there is smoke you may suspect carbon monoxide.

By all means take no chances. Don't wait for a chemist's report on the samples of air from suspected areas. Ventilate! Constant alertness on the part of watch force men and safety inspectors is an absolute necessity to combat such hazards. The education of the men by their supervisors and the use of warning posters is recommended, but above all, ventilation by exhaustion and the introduction of a fresh supply of air is imperative under these dangerous conditions. Several narrow escapes from death have been experienced in shipbuilding due to the thoughtlessness of the men and not because of ignorance. They forget to think.

Insulation Materials

The use of insulation cement, if it contains toxic solvents such as carbon tetrachloride, is a menace to workmen unless precautions are taken to properly safeguard them under such hazardous conditions. A large shipyard recently experienced such conditions which were brought to the attention of the plant health committee and the management. The result was that the entire supply was re-distilled and a substitute safe solvent provided, thus eliminating the hazard without loss of material. This demonstrates again that careful planning will assure safe production, always a winning pair.

The use of water repellent asbestos insulation has recently replaced some types of material formerly used in ship work. For protection against dust or possible asbestosis from such material, it is recommended that both on ships and in shops, or where the material is prepared, it be dampened and that dust respirators be worn, also that special ventilation be provided. Periodic medical examination of those exposed to such hazards is also necessary.

Sand Blasting and Plating

Sand blasting and shot blasting, with its silicosis hazard, can be done safely if provision is made for standard sand blast rooms or cabinets. Special ventila-

tion must be provided, with frequent inspections of all equipment by an experienced safety inspector or supervisor. This check-up must never be neglected.

Regular periodic examinations, including X-rays, are mandatory. The least suspicion of a leaking face piece can be easily detected by the operator and should be reported at once to the safety department for immediate correction. If an operator begins to eat sand, he will realize at once that his equipment is not safe.

Fumes and dust from friction saws in shops are easily removed by proper exhaust ventilation and should be carried by ducts from the machine to dust collectors out of the shops if possible.

Plating room fumes, with modern ventilating systems now available, are no longer a problem in any up to date shipyard. A few years ago, however, a different story could be told.

Recent changes in painting specifications on naval vessels have provided for the use of zinc chromate which, although perhaps not particularly toxic, must be considered sprayed in small compartments.

Respirators are advocated along with safe ventilation. When working in large shops large plates are sprayed, after they are placed in racks from the pickling

the use of air line respirators is recommended, as these areas are too large for efficient exhaust ventilation. However, operators handling material in these locations, especially above pickling should be provided with respirators.

They may be placed in the crane cabs to remove fumes and vapor away from the operators.

Provision must be furnished for any worker which dust fumes or smoke from any space containing lead is breathed. For example; when welding, cutting, grinding or straightening where metal, coated with paint contained.

Special ventilation, using exhaust hoods or tubing kept not far from the job and drawing fumes discharged where the worker's air will not be breathed, is recommended.

In construction two types of ventilation are needed, local exhaust to remove

fumes at the point of origin and general ventilation to supply fresh air to confined working spaces.

Lacquer spraying, if done in approved booths, properly ventilated, presents no greater problem. When cleaning compounds are being used, chemical cartridge respirators will give protection if concentrations are low.

The use of proper extinguishers on different type fires must be considered. Fumes from the use of the wrong ones may cause the death of persons improperly instructed. Periodic demonstrations by those responsible should be made for the benefit of firemen, watch force men, and safety inspectors. The use of instructive posters and bulletins is also advised.

Fumigation of refrigerator spaces in ships practically ready for delivery is important. Precautions must be taken to safeguard men whose duty it is to open and ventilate such spaces after fumigation. They must wear all-service gas masks while installing temporary ventilation equipment and, if a deficiency of oxygen is suspected, an oxygen breathing apparatus must be used.

Cooperation of Management and Employees

An important item in ventilation of ships under construction is to impress management with the necessity for co-operative planning by the engineering department and drawing rooms for the early installation of as much of the ships permanent ventilation system as possible, especially in engine and boiler rooms. Present construction of naval vessels practically prohibits the use of temporary ventilation units, due to the inaccessibility of such spaces and the impossibility of bringing in fresh air, especially after they are closed in.

The importance of the availability of trained ventilation men must be considered. Their services are vital in the avoidance of delays in maintaining continuous production. The elimination of fumes by their alertness to such hazards and inconveniences will help to minimize absenteeism and assure delivery of ships ahead of schedule, thus assuring a quicker victory.

We must not forget the importance of organized first aid crews trained in the use of inhalators, resuscitators and approved methods of artificial respiration. These crews with portable emergency equipment must be available and ready to act at a moments notice.

Perhaps one of the most important methods of impressing employees, especially new ones, with the idea of danger from respiratory and other hazards is through safety instruction in orientation classes before they start to work. This is being done in many industrial plants with marked success. We believe that such a

program will be of vital interest to who have had no previous shipyard experience.

Before closing I want to mention ventilation standards as recommended by the U. S. Navy Department—U. S. Maritime Commission, "Safety and Industrial Health Manual in Contract Shipyards" a recent issue, and the "1021 Answers to Industrial Health and Safety Problems" published this year by Occupational Hazards, Inc. They are most helpful and timely publications and should be available to everyone connected with safety programs in any industry.

Crane Safety

LIEUT. COMDR. L. F. KENGLE, U.S.N. (Ret)

A survey of the information at hand on crane safety shows that there is a wealth of material on this serious subject. It has been exhaustively studied and reported. As you know, standards of safety have been set up by the American Society of Mechanical Engineers, by the Bureau of Yards and Docks of the Navy Department, by the National Safety Council, by the American Standards Association, by the states in their Industrial Accident Commissions and by the insurance carriers for private concerns. It should be apparent then, that since these extensive standards cover the design of the structure and the safety of the mechanical equipment and protective devices, cranes may be acquired, redesigned and overhauled with a maximum of assurance that from the items of design every known hazard to health and safety will be eliminated.

Criticism of Present Rules

From the above sources there may also be gained a well-rounded set of rules covering inspection and test. Not only is this information available from these sources, but methods of reporting, checking and inspection can be set up, so that positive assurance may be had that these minimum standards will be maintained throughout the life of the equipment. These rules cover the vast majority of all crane operations. The only criticisms that

may be leveled at these rules are: First, in the simplification of the rules so they may be easily understood by all operators; secondly, in the adequacy of the rules to cover all incidents; third, in the standardization of the equipment used; and, fourth, in providing weight indicators to supplement on the part of the operators.

It requires judgment to make the rules fit into one's own crane problems. It is recommended that they be perused thoroughly, so that sets of rules and instructions may be made out for each activity with extraneous material eliminated from the instruction books issued to the operative personnel.

Basis for Discipline

We find it is better to base your discipline on a violation of a rule rather than upon an incident. This establishes in the minds of the operating personnel a realization of the significance of a published rule or regulation. Although the violation of a rule may not result in an accident, the continued violation of a published rule will eventually lead to a serious incident. After an incident of serious nature, its effect has a disciplinary aspect. If the rules are adequate, concise, and understandable and are complied with by personnel, no incident can occur.

I believe that if we will check all of our