

Construction Section

Officers 1935-36

General Chairman—W. A. SNOW, Associated General Contractors of America, Inc., 1329 "E" Street, N. W., Washington, D. C.

Vice-Chairman for Heavy Construction and Railroad Contractors—R. J. REIGELUTH, C. W. Blakeslee & Sons, 58 Waverly St., New Haven, Conn.

Vice-Chairman for Highway Construction—F. I. ROWE, W. L. Johnson Construction Co., Hicksville, Ohio.

Vice-Chairman for U. S. Engineer Department—MAJOR ELLIOTT VANDEVANTER, C. of E., Office of the Chief of Engineers, Washington, D. C.

Vice-Chairman for Building Construction—CHESTER W. WRIGHT, Wright & Kremers, Inc., Niagara Falls, N. Y.

Secretary—ROBERT MCKINLEY, General Accident Fire & Life Assurance Corp., Detroit, Mich.

News Letter Editor—G. O. GRIFFIN, Dravo Corp., Neville Island, Pittsburgh, Pa.

Engineering Committee Chairman—E. N. GOLDSTINE, San Francisco, Calif.

Membership Committee Chairman—THOMAS BENTLEY, The A. Bentley & Sons Co., Toledo, Ohio.

Poster Committee Chairman—R. A. SNOW, Carolina Power & Light Co., Raleigh, N. C.

Program Committee Chairman—V. P. AHEARN, National Sand & Gravel Assn., Munsey Bldg., Washington, D. C.

Publicity Committee Chairman—W. P. CONN, Editor, "The Constructor," Washington, D. C.

Statistics Committee Chairman—C. H. BLACK, Stone & Webster Engineering Corp., Boston, Mass.

Past General Chairmen—

W. F. AUSTIN, Detroit, Mich.

E. N. GOLDSTINE, San Francisco, Calif.

JOHN RUSSELL, JR., Public Service Electric & Gas Co., Newark, N. J.

Officers Elected for 1936-37

General Chairman—W. A. SNOW, Associated General Contractors of America, Inc., Washington, D. C.

Vice-Chairman for Heavy Construction—R. J. REIGELUTH, C. W. Blakeslee & Sons, New Haven, Conn.

Vice-Chairman for Highway Construction—F. I. ROWE, W. L. Johnson Construction Co., Hicksville, Ohio.

Vice-Chairman for U. S. Engineer Department—MAJOR ELLIOTT VANDEVANTER, C. of E., Office of the Chief of Engineers, Washington, D. C.

Vice-Chairman for Building Construction—CHESTER W. WRIGHT, Wright & Kremers, Inc., Niagara Falls, N. Y.

Secretary—ROBERT MCKINLEY, General Accident, Fire & Life Assurance Corp., Detroit, Mich.

News Letter Editor—G. O. GRIFFIN, Dravo Corp., Neville Island, Pittsburgh, Pa.
Engineering Committee Chairman—THOMAS SOULE, Industrial Indemnity Exchange, San Francisco, Calif.
Membership Committee Chairman—F. J. CRANDELL, Liberty Mutual Insurance Co., Boston, Mass.
Poster Committee Chairman—S. M. LAUDERDALE, Civilian Conservation Corps, Washington, D. C.
Program Committee Chairman—V. P. AHEARN, National Sand & Gravel Assn., Washington, D. C.
Publicity Committee Chairman—W. P. CONN, "The Constructor," Washington, D. C.
Statistics Committee Chairman—C. H. BLACK, Stone & Webster Engineering Corp., Boston, Mass.
Past General Chairmen—
 W. F. AUSTIN, W. E. Wood Co., Detroit, Mich.
 EDGAR N. GOLDSTINE, Consulting Safety Engineer, San Francisco, Calif.
 JOHN RUSSELL, JR., Public Service Electric & Gas Co., Newark, N. J.

The first session was called to order by General Chairman Welton A. Snow, Associated General Contractors of America, Inc., Washington, D. C., who presided,

outlining the activities of the past year and commending the work of the various committee chairmen. Addresses were given as follows:

Construction Safety Ain't Different

By G. O. GRIFFIN.

Safety Director, Dravo Corporation, Pittsburgh, Pa.

The construction industry in 1935, out of 30 major industries, ranked twenty-seventh in accident frequency and twenty-ninth in severity; and the only excuse that was ever given is, "Well, we're different." We aren't different! It's just

an alibi. The cement, quarry and public utilities industries contain many hazards similar to those of the construction industry, yet each has a superior accident rate.

The following table gives a percentage

Type of Accident	Per cent in Construction Industry	Per cent in All Industries
All types	100.0	100.0
Handling objects	25.9	26.8
Falls to the same level	9.5	9.6
Falls to a different level	8.7	14.9
Machinery	12.0	7.5
Vehicles	10.9	6.0
Falling objects	8.7	11.1
Using hand tools	7.6	7.9
Stepping on or striking against objects	5.6	6.5
Electricity, explosives, heat	3.6	2.7
Harmful substances	2.1	2.6
Other	5.4	4.4

distribution of the cases (nearly all compensable) covered in recent one-year reports from Illinois, New York, Maryland, New Jersey and Pennsylvania. These reports cover 224,661 injuries in all industries and 40,620 injuries among construction company employees.

Is it not remarkable how nearly equal these percentages are for most types of injuries? In only four instances does the difference in percentage exceed 1 per cent. The construction industry had 6 per cent more accidents due to falls to a different level, and 2 per cent more due to falling objects, than the average for all industries. Construction work had 4 per cent fewer accidents due to machinery and 5 per cent fewer due to vehicles.

It would appear, therefore, that the solution to the problem, the reduction of construction accidents, could be accomplished by the use of the same methods that other industries have used so successfully.

Actually, the best safety records known to the National Safety Council for construction work were not, as one might expect, made by contractors, but by the construction departments of an oil refiner, a manufacturer, and a public utility. The Norco Refinery of Shell Petroleum Corporation holds the best record with 1,929,478 man-hours operated without a disabling injury. DuPont's Penn's Grove plant has a record nearly as good; and the construction department of the Indianapolis Power & Light Company has the third best record.

These outfits didn't have any tradition of "a man a floor" or "a death for so many hundred thousand dollars worth of work" to live up to. They knew they weren't different; they just went ahead and did it. They had the safety programs of the parent corporation which were not built in particular for construction work, but which apparently functioned very well.

I have heard this same excuse in my own company many times. But last year we were rather fortunate in having one job hang up a record of about 125,000 man-hours without a disabling injury. That's nothing to write home about, but it sure was a help when the boys on the other jobs began the old "We're different" story.

Our company has several fields of op-

eration besides that of heavy construction. We build boats, operate a barge line, and a sand and gravel company, besides fabricating steel, installing machinery and handling contractor's equipment. The types of accidents reported by these various subsidiaries differ very little. Tow boat or construction job, machine shop or gravel yard—they all report falls, cuts and other injuries in about the same proportion. However, there are some queer ones. One day last week we had a man fall out of his berth and crack a rib, and in the other case a spider bit the pilot. Recently, on one of the dam jobs a man was hurt because he didn't understand the foreman's order. The foreman had just had all his teeth out.

All books and theories on safety say that accident severity cannot be controlled. In general, I agree, but I feel that it can be controlled to a greater extent on construction work than on many other types. Most severe accidents in construction can be attributed to certain types of occurrences which can be guarded against fairly completely; by this I mean prevention of long falls by special types of scaffolding and railings, and the reduction in falling of material by the close inspection of mechanical equipment. To a very great extent, this has been done and the records show it.

I am about, however, to suggest something which may be quite controversial. All rules for safety contests and supposedly all fair safety men insist that if a temporarily injured employee is unable to return to a regularly established job on the day following his injury, he should be kept at home and recorded as a lost-time accident. How the case is recorded is of little interest to me.

It is my contention that on construction work you can improve your severity rate and do everyone concerned a favor by keeping the injured man on the job. In this way, you can keep control of him and of his injury, be sure he receives adequate treatment and reduce his suffering and loss of wages. If you don't do this, you frequently lose control of the case entirely and have a simple seven-day injury turn into an expensive one with long disability.

To get back to our real subject, the program which, in my opinion, would ma-

terially improve accident records in the construction industry is that which other industries have been using for so long. Briefly, a program based on adequate accident records, consistent inspection and maintenance of plant, a complete medical program and the principle of supervisory responsibility, cannot help but succeed.

Dust Diseases As They Affect the Construction Industry

By A. J. LANZA, M. D.

Assistant Medical Director, Metropolitan Life Insurance Company, New York City

With a possible single exception, there is but one dust disease and one dust causing that disease with which the construction industry is concerned. The disease is silicosis and the dust causing it is dust containing free silica (SiO_2). Dusts containing silica in combined form have not been shown to cause disability or disease, with the exception of asbestos, which is a silicate.

The outstanding facts with regard to silicosis have often been detailed and will be only briefly summarized here. The dust must be in a fine state of subdivision to reach the lungs. The particles which do the damage are less than ten microns in diameter. In this country, the amount of dust in the air at any location is determined by the standard method elaborated by the United States Bureau of Mines and the United States Public Health Service, using the impinger, the results being expressed in millions of particles per cubic foot. In order to estimate the hazard, we must know the number of particles and the percentage of silica, because a dust containing 100 per cent pure silica would be more harmful than one containing 50 per cent silica.

When we know the amount of dust—in terms of averages—the amount of silica, and the extent of exposure, we are in a position to evaluate the seriousness of the hazard. We know that silicosis is a chronic disease, taking usually years to develop, and as we see it in American industries, causing little or no disability unless there is superimposed upon it an infection. This infection is most often tuberculosis, to which the individual with silica damaged lungs is very susceptible. The more severe the silica damage, the more apt tuberculosis is to develop.

We do not as yet have permissible or safe standards of dustiness. There is such an extremely wide variation of industrial processes and environmental factors that any elaborate system of standards would be impracticable; but a simple workable standard is highly desirable. There is a rough standard, which is based largely on the work of the Public Health Service, of ten million particles of dust per cubic foot. This is a convenient target to shoot at when dust control measures are undertaken in an industrial plant. That is not to say, however, that a threshold of ten million particles of a highly siliceous dust is safe. This standard was based on exposure to granite dust, containing about 35 per cent pure silica.

The construction section of this Congress embraces many types of industry and a multitude of processes. It is not practicable, therefore, to present a complete scheme of all the hazards in these industries. We can, however, attain our object in a sufficiently satisfactory manner by considering first, materials, and second, the processes in which these materials are used. The construction industry uses enormous amounts of certain well known materials. Lime, gypsum, cement, sand, occur to everyone's mind when you mention construction. Many of these substances are used in processes which involve considerable amounts of dust, wherein lies the possibility of a health hazard.

There is no silicosis without silica-free silica. So right off, the manufacturer or industrial company has the first clear-cut index of the potential harmfulness of a dust which may be causing concern to him or his employees. Does

it contain free silica in appreciable amounts?

What is an appreciable amount? Probably in excess of 5 per cent. At least, that is well on the conservative side. Non-silicious dusts may be a nuisance or an annoyance to employees or to neighboring communities, but they are not concerned with silicosis. If the employer does not know whether a dust to which his employees are exposed contains silica—that is the first thing for him to determine. Should he find that the dust does contain free silica, in a determined percentage, then the next step is to ascertain the amount of such dust present in the air where his employees work.

We are frequently asked whether dust arising from gypsum, cement, lime, marble, talc, rock wool, mineral wool and many other substances, may cause silicosis. We say to the inquirer, "You know the materials you are working with. Do they contain free silica?" He may reply, "No," or "Only a trace." The conclusion then is obvious. There is no silicosis hazard.

The type of process in which the dust is generated is of great practical importance. If the process is conducted in a confined place, with poor ventilation, it is apparent that the hazard is much more dangerous than if it were in the open air, because in the confined place, the workman gets a much bigger dose of silica.

Recently I saw some X-ray films of brick masons. These masons handled only fire bricks—made from a highly silicious material—and they were employed in lining kilns and furnaces. Their films showed well developed silicosis. Their job consisted in breaking up the worn-out lining in furnaces and building new ones. They were continuously exposed to a highly silicious dust in a very close, confined place. The same material could probably be handled in other types of construction work with little or no hazard.

The mention of close and confined places brings to mind tunnels, about which there has recently been much agitation. Without going into details concerning this subject, the lesson to be learned is clear. The digging of a tunnel is not a permanent undertaking in any locality but the work should be safeguarded as in more permanently estab-

lished industries. Where a tunnel is being constructed in a highly silicious rock, the dust hazard looms very large. It is similar to hard rock mining and everything conspires to make the control of dust difficult. It is interesting to note that tunnel work in various parts of the world has been followed by similar experiences.

The report of the Director General of Public Health for New South Wales in Australia, 1924, details an investigation concerning ventilation and sandstone dust present in the air of certain sewer tunnels in Sidney. Apparently there was an excessive amount of silicosis and tuberculosis among these tunnel workers.

A report of the South African Institute for Medical Research, April, 1935, details a severe silicosis hazard among sewer tunnel workers in South Africa.

We are justified in concluding that tunnel work calls for extraordinary precautions for safety and health with a supervision of the health of tunnel workers comparable to that followed in other industries. Grinding or pulverizing sand, gravel, and other highly silicious materials are processes that need very careful control and supervision.

The control of the dust hazard is an engineering problem and in the main depends on an effort to entrap the dust at its point of origin by using water, or suction exhaust systems, or both. Once the dust is in the air, reliance is placed upon further use of water, and on dilution of the silica dust by increased ventilation and on protecting the individual by a suitable mask or respirator. The United States Bureau of Mines now certifies respirators that are safe for silica dust. The use of respirators should be restricted to exposures which are intermittent or temporary.

Where ventilation equipment designed to remove dust from the air is installed, its efficiency should be checked from time to time by dust counts, using the standard impinger method. As with other protective devices, there is always danger that this sort of apparatus becomes greatly impaired or useless because of failure to maintain it properly.

I mentioned an exception to the statement that only free silica dust will produce disease of the lungs. This exception is asbestos, a magnesium silicate.

The inhalation of asbestos dust produces a condition of the lungs similar to silicosis. The pathology is quite different and the appearance on X-ray films is distinct from silicosis. Asbestosis apparently does not predispose to tuberculosis and in this country has not been shown to cause much disability, though a few deaths have been recorded. In the manufacture of construction material, asbestos is usually combined with other substances which, by reducing the amount of asbestos in the dust, tend to mitigate the hazard.

A matter of great concern to the employer is what disposition to make of cases of silicosis among his employees. If active tuberculosis is present, it is to the interest of the individual and his fellow workmen that he be removed from his occupation and given proper care. If

infection is not present, there will be little or no disability and the employer should protect the individual from further exposure through methods suitable to the situation involved.

The important item to remember is the nature of the material and the process in which it is employed. Consideration of these two items will enable the employer to ascertain whether a silica hazard is present and to act accordingly. Again let me emphasize that where workmen are exposed to a highly silicious dust in confined places, the situation is extremely serious and calls for energetic and comprehensive measures of control and continued medical supervision of the men. Dust samples should be taken frequently and the men should be examined frequently so that serious disease will not occur.



Physical Examinations of Construction Employees on Public Works Programs

By L. M. DEARDORF

Superintendent of Construction, W. L. Johnson Construction Company, Hicksville, O.

If there ever was a time when employees on Public Works projects should be given physical examinations before permitting their names on the payroll, it is now.

Any contractor who secures a Public Works project with the Highways, PWA, the U. S. Engineers, or any of the other department of the Federal Government is required, as a part of the labor regulations, to submit a requisition for his employees to the National Reemployment Service. The National Reemployment Service is dominated by the WPA organization to the extent that all semi-skilled and common labor are furnished only from relief lists. In the majority of cases those unfortunate individuals who are still on relief are there only by reason of a mental or physical deficiency. They have done very little work during the past five or six years and are pretty

thoroughly demoralized mentally; physically they have permitted their bodies to be run down about like an old paver that has been standing alongside the road for a corresponding period of years.

Our procedure in carrying out physical examinations for our employees is as follows: The contract having been awarded, and the superintendent assigned to the project, one of his first important preliminary instructions is to talk to the doctors in the vicinity of the project and explain to them the problem which we face in securing competent physically-able workmen. If the M. D. shows any sympathy in our problems and troubles, we negotiate for mass examination of the employees. The price paid for the examination is from \$1.00 to \$2.50.

The findings have been very interesting on the various projects as the following facts will testify.

On one project where 85 men were examined 20 of these were rejected for these reasons:

- Three hernias.
- One leakage of the heart.
- One evidence of intemperance and a large tumor on shoulder.
- One very nervous; heart trouble; throat irritation; bad teeth.
- One deaf in right ear.
- One high blood pressure.
- Two with only one eye and too old.
- One with defective hearing.
- One with bronchial asthma.
- One with lumbago.
- One with frail makeup; bronchial trouble; bad wrists, illiterate.
- One partial stiffness in left elbow joint.
- One anaemic.
- Two general makeup bad; unalert, mentally and physically.
- Two too young for construction work.
- One too old and too frail for construction work.

Another project in Ohio got under headway in June when the weather was extremely hot. The project superintendent contacted the Regional Employment Center from which the labor was assigned. The Employment Center was advised as to the nature of the work, that only men fit physically and mentally could be accepted, that each man would be physically examined by a competent physician before being accepted. The Employment Center gave us wonderful cooperation. Men from relief rolls were first called to the Employment Office for an interview before assignment, and only such men as could show they were physically fit and able bodied were assigned to our project. On one requisition for 30 laborers, the Employment Center called to their office 100 men who were on relief. Seventy-eight men reported. Of these, the Employment Officer turned down 74 because of old age or physical disabilities. Four of these 100 men were assigned to our project; 3 reported for work. Of these three, one was disqualified by physical disability, and one was discharged after being on the job four hours.

For the following three weeks there were many rejections, which included those rejected by the physician and many others who had come to the project with no intention of attempting to do a day's

work. In fact, about 60 per cent of those examined and found physically fit were not mentally inclined to do hard labor. We would first send an applicant to the foreman for a day's trial work, and if he showed an inclination to work he was given a physical examination. If not, he was discharged and we were saved the trouble and expense of an examination.

About the first of July a number of contractors were finishing their projects and releasing their labor. The Employment Center transferred those men who had a relief status to our project and discontinued sending us men from the unemployed ranks. Our number of rejections then fell from over 70 per cent to around 10 per cent.

There is a certain moral effect in carrying on physical examinations in that they give the man who is employed a feeling that he is just a trifle superior to the general run of people who are available, and this feeling is revealed in the interest which he takes in his work and the building up of morale on the project.

The matter of physically examining a number of employees on a Public Works Project is much more expensive than in any other industry due to the regulation that semi-skilled and common labor do not become a part of the contractor's organization, but are only on the present project and the contractor must build a complete new organization from skilled labor on down when he moves on to another project.

Another advantage in physical examinations is evident when you notify the Employment Center that the men will be subjected to a physical examination. The Employment Center is much more particular. We have found the Employment Service interested in the physical examinations and they have given us every reasonable cooperation.

We have heard no objections from the employees, organized labor, or the public with reference to our method of doing this phase of our business. We, therefore, urgently recommend that every contractor-employer adopt physical examinations for his employees. We consider our adoption of physical examinations for construction employees another stepping-stone along the road of safety and a non-accident year of road building.

WEDNESDAY MORNING SESSION

October 7, 1936

Round Table Discussion

R. J. Reigeluth, vice-president, C. W. Blakeslee & Sons, New Haven, Conn., presided at the general round-table discussion which comprised the Wednesday morning session of the Construction Section.

THURSDAY MORNING SESSION

October 8, 1936

Safety in Building Construction

By CHRISTIAN J. JENSEN

Supt. of Construction, M. B. Markland Contracting Co., Atlantic City, N. J.

Construction work must be planned so that both the workers and public will be protected from injury, that there will be no damage to adjoining properties, and that there will be no failure after the job is completed.

In one case one person was killed and several were injured when a reinforced cinder concrete slab failed and collapsed about fifteen years after it was built. This was caused by the chemical action of elements in the cinders that corroded the galvanized steel reinforcement. Many buildings have floor and roof slabs of cinder concrete with no reinforcement but the high rib steel lath on which is laid a three inch thick cinder concrete slab, and although there may be no failures with loss of life, this in my opinion is unsafe construction. Cinder concrete should not be used in building construction except as a fill over properly reinforced stone concrete.

At the start of a job we erect enclosures and to that extent protect the public. Then we begin construction. To protect the worker it is the employer's

duty to supply sound, good lumber for scaffolding. When a scaffold is built, it must be properly braced, because even good lumber will fall if it is overstressed.

On many jobs it is necessary to build temporary elevators for hoisting materials. These are subject to many stresses, and it is important not only that the lumber be of very good quality but also that the men doing the work be intelligent and experienced. On one job a man was riding down on an elevator, and the engineer thought it would be a good joke to frighten him. The elevator started at high speed and was suddenly stopped near the ground, but the joke was a tragedy as the sudden stop dislodged the cathead, which fell and killed the rider. If the elevator had been properly built there would have been no accident—though that does not excuse the operator, who was guilty of involuntary manslaughter.

When raising material from one elevation to another, great caution should be taken to use good rope. If rope is ex-

posed to the weather it deteriorates and very often an apparently good rope will fail. But accidents have happened when construction was done with good materials and workmanship because an incompetent man has tied unsafe knots or given an improper signal for hoisting or lowering a load.

All floor openings and wells should be enclosed with proper guards—there should be absolutely no boards or planks on which men walk that do not have proper bearing.

Another cause of accidents in construction work is improper construction of ladders and ladders not fastened to their top bearing. It is not always possible to fasten a ladder at the top, but in that case it can be braced near the bottom.

There are jobs where it is impractical to keep electric wires out of reach of the workers. The Atlantic City Convention Hall was of that type. Most of the power used was electric, and as some of the equipment was not stationary, the wires were of necessity so placed that they could be speedily moved. A laborer had a habit of reaching up and taking hold of the wires and he, in addition to a general warning to all men, was particularly warned that he must not touch the wires at any time. He replied that there was no danger, as the wires were insulated. A few days later, when the wires were wet, he again grasped one and received a shock from which he died, although tests made failed to find any current except at the terminals.

The Ohio Plan of Organization and Mode of Attack Against Construction Accidents

By THOMAS P. KEARNS

Superintendent, Industrial Commission of Ohio, Columbus

Nationally the construction industry stands twenty-sixth among the thirty industrial classifications in accident frequency.

Considering the past experience of some other groups which have progressed far along the path of safety, such a record might not offer much discouragement to safety advocates, were it not that progress in accident prevention in construction work is being made so slowly and in some respects has grown worse.

There is no tenable alibi for this position. The industry has its dangers, but the normal hazards encountered by construction workers are no more pronounced than those of workers in other groups. Yet iron and steel, rubber, cement, utilities, railroads and other groups with comparable dangers are constantly demonstrating that accidents can be prevented. Why? Simply because they have gone at the work of prevention intelligently, persistently and in a spirit of cooperation.

It is not a question of initiative, genius

or application. Men in the construction field are just as intelligent as those of other groups. In fact, the skilled craftsmen upon whose services the modern contractor depends probably enjoy the highest standard of literacy of any of these groups. The very nature of their work demands a high order of intelligence.

The construction industry holds its present rating in relation to safety simply because it chooses to. It has never, either nationally or along state lines, taken safety seriously enough to hurdle a few barriers of prejudice, take up the work of accident prevention methodically and give it consideration equal to that directed toward production and profits.

The experience of other groups has been that it is a long, hard battle to reach a point where accident records can be viewed with any degree of satisfaction. Construction has no right to expect a special dispensation that will improve its record and lower its rates over night.

There is no mystery about the causes

of accidents in the construction field. In Ohio and I think in other states six principal causes contribute to at least 75% of our accidents. In order of accident frequency these are: handling objects, falls of persons, stepping upon or striking against objects, hand tools, falling objects and hot, corrosive and poisonous substances. Industrially operated motor vehicles and machinery are close up and, if the tendency of the past few years continues, the former will soon gain a foothold among the "Big Six," as it has in Ohio industry as a whole.

Not one of these accident causes affords an insurmountable obstacle to safety. The majority of them are comparatively easy to eliminate because they can be traced largely to lack of proper selection, direction and supervision, especially the latter. Intelligent work assignments, rigid inspection and supervision and good housekeeping will do away with a large percentage of construction accidents.

The primary responsibility for accident prevention rests with the employer. As a matter of moral duty and economic prudence he must provide safe working conditions, safe equipment and enforce safety methods and safe practices.

Many individual firms are demonstrating that construction jobs can be done without accidental death or injury. We have in our state a number of construction firms engaged in both building erection and public work that have completed large operations without a disabling injury, and some have gone a year, eighteen months and even two years without a reportable injury. These firms have no monopoly on safety ideas or safety systems. They simply preach and practice safety and reap its rewards.

Two methods are open for the advancement of construction safety—arbitrary enforcement of safety regulations, and safety training or organized educational safety work.

Safety education as a means of preventing accidents in industry, is a theory of comparatively recent origin, but it is fundamentally sound and has long since passed the experimental stage. As a matter of fact, this is the principal method used in most states today, and in some it is the only method.

Inspection and the exercise of its attendant enforcement authority have, without doubt, served a very useful purpose. They have been the means of eliminating innumerable hazards from industry, thereby preventing much loss of life and needless suffering.

The installation of safeguards is essential to the success of any safety program:

First, because an unguarded hazard is a constant menace to every worker, regardless of how well trained or how careful he may be, owing to human fallibility;

Second, because it is impossible to obtain the cooperation or support of the workers, so essential to the success of the safety program, unless and until the employer has given a tangible demonstration of his interest in their protection and welfare by supplying the necessary mechanical safety appliances.

One of the primary steps in safety education is the adoption of standard, practical and comprehensive codes of specific requirements providing the greatest measure of protection to workers. This is essential for the proper guidance of the employer as well as the enforcing authorities.

The Construction Safety Code of Ohio, generally recognized as one of the finest mediums of its kind, was developed to its present status with the constant objective of fair, equitable and workable requirements, fashioned along the lines of safe standard practice. Added to these standards is the permissible alternative of "equal or better" substitution. A condition below these standards is not only poor construction but obviously dangerous.

Ever since the organization of the division of Safety and Hygiene we have concentrated efforts toward the improvement of the accident situation in the construction industry.

Originally we devoted our attention to survey of jobs for the detection of accident hazards, urging of compliance with regulatory provisions and personal contact with contractors and their employees. While this was productive of good results, we soon found that attempting to contact all operations was impracticable.

Several years ago we conceived the idea of supplementing this effort with a cam-

paign along state-wide lines to unify the construction forces through a competitive safety contest of all construction interests, dividing them into groups according to hazards as represented by premium rates paid for state insurance. At one time more than 800 concerns were enrolled in this contest. This campaign has been carried on continuously, but up to the present time we have had no really outstanding results, largely because of indifference and lack of cooperation. The enrollments in the campaigns, compared with the strength of the industry in the state, were comparatively few and the exposure represented only a small proportion of the man-hours worked.

With a few notable exceptions we were not getting the support we should have had from the larger concerns; and without their interest it was extremely difficult to enlist the support of the smaller concerns, where indifference to safety was even more pronounced. However, even in the face of these discouragements, we have managed to make headway, not so much in aggregate gains against accidents as in the stimulation of safety spirit among the leaders of the movement, to many of whom the division owes a debt of gratitude for the time given at their own expense in an endeavor to inject more life into it. Having received evidences of safety's value to their own experience, they were willing and even eager to go along with any plan that gave promise of results to their colleagues.

During the early months of 1935 we made a very careful study of the accident experience of the construction industry, and the analysis revealed that notwithstanding the prior depression years when there was practically little work, the industry's experience had not materially improved. We decided, therefore, to call together outstanding leaders of the construction industry for a full and frank discussion of the problem. The meeting was held in October, and a committee of three was appointed to select representatives of all branches of the industry and affiliated bodies. Early in the spring of 1936 another meeting was held, and the "Ohio Construction Council for Safety and Compensation Insurance" was organized. The council consists of 17 mem-

bers representing 17 branches of the industry and organized labor, each council member having an alternate in case of his absence or inability to attend. From the council an executive committee was organized consisting of seven men who are the executive officers of the organization.

Permanent committees have been established under capable leadership, consisting of (1) accident prevention, (2) rates and standardization, (3) legislative, (4) safety codes and regulations, (5) publicity and propaganda and (6) membership.

A 10-point program has been outlined as the immediate objective of the organization. It consists of the following:

A concerted, state-wide program to reduce accidents by adherence to safety rules and regulations; to see that injured employees get proper medical care, thereby hastening the period of rehabilitation; to insist that all employers amenable to the fund pay their premiums and hold certificates of coverage; to urge legislation requiring building departments of cities to have coverage certificates filed with plans and specifications; to urge similar requirements by federal, state and county authorities; to have architects incorporate these provisions in public and private contracts; to educate the public to the economic levies they assume through failure to abide by these requirements; to check up on the qualifications of physicians to prevent cases of malinger; to urge centralized procedure in the investigation and hearing of claims to obviate the expense of employers and claimants traveling to the state capital and to enlist the support of all construction interests in cooperative, accident prevention work, the handling of compensation insurance and other major problems confronting the industry.

The council is strictly a non-profit organization, its officers serving without remuneration. The membership dues are a minimum of \$1 per year per company or organization and this money is used purely for the expense incidental to organization activity and publicity.

The program will be extended into every section of Ohio as rapidly as it is possible to organize the fourteen subdivisions established for the state.

In each industrial center, therefore, will be set up a local or district Construction Safety Council composed of representatives of the employer and employee, who shall be selected by and through employers' organizations and employees' organizations. In each center will be held educational and instructive meetings to acquaint both employer and employee with the seriousness of the accident situation and to instruct them in the proper method of promoting plans for safety contests. These meetings will also emphasize the proper manner in which to construct, erect and use the temporary facilities, safeguards and devices commonly found on every construction job.

Where heretofore the safety efforts have been largely directed by the employers, under the present plan joint action of both employers and employees is being pursued. It is felt that, since safety rewards are mutually beneficial, safety

activities should be a matter of mutual responsibility. We believe this method is the only logical approach to the problem of safety in the industry. How well it works out will be made more apparent when the activities of the council are more thoroughly co-ordinated, which should be early in the coming year.

One feature of the new Ohio campaign that makes it predestined for success is that the industry is not satisfied with a position of entire dependency upon state agencies. The leaders of the movement have approached their problems in a business way.

The entire plan of organization is to create a medium by which and through which the industry will control its accident frequency and which will further serve as a counseling body between the industry and the Industrial Commission on all matters pertaining to accident prevention.

ADJOURNMENT